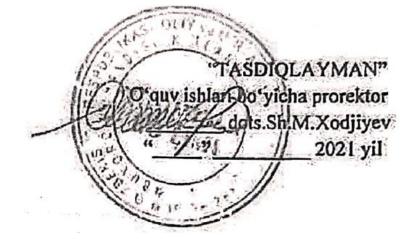


O'ZBEKISTON RESPUBLIKASI OLIY VA O'RTA MAXSUS TA'LIM

VAZIRLIGI

BUXORO MUHANDISLIK – TEXNOLOGIYA INSTITUTI

"XORIJIY TILLAR" kafedrasi



INGLIZ TILI

fanidan

O'QUV – USLUBIY MAJMUA

Bilim sohasi: 300000 – Ishlab chiqarish texnik soha

Ta'lim sohasi:320000 – Ishlab chiqarish texnologiyalari

Ta'lim yo'nalishi: 5321504-Texnologiyalar va jihozlar (mashinasozlik) yo'nalishi

Buxoro-2021

Fanning o'quv-uslubiy majmuasi o'quv dasturiga muvofiq ishlab chiqilgan va BMTI o'quv uslubiy kengashida muhokama qilingan va foydalanishga tavsiya etilgan. (Bayonnoma №1 "__" ____ 2021 yil)

> M.Sh.Shoyimqulova BMTI "Xorijiy tillar" kafedrasi ingliz tili katta o'qituvchisi

Taqrizchilar:

Tuzuvchilar:

M.Z.Salomova BMTI "Xorijiy tillar" kafedrasi katta o'qituvchisi

Z.I.Rasulov BDU"Ingliz filologiyasi " kafedrasi dotsenti

Fanning o'quv-uslubiy majmuasi "Xorijiy tillar" kafedrasining 2021 yil "____" dagi "1"- sonli yig'ilishida muhokamadan o'tgan va institut kengashida ko'rib chiqish uchun tavsiya etilgan.

Kafedra mudiri

H.O'.Yusupova

MUNDARIJA:

1. O'QUV MATERIALLARI:....

- I SEMESTR
- 1 dars
- 2 dars
- 3 dars
- 4 dars
- 5 dars
- 6 dars
- 7 dars
- 8 dars
- 9 dars
- 10 dars
- 11 dars
- 12-dars
- 13 dars
- 14 dars
- 15 dars
- 16 dars
- 17 dars
- 18 dars
- 2. MUSTAQIL TA'LIM MASHG'ULOTLARI, MAVZULARI, SHAKLI, KO'RSATMALAR, VARIANTLAR, TUSHUNTIRISHLAR, BOSHQA MA'LUMOTLAR:.....
- 3. GLOSSARIY:....
- 4. ILOVALAR:

(NA'MUNAVIY) FAN DASTURI :.....

ISHCHI FAN DASTURI:.....

- TARQATMA MATERIALLAR:.....
- TESTLAR:.....
- BAHOLASH MEZONI:.....
- OUM ELECTRON VARIANTI
- 5. FOYDALANILGAN ADABIYOTLAR:

CONTENT:

1. Training materials: I TERM.

Lesson 1. Lesson 2 Lesson 3 Lesson 4 Lesson 5 Lesson 6 Lesson 7 Lesson 8 Lesson 9 Lesson 10 Lesson 11 Lesson 12 Lesson 13 Lesson 14 Lesson 15 Lesson 16 Lesson 17 Lesson 18 **2. INDEPENDENT WORK 3. GLOSSARY 4. APPENDIXES:** STANDARD CURRICULUM **CURRICULUM** HANDOUTS TESTS **EVALUATING** ELECTRON VERSION OF METHODICAL COLLECTION **5. USED LITERATURE**



SECTION 1. MECHANICAL ENGINEERING LESSON 1. Unit 1. Lesson 1. TEXT 1: MECHANICAL ENGINEERING AS A FUTURE

PROFESSION

1. Pre-reading comprehension: Active vocabulary:

engineering	инженерное дело
mechanical engineer	инженер-механик
automotive engineering	автостроение
engineering solutions	техническое, инженерное решение
automobile	легковой автомобиль
vehicle	автотранспортное средство
machinery	машинное оборудование
dynamics	динамика
statics	статика
hydraulics	гидравлика
strength of materials	сопротивление материалов
kinematics	кинематика
applied thermodynamics	прикладная термодинамика
mechanism	механизм
efficiency	эффективность
-	

2. Read the following text.



Engineering as said in the English-English dictionary is

1. The practical application of scientific knowledge in the design, building and control of machines, roads, bridges, electrical apparatus, chemicals;

2. The work, science or profession of an engineer.

The primary types of engineering are chemical, civil, electrical, industrial, and mechanical.

We will study thoroughly mechanical engineering. Mechanical engineering is the application of physical principles to the creation of useful de-vices, objects and machines. Mechanical engineers use principles such as heat, force, and the conservation of mass and energy to analyze static and dynamic physical systems, in contributing to the design of things such as au-tomobiles, aircraft, and other vehicles, heating and cooling systems, house-hold appliances, industrial equipment and machinery, weapons systems, etc.

Fundamental subjects of mechanical engineering include: dynamics, statics, strength of materials, hydraulics, kinematics, and applied thermody-namics.

Mechanical engineers should understand and be able to apply con-cepts from the chemistry and electrical engineering fields.

Engineers in this field design, test, build, and operate machinery of all types; they also work on a variety of manufactured goods and certain kinds of structures. The field is divided into machinery, mechanisms, materials, hydraulics, and pneumatics; and heat as applied to engines, work and energy, heating, ventilating, and air conditioning. The mechanical engineer, there-fore, must be trained in mechanics, hydraulics, and thermodynamics and must know such subjects as metallurgy and machine design. Some mechani-cal engineers specialize in particular types of machines such as pumps or steam turbines. A mechanical engineer designs not only the machines that make products but the products themselves, and must design for both econ-omy and efficiency. A typical example of modern mechanical engineering is the design of a car or an agricultural machine. One of the subtypes of mechanical engineering is automotive engineer-ing.

The automobile was invented in the late 1800's and did not come prominence until the early 20th century. Its basic configuration was deter-mined and mass-production methods were established.

It becomes available to a society. The automobile vastly expanded most people's mobility horizons. It enabled profound changes in most as-pects of modern life. New roads were built to support the automobile. But as there are many advantages so disadvantages of the car invention also exist. It includes air pollution and car accidents. But all this fostered new engineering solutions to improve the quality of the human condition.

3. Choose from the text and put down the English equivalents to the Russian word combinations given below:

сельскохозяйственная машина применение научных знаний создание полезных приборов основные дисциплины промышленные изделия паровые турбины загрязнение воздуха электрические приборы система подогрева и охлаждения промышленное оборудование

серийное производство

дорожно-транспортное происшествие

4. Complete the sentences with given verbs:

operate use specialize design divided work study

- 1. We will...thoroughly mechanical engineering.
- 2. Mechanical engineers...principles such as heat, force.
- 3. Engineers in this field..., and... machinery of all types.
- 4. They also...on a variety of manufactured goods.
- 5. The field is...into machinery, mechanisms, materials, hydraulics.

6. Some of them...in particular types of machines.

Seneral understanding

5. Answer the following questions:

- 1. What is engineering?
- 2. What types of engineering do you know?

3. Why do mechanical engineers use such principles as heat, force, and the conservation of mass and energy?

- 4. What subjects must the mechanical engineer be trained in?
- 5. Are there any disadvantages of the car invention?

6. Cover the text with your hand or a piece of paper. In pairs, try to remember five things about mechanical engineering.

7. Speak about mechanical engineering as a future profession.

LESSON 2. Unit 1. Lesson 2. TEXT 2: AUTOMOTIVE ENGINEERING

Pre-reading comprehension: Active vocabulary:

incorporate	включать
software	программное обеспечение
safety engineering	техника безопасности
involve	вовлекать
separate	разделять
stream	направление
determine	определять
delivery	поставка
responsible	ответственный
evaluation	оценка
conduct	проводить
level	уровень
interaction	взаимодействие
interference	помеха
handle	решать
team	команда
powertrain	трансмиссия
exterior	внешний
interior	внутренний

1. Read the text.

Automotive engineering is a branch of Vehicle engineering. It incorpo-rates elements of mechanical, electrical, electronic, software and safety engi-neering as applied to the design, manufacture and operation of automobiles, buses and trucks and engineering subsystems.

Automotive engineers are involved in almost every aspect of designing cars and trucks. Broadly speaking automotive engineers are separated into three main

streams: product engineering, development engineering and man-ufacturing engineering.

- Product engineer (also called design engineer), that would design components/systems (i.e brake engineer and battery engineer).

- Development engineer, that engineers the attributes of the automo-bile.

- Manufacturing engineer determines how to make it.

A Development Engineer is a job function within Automotive Engi-neering, in which the development engineer has the responsibility for coordi-nating delivery of the engineering attributes of a complete automobile (bus, car, truck, etc.). The Development Engineer is also responsible for organising automo-bile level testing, validation, and certification. Components and systems are designed and tested individually by the Product Engineer. The final evalua-tion though, has to be conducted at the automobile level to evaluate system to system interactions. As an example, the audio system (radio) needs to be evaluated at the automobile level. Interaction with other electronic compo-nents can cause interference.

The design of modern cars is typically handled by a large team of de-signers and engineers from many different disciplines. As part of the product development effort the team of designers will work closely with teams of de-sign engineers responsible for all aspects of the vehicle. These engineering teams include: chassis, body and trim, powertrain, electrical and production. The design team under the leadership of the design director will typically comprise of an exterior designer, an interior designer (usually referred to as stylists), and a color and materials designer. A few other designers will be involved in detail design of both exterior and interior.

2. Match the beginning of the sentence with its end.

1. Components and sys-tems	a. will be involved in detail design of both exterior and interior
2. Other designers	b. are involved in designing cars and trucks
3. Automotive engineer-ing	c. is typically handled by a large team of designers.
4. Automotive engineers	d. are designed and tested by the Product Engineer.
5. The design of modern cars	e. is a branch of Vehicle engineering.
2 Match the words to their a	Jafinitiana

3. Match the words to their definitions.

a. is responsible for organizing
automobile test-ing, certification.
b. determines how to make the
automobile.
c. is involved in automobile
designing and testing.

General understanding:

4. In pairs, ask and answer the following questions:

1. What three main streams are automotive engineers separated into?

- 2. What does automotive engineering incorporate?
- 3. Are manufacturing engineers responsible for organising automobile level testing and certification?

4. What is typically handled by a large team of designers and engineers from many different disciplines?



technology.mp3 Listening comprehension:Technology

What	_ technology? Would	we still be living in caves? Probably. I think there are
two	technology. The kind	ds before and after computers. When we think about
technology before computers,	it	It was all mechanical. Things like steam trains
and fridges. At the time, that	t	technology. But, today's technology is really
cutting edge. It's the kind of t	echnology that	soon as it hits the shelves. I love
this. It's so exciting seeing it	all happen. I love	technology we'll have in the
future, and then buy	It's	like buying technology from science fiction movies.
I'd love to live to be 200 so I	can see what technolo	ogy



LESSON 3. Unit 1. Lesson 3. TEXT 3 AUTOMOBILE PRODUCTION Pre-reading comprehension: *Active vocabulary*

1. Match the English combinations with the corresponding Russian ones:

1. mechanical engineer	а. долгий срок службы
2. deal (with)	b. запустить в массовое произ-
3. designing cars	водство
4. put into mass production	с. подвергать испытаниям
5. long service life	d. плавное сцепление
6. driving safety	е. отвечать современным требо-
7. meet up-to-date demands	ваниям
8. smooth-acting clutch	f. иметь дело (с кем-л., чем-л.)
9. silent gearbox	g. надежные тормоза и рулевое
10. dependable brakes and steering	управление
system	h. безопасность езды (вождения)
11. subject to tests	і. бесшумная коробка передач
	ј. инженер-механик
	k. конструирование автомобилей
2 Read the text	

2. Read the text.

Specialists in automobile industry deal with designing and manufactur-ing cars, so they should know that the production of the automobile comprises the following phases:

1) Designing,

2) Working out the technology of manufacturing processes,

3) Laboratory tests,

4) Road tests,

5) Mass production (manufacturing).

Why is it necessary to know all these facts?

It is important to know them as before the automobile (car or truck) is put into mass production, it should be properly designed and the automobile must meet up-to-date requirements.

What are these requirements?

The automobile must have high efficiency, long service life, driving safety, ease of maintenance and pleasant appearance.

In order to obtain all these qualities engineers should develop up-to-date methods of designing cars, using new types of resistant to corrosion light mate-rials. Also it is important to know computer science because it is intended to shorten the time between designing and manufacturing. Computers offer quick and optimal solutions of problems.

But before the car is put into mass production all its units and mecha-nisms are tested, first in the plant's laboratory, then the car undergoes a rigid quality control in road tests. Only then the car is put into mass production. Why are these tests required? What qualities are required of the automobile? The modern automobile must be rapid in acceleration, must have smooth acting clutch, silent gearbox, dependable brakes and steering system, as well as pleasant appear-ance. Also it must be comfortable and have all conveniences.

3. Find the answers to the following questions. Write down the ques-tions in the order they are asked.

1. Why is it important for the specialists in automobile in-dustry to know computing methods?

2. What qualities are required of the automobile?

3. Why are cars subjected to road tests?

4. What requirements must the automobile meet?

5. What phases does the pro-duction of the automobile comprise? technological processes, laboratory and road tests, mass production, must have smooth acting clutch,

a. It must have high efficiency, long service life, driving safety, ease of maintenance and pleasant appearance.

b. They should be able to develop up-to-date methods of designing cars and shorten the time between designing and manufacturing. c:Beeauseatheyhnusenneetupprodateerequirements.

d. Designing, working out

technological processes, laboratory d. Designing, working out and road tests, mass production. technological processes, laboratory e. It must be rapid in acceleration, and road tests, mass production. must have smooth acting clutch, silent gearbox, dependable brakes and steering system.

4. Complete the sentences using the information from the text:

- 1. The cars are subjected to road tests in order...
- 2. The car must have the following units...
- 3. The car must have the following qualities...
- 4. The production of the automobile comprises the following phases...
- 5. Engineers should develop up-to-date methods of...

5. Work with a partner to label the types of cars.



- a. Convertible
- b. Estate car(station wagon)
- c. Hatchback
- d. Pick up
- e. Saloon(sedan)
- f. Sports car
- g. Limousine
- h. Coupe
- i. SUV(4x4)

General understanding:

6. Which types of cars would you choose for your parents, friends and yourself? Justify your choice and compare it with your partner.

7. Speak about the modern automobile. JUST FOR FUN

Read the text and fill in the gaps with the words from the list:

retake	examiner	unfriendly
underestimated	overcrowded\crowded	conductor
useless	luckily	disbelief
backwards	disappointed	

The driving test

I knew I would have to 1) ... my driving test as soon as I saw the 2) ... He didn't even say "hello" and seemed very 3) I was a little bit late I suppose as I had slightly 4) ... how long it would take me to get there. As usual in this 5) ... city all the buses were packed and I had had to wait more than twenty minutes before a 6) ... would let me get on a bus. I knew apolo-gizing would be 7) ... so I just got in the car. 8) ... I wasn't feeling particularly nervous but this horrible man stared at me in 9) ... as I began to drive off. I put the

car into gear, but it went 10)... so fast I couldn't believe it-straight into the wall. I was so 11) ... when he told me I had failed that I thought I might cry.

ACTIVATE YOUR GRAMMAR SKILLS

Comparative and superlative forms

1. Make up comparative and superlative forms of the adjectives and adverbs in the expressions listed below and translate them:

Important properties, pure metals, much experience, new solutions, long ser-vice life, good protection, well-known metals, useful devices, high efficien-cy, bad results, a modern truck, a large team of designers.

2. Translate these sentences into Russian. Pay attention to the com-parative and superlative forms of the adjectives and adverbs:

1. Metals are the most widely used materials in industry.

2. In general, a metal with small grains will be harder and stronger than one with coarse grains.

3. Small amounts of other metals, less than 1 per cent, are often added to a pure metal.

4. Toughness is different from strength: the toughest steels are different from the ones with highest tensile strength.

5. Plastics are lighter and more corrosion-resistant, but they are not usual-ly as strong as metals.

6. Hot-worked products have better ductility and toughness than the un-worked casting.

7. Rolling is the most common metalworking process.

8. Medium-carbon steels containing from 0.2 to 0.4 per cent carbon are tougher and are used as structural steels.

9. In operations that involve stretching, the best alloys are those which grow stronger with strain.

10. Metals such as copper and aluminium are more ductile in such op-erations than other metals.

11. The properties of a metal can be further improved by use of heat treatment.

12. The higher the pressure, the higher the temperature.

3. Translate the following word-combinations into English:

Самый доступный автомобиль, более прочный материал, наименьшая частица, самый обычный процесс, самое известное изобретение, глад-кая поверхность, самый лучший проект, более низкая температура, наилучший сплав, более хрупкий металл, самые вредные вещества, но-вые методы. **There is/are**

1. Translate the following sentences into Russian. Change the sentenc-es into negative form and questions:

1. There are many different electric cars around the world.

2. There were special driveways for trucks many years ago.

3. There is hardly a place in the world that is not covered by some line of communication.

4. Today there are several hundred million cars in the world not to men-tion millions of motorcycles.

5. There were few roads at the end of the 19 th century in Russia.

6. There are a lot of employment opportunities in mechanical engineer-ing.

7. There is another version of the car where the rear seat can be complete-ly folded away.

8. There will be eight remotely controlled TV cameras for complex cross-ing from Hyde Park Corner to the Hammersmith flyover.

Listening comprehension:

Are you into cars? My brother is		He buys car magazines, watches car	
programmes on TV and		_ looking at car websites. He knows the name,	
maker, engine size and	ever	ry car on the planet. Every time we go out, he	
	about the cars he sees. I like	e cars. They are interesting.	
lot of money, I'd like to		y a sports car. I'm saving up for a small car	
	. I'll probably buy	that is good for the	
environment. My brother th	inks these are boring. He say	ys be powerful and	
fast. I don't agree. I think cars should get		and be big enough for me and my	
friends. I also prefer smalle	r cars because they are	·	

SECTION 2. MECHANICS OF MATERIALS

LESSON 4. Unit 2. Lesson 1. TEXT 1: BASIC PRINCIPLES

1. Scan the texts and find English equivalents for the following words:

Твердое тело, ось, сопротивление материалов, внешняя сила, рав-новесие, внутренняя сила, статика, осевое (продольное) напряжение, деформация, нагрузка, сопротивление, жесткость, прочность, способ-ность выдерживать нагрузку, план-функция, международная система единиц, циклическое нагружение, сосредоточенная нагрузка, ударная нагрузка, статическая нагрузка.

Pre-reading comprehension: *Active vocabulary*

Mechanics of materials is the branch of applied mechanics that deals with the internal behavior of variously loaded solid bodies. The "solid bodies" referred to include shafts, bars, beams, and columns, as well as structures and machines that are assemblies of these components. Also called strength of materials or mechanics of deformable bodies, mechanics of materials focuses primarily on stress analysis and on the mechanical properties of materials.

The study of mechanics of materials is based upon an understanding of the equilibrium of bodies under the action of forces. While statics treats the external behavior of bodies that are ideally rigid and at rest, mechanics of materials is concerned with the relationships between external loads and internal forces and

deformations induced in the body. Stress and strain are fundamen-tal quantities connected with them.

Complete analysis of a structure under load requires the determination: stress, strain, and deformation through the use of three fundamental principles: the laws of forces, the laws of material deformation, and the conditions of geometric compatibility.

Investigation of the behavior of solids under loads began with Galileo Galilei (1564-1642), though Robert Hooke (1635-1703) was the first to point out that a body is deformed if a force acts upon it. Since then many engineers, scientists, and mathematicians in the field of stress analysis have developed the basic knowledge on which modern methods are based, and the literature related to the strength of materials is voluminous.

Exercise № 1. Look at the pictures and answer the questions.



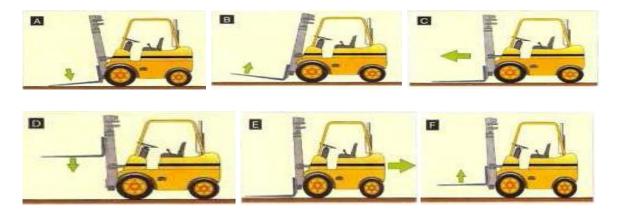
1. How many pedals does it have?

- 2. How many levers does it have?
- 3. Is the steering wheel on the left or on the right?

Exercise № 2. Read the manual. Write the letters (A-G) from the pictures next to the controls.

In the pictures, you can see the controls of the forklift truck. On the left is a lever. This is the direction lever $(1_____)$. Push this lever forwards, and the truck moves forwards. Pull it backwards, and the truck reverses. Next, you can see steering wheel $(2____)$. This turns the truck to the left and right. At the top, on the right, you can see two levers. Push the left-hand lever $(3____)$ forwards and fork moves up. Pull it back, and the fork moves down. Push the right hand-lever $(4____)$ forward, and the fork tilts up. Pull it back, and the fork tilts down. At the bottom, on the right, you can see a lever. This is the parking brake $(5____)$. At the bottom, you can see two pedals. The LH pedal is the brake $(6____)$. The RH pedal is the accelerator $(7____)$.

Exercise № 3. Describe these movements of the truck. Use words from the manual. *Example: A. The fork tilts down*







A long time ago, robots fiction. Children loved looking at movies with robots. Today, robots are real, and _ . In the future, we will all have robots. They will vacuum the floor, wash the dishes, our cars. I even think one day we'll have robot friends. In Japan today. making and robots to help old people to . It's still early days. I'd say we are another 20 to 30 years away _____ in our lives. What will happen to us when the world from robots _____ is full of robots? There'll be no jobs. McDonalds will be . Maybe one day we won't be able to tell robots and humans apart. Maybe world.



3. Read the text once again and answer the questions:

- 1. What is mechanics of materials?
- 2. Give some examples of the solid bodies.
- 3. What are the fundamental quantities of mechanics of materials?



LESSON 5. Unit 2. Lesson 2. TEXT 2: FORCE AND LOAD CLASSIFICATIONS

Pre-reading comprehension: Active Vocabulary

All forces acting on a body, including, the reactive forces caused by supports, are considered external forces. These forces are classified as surface forces and body forces. A surface force is of concentrated type when it acts at a point, but it may also be distributed over a finite area. A body force acts on a volumetric element rather than on a surface and is attributable to fields such as gravity and magnetism. The force of the earth on an object at or near the surface is termed the weight of the object. Internal forces in a body can be considered as forces of interaction between the constituent material particles of the body.

The loads on bodies may be concentrated and distributed forces. Any force applied to an area is a concentrated load. A load slowly and steadily applied is regarded as a static load, while a rapidly applied load is called an impact load.

In the International System of Units, force is measured in newtons (N), but because the newton is a small quantity, the kilonewton (kN) is often used in practice. In the U.S. Customary System, force is expressed in pounds (lb) or kilopounds (kip).



3. Read the text once again and answer the questions:

- 1. What is a surface force and body force?
- 2. Give some examples of the solid bodies.
- 3. What are three standpoints of the load carrying capacity of a body?

Exercise №1. Complete the dialogues with the words in the box.

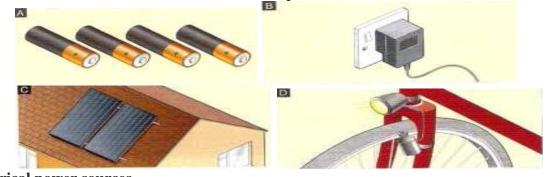
It's	that	these	They're	this	those	
	•	What's			called in English?	
	0				called a screw.	
	•	What's			called?	
	0				called a motorbike	
	•	What are			called in English?	
	0				called bolts.	
	•	What are			called?	
	0				called antennas.	
1	B	-	2	26	3 000	Lel'

■ Exercise №2. Repeat new words and match them with pictures.

nails.....bolts.....nuts.....spanner.....washers....staples.....screws..... screwdriver



Exercise №3. Match the words with the pictures



Electrical power sources

- 1. Mains electricity * AC adapter
- 2. Solar power
- 3. Dynamo 4. Batteries
- 18



Airplanes are amazing. How does something	heavy get off the			
ground? I'm alwaysamazed at how the millions of different				
together. Travelling by airplane is always a wonderfulexperience.				
whether economy class iscramped and has no space. I like				
playing with entertainment syste	m, especially nowthey have all			
the latest movies airplanefood.	Many of my friends say			
, but I loveit. I often ask the pas	senger next to me if I can have			
the dessert or want. The only this	ng I don'tlike about planes is			
turbulence. When the airplane p	ockets, I always worry			
But I once read that turbulence has				

anairplane to crash.



LESSON 6. Unit 2. Lesson 3. TEXT 3: SCOPE OF TREATMENT

The usual objective of mechanics of materials is the examination of the load carrying capacity of a body from three standpoints: strength, stiffness, and stability. These qualities relate to the ability of a member to resist permanent deformation or fracture, to resist deflection, and to retain its equilibrium configuration. The stress level, sometimes expressed through failure theories which relates to the complex stresses in a structure with the experimentally obtained axial stress, is used as a measure of strength. Failure can be defined, in very general terms, as any action that results in an inability on the part of the structure to function in the manner intended.

The main concerns in the study of mechanics of materials may be summarized as follows:

1. Analysis of stress and deformation within a loaded body, which is accomplished by application of one of the methods.

2. Determination by analysis (or by experiment) of the largest load a structure can sustain without suffering damage, failure, or compromise of function.

3. Determination of the body shape and selection of those materials which are most efficient for resisting a prescribed system of forces un-der specified environmental conditions of operation. This is called the design function.

The ever-increasing demand for more sophisticated structural and machine components calls for the concepts of stress and strain and of the behavior of materials.

2. Fill in the gaps with the words and right preposition from the texts:

1. A surface force is ... concentrated type when it acts ... a point, but it may also be distributed ... a finite area.

The design function is determination ... the body shape and selection ... those materials which are most efficient ... resisting a pre-scribed system ... forces ... specified environmental conditions ... operation.
 The study ... mechanics ... materials is based ... an understanding ... the equilibrium ... bodies ... the action ... forces.

4. ... the International System of Units force is measured ... newtons.

5. Mechanics ... materials focuses primarily ... stress analysis and ... the mechanical properties ... materials.

General understanding

3. Read the text once again and answer the questions:

- 1. What is the usual objective of mechanics of materials?
- 2. What is the design function.
- 3. Who began to investigate the behavior of solids under loads?
- 4. What is used as a measure of strength?
- 5. What is force measured in?
- 6. What does complete analysis of a structure under load require?

4. Complete the sentences using the information from the text:

- 1. The usual objective of mechanics of materials is ...
- 2. The loads on bodies may be ...
- 3. Robert Hooke was the first to ...
- 4. Failure can be defined as ...
- 5. Mechanics of materials is the branch of ...
- 6. Statics treats ...

Exersise. Match the pictures with the words in the box



What do you think? Is television good or bad? I loved it ______. My eyes were glued to the TV screen for hours and hours. I watched cartoons and other ______. It was good at the time, but maybe I ______.

outside playing or doing something more useful. There's ______ TV. There are so many programmes that you watch just because you're too lazy ______. A lot of people turn on the TV and sit in front of it all day or all night. ______ time! I think television programmes are getting worse. Reality TV and celebrity chat ______. The only good things on TV nowadays is the news, live sport and comedy shows. Plus an interesting ______.



LESSON 7. Unit 2. Lesson 4. Drawing (Sheet metal forming, forging) Pre-reading comprehension:

Active Vocabulary

TEXT 4 : APPLIED MECHANICS

1. Match the English terms with the corresponding Russian one

а. применять
 b. частица
с. отношение
d. условие
е. законы механики
f. движение
g. величины
h. масштаб, размер
і. незначительный
ј. прикладная механика
k. размеры
1. постоянный
m. твердое тело

2. Read the text.

Mechanics is a branch of physical science which considers the effect of forces upon the motion or upon the conditions of material bodies. Applied mechanics is a part of mechanics. It includes the laws of mechanics to be applied to the motions of particles and of rigid bodies as used in problems of engineering. The condition of rest is considered to be the limit-ing condition of motion.

A particle is a body or a part of a body the dimensions of which are small and negligible when it is compared with its surroundings or with its range of motion, so that the force acting upon it may be localized at a point. The subject of applied mechanics may be divided into two parts statics and dynamics, and dynamics may be further divided into kinematics and kinetics. It is statics that treats bodies in equilibrium, and dynamics that treats the particles and bodies in motion. Kinematics is the part of dynamics to treat the motion of particles and rigid bodies without reference to the forces that produce or change the motion. Kinetics is the part of dynamics to treat the motion of material bodies which are changed by the application of forces. In order to understand thoroughly such a subject as applied mechanics, it is nec-essary for the student to solve a number of problems.

There are three common methods of analysis of problems: the graphic method, the trigonometric method and the algebraic one. In the graphic method, the quantities are represented by corresponding lines or areas; the relations between them are represented by the relations of the parts of the di-agram.

In the trigonometric method, the quantities are represented by lines or areas as well but they are not necessarily drawn to scale.

In the algebraic method, quantities are represented by symbols; the relations between them are shown by signs indicating the operations; and the solution of the resulting equations is made by algebra.

General understanding

3. Complete the sentences with one possible answer:

1. Mechanics is a branch of physical science which considers ...

b) the effect of radiation upon people and animals.

c) the effect of forces upon the motion or upon the conditions of material bodies.

d) the forms of transformation of energy connected with the movement of material systems under the action of force factor.

2. ... the quantities are to be represented by corresponding lines or areas; the relations between them are to be represented by the relations of the parts of the diagram.

a) In the algebraic method ...

b) In the graphic method ...

c) In the trigonometric method ...

3. ... is the part of dynamics to treat the motion of material bodies which are changed by the application of forces.

a) Kinetics

b) Kinematics

c) Statics

4. Insert the preposition wherever necessary:

1. Applied mechanics may be divided ... two parts statics and dynamics.

2. Statics treats ... bodies ... equilibrium.

3. A problem ... mechanics consists ... a statement ... certain known quantities and relations ... which certain other unknown quantities or relations are to be determined.

4. ... the trigonometric method, the quantities are to be represented ... lines or areas.

5. Understanding ... applied mechanics depends ... the ability ... students to solve a number ... problems



How important ______ mobile phone? Do you really need it? In the 1980s there were no mobile phones. People ______ phone their family and friends and do business. Of course, there were more public telephones then. There was a telephone box ______ street corner. I wonder whether mobile phones ______ thing. For sure, they are very convenient, but they can ______. There's nothing worse than talking to someone and then _______ ten minutes while they answer their phone. I have even seen people _______ person chats on the phone for 30 minutes. How would _______ if you didn't have a mobile? Would you miss listening to other people's conversations on the train?

LESSON 8. Unit 2. Lesson 5. TEXT 5: PROPERTIES OF METALS AND THEIR USES Pre-reading comprehension:

Active Vocabulary:

alloy	сплав
steel	сталь
strength	прочность
ferrous	черный
nonferrous	цветной
toughness	жесткость
bending	сгибание
softness	мягкость, пластичность
rusting	коррозия
oxidation	окисление
sharp melting point	четкая точка плавления

coefficient of expansion breadth thickness specific gravity specific density electrical resistance mechanical properties sheathing tensile strength

compressive strength ductility

коэффициент расширения ширина, степень, объем плотность удельный вес (масса) удельная плотность электрическое сопротивление механические свойства обмотка предел прочности, прочность на растяжение прочность на сжатие ковкость

1. Read the text.

The selection of the proper metal or alloy for a given use is an im-portant part of the practice of metallurgy. Because iron and steel are used in larger quantities than any of the other metals, it is common practice to divide materials into ferrous and nonferrous.

- Strength, ease of shaping and relatively low cost are of greatest importance for major structural purposes. For these purposes steel is ideally suited. For automobile parts, and wherever greater strength and toughness are required, more expensive special steels are used.

- Metals light in weight – For making different machine parts, and in other applications where strength must be combined with light weight, metals such as aluminum or magnesium and their alloys are used.

- Softness. Ease in bending – For uses requiring softness and ease in bending, as in cable-sheathing and where certain chemical properties are needed, lead and its alloys may be employed.

- Susceptibility to corrosion – Metals vary greatly in their susceptibility to atmospheric and chemical corrosion. The rusting of iron is the commonest example.

- Oxidation or corrosion of those metals takes place at ordinary temperatures. Such metals as sodium, magnesium, zinc, iron, nickel, lead are difficult to obtain free in nature as they unite readily with other elements. And such metals as hydrogen, silver, copper and gold are found free in nature be-cause they combine with other elements with difficulty. They do not corrode and are not easily oxidized.

- Melting Point – The melting point is the temperature at which a substance passes from a solid to a liquid condition. Pure substances have a sharp melting point, that is, they pass from entirely solid to entirely liquid form in a very small temperature range. Alloys usually melt over a much wider tem-perature interval.

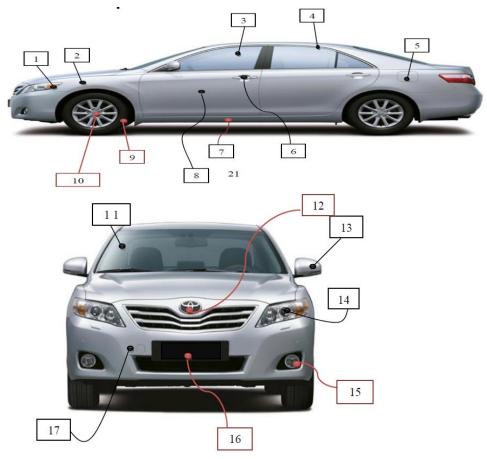
- Coefficient of expansion – With few exceptions, solids expand when they are heated and contract when cooled. They increase not only in length but also in breadth and thickness. The number of factors that shows the actu-al increase in unit length of a solid when it is heated one degree is called its "coefficient of expansion".

- Specific Gravity – Sometimes it is an advantage to compare the densi-ty of one metal with that of another. For such a purpose, we need a standard. Water is a standard that physicists have selected with which to compare den-sities of solids and liquids. The weight of a substance compared to the weight of an equal volume of water is called its specific density or specific gravity.

- Electrical resistance – The opposition to electric current as it flows through a wire is known as the resistance of the wire.

- Mechanical properties - Generally we are very much concerned with the mechanical properties of metals and alloys. The mechanical properties, such as hardness, tensile strength, compressive strength, and ductility are those measured by mechanical methods

2. Label the parts of the car.



•roof •wing •indicator •fog light •side window •front bumper •number
plate •logo •petrol flap •door handle •sill •door •headlight •tyre
•wheel trim •windscreen •wing mirror

3. Match words from the two columns to find the exterior car parts:

front	whiper
petrol	light
head	bumper
wheel	cap
windscreen	arch
number	window
side	pipe
exhaust	plate
1 What same anter	and made of the 4 moder is 19 Wards with a month

4. What car parts are made of what material? Work with a part-ner to complete the table.

Material	Car part(s)
steel	
wood	
sheet	
metal	
magnesium	
glass	
plastic	
rubber	
aluminum	
leather	
textile	

5. Complete the sentences about materials and their properties with the following words:

shatterproof light corrosion-resistant durable elastic natural rig-id malleable

a. Wood is very often used in interiors because it looks...and warm.

b. Aluminum and magnesium are important in car manufacturing because they are...and therefore good for weight-saving.

c. Rubber should be able to withstand great temperature differences while staying... In other words, it shouldn't become brittle.

d. Windscreens are made of special... glass to protect drivers in accidents.

e. Fabrics used in cars need to be... and not look old too quickly.

f. Steel is used for load-bearing parts because it is...

g. Sheet metal is used for large car parts because it is...and dent-resistant.

h. Aluminum is ideal for bumpers and other body parts because it is... JUST FOR FUN

Read the text and fill in the gaps with the words from the list: ignition; gear; brake; seatbelt; accelerator pedal; dashboard; clutch pedal; rear view mirror.

The first time I drove after passing my driving test, I was determined to get everything right. Got into the car, turned the key in the 1) ... and put my foot on the 2) ... while changing into first 3)

Slowly I pressed down on the 4) ... and pulled out into the road. Driv-ing along, I remembered to look at the petrol gauge on the 5) ... to make sure I had enough petrol. Suddenly, a flashing light in the 6) ... caught my eye. There was a police car behind indicating that I should pull over, so I gently pressed on the 7) ... and stopped. Winding down the window, I asked the policeman what was wrong – I had thought I was doing so well! His answer was very embarrassing: "You've forgotten to put on your 8) ..."

General understanding

ACTIVATE YOUR GRAMMAR SKILLS

Modal verbs

1. Read the following sentences, find modal verbs or their equivalents and translate the sentences:

1. The atoms are arranged regularly and can slide over each over.

2. Lead is soft and can be bent by hand, while iron can only be worked by hammering at red heat.

3. Forging, bending, and shearing may be used alone, but often all three are used on one part.

4. Engineers must know how materials respond to external forces, such as tension, compression, torsion, bending and shear.

5. The materials may also have permanent deformation or they may fracture.

6. Stiffness is important when a rigid structure is to be made.

7. Ductile materials can absorb energy by deformation but brittle materials cannot.

8. Density is important in any application where the material must not be heavy.

9. All metals can be formed by drawing, rolling, hammering and extrusion, but some require hot-working.

10. These machines are not needed now, but they may be required in about ten years.

11. The ambulance car is to be specially equipped – the driver's compartment should be isolated from the patient room by a partition.

Participle I, II 1 a. Form Participle I, using the verbs from the 1st column.

b. Form Participle II, using the verbs from the 2nd column.

to design	to drive
to study	to separate
to use	to make
to heat	to increase
to find	to fall
to develop	to forget
to choose	to move
to break	to investigate
to increase	to apply
to build	to work

c. Try to make 5 sentences of your own, using the verbs listed above.2. Translate the following sentences, find Participles. State the form and the function:

1. In some countries where automobiles are found in millions they are playing a most important part in the solution of many problems of transport.

2. The electric automobile energized by rechargeable batteries appeared to have a great future nearly a century ago.

3. The first practical internal combustion engine was built by Etienne Lenoir, a Belgian living in France.

4. Responding to the global environmental challenge, Michelin introduced the world's first 80,000-mile tire in 1992.

5. Soon sundry vehicles powered by steam, internal combustion engines, and electricity were rolling across Germany, France and the United States.

6. Transportation is a system consisting essentially of three components: driver, vehicle and road.

7. All the companies investigating diesels are trying to reduce noise and smoke, but the problems are not yet entirely solved.

8. Gold does not rust not even when heated.

improvement усовершенствование

SECTION 3

THE HISTORY OF THE AUTOMOBILE



LESSON 9. Unit 3. Lesson 1. TEXT 1: WHERE DOES THE WORD "AUTOMOBILE" COME FROM?

Pre-reading comprehension:

Active Vocabulary

1. Before you read the text try to guess the answer to the follow-ing question:

consist of	состоять из
self-moving	самодвижущийся, самоходный
arise from	обуславливаться
unprovided	необеспеченный
rails	железнодорожные пути
substantially	значительно
adapt for	приспособить
cease	перестать
luxury	роскошь
decisive factor	решающий фактор
solution	решение
development	развитие
road maintenance	содержание дорог
improvement	усовершенствование

The word automobile is not English. It consists of two words: autos and mo-bilis. Autos is a Greek word meaning "self", mobilis — a Latin word meaning "movable". The two words taken together mean "self-moving". Thus, an au-tomobile means a self-moving vehicle. The synonyms of automobile are: auto, car, auto-car, motor car.

The role and importance of an automobile arise from the fact that it can move along roads unprovided with rails. In this respect, it substantially differs from a street car (tram) and a railway car (train). In fact, it often replaces street cars, railway cars, and other agencies of transportation and communication.

In short, the automobile is a vehicle well adapted for ordinary road conditions.

The automobile has long since ceased to be a matter of luxury or sport and has become a decisive factor in the economic development of many countries. This accounts for the fact that the world at large uses a great number of automobiles. In some countries where automobiles are found in millions they are playing a most important part in the solution of many problems of transport.

The development of automobiles is also accountable to a large extent for the progress in road maintenance, improvement and construction.

Read the text and do the following exercises:

2. Find the synonyms to the word "automobile" in the text above.

3. Fill in the gaps with the suitable words and words-combinations from the text:

1. An automobile means...

2. The role and importance of an automobile arise from the fact that it can ... rails.

3. The automobile is a vehicle ... for ordinary road conditions.

4. The automobile has become... in the economic of many countries.

5. The development of automobiles is accountable for the progress in road...

General understanding

4. Answer the questions:

- 1. What is the original of the word automobile?
- 2. What fact does the role and importance of the automobile arise from?

3. Why does the automobile play an important part in the economic development in many countries?

LESSON 10. Unit 3. Lesson 2. TEXT 2: THE EARLY DAYS OF THE AUTOMOBILE

1. Scan the text and find the names of famous scientists and their inventions:

achievement	достижение
single	один
attempt	попытка
mechanical power	механическая энергия
propel	приводить в движение
suggest	предлагать
military engineer	военный инженер
steam-driven engine	паровой двигатель
three-wheeled carriage	трехколесный экипаж
brake	тормоз
gearbox	коробка передач
opposition	сопротивление
lag	отставать
restriction	ограничение
legislative act	законодательный акт
outlaw	запрещать
editor	редактор
issue	издавать, выпускать
appear	появляться

escort

prosecute

Like most other great human achievements, the motor car is not the product of any single inventor.

One of the earliest attempts to propel a vehicle by mechanical power was suggested by Isaac Newton. But the first self-propelled vehicle was constructed by the French military engineer Cugnot in 1763. He built a steamdriven engine which had three wheels, carried two passengers and ran at maximum speed of four miles per hour.

In 1784 the Russian inventor Kulibin built a three-wheeled carriage. In his vehicle he used for the first time such new elements as brakes, rollers and a gearbox.

In 1825 a steam engine was built in Great Britain. The vehicle carried 18 passengers and covered 8 miles in 45 minutes. However, the progress of motor cars met with great opposition in Great Britain. Further development of motor car lagged because of the restrictions resulting from legislative acts.

The most famous of these acts was the Red Flag Act of 1865, according to which the speed of the steam-driven vehicles was limited to 4 miles per hour and a man with a red flag had to walk in front of it.

In Russia there were cities where motor cars were outlawed altogether. When the editor of the local newspaper in the city of Uralsk bought a car, the governor issued these instructions to the police: "When the vehicle appears in the streets, it is to be stopped and escorted to the police station, where its driver is to be prosecuted."

2. Fill in the gaps with the words from the text and translate the sentences into Russian:

1. Like most other great human, the motor car is not the product of

2. In his vehicle Kulibin used for the first time such new elements as ..., ... and ...

3. The progress of motor cars...in Great Britain.

4. The speed of the steam-driven vehicles was... to 4 miles per hour and a man with a red flag ... front of it.

5. In Russia there were cities where...were outlawed altogether.

General understanding

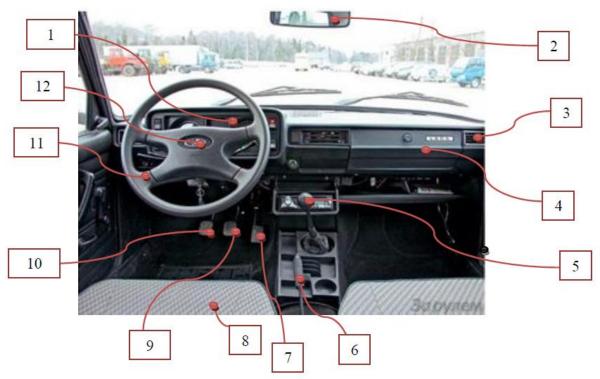
3. What do these dates and figures refer to in the text?

1865 • 8 • 1763 • 45 • 1825 • 1784 • 4 • 3

4. Answer the questions:

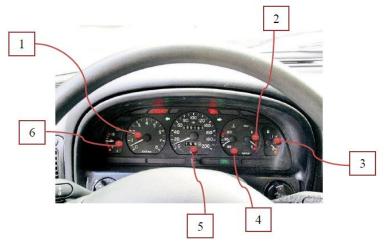
1. Is the motor car a product of a single inventor?

- 2. When was the first self-propelled vehicle constructed?
- 3. Did the progress of motor cars meet with great opposition?
- 5. Speak about the history of the automobile.
- 6. Label the parts of a car interior.



•steering wheel •real-view mirror •handbrake •car seat •brake pedal • glove compartment •horn •dashboard •gear stick •air vent • clutch pedal •accelerator.

7. Match the numbers with the names of the instruments.



•engine oil pressure gauge • rev counter • coolant temperature gauge • fuel gauge • speedometer • voltmeter JUST FOR FUN

Read the following news report and fill in the correct words from the list:

braked injuries direction crashed damaged overtake skidded collision

"... There have been further road accidents following yesterday's heavy rain. Early last night two motorists suffered serious 1) ... in an incident involving three vehicles.

Mr. Ray Amberly from Newden was traveling along Pyke Road at around 90 mph when he noticed the van behind his car which was driven by Mr. Joseph Brown, moving out to 2) ... him. Mr. Amberly 3) ... slightly in order to let the driver of the van pass, but instead of slowing down, his car 4) ... on the slippery surface and 5) ... into the van. As a result, the van was knocked into the third vehicle, which was coming from the other 6) It was driven by Mr. Luke Porter. All three vehicles were severely 7) ...

in the 8) ... and the three drivers had to be taken to hospital.

Police believe that the crash could have been avoided if the drivers had not been so fast under such dangerous conditions."

ACTIVATE YOUR GRAMMAR SKILLS

Active Voice

1. Translate into Russian. Determine the Tense of the verb:

1. Some of America's most distinguished inventors were promoting electrics or taking part in their development.

2. This car was so comfortable and reliable that one of the models of Rolls-Royce cars ``Silver Ghost`` had not changed greatly for 20 years since 1907.

3. Internal combustion gasoline engines run on a mixture of gasoline and air.

4. Each cylinder contains a piston that travels up and down inside the cylinder bore.

5. Most engines have two valves per cylinder, one intake valve and one exhaust valve.

6. By the time the crankshaft completes two revolutions, each cylinder in the engine will have gone through one power stroke.

7. Some newer engines are using multiple intake and exhaust valves per cylinder for increased engine power and efficiency.

8. An engine running without oil will last about as long as human without blood.

9. At the outbreak of World War I the number of vehicles in Russia did not exceed 10,000units, mostly of foreign make.

10. It was only after the Great October Socialist Revolution that automotive industry began developing in our country.

11. In 1937 the Soviet Union was the first in Europe and the second in the world (after the USA) in the production of trucks.

12. On passenger cars the lines of the body play a great role.

Passive Voice

1. Translate into Russian. Determine the Tense of the verb:

1. Before World War I only a few automobiles were produced in Russia.

2. A successful research has been made in materials for machine parts that operate at high temperatures and under high tensile forces.

3. The heater is located in the trunk, it works on petrol.

4. Another experiment is being conducted over a crowded area of Central Glasgow which includes 80 traffic signals.

5. Air is mixed with the vapour of the petrol in the carburetor.

6. Car A was driven by a driver avoiding any risk, and car B as fast as legally possible.

7. The valves are the openings in the cylinder wall that are uncovered by the piston at the end of its outward travel.

8. Machine-tools usually work materials mechanically but other machining methods have been developed lately.

2. Put the verbs in brackets in the right form and translate them into Russian:

1. The truck (to adapt) for operation under any climatic and road conditions.

2. During six years only 451 cars and a few score of trucks (to deliver).

3. An electric warning system which tells the motorists when his wheels are spinning on slippery roads (to develop) by a Swedish engineer, Helge Ceder.

4. The first electrical cars (to build) at the end of 19 th century.

5. Air (to draw) into the heater from the saloon by a fan.

6. Every year several thousand people (to kill) on the roads in Great Britain.

7. In 1903 nobody (to allow) to drive faster than 20 miles an hour.

8. New alloys (to engineer) for use in new technology.

9. The company (to find) in 1889 and since then it (to engage) in the construction of coach work for passenger transport.



General understanding

LESSON 11. Unit 4. Lesson 1. SECTION 4. CAR INDUSTRY AND ENVIRONMENT. TEXT 1: CARS: PASSION OR PROBLEM?

удобство
увлекательный
ценный
выпускать
доступный
развлечение
реклама
сотовый телефон
десяток
уличное движение
средняя скорость
заполнять
скоростная автомагистраль (без
платы за проезд)
специалист по охране окружающей
среды
топливо
защищать
бензин
стоянка для автомобилей
доступный
считать
нуждаться
загрязнять
полет
работающий на солнечной энергии

1. Read the first paragraph of this text. Predict what the rest of the reading will be about, using the choices below. You can circle more than one answer. Then continue reading it.

- 1. the convenience of cars
- 2. the excitement of cars
- 3. the development of cars
- 4. the danger of cars

For some people, the car is a convenient form of transportation. But for others, the car is an exciting hobby. Some people spend their lives collecting valuable cars. Others drive them in races, including the Mille Miglia in Italy, the Carrera Panamericana in Mexico, and the worldfamous Indianapolis 500. For many people, cars are more than transportation. They are a source of passion and pleasure. Yet cars can also be a source of many problems.

In 1903, Henry Ford began selling the Model T car for \$825. His company, Ford Motors, was the first to produce cars in large numbers. This made the car available to large numbers of people and helped them to travel long distances quickly and easily. The car has brought people much closer to places of work, study and entertainment.

Many people also work in car-related industries: fixing cars, washing cars, advertising cars and selling car products such as stereos and cellular phones.

Most Americans buy a new car every five or six years. This means that one American may own a dozen cars in a lifetime. In fact, there are more cars than people in the United Slates. In New York City, 2.5 million cars move in and out of the city each day. In this traffic, the average speed is sometimes 8.1 miles per hour. This speed could easily be reached by riding a horse instead of driving a car. But New Yorkers continue to drive, just as people do in California, where freeways are often very crowded. Some environmentalists believe that forms of public transportation such as buses and trains have not been fully developed in the United States. They try to teach others that public transportation saves fuel and helps to protect the environment. Many people are unhappy with car traf-fic and pollution, as well as with the use of beautiful land for building new roads. One environmentalist, Jan Lundberg, left his Mercedes-Benz in Los Angeles and moved to the forests of northern California. There he works on the Auto-Free Times, a newspaper that teaches people how to live without driving. Lundberg travels on foot, on bicycle, or by bus. Before he decided to live without a car, Lundberg worked for the oil companies, studying the prices of gasoline.

Lundberg and other environmentalists dream of turning parking lots into parks and replacing cars with bicycles, but most people around the world believe that the car is a necessary part of life in today's world. Still, there is an important question that must be answered: What kind of fuel will we use when gasoline is no longer available? Lundberg believes that by the 2021, there will no longer be oil for gasoline makers to use. To solve this problem, car companies in Korea, Japan, Europe, and the United Stales are trying to develop an electric car that will not require gasoline at all. The electric car is not a new idea. It had success with American wom-en in the early 1900s.

Women liked electric cars because they were quiet and did not pol-lute the air. Electric cars were also easier to start than gasoline–powered ones. But gasoline-powered cars were faster, and in the 1920s they be-came much more popular.

The electric car was not used again until the 1970s, when there were serious problems with the availability of oil. Car companies began to plan for a future without gasoline. The General Motors Company had plans to develop an electric car by 1980; however, oil became available again, and this car was never produced.

Today there is a new interest in the electric car, which is partly re-lated to a passion for speed and new technology. In 1977, engineer Paul MacCready, designed a human-powered airplane that successfully completed a three-mile flight. A similar airplane crossed the English Channel in 1977, followed by a solar-powered airplane. In 1987, the Sunraycer, a solar-powered car, won a 2,000-mile race in Australia. As a result of this success, the General Motors Company began new work on the development of the electric car. The Toyota Company recently decided to spend \$800 million a year on the development of new car technology. Many engineers believe that the electric car will lead to other forms of technology being used for transportation.

Cars may change, but their importance will not. Cars are important to nearly everyone, including engineers, businesspeople, environmentalists, and even poets. Poet Curt Brown believes that cars are part of our pas-sion for new places and new experiences. According to Brown, this "very,

very comfortable flying chair" will continue to bring us travel and adventure, no matter how it changes in the future.

General understanding

2. Number the following main ideas in the order they appear in the text:

- ___a. Soon there will be no oil to fuel cars.
- ___b. Cars, whether gasoline or electric powered, will always be important.
- ____c. Cars can cause problems.
- ____d. To some people, cars are more than transportation.
- ___e. Some environmentalists teach people how to live without cars.

___f. People in the U.S. need cars to go to school, to work, and to places of entertainment.

3. Complete the following lists with information from the text: Advantages of the car:

1. Some people enjoy
2. People can travel
3. People are closer to
4. Some people make money by
Disadvantages of the car:
Disadvantages of the car: 1. Lots of traffic and
6

4. Gasoline may no longer	
---------------------------	--

LESSON 12. Unit 4. Lesson 2. TEXT 2 PLANNING FOR AN ENVIRONMENT-FRIENDLY CAR

1. An environmentalist is someone who works to protect the environment: the air, land and oceans of the Earth. Read the article below. It describes a meeting of environmentalists who want to prepare for the future with fewer cars. Replace the underlined words and phrases with the words printed above the text.

available convenient develop engineers fuel industries passion source technology valuable At a recent meeting of environmentalists, the problem of cars was discussed. Most environmentalists believe that in the future, there will be no more oil. This means that there will be no more gasoline for the cars that so many of us drive every day.

The environmentalists agreed that cars have made our lives much easi-er and more comfortable. But they believe that it is very important for the people who are working on machines to try and build new ones that will not require gasoline.

"We have always been good at using science to create new machines", said one environmentalist. "This is very important. Our ability to build and create new forms of transportation will help us face a future without gasoline."

The environmentalists also discussed the importance of working with businesses to help them prepare for the future. "A world without gasoline means a world with fewer cars, added one man. "And this is good because it means less pollution. Maybe companies could find a way to pay extra money to workers who take buses or ride bicycles to work."

Most of the people at the meeting described their deep love for the Earth and their desire to keep it clean. They want to power cars by using so-lar or electric power as the place where energy comes from. Both of these create less pollution than gasoline, and they will continue to be usable in the future.

General understanding

2. What ideas did the environmentalists discuss at the meeting?3. Environmental awareness will become increasingly important in the future. How environmentally-conscious are you?

Which students in the class do you think would answer "yes" to the follow-ing statements? Ask them and see if you were right.

1. Fuel should be highly taxed.

2. I always find out if my car has been manufactured in a plant with an eco-audit.

3. I consider the car's recyclability when I decide which new car to buy.

4. Introducing a speed limit on roads is a good idea.

5. A car's fuel consumption is a key priority when I buy a car.

4. Read and translate the phrases used to talk about the future:

without doubt I'm absolutely certain there's a good chance

is quite likely there's no doubt that we are convinced

it's highly probable is expected to

Now use these phrases to discuss these statements in small groups.

In the next five/ten/twenty years...

cars will have an auto pilot.

sports cars will have a top speed of more than 300 km/h.

cars will use only one litre of petrol per 100 km.

environmentally-friendly cars will be more important.

cars will be like office with on-board computers and email facilities.

5. Work with a partner. Prepare a short presentation of these topics.

Look at the useful phrases for help with presentation language.

I am going to speak about...

There'll be time for questions at the end.

Firstly/Secondly/Thirdly/Finally...

Now we come to...

In conclusion...

Are there any questions?

- Fuels of the future
- The car of the future
- The future of my company

Give your presentation to your fellow students.

ACTIVATE YOUR GRAMMAR SKILLS

Sequence of tenses

1. Translate the following sentences:

1. He asks if he may keep this car as long as he needs it.

2. In 1847, Werner von Siemens publicly said he would build an electric-powered carriage.

3. The makers claimed that the twenty-four-cell battery could propel the vehicle at a speed of about ten miles an hour for five hours.

4. Lundberg believes that by the 2021, there will no longer be oil for gasoline

makers to use.

5. Poet Curt Brown believed that cars were part of our passion for new places and new experiences.

6. The report said it had decreased the efficiency by twenty per cent.

7. They thought I could drive a car.

8. They asked how normal temperature was maintained in the cooling system.

9. They said that the manager would inspect the automobile plant the following day.

Conditionals

1. Translate the sentences and define the type of Conditional:

1. If he didn't flush the system, the radiator might get blocked.

2. If the engine did not have a method for cooling itself, it would quickly self-destruct.

3. If no universal joints were used, the shaft would jam in its bearings from the up and down movement of one end of it.

4. If the rolling is finished cold, the surface will be smoother and the product stronger.

5. If several hundred million cars changed over to electricity they would require six million kilowatt hours and all the power stations in the world now generate only a little over a third of that.

6. If any one of these components failed, the whole system would fail, and conditions of hazards would be created on the road.

7. If you didn't do that, the system might freeze up.

8. If there's leak at the cylinder head, there's nothing you can do but take it off and fit a new gasket.

9. If you leave the car very long, the police might tow it away.

10. If the fuel is injected directly into the chamber, it ignites very quickly.

LESSON 13. Unit 5. Lesson 1. SECTION 5 TEXT 1 THE CHANGING EXPECTATIONS OF AUTOMOTIVE

ENGINEERS

SUPPLEMENTARY READING

Read the following texts and make the summaries. Useful phrases are given below:

1. The object of this paper/ text is to present (to discuss, to describe, to show)...

2. The text discusses some problems relating to...

3. The paper begins with a short discussion on...At first, the author notes that (describes)...

4. Next (Further, Then) the author explains that... The next paragraph deals with (presents, discusses, describes)...

5. The final paragraph states (describes, ends with)...The conclusion is that the problem is ...

6. In my opinion (To my mind, I think) ... The text/ paper is interesting (not interesting), of importance (of little importance), valuable (invaluable), up-to-date (out-of –date), useful (useless) ...

automotive engineer	инженер-механик, инженер- автомобилист
be associated with	быть связанным с
suspension system	система подвески
door handle	дверная ручка
venture	решиться, рисковать
add-ons	дополнительные устройства
highlight	придавать большое значение
competitive quality	конкурентоспособное качество
manufacturing capability	производственные
	(технологические) возможности
software development	разработка программного
	обеспечения
vehicle performance evaluation	оценка работы машины
prior to	до
computer simulation	компьютерное моделирование
compliance	соответствие
regulations	технические нормы

In the past, automotive engineers were closely associated with the field of mechanical engineering. After all, most automotive engineers dealt with topics such as gasoline and diesel engines, transmissions, suspension systems, chassis, door handles, seats, etc. A few ventured off into new devel-opments such as turbine gas engines, continuously variable transmissions, or even Sterling engines. Some dealt with plastics and painting systems. The vast majority of knowledge needed by the automotive engineer of the past was mechanical in nature.

The reality of today is that the automotive engineer knows about far more than just mechanical engineering. To attract the best, the industry needs to project an image of the automotive engineer as someone with skills and knowledge beyond mechanical engineering.

The modern automobile has often been described as a computer on wheels. It is that and more — much more. Electronics control component systems such as the engine, transmission, and brakes. Those controls have become not just add-ons but integral parts of the operation of each system and the whole vehicle. A focus is on intelligent vehicle technology, which highlighted the integration of more electronics into the vehicle.

No longer can design engineers "throw their designs over the wall" to the manufacturing engineer. The design engineer must know enough about the manufacturing capability of his/her organization or supplier, and the manufacturing engineer must be an early participant in the de-sign team. Competitive quality and cost require that the design specifica-tions match the manufacturing capability. Empty promises by manufactur-ing ("give us a design and we will build it") are no longer accepted.

Software development is not only necessary to achieve optimum opera-tion of each vehicle computer, but vehicle performance evaluation prior to design is becoming standard practice. Computer simulation for demonstrating compliance with regulations will probably be widely accepted in the nottoo-distant future.

General understanding

LESSON 14. Unit 5. Lesson 2. TEXT 2: ALLOYS Essential vocabulary:

alloy	сплав
property	свойство
homogeneous	однородный
heterogeneous	неоднородный
tiny	маленький

compound	соединение
carbon	углерод
hardening agent	отверждающий
	реагент
brittle	хрупкий
advent of furnaces	появление печей
damascus steel	булатная сталь
tensile	растяжение
stainless steel	нержавеющая сталь

Alloy is a substance with metallic properties that consists of a metal fused with one or more metals or nonmetals. Alloys may be a homogeneous solid solution, a heterogeneous mixture of tiny crystals, a true chemical com-pound, or a mixture of these. Alloys are used more extensively than pure metals because they can be engineered to have specific properties. New alloys are being engineered for use in new technology, including materials for the space program.

Steel is a metal alloy whose major component is iron and carbon. Car-bon acts as a hardening agent. Steel with increased carbon content can be made harder and stronger than iron, but is also more brittle.

Currently there are several classes of steels in which carbon is replaced with other alloying materials. A more recent definition is that steels are iron-based alloys that can be plastically formed.

There are different types of steels. Chromium steel finds wide use in automobile and airplane parts on account of its hardness, strength, and elas-ticity, as does the chromium-vanadium variety. In a modern sense, alloy steels have been made since the advent of furnaces capable of melting iron, into which other metals may be thrown and mixed. Also there exist Carbon steel and Damascus steel, which was famous in ancient times for its flexibil-ity.

Nickel steel is the most widely used of the alloys. It is nonmagnetic and has the tensile properties of high-carbon steel without the brittleness. Stainless steels and surgical stainless steels contain a minimum of 10.5% chromium, often combined with nickel, to resist corrosion. Some stainless steels are non-magnetic. There are tool steels, HSLA Steel (High Strength, Low Alloy) and ferrous super alloys.

General understanding

Exercise-2Match the words.		
Long	wires	
Wise	life	
Management	systems	
Plastic	inf. Technology	

Information people Science and productivity Improving technology Exercise 3. Give the synonyms of the following words. fast big to last problem enormous to make solution to keep must -

> LESSON 15. Unit 5. Lesson 3. TEXT: THE HISTORY OF THE **AUTOMOBILE**

Essential vocabulary: steam пар

tricycle prevail преобладать appear появляться storage battery forerunner gasoline-powered en-gine horseless carriage hand-crank mount устанавливать steering tiller рулевой рычаг gear передача tire шина rubber резина smelly пахучий shock absorber амортизатор luxury роскошь spark plug свеча зажигания reliable braking front suspension large-scale production seat adjuster ignition system fuel efficiency passenger safety global positioning sys-tem (GPS)

трехколесный автомобиль аккумуляторная батарея предшественник бензиновый двигатель самодвижущийся экипаж заводная рукоятка, ручка рулевое устройство надежное торможение передняя подвеска крупномасштабное производство регулятор положения сиденья система зажигания топливная экономичность безопасность пассажиров глобальная навигационная спутниковая система

About 8,000 cars were registered in America at the start of the 20th century. There are now some half billion in the world, one-third in the United States, where more than 1.5 trillion miles are traveled each year. For hundreds of years, humans have attempted to develop means for faster, more economical travel. Vehicles have been powered by humans and animals. In 1769, Frenchman Nicolas-Joseph Cugnot built the first automo-bile. It was actually a steam-powered tricycle. During the 19th century, steam power prevailed.

Electric cars appeared in the late 1800s. Cleaner than steam-powered cars, they had a large bank of storage batteries under the hood. They could travel at 10 to 20 miles per hour for a distance of 50 miles before the batter-ies needed recharging. In the second half of the 19th century, Siegfried Mar-cus of Austria created the forerunner of the modern automobile. German en-gineer Gottlieb Daimler put a gasoline-powered engine on a bicycle. Karl Benz followed with the first gasoline car. By 1900 a typical automobile in the United States looked something like this: It was shaped like a box, much like a horseless carriage. There was little protection from rain, dust, or other hazards. It was started by a handcrank. Engines were mounted under the body, and steering was often by till- er. All of the parts including the gears and drive systems were exposed to the elements. Early tires were solid rubber. The arrival of pneumatic tires made the ride more comfortable. Kerosene side lamps and smelly acetylene head-lamps lit the traveler's way. There were no shock absorbers or heating sys-tems.

People who drove autos in the early days were seen as heroic adventur-ers. By 1900 there were 50 automobile-manufacturing companies.

Engineers of that century began to enhance the popularity of the car and improve its safety. They included the electric starter in 1911. It was introduced by Charles Kettering.

By the middle of 1920s, other innovators were changing the industry. William Durant surpassed Ford in sales by offering variety. He began buying different car firms that built to different tastes – luxury, speed, comfort, and utility. The first were Olds, Oakland (later the Pontiac), and Cadillac. Then he bought out makers of motors, spark plugs, and other components and ac-cessories. All this resulted in the General Motors Company, the forerunner of the modern automotive operation.

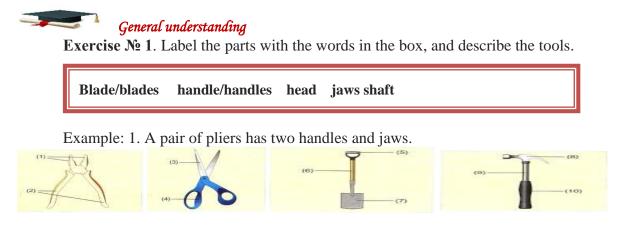
The 1930s saw more reliable braking, higher-compression engines, and the world's first diesel engine by Mercedes. Automobile engines were be-

coming larger, and many had 12 and 16 cylinders. Independent front suspen-sion was added to make larger cars more comfortable.

Large-scale production began in the early 1950s. New automotive features included air conditioning, electrically operated car windows, seat adjusters, and a change from a 6-volt to a 12-volt ignition system which improved engine performance. Cars increased in size and weight, but power steering and brakes made them easier to handle.

In the early days of the car, the biggest worry was keeping it running. Today we are concerned with aerodynamic designs for speed and fuel efficiency, passenger safety issues, and pollution control systems. In 1900 a car might have a total of 100 parts, while today it has some 14,000. Accessories can include CD players, tape decks, television and phone installations, and separate sound and temperature controls in the front and back of a vehicle. Some cars are equipped with satellite-aided global positioning system (GPS) locator beacons.

In one form or another, the vehicle has become the major transporter of people and goods in the world. Its basic design and power systems have been widely adapted to vehicles such as the ambulance, jeep, police car, minivan, limousine, pickup truck, and tractor trailer.



Exercise No 2. Look at this toolboard for 15 seconds. Then close the book and list all the tools. Begin: Five screwdrivers. They're at the top, on the left.

Exercise № 3. Look again at the toolboard on the next page and make sentences with the words in the box. **above below to the left of to the right of**



Exercise № 4. How can you describe this picture? Write and speak about the future of technology.

Exercise №1. Listen and repeat.



Task №2. Complete the instructions. Use the words from exercise 1.

- 1. ______ the hammer on the table.
- 2. _____ the hammer off the table.
- 3. ______ the lever.
- 4. ______ the lever
- 5. ______ the nut.
- 6. _____ the nut.

Exercise №3 Match the parts with their functions.

Part

Function

1. Thermometer a) shine a light 2. Compass b) make electricity 3. Torch c) turn the dynamo 4. Clock d) tell the time 5. Alarm e) find North 6. Solar panel f) receive radio signals 7. Handle g) measure temperature h) make a loud noise 8. Antenna

Exercise №4 Make a list of job titles useful for you. Use a dictionary.

Examples: marine technologist, computer operator, automotive engineer, architectural technician

Exercise №5 Match the pictures with the verbs in the box.cut drive in grip loosen tighten



Listening comprehension: Digital cameras

Digital cameras	. I love my digital camera. I take it everywhere
with me. My friends	, but I've got
really good photos. Digital cameras are so	much better cameras
with film. They're also much better that	in mobile phone cameras. My digital camera
pocket and take	s great photos. I usually take a few photos every
day and online f	For my friends to see. The best thing about digital
cameras is that they	to use. It's child's play. The good thing is that
digital cameras today	quality photos
only get on really expensive cameras. A	All you need is 10 to 12 megapixels. That's

LESSON 16. Unit 5. Lesson 4. TEXT: THE AUTOMOBILE LIFE CYCLE Essential vocabulary:

Essential vocabulary:	
conclude	заканчиваться
scrapping	сдача в лом
approximately	приблизительно
account for	составлять
environmental impact	воздействие на
	окружающую среду
acquisition	добывание
processing	переработка
consumption	потребление
copious amount	огромное количество
involve	включать
release	выделять, выпускать
assembly plant	сборочный завод
pollutant	загрязняющее вещество
coating	покрытие
wastewater	сточные воды
trash	мусор
scrap metal	металлолом
emission	выброс, выделение

The life cycle of an automobile begins with concept and design and concludes with retirement (end-of-life scrapping). Today, a vehicle consists of approximately 15 000 parts. Steel, iron, glass, textiles, plastic, and non-ferrous metal dominate automobile construction. They account for more than 80% of the material used in today's vehicles. A common trend in the material composition of a car is toward increasing the use of light-weight materials, especially numerous types of plastics and light metal alloys (such

as alumi-num and magnesium). The environmental impacts and concerns that arise from the acquisition and processing of virgin resources that serve as input for automotive material include the substantial consumption of resources (mate-rial and energy). In addition, copious amounts of energy are consumed in heating, cooling, and producing millions of tons of steel, aluminum, plastic,

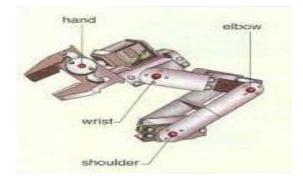
and glass. Processing these materials involves a variety of heavy metals, tox-ic chemicals, chlorinated solvents, and ozone depleting chemicals. More than half of all releases and transfers of pollutants originate from the painting and coating operations. The largest solid waste streams generated by an au-tomobile assembly plant are wastewater treatment sludges, waste oil, plant trash, and scrap metal. The utilization of an automobile accounts for approx-imately 80% of the total primary energy consumption of the life cycle of an automobile. Most of the CO2 and CO emissions are released during the utili-zation. Besides the resource consumption when running a vehicle and the necessary infrastructure (e.g. highways, service-and gas stations), the maintenance and service operations contribute significantly to the environ-mental effects of automobile use.

Opportunities for environmental improvement exist during each life-cycle stage of an automobile. Significant changes in the material and process selection and management are necessary to reduce the overall environmental impact throughout the entire life cycle of an automobile.

General understanding

Exercise № 2. Complete these sentences with can and can't.can can't has is isn't

- 1. A helicopter _____ fly sideways, but a plane _____
- 2. A plane ______fly sideways, but it ______fly forwards.
- 3. A plane ______fly straight up, but a helicopter ______.
- 4. A plane ______fly straight up, but it ______fly diagonally.



Exercise \mathbb{N}_{2} 3. Complete the text about the robot armwith the words in the box.

This robot arm (1)_____ like a human arm. It (2)_____ a "wrist", an "elbow" and a "shoulder".

 The wrist (3)______ like the human wrist.

 It (4)______ three movements.

 (5)______ rotate it.

 It (6)_____ move

 from side to side.

 It (7)_____ move

up and down.

The elbow (8)_____ like the human elbow. It (9)_____ one movement. It (10)_____ move up and down.

The shoulder (11)______ like the human shoulder, because it only one (12) ______ two movements. It (13)_____ rotate, and it (14)_____ move up and down. But it (15)_____ move sideways.



I have a strange hobby. It's visiting factories. I'm really interested ________ on my factory visits. Factories are amazing. They are like mini cities. The thing that surprises _______ how everything works together. Everyone knows exactly what _______ to do it. Even the robots. Car factories are cool, but very noisy. A car assembly _______ a giant ballet dance with everything moving perfectly together. It's _______ visit factories. All you have _______ to their home page and see if they have visiting times, or write to them. The best factories _______ ones that produce food and drinks. You always _______.

Literature used:

1. U. Mildenberger, A. Khare / Technovation 20, 2000.

2. Marie Kavanagh English for the Automobile Industry: Английский язык для автомобильной промышленности – Oxford University press, 2011.

3. Сафронова С.П. Пособие по английскому языку для транспортных техникумов: Учебное пособие.-М.: Высшая школа, 1984.

4. Гниненко А.В. Современный автомобиль как мы его видим: учебник английского языка.-М.:Астрель:АСТ:Транзиткнига, 2005.

5. Шляхова В.А. Английский язык. Контрольные задания для студентов технических специальностей вузов: Учеб.-метод. пособие.-2-е изд., испр. и доп.- М.: Высшая школа, 2005.

6. Hornby A.S. Oxford Advanced Learner's Dictionary of Current English. – Oxford: Oxford University Press, 2007.

7. Галевский Г.В., Мауэр Л.В., Жуковский Н. С. Словарь по науке и технике (Англо - Русский) – М.: Флинта: Наука, 2003.

8. Рябцева Н.К. Научная речь на английском языке. Руководство по научному изложению. Словарь оборотов и сочетаемости общенаучной лексики: Новый словарь-справочник активного типа. – М.: Флинта: Наука, 2006.

9. Charlotte Williamson, Nigel Browing. Vehicle maintenance. – London: Cassel Illustrated, 2004.

10. The Fascination of Technology – Issue 02/2008.

TERM II.

LESSON 1. Unit 1. Lesson 1. Text: What is Mechanics?! Part 1

Pre-reading comprehension: Active Vocabulary

Выберите нужное местоимение.

1. Mechanics is an ancient science. (*It, She*) has (*it, its, her*) origins in Ancient Greece. We call (*it, its, her*) classical Mechanics. (*It,Its, She*) is of great importance for most branches of engineering. 2. (*His, He, Him*) is explaining the use of mechanics in engineering to (*he, his, him*) students. 3. (*Me, I, My*) always discuss (*I, my, me*) writings with (*they, their, them*). 4. (*Them, They, Their*) often demonstrate (*them, their, they*) the application of classical mechanics in practice. 5. (*Her, She*) always tells (*we, us, our*) about (*she, her*) studies at the University.

I. Переделайте следующие предложения в вопросительное (общий вопрос) и отрицательное:

- 1. Force is the action of one body on another.
- 2. The stars are in a state of motion.

II. Поставьте все возможные специальные вопросы к следующим

предложениям:

1. Quantum mechanics is a comparatively recent invention.

2. These objects are under the action of great forces.

III. Заполните пропуски соответствующими личными формами глагола *to be*.

1. Mechanics ... the area of physics that deals with the behavior of physical bodies when they ... met with forces.

2. Quantum mechanics ... discovered in the early 20th century.

3. Historically, mechanics ... among the first of the exact sciences to be developed.

4. The central concepts in classical mechanics ... force, mass and motion.

5. Neither force nor mass ... very clearly defined by Newton.

6. Forces change the state of motion of bodies to which they ... applied.

7. The Earth's motion ... not apparent, the surface of the Earth and everything on and around it ... always in motion together.

IV. Переведите следующие предложения на русский язык, объясните функции глагола *to be* в каждом из них.

1. Time is the dimension of the duration.

2. Minutes and hours are among the units in which time is expressed.

3. One way to proceed is to regard Earth gravity.

4. It is to be known that a man in a train is in motion with respect to the people on the station platform.

5. These two objects are moving with the same speed but in different directions.

6. Mechanics will be important for you – motion is a fundamental idea in all sciences.

7. Sometimes it is difficult to stop an object when it is in motion.

8. Force, work, energy and power are studied in physics.

Section B. Reading. Writing. Speaking

I. Используя англо-русский словарь, переведите следующие слова и словосочетания на русский язык. Уточните их произношение по словарю:

condition	to resist – resistance	
action	translational motion	
to apply – application	force	
to found – foundation	magnitude	
space	to direct – direction	
position (сущ., гл.)	to vary – variation	
measure (сущ., гл.)	velocity	
to refer to – reference	to deal with	
to require	both and	
to use	quantity	

II. Прочитайте интернациональные слова, уточните их произношение и перевод по словарю. distance, idea, concept, conception, operation, mass, coordinate, vector, discipline, fundamental

III. Переведите следующие слова, обозначающие название наук, обратите внимание на характерный для них суффикс –*ics*. mechanics, physics, kinematics, dynamics, statics, thermodynamics, mathematics, automatics, aeronautics, hydrodynamics

IV. Соедините слова и словосочетания с их переводами:

a.

- 1. body's velocity
- 2. to found
- 3. resistance to change
- 4. magnitude of the force
- 5. both force and motion
- 6. to refer to the fact
- 9. to measure the required time
- 8. point of application

b.

- 1. прикладная наука
- 2. точка отсчета координат
- 3. изменение скорости
- 4. поступательное движение
- 5. состояние покоя
- 6. под воздействием силы
- 7. положение точки Р
- 8. направление силы

- а. сопротивление изменению
- b. ссылаться на факт
- с. скорость тела
- d. измерять необходимое время
- е. основывать
- f. как сила, так и движение
- g. величина силы
- h. точка приложения
 - a. direction of the force
 - b. condition of rest
 - c. applied science
 - d. position of the point P
 - e. reference point of origin
 - f. translational motion
 - g. variation of velocity
 - h. under the action of force

V. Выпишите из следующих слов и словосочетаний пары *синонимов*, т. е. слов со схожими значениями.

to require; idea; velocity; change; to resist; magnitude; both ... and ...; measure; base; to demand; to apply; speed; foundation; as well as; to oppose; quantity; value; variation; to use; concept

VI. Вставьте подходящие слова из предложенных ниже.

motion	direction	deals with	magnitude
force	action	space	vector
coordinate	position	both and	translational

1. Thermodynamics ... heat and temperature and their relation to energy and work.

2. ... is the action of one body on another.

3. The effect of the force depends both on the ... and on the ... of the

••••

4. Velocity is a ... quantity.

5. In geometry, a ... system is a system which uses one or more numbers to determine the ... of a point.

6. Kinematics describes the motion of ... bodies ... systems of bodies.
7. ... is the movement of an object from one point to another through

VII. Назовите русские эквиваленты.

to describe the conditions of rest and motion; to apply in practice; a branch of mechanics; to found a new discipline; to require special attention; to study the concept with regard to the theory; resistance to the movement; the direction of the movement; the change of the velocity; to be divided into some parts; to deal with both motion and force; both concepts

VIII. Переведите производные слова, обращая внимание на префиксы с отрицательным значением.

necessary (*необходимый*) – *un*necessary; experienced (*опытный*) – *in*experienced; organic (*органический*) – *in*organic; pure (*чистый*) – *im*pure; movable (*подвижный*) – *im*movable; logical (*логический*) – *il*logical; rational (*рациональный*) – *ir*rational; responsible (*ответственный*) – *ir*responsible; to believe (*верить*) – to *dis*believe; to mount (*монтировать*) – to *dis*mount; usual (*обычный*) – *un*usual; essential (*существенный*) – *non*-essential

IX. Используя отрицательные приставки, образуйте слова с противоположными значениями и переведите их.

- 1. un-: divided, comfortable, prepared
- 2. *in* : direct, accuracy, dispensable
- 3. *im*-: possible, personal, mobile
- 4. *il* : legal, limited, liberal
- 5. *ir*-: regular, resistible, replaceable
- 6. dis- : placement, advantage, organized
- 7. non-: productive, sense, conductor

Х. Прочитайте и запомните следующие наиболее употребляемые сокращения:

e.g. (*for example*); etc. (*and so on*); i.e. (*that is*); cm (*centimeter*); cu (*cubic*); fig (*figure*); ft (*foot/feet*); ft-lb (*foot-pound*); in (*inch*); lb (*pound*); mps (*meters per second*); sq (*square*); t (*temperature*)

LESSON 2. Unit 1. Lesson 2. Text: What is Mechanics?! Part 2. XI. Прочитайте текст, предварительно уточнив по словарю произношение слов: science, engineering, indispensable, to associate, specification, to characterize, quantity, prerequisite. **Переведите информацию об основных понятиях механики на русский язык.**

Mechanics is the science which describes and predicts the conditions of rest or motion of bodies under the action of forces. It can be applied science, not an abstract or pure one. It is to be noted that mechanics is the foundation of most engineering sciences and is an indispensable prerequisite to their study. Fundamental concepts of mechanics are the following:

 \Box SPACE. It is associated with the notion of the position of a point P given in terms of three coordinates measured from a reference point of origin.

 \Box TIME. The definition of an event requires specification of the time and position at which it occurred.

MASS. It is used to characterize and compare bodies, e.g., response to
 Earth's gravitational attraction and resistance to changes in translational motion.
 FORCE represents the action of one body on another. A force is

characterized by its point of application, magnitude, and direction, i.e., a force is a vector quantity.

In Newtonian Mechanics space, time and mass are absolute concepts independent of each other. Force, however, is not independent of the other three. The force acting on a body is related to the mass of the body and the variation of its velocity with time.

Mechanics can be divided into sub-disciplines:

1. Statics is the study of forces in the absence of changes in motion or energy.

2. Dynamics is the branch of mechanics that deals with both motion and force together. Dynamics may be broken down into kinematics and kinetics.

Kinematics is the study of motion without regard to the forces or energies that may be involved.

It is the simplest branch of mechanics. Kinetics deals

with the forces and moments involved in making the body move along with the measurement of various parameters describing the motion.

XII. Прочитайте предложения, выбирая один из предложенных вариантов.

 The action of forces determines the structure / the state of rest or motion / the physical properties of bodies.
 The main concepts of mechanics are mass, force, space and velocity / space, time, light and mass / force, mass,

time and space.

3. Mass is the measure of an object's resistance to *a* change in its state of motion / the force of friction / its attraction to the Moon.

4. A vector quantity means a value of something which possesses both *a point* of application and time / magnitude and direction / direction and mass.

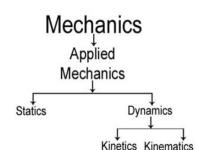
5. In Newtonian Mechanics space, time and mass *depend on the force acting* / *depend on the shape of a body* / *don't depend on each other*.

6. *Engineering / Dynamics / Statics* is not considered to be a branch of classical mechanics.

XIII. Являются ли данные утверждения верными. Обоснуйте своё мнение, используя фразы, выражающие *согласие / несогласие*.

I agree with this statement... That's true... I think so...

I don't agree... I disagree... I don't think so...



The author is right...

I'm afraid that's not true... I think otherwise...

I suppose so...

1. Mechanics is the science which studies the structure and properties of moving bodies.

2. In mechanics the concept of space deals with a three-dimensional (3D) system used to indicate the body's position.

3. Force is a scalar quantity that is only described by a magnitude.

4. In Newtonian Mechanics force is the concept that is completely independent on other notions.

5. All the branches of mechanics study motion under different conditions.

6. The study of dynamics requires the understanding of motion without the influence of the acting forces.



General understanding

XIV. Просмотрите текст еще раз и ответьте на следующие вопросы:

- 1. How is the term "mechanics" defined?
- 2. What are the basic concepts of mechanics?
- 3. What does the notion "time" describe?
- 4. All the forces involve an interaction between two bodies, don't they?
- 5. Is force a vector or a scalar quantity?

6. Are all the main concepts of Newtonian Mechanics related to each other?

7. What does kinematics study?

8. Which branch of mechanics describes forces that don't influence the changes of motion?

General understanding

THE ACTIVITIES

LISTENING GAP FILL

Speed kills. This is something I remember from a road ______ many years ago. It's true. There are too many drivers ______. So many people are killed on the road ______. I don't understand why people don't follow the speed limits. Many people _______ speed. Of course, it is exciting to go fast. That's why things like roller coasters are so exciting. The _______, the better they are. It's different _______. I think governments should limit the speed ______. If the speed limit on the road is 100kph, why sell cars that can go 200kph. I hope in the future they have sensors on the road ______ the speed of your car.

LESSON 3. Unit 2. Lesson 1. Text: What is Motion?! Part 1. Pre-reading comprehension: *Active Vocabulary*

Переведите, обращая внимание на степени сравнения прилагательных и наречий.

1. We need a greater force to move one kilogram weight through a distance of one metre than to move one pound weight through the same distance.

2. The best way to understand this phenomenon is to make some experiments.

3. Prior to Galileo it was believed that the heavier the object the faster it fell to the ground.

4. Prior to the Renaissance, the most significant works in mechanics were those written in the 4th century BC by Aristotle.

5. The distance travelled by the car in five minutes is ten times as big as the distance passed by the bicycle.

III. Переведите следующие предложения на русский язык, обращая внимание на конструкцию *'the ... the ...'*:

1. The nearer the body gets to the Earth, the more quickly it speeds up.

2. The more rapid the motion of bodies is, the greater is the force necessary to stop them.

3. The faster an object moves, the greater is the air resistance.

4. The higher the speed of the car is, the greater is the acceleration.

5. The heavier the body is, the greater is its kinetic energy.

6. The more you study physics, the clearer are its connections with other sciences.

IV. Переведите на русский язык следующие предложения:

1. Статика – это самый простой раздел механики.

2. Самый общий вид движения сочетает в себе как возвратно-

поступательное, так и вращательное движение.

3. Движение самых маленьких тел рассматривается с использованием квантовой механики.

4. Когда направление движения предмета изменяется, имеют место более сложные (*complex*) движения.

5. Ускорение более маленькой массы будет больше.

Выберите правильную форму глагола.

1. There (*are, is*) no absolute rest as all bodies in the Universe are in a state of motion.

2. There (*are, is*) also more complex movements when an object's direction is changing.

3. There (are, is) also special laws when you reach the speed of light.

4. If there (are, is) no other traffic, the driver can maintain a constant speed.

5. In the language of science there (*are, is*) a difference in the meaning of 'speed' and 'velocity'.

6. There (*are*, *is*) lots of colleges and higher educational establishments in Belarus.

7. Our University (*is*, *are*) very large. There (*is*, *are*) more than ten thousand students in it. There (*are*, *is*) ten departments in it.

II. Поставьте в вопросительную и отрицательную формы следующие предложения.

1. There are two types of translational motion.

2. To every action there is an opposite and equal reaction.

III. Следующие предложения переведите на английский язык, используя конструкцию *there is/are*.

1. В физике существуют два вида механики: классическая и квантовая.

2. В автомобиле находятся люди, они движутся вместе с автомобилем.

3. Есть несколько важных характеристик движения.

4. Известно, что на земле существует около 104 различных видов атомов.

5. Существует ли абсолютный покой?

6. Какие есть виды движения?

7. Есть ли различие между словом «работа» в повседневном использовании и в механике?

I. Поставьте в вопросительную и отрицательную формы следующие предложения:

1. A force has its point of application, magnitude and direction.

2. Engineers have to give due attention to the problem in question.

3. The students have already finished the experiment with electric current.

II. Поставьте все возможные специальные вопросы к данным предложениям:

1. The body has constant position if its position is not changing.

2. In the language of science the words 'speed' and 'velocity' have a difference in their meaning.

3. A laboratory assistant has just installed new devices in the lab.

III. Заполните пропуски соответствующими формами глагола to have:

1. To really understand motion, you ... to think about forces, acceleration, energy, work, and mass.

2. The body ... been moved from one position to another.

3. By the end of the 19th century a new science 'atomic physics' ... appeared.

4. To perform experiments on inertial forces, the physical law ... to be considered.

5. After a mass ... been lifted above the surface of the Earth, it ... energy because of its position.

6. Next week the students ... to carry out an experiment with a new substance.

I. Используя англо-русский словарь, переведите следующие слова и словосочетания на русский язык. Уточните их произношение по словарю.

means
specific
basic
to remain
original

curved path	to act on/upon
curvilinear motion	according to
rotary motion	to produce
oscillating motion	equal (прил., гл.)
mean (прил., гл., сущ.)	opposite

II. Прочитайте и переведите интернациональные слова. Уточните их произношение по словарю.

constant, planet, galaxy, type, material, interval, principle, to demonstrate, inertia, physics, normal, acceleration

III. Найдите эквиваленты следующих слов и словосочетаний:

a.

1. oscillating motion of the swings а. первоначальное состояние покоя 2. to revolve around stars b. согласно законам физики с. средняя величина 3. original state of rest 4. according to the physical laws d. криволинейное движение 5. a mean quantity е. двигаться по прямолинейной траектории 6. curvilinear motion f. колебательное движение качелей 7. to act on the body g. действовать на тело 8. to move along a straight path h. вызывать ускорение 9. to produce acceleration і. вращаться вокруг звезд b. 1. уравнение означает, что... a. equal and opposite forces b. rotary motion 2. изменение относительно другого тела c. the equation means that... 3. равные и противо-направленные силы 4. закон утверждает, что... d. motion along a curved line 5. движение по криволинейной траектории e. the law states that ... 6. вращательное движение f. a specific period of time 7. конкретный период времени g. the mean of 5 and 3 8. среднее значение 5 и 3 h. to remain unchanged

9. оставаться без изменений

i. a change with respect to another body

IV. Заполните пропуски подходящими по смыслу словами из предложенных ниже.

states	linear motion	according to	line
acting	revolve	equal	basic
opposite	original state	acceleration	refers
1 .1 1	.1 .1	1 1' 1' NT	1

1. ... the plan the theme of motion will be discussed in November.

2. Water exists in three ...: liquids, gases and solids.

3. The wheel began to

4. ... is motion along a straight ... that can be described mathematically using only one dimension.

5. Newton's Three Laws of Motion are the ... principles of the motion of all physical objects.

6. After a few minutes of motion the object entered into its ... of rest.

7. Two forces ... on a body are in magnitude and ... in direction.

8. Letter *a* in the equation $F = m \cdot a \dots$ to the \dots .

V. Переведите на русский язык следующие словосочетания: motion along a curved path; in the opposite order; to produce equal forces; to remain in the original state; to define the basic principles

of the law; constant state of motion; means of mathematical calculations; to revolve about the axis; to state the law with respect to the type of motion; equal quantities; interrelation between force, mass and acceleration

VI. Вспомните значения слов *measure, position, state, mean/means* и переведите слова в скобках на английский язык.

1. The room (*размером*) 6×6 metres.— (*Единица измерения*) is given in centimeters. — (*Измерь*) each angle of the triangle. – I have the (*размеры*) of the room in my notebook.

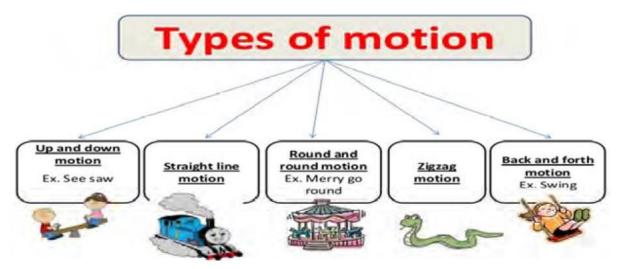
2. The lever is in the off (*положение*). – He pulled out a chair and (*поставил*) it between them. – Advantageous (*месторасположение*) of the laboratory helped them to work in cooperation. – It is necessary to (*разместить*) an object in the scheme.

3. The ice converted to a liquid (*состояние*). – We are worried about the (*положение*) of affairs. – The diagram (*указывает*) that the acceleration has increased. – The engineer (*заявил*) that the experiment was a complete success. 4. Mechanics is the (*способ*) for understanding the nature of motion. – The (*среднее значение*) of 10 and 20 is 15. – What did this symbol (*означал*)? – (*Средняя продолжительность*) solar day is 24 hours. – The most effective (*средство*) to learn something is to try to do this. – What does the letter *F* in the equation $F = m \cdot a$ (*означает*)?

LESSON 4. Unit 2. Lesson 2. Text: What is Motion?! Part 2. Pre-reading comprehension: *Active Vocabulary*

VIII. Прочитайте текст, предварительно уточнив по словарю произношение следующих слов: circle, ancient, specific, amount, Universe, perpetual, law, inertia, equation. Переведите законы Ньютона на русский язык.

Motion can be defined as a change in the position of a body with respect to time and another body. Motion and rest are fundamental ideas in physics. There is no absolute rest as all bodies in the Universe are in a constant state of motion. Stars, planets and even galaxies are in motion with respect to each other. Planets revolve around stars and galaxies move away from each other. Motion along a straight path is referred to as *linear motion*. Motion along a curved path is referred to as *curvilinear motion*. Rotary motion is anything that moves in a circle. This type of motion was among the first discovered in ancient times. Oscillating motion means the movement of something back and forth. Motion is measured as the distance covered by an object in a specific interval of time.



Newton's Three Laws of Motion are used to define principles that are fundamental to the fields of physics. First presented in 1686, these laws demonstrate the basic concepts that define the motion of all physical objects. Newton's First Law of Motion defines the concept of inertia. The law states that an object will remain in its original state of motion until acted upon by an outside force. According to Newton's Second Law acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated), the greater the amount of force needed (to accelerate the object). The Second Law gives us an exact relationship between force, mass, and acceleration and can be expressed as a mathematical equation: Force = Mass times Acceleration ($F = m \cdot a$). According to Newton's Third Law for every action there's an equal and opposite reaction. This means that for every force there is a reaction force that is equal in size, but opposite in direction.

IX. Прочитайте предложения, выбирая один из предложенных вариантов.

1. In physics motion is a change in position of an object over *distance / time / another object*.

2. All the bodies in the Universe *move from time to time / are in a state of rest* with respect to each other / are in a constant state of motion.

3. Motion along a curved path is called *curvilinear / linear / rotary* motion.

4. Oscillating motion is anything that moves *in a circle / backwards and forwards / along a straight path*.

5. Newton's Three Laws of Motion define the principles of motion of *liquid* / *only irregular-shaped* / *all physical* objects.

6. Newton's *First / Second / Third* Law is often referred to as the law of inertia.

7. The Second Law defines the dependence of force on *mass and time / mass and acceleration / mass and distance*.

8. The equality F1 = -F2 describes the idea of Newton's *First / Second / Third* Law.

Х. Используя фразы *согласия / несогласия*, выразите свое отношение к следующим утверждениям:

1. Any body that keeps changing its position with respect to time and another body is said to be in motion.

- 2. There are some objects in the Universe that always remain at rest.
- 3. Each type of motion depends on the way an object moves.
- 4. Newton's Laws of Motion were first presented in 1689.
- 5. Newton's First Law defines the concept of force.
- 6. The Second Law can be expressed mathematically by an equation.
- 7. Newton made a great contribution to the development of physics.

XI. Просмотрите текст еще раз и ответьте на вопросы.

- 1. Does a notion 'absolute rest' exist?
- 2. What kind of motion can be defined as linear?
- 3. What type of motion was first discovered in ancient times?
- 4. How can motion be measured?

5. Newton's Four Laws of Motion describe the nature of motion on the Earth, don't they?

6. How can Newton's First Law be formulated?

7. What is the relationship between force, mass and acceleration according to Newton?

8. Why does an object get pushed back whenever it pushes another object?

9. Why do you think Queen Anne knighted Isaac Newton in 1705?



General understandina

LISTENING GAP FILL

My energy levels	down. Sometimes I'm full of energy,	and
sometimes I'm	energy. Mornings are when my energy le	evels are
high. I wake up	. I don't need 30 minutes to wake up, lil	ke some
people I know. For	food I eat doesn't affect how energe	tic I am.
Some people	lunch, while others complain they need to	eat
something for an	I seem to have the same level of ener	gy
	nothing all day. The one thing that does affect my energ	gy is the
weather. A bright, sunny da	ay gives me lots of energy. A dull,	me
feel	. I also have a lot of energy if I'm doing something	exciting -
	study or work.	_

LESSON 5. Unit 2. Lesson 3. Translational Motion. Part 1.

Pre-reading comprehension: Active Vocabulary

I. Переведите следующие предложения, обращая внимание на способы передачи страдательного залога.

1. Motion is usually described in terms of distance, velocity, acceleration, time and speed.

2. Classical mechanics is' based on Newton's Laws of Motion.

3. Many important discoveries were made in physics and engineering.

4. The problem will be solved in two weeks.

5. The experiment was made for the second time.

II. Поставьте сказуемое в предложениях в страдательный залог.

1. In kinematics motion (to describe) with respect to speed, time and acceleration.

2. Students (to give) every opportunity to acquire knowledge in different branches of science.

3. The significant works in mechanics (to write) in the 4th century.

4. Newton's Laws of Motion (to discuss) at the lecture next week.

5. The radio (to invent) in 1895.

III. Поставьте: a) общие; б) все возможные специальные вопросы к следующим предложениям:

1. Newton's Laws of Motion were presented in 1686.

2. The most significant works in mechanics were written in the 4th century BC by the Greek philosopher Aristotle.

3. The University laboratories are equipped with up-to-date mechanisms and devices.

Переведите следующие предложения на русский язык, обращая внимание на многофункциональные слова.

A.

1. One must know that there is no absolute rest.

- 2. Mechanics can be an applied science, not an abstract or pure one.
- 3. Force represents the action of one body on another.
- 4. There are two systems of measurement: the metric system and the English one.

5. One must remember that physics is one of the main sciences about nature. **B.**

1. Physics studies physical phenomena. It is one of the most ancient sciences about nature.

2. It is known that direction is important in mechanics.

3. It was not easy to carry on scientific investigations more than three hundred years ago. It took Newton about 20 years to complete his theory of gravitation.

4. It is mechanics that is the foundation of most engineering sciences.

5. It is in the real world where most movement is a combination of translational and rotational motion.

6. It was not until 1686 that Newton's three Laws of Motion were first presented.

7. It is necessary to point out that Newton's Laws are true to this day.

8. It was not until the middle of the 19th century that the molecularkinetic theory of gases found its further development.

I. Используя англо-русский словарь, переведите следующие слова и словосочетания на русский язык. Уточните их произношение по

словарю.	
relative to	some
to fix	same
fixed point	behavior
to turn out	to involve
to turn about / around / on	surface
axis	loop
to rotate	degree
to combine	-

II. Прочитайте и переведите интернациональные слова, при необходимости воспользуйтесь словарем.

to fix, object, combination, asteroid, airport, physics, atom, line, parallel, situation, theory, orientation

III. Соедините словосочетания с их переводами.

a.

- 1.1. translational motion
- 2. relative to a fixed point
- 3. to change a position
- 4. general idea
- 5. travelling along a straight line
- 6. a real-life situation
- 7. up and down
- 8. in the same direction
- b.
- υ. 1 թ. οбπ
- 1. в общем
- вращаться вокруг оси
 вращательное движение
- 4. вперед и назад
- 5. сочетание двух видов движения
- 6. некоторая степень вращения
- 7. параллельно поверхности
- 8. играть важную роль

- а. вверх и вниз
- b. изменять местоположение
- с. перемещение по прямой
- d. поступательное движение
- е. реальная ситуация
- f. относительно неподвижной точки
- g. в одинаковом направлении
- h. общая идея
 - a. to turn about an axis
 - b. combination of two types of motionc. to play a key role
 - d. in general
 - e. parallel to the surface
 - f. forwards and backwards
 - g. some degree of rotation
 - h. rotational motion

IV. Выпишите из следующих слов пары синонимов и переведите их на русский язык.

to move; to rotate; relative to; direction; to continue; to understand; in general; constantly; some; curved; with respect to; to go on; on the whole; curvilinear; to travel; orientation; continually; certain; to comprehend; to revolve

V. Вставьте подходящие по смыслу слова из предложенных ниже:

relative to	motion	to fix	straight
axis	surface	object	rotational
space	dimensions	rotation	space
combination	key		

1. Translational motion is the ... by which an ... travels from one point in ... to another.

2. Newton's Laws play a ... role in studying motion.

3. An object has linear motion when it moves along a ... line.

4. In two ... we need to determine two coordinates ... the position of an object.

5. ... motion means that a body moves around a fixed ..., for example, the ... of the Earth.

6. Any equation of motion can be expressed by the ... of three Newton's Laws.

7. What do we mean to talk about a straight line on a curved ...?

8. In ... objects are constantly moving ... one another.

VI. Заполните пропуски в предложениях, выбирая из пары слов подходящее по смыслу.

a) general – in general

1.... understanding of the laws of mechanics helps to explain the motion of different objects.

2. ..., motion is a concept that is applied to objects, bodies and matter particles.

3. ..., it is difficult to imagine that all bodies in the Universe are constantly moving.

4. The dependence of force on mass and acceleration can be described by a \dots equation F = ma.

b) some - same

1. In the situation of equilibrium forces they act on the ... object.

2. Ancient scientists Aristotle and Archimedes laid ... foundation of what is known as classical mechanics.

3. The motion in which all particles of a body move through the ... distance in the ... time is called translational motion.

4. Newton's Third Law means that for every force there exists ... equal and opposite force.

5. Mass is not the ... as weight.

c) cause – case

1. In most real-life ... forces can only be applied for a fixed time.

2. An acting force can ... the change in the direction of a moving body.

3. In the ... of the Sun's force on the planets the objects are separated by a vast distance.

4. The ... of the behaviour of physical bodies are forces and their effect on these bodies.

S

LESSON 6. Unit 2. Lesson 4. Translational Motion. Part 2.

Pre-reading comprehension: Active Vocabulary

VII. Назовите русские эквиваленты следующих словосочетаний:

without a change in the body's orientation; to point in the same direction; to be opposed to something; to understand the behavior of a system; in theory; to travel in a straight line; to move in a curved path; a combination of several aspects; an axis of rotation; the study of motion causes; flat surface; parallel forces

IX. Прочитайте текст, предварительно уточнив в словаре произношение следующих слов: pure, oppose, key, aeronautics, circle, invariably, situation, continually. **Назовите отличие поступательного движения от вращательного.**

Translational motion is movement



The motion of a car speeding in a straight line is translational in relation to the road

of an object without a change in its orientation relative to a fixed point, as opposed to rotational motion, in which the object is turning about an axis. In other words, an arrow painted on an object undergoing pure translational motion would continue pointing in the same direction; any rotation would cause the arrow to change direction.

In the real world, most

movement is a combination of the two. In space, for example, objects such as stars, planets and asteroids are constantly changing position relative to one another, but are also invariably rotating. An understanding of translational motion plays a key role in basic physics and in comprehending the behavior of moving objects in general,

from atoms to galaxies. In theory, pure translational motion need not involve traveling in a straight line. It is possible for an object to move in a curved path without changing its orientation: however, in most real-life situations, a change in direction would involve turning on an axis, in other words, rotation. In aeronautics, translational motion means movement along a straight line, forwards or backwards, left or right and up or down. When an airplane is circling an airport, it is continually changing its orientation and undergoing some degree of rotation.



An object that is moving parallel to a curved surface like a roller coaster on a loop is moving translationally

Х. Прочитайте предложения, выбирая один из вариантов.

1. In translational motion an object doesn't change its orientation relative to *another moving object / the Earth / a fixed point*.

2. *Rotational / Linear / Curvilinear* motion means turning of an object about an axis.

3. The motion of all objects in the world can be explained by *the force of* gravity / their nature / translational motion.

4. Translational motion *always involves / need not involve / never involves* travelling in a straight line.

5. In most real-life situations change in direction means *rotation / moving up* and down / moving left or right.

6. Most movement is a combination of *translational and oscillating* / oscillating and rotational / translational and rotational motions.

XI. Используя фразы согласия / несогласия, выразите свое отношение к следующим фактам:

1. The motion where the body moves but not rotates from one point to another is called translational motion.

2. In translational motion all the points of a moving body are in the same direction.

3. Rotational motion is one of the types of translational motion.

4. In the real world any movement of any object is only one type of motion.

5. Both atoms and galaxies move according to the same nature of motion.

6. Translational movement of any body can occur along a curved path or along a straight line.

7. A line around which every point in the body moves in a circular path is called a degree of rotation.

General understanding

XII. Просмотрите текст еще раз и ответьте на вопросы.

1. What is translational motion?

2. Can you give any examples of something that usually undergoes only translational motion?

3. What is rotational motion?

4. What are examples of objects that undergo only rotational motion?

5. In real-life situations any movement is usually a combination of both types of motion, isn't it?

6. Can you name something that commonly undergoes both translational and rotational motion simultaneously?



LESSON 7. Unit 2 Lesson 5. Translational Dynamics. Part 1. Pre-reading comprehension: Active Vocabulary

I. Переведите предложения на русский язык. Обратите внимание на особенности перевода сказуемых в страдательном залоге.

1. The professor was asked to lecture on translational dynamics.

2. At the age of 19 Newton was sent to Cambridge to continue his studies.

3. Our students are taught to carry out research.

4. My friend is invited to the students' conference on the problems of mechanics.

5. The laws of motion were formulated by Newton more than 300 years ago.

6. The object will continue to move for some time until it is stopped by friction.

7. In translational dynamics the movement of objects is analysed by a series of equations.

8. Newton's Laws of Motion are often referred to in the lectures on mechanics.

9. The body has been acted upon by some force therefore it is not in the state of rest now.

10. The basic concepts that define the motion of all physical objects were much worked on.

11. The development of mechanics was greatly influenced by Isac Newton.

12. In most real-life situations the movement in a straight line is followed by the movement in a curved path.

II. Раскройте скобки и поставьте сказуемое в страдательный залог.

1. The results of the experiments (to speak of) at the conference.

2. The experiments (to follow) by calculations.

3. Action and reaction (never speak of) as balanced forces since they don't act on the same body.

4. The Second Law of Motion describes what happens to a massive body when it (to act upon) by an external force.

5. The lectures on mechanics (to attend) by many students.

6. The development of science in Russia (to greatly influence) by M. Lomonosov.

Переведите следующие предложения на русский язык, обращая внимание на *that (those*).

1. Newton formulated three basic laws of motion that became the foundation of classical mechanics.

2. The direction of a body's motion is the same as that of the force that acts on it.

3. Lomonosov found that heat, light and electricity are different forms of motion.

4. The physics of things at rest is much simpler than that of things in motion.

5. It is known that statics studies the forces that keep an object in equilibrium.

6. If the forces that cause motion are greater than those that oppose it, an

increase in speed that is known as acceleration takes place.

I. Используя англо-русский словарь, переведите следующие слова и словосочетания на русский язык. Уточните их произношение по словарю.

1
translational dynamics
to vary – various
unless
to multiply – multiplication
to divide – division
hard
friction

solid (сущ., прил.) to convert to increase to expand volume form (сущ., гл.) in accordance with substance in terms of to expect

II. Прочитайте и переведите интернациональные слова.

series, molecule, to analyse, temperature, electromagnetic, kinetic, energy, gas, material, gravity

III. Переведите следующие предложения, обращая внимание на значения выделенных слов.

1. The mathematical method developed by Newton was the *subject* of numerous discussions.

2. The *subject* 'Strength of Materials' includes failure of materials that *are subjected* to different forces.

3. A body starts moving *because of* forces acting on it.

4. Molecules of a solid will move faster *because* electromagnetic energy is converted into kinetic energy.

5. The experiment failed *because of* some minor mistakes.

IV. Соедините эквиваленты следующих словосочетаний:

a.

- 1. to analyse the movement of bodies
- 2. to multiply force by acceleration
- 3. the temperature of a substance
- 4. to expand in volume
- 5. an average speed of a molecule
- 6. to require more time
- 7. because of gravity
- 8. heavier substances
- b.
- 1. ряд уравнений
- 2. плавиться до жидкого состояния
- 3. делить силу на массу
- 4. увеличивать температуру
- 5. весить вес
- 6. преобразовывать элек-
- тромагнитную энергию
- 7. равняться чему-либо
- 8. движение молекул

- а. температура вещества
- b. расширяться в объеме
- с. из-за силы тяжести
- d. анализировать движение тел
- е. более тяжелые вещества
- f. требовать больше времени
- g. умножать силу на ускорение
- h. средняя скорость движениямолекулы
 - a. to divide force by mass b. to be equal to
 - c. to convert electromagnetic energy
 - d. to increase the temperature
 - e. to melt into a liquid state
 - f. molecular motion
 - g. to weigh weight
 - h. a series of equations

V. Выпишите из слов и словосочетаний пары антонимов, т. е. слов с противоположными значениями:

various; hard; to expand; liquid; unless; to multiply; to include; the first; fast; to increase; high; true; if; to divide; slow; false; solid; to exclude; to compress; easy; the same; low; the last; to decrease

VI. Вставьте подходящие слова из предложенных ниже:

various	state	solid	equations
increase	converted	formula	multiplied
substance	friction	to expand	in accordance with

to require to hold

- 1. Physicists use different ... to describe ... physical facts.
- 2. The ... S = vt can be read as distance S is equal to velocity v ... by time t.
- 3. The forces acting on a body at a ... of rest are gravity and
- 4. One type of energy can easily be ... into another.
- 5. The ... in temperature usually causes an object ... in volume.
- 6. The molecules in a ... always behave ... Newton's laws of motion.
- 7. ... is one of the four fundamental states of matter.

VII. Переведите на русский язык следующие словосочетания:

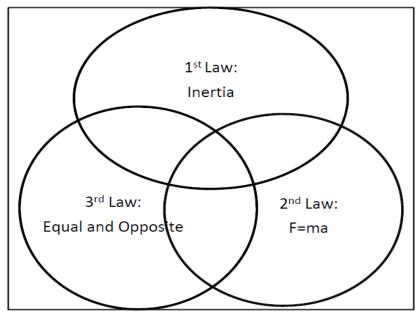
translational dynamics; to study the movement; to change body's motion; to multiply by 2; to include various acting forces; solid substances; in terms of mathematics; to be converted into kinetic energy; to apply heat; to form a gas; to hold true; a higher boiling point; hydrogen bonds





Прочитайте текст, выпишите из второго абзаца сказуемые в страдательном залоге с относящимися к ним подлежащими. Переведите информацию о влиянии температуры на движение молекул.

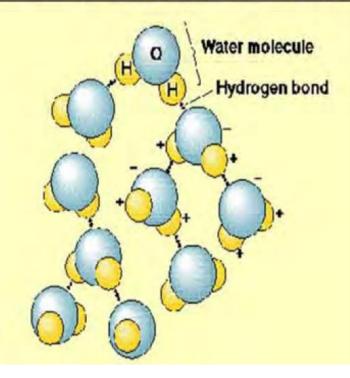
The study of translational motion is known as translational dynamics and uses a series of equations to analyze the movement of objects and how they are affected by various forces. The tools used to study movement include Newton's laws of motion. The first law, for example, states that an object will not change its motion unless a force acts upon it, while the second law states that force is equal to mass multiplied by acceleration. Another way of saying this is that acceleration is equal to force divided by mass, which means that it is harder to



ans that it is narder to change the translational motion of a massive object than a less massive one. The forces that can act on an object include and friction. **Atoms and Molecules.** On the molecular level, the temperature of a substance can be defined largely in terms of the translational motion of its atoms or molecules.

Rotation also plays a role on molecular motion, but it is not important in terms of temperature. If heat is applied to a solid, electromagnetic energy is converted into kinetic in that its molecules will move about faster. This increases its temperature and may cause it to expand in volume. If enough heat is applied, the material will melt into a liquid state and finally boil to form a gas, as the average speed of the molecules increases. The molecules in a substance subjected to heat behave in accordance with Newton's laws of motion. Molecules with more mass require more force to increase their

Hydrogen Bonds in Liquid Water



speed. Heavier substances will therefore usually require more heat to cause them to melt or boil. Other forces, however, can also act on molecules to restrain them, so this rule does not always hold true. Water, for example, has a higher boiling point than would be expected for its molecular weight because of the hydrogen bonds that hold the molecules together.

XI. Выберите один из вариантов и прочитайте следующие предложения:

1. Translational dynamics studies the influence of *external loads / various forces / object's structure* on moving objects.

2. The fact that a ball will not move until someone kicks it is explained by the *first / second / third* law of motion.

3. According to the Second Law it is *more difficult / the same / easier* to push an empty box than a full one.

4. *Gravity / Pressure / Friction* is a force acting in the opposite direction of motion.

5. In the study of molecules *temperature / weight / acceleration* is defined as translational motion of atoms and molecules.

6. When a solid is heated, the atoms and molecules gain *potential / kinetic / electric* energy.

7. Water has a higher boiling point than expected because of *its molecular* structure / atomic weight of its molecules / hydrogen bonds.

XII. Согласитесь или не согласитесь со следующими утверждениями. Обоснуйте свой ответ.

1. Translational dynamics is the name given to the rules of motion.

2. Force is the main quantity that influences the movement of an object.

3. The motion of a body doesn't depend on its mass.

4. The motion of atoms and molecules is explained by all the laws of physics except Newton's ones.

5. Heat, temperature and motion of molecules are all closely related.

6. A solid always remains in its original state independent of the applied temperature.

7. Inner molecular bonds can affect the amount of energy necessary to convert one form of matter into another.

General understanding

XIII. Просмотрите текст еще раз и ответьте на вопросы.

1. What does translational dynamics deal with?

2. What helps to study the movement of objects?

3. Which Newton's law says that heavier objects require more force than the lighter objects to move or accelerate them?

4. Only translational motion of atoms and molecules explains the temperature change of substances, doesn't it?

5. What happens to a solid when it is heated?

6. Can you give any examples of a substance change from one state into another?

7. In what cases doesn't the Second Law of Motion hold true on the molecular level?

LESSON 9. Unit 3. Lesson 1. Different Types of Energy Pre-reading comprehension:

Active Vocabulary

I. Переведите следующие предложения на русский язык, обращая внимание на глагол *to do*:

- 1. The energy of a body is the capacity of that body to do work.
- 2. When we do any work then after some time we do feel tired.
- 3. What does the term "average speed" mean?

4. If there is no other traffic, the driver drives his car at a constant speed. But he does it at an average speed because of other traffic.

5. They did not find the solution of this problem.

II. Переделайте следующие предложения в вопросительные и отрицательные:

- 1. They always do the work in time.
- 2. He always does the work in time.
- 3. She always did the work in time.

I. В следующих предложениях найдите сказуемое, определите его время и залог.

1. Gravity acts as a constant force on the body.

2. In 1845 James Joule discovered the link between mechanical work and the generation of heat.

3. The scientists have discovered many important phenomena.

4. By the third year the students will have studied some important subjects such as physics, chemistry, material science, etc.

5. When cooling, an object will transmit its heat energy to its surroundings.

6. Newton had laid the foundation of his discoveries by the age of 24.

7. Suppose that an object is moving along a straight line. The same object will be moving for some time until friction stops it.

8. After the experiment had been finished the assistant compared the results.

II. Выберите правильную видо-временную форму сказуемого.

1. M. Lomonosov (*contribute, had contributed, contributed*) to the development of science.

2. M. Lomonosov (*had discovered, has discovered, discovered*) the law of the conservation of matter many years before Lavoisier.

3. Next week the teacher (*explain, will explain, will have explained*) different types of energy to us.

4. Let us assume that now a body (*changes, is changing, will change*) its position in respect to other bodies. We may say that this body (*moves, is moving, will move*).

5. Newton (*gathered*, *had gathered*, *has gathered*) the results of the experiments that many other scientists and investigators (*made*, *had made*, *have made*).

6. During the last three months we (*study, were studying, had been studying*) a number of problems that (*are, were*) associated with motion and force.

7. Every year our scientists (*solve, are solving, have solved*) a lot of important scientific problems.

8. They (*are making, have made, have been making*) a lot of experiments for the last two years and (*prove, proved, have proved*) the theory.

Поставьте все возможные вопросы к следующим предложениям:

1. Classical mechanics formed the foundation for the further development of that science.

2. Statics studies bodies in a state of rest.

3. The lecturer has given the equation describing motion in terms of distance and time.

4. Mechanics will help us to solve many engineering problems.

5. Industrial applications usually follow laboratory experiments.

I. Используя англо-русский словарь, переведите следующие слова и словосочетания на русский язык. Уточните их произношение по словарю.

capacity	a number of
to perform	to provide
property	to make

abilityto requireto differto releasesince (предлог, союз)to generateto addto generate

II. Прочитайте и переведите интернациональные слова, в случае затруднений уточните произношение и перевод по словарю.

energy, conservation, object, type, class, classification, function, thermal, radiation, mechanical, to absorb, reaction

III. Соедините слова и словосочетания с их переводами.

- a
- 1. mechanical appliances
- 2. energy loss of a body
- 3. to give out heat
- 4. various purposes
- 5. the law of energy conservation
- 6. sound energy
- 7. in the form of heat
- 8. different types of energy
- 9. to generate nuclear energy
- b.
- 1. отвечать требованиям
- 2. физическое свойство
- 3. природные источники
- 4. выполнять работу
- 5. исследования в области физики
- 6. электрооборудование
- 7. воспринимать звук
- 8. химическая реакция
- 9. световая энергия

- а. высвобождать энергию
- b. закон сохранения энергии
- с. звуковая энергия
- d.производить атомную энергию
- е. механические приспособления
- f. различные виды энергии
- g. потеря энергии тела
- h. различные цели
- і. в виде тепла
 - a. to perform work
 - b. electrical equipment
 - c. to suit one's requirements
 - d. a physical property
 - e. light energy
 - f. natural sources
 - g. a chemical reaction
 - h. the research on physics
 - i. to perceive sound

IV. Переведите следующие предложения на русский язык, обращая внимание на разные значения выделенных слов.

a) People have known different types of motion *since* ancient times. – Force is a vector quantity *since* it has both magnitude and direction. – *Since* the weight of a body is a force, it must be expressed in force units. – In this laboratory chemical tests have been performed *since* 1995.

b) Mechanics can be divided into *a number of* sub-disciplines. – The lecturer gave the students *a number of* examples of rotary motion. – The table shows *the number of* experiments carried out with light energy. – The number of engineering problems that are solved with the help of mechanics is great.
c) During the rotational motion an object *turns* about its axis. – Sometimes it's rather difficult to count the number of *turns* of a revolving wheel. – Each of the students *in turn* had to describe the properties of a chemical substance. – Mechanics is divided into statics, dynamics and kinematics which *in its turn* can be either classical or relativistic.

d) Sound energy which is given out by a body *makes* us hear different noises. – Two and two *make* four. – Two halves of something *make* a whole. – If heat is applied to a solid, electromagnetic energy *makes* its molecules move faster.

V. Вставьте подходящие по смыслу слова из предложенных ниже.

sources	th	ermal	capacity	motion
released	p	ossesses	electrical	performing
convert	substances	energy	mechanical	equipment

1. Scientifically speaking energy is the ... for doing work.

2. When a body is capable of ... work, it ... energy.

3. There exist many natural ... of energy in the world.

4. ... energy refers to the internal energy present in a system due to its temperature.

5. Electrical ... is used to do work and to provide ... energy.

6. Chemical energy is ... or absorbed because of a reaction between a set of chemical

7. In the physical sciences ... energy is associated with the ... and position of an object.

8. Many modern devices are used today to ... mechanical energy into other forms of

VI. Дополните предложения, используя предложенные слова.

a) differ, difference, different, differential

- 1. Mass and weight are absolutely ... physical concepts.
- 2. These two objects ... in size but not in colour.
- 3. What is the main ... between linear motion and curvilinear motion.
- 4. This problem can be solved with the help of a ... equation.

b) added, addition, additional, additionally

- 1. When an object is heated it means energy is ... to it.
- 2. They had to carry out ... experiments to prove their ideas.
- 3. During the class they revised ... and division.

4. In ... to different types of energy they also discussed various sources of energy.

5. The battery was ... charged.

c) classes, classified, classification

- 1. The table depicts the ... of energy according to its types.
- 2. Non-organic chemical substances have different ... : simple and compound.
- 3. Simple substances are ... into metals and non-metals.

d) equip, equipped, equipment

- 1. The laboratory is ... with most modern mechanical appliances.
- 2. Electrical ... is used to do work and to provide energy.
- 3. The scientists helped to ... the workshop with all the necessary devices.

VII. Назовите русские эквиваленты следующих слов:

to store energy in the body; a physical property of a substance; living and nonliving objects; different mathematical functions; to provide energy for various purposes; to perceive sounds; to require additional energy; release of energy; in the form of heat; a nuclear power plant; a measure of energy; to follow a law; a number of types; a very detailed classification



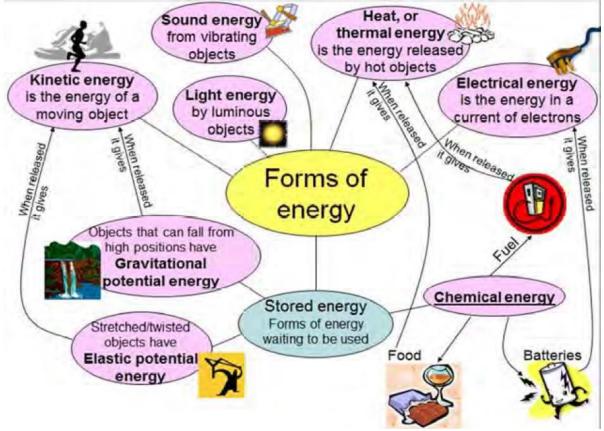
LESSON 10. Unit 3 Lesson 2 Different Types of Energy Pre-reading comprehension:

Active Vocabulary:

Х. Прочитайте текст и составьте список основных форм энергии.

When we walk or run or doing any work then after some time we feel tired. This is because of loss of energy of our body. This energy is stored in our body. Thus, the energy is defined as the capacity to perform any work. This is the physical property which follows the law of conservation. The meaning of energy is the hidden ability to perform a task. Energy exists in all objects of life, living or non-living. Energy also exists in natural sources. Since the possession of the energy differs in different cases, energy can be classified into different types of energy. They are broadly classified as 7 types of energy based on the scientific functions.

• Heat is a form of energy. When an object is heated, it means energy is added and when an object gives out heat (like radiation), the object gives out energy. The type of energy involved here is the '*thermal energy*'.



• Electrical equipment is used for a number of purposes. In each case, the purpose is to do some work or in turn provide energy. Here the type of energy is *'electrical energy'*.

• We see objects with the help of light, that is, light provides the necessary energy to help us to see. This energy is called '*light energy*'.

• Similarly, we perceive sound for various purposes. You can hear a noise from an object when it gives out an energy which makes you hear. This type of energy is '*sound energy*'.

• Mechanical appliances work to suit your requirements. For example, you use a car to travel. Here the energy provided to you to travel is a '*mechanical energy*'.

• Energy is released or absorbed during chemical reactions. When water is poured on an acid heat evolves, which means release of energy in the form of heat. But in this case the actual reason is a chemical process and hence this type of energy is called '*chemical energy*'.

• The research on physics of atoms and molecular structure of objects reveals that energy is released which is called as '*nuclear energy*'. Nuclear power plants generate electrical energy based on this concept.

XI. Дополните предложения, выбирая один из предложенных вариантов.

1. A body possesses energy when it is capable of *moving / doing work / keeping the state of rest*.

2. The more work a body can do, *the more energy / the less energy / no energy* it possesses.

3. According to the law of conservation energy can *be created / be destroyed / be neither created nor destroyed*.

4. The classification of energy forms is based on *the amount of energy / the scientific function / the type of performed work*.

5. *Light / Mechanical / Sound* energy is produced when an object is made to vibrate.

6. Mechanical energy is produced by *all moving objects / bodies at rest / interacted objects*.

7. *Work / Radiation / Heat* is a transfer of energy from one object to another because of a difference in temperature.

8. Once a chemical energy is released from a substance, that substance *remains unchanged / is transformed into a new substance/ is transformed into water*.

XII. Являются ли данные утверждения верными. Обоснуйте свое мнение, используя фразы, выражающие *согласие / несогласие*.

1. Our Universe is made from energy and it is fundamental to the existence of everything.

2. There exit only two forms of energy.

3. The classification of energy types depends on the amount of generated energy.

4. Energy is never created or destroyed.

5. Terms 'thermal energy' and 'heat' do not mean one and the same type of energy.

6. Light energy released by moving charged particles is invisible to a human eye.

7. Nuclear energy is the energy that is released when the nuclei of atoms are divided or collided.

General understanding

Х. Просмотрите текст еще раз и дайте ответы на следующие вопросы:

- 1. How can the concept of energy be defined?
- 2. Where does energy exist?
- 3. What happens if an object is heated?
- 4. What type of energy runs our appliances?
- 5. Why do we hear sounds?
- 6. What energy is released during chemical reactions?
- 7. What are nuclear power plants used for?

LESSON 11. Unit 3 Lesson 3. Kinetic Energy Pre-reading comprehension:

Active Vocabulary:

I. В следующих предложениях найдите сказуемое, определите его время и залог.

1. Several formulations of mechanics have been developed using energy as a core concept.

2. The law of conservation of energy was first postulated in the early 19th century.

3. The kinetic energy of an object is given by special formulas.

4. Newton's Laws of Motion that will be discussed in the text are based upon his own and Galileo's experiments.

5. The acceleration that had been experienced by the body was calculated.

6. At present many important problems in physics and mechanics are being solved by scientists.

7. Many problems that are connected with kinematics have been solved by a group of young researchers.

II. В следующих предложениях выберите правильный залог сказуемого.

1. The science which (*deals, is dealt*) with the laws of mechanical motion (*calls, is called*) mechanics.

2. The chemical energy (*has converted*, *has been converted*) into kinetic energy, the energy of motion.

3. The foundations of dynamics (*laid, were laid*) at the end of the 16th century by Galileo Galilei who (*derived, was derived*) the law of motion for falling bodies.

4. The facts that you (*have given, have been given*) above (*illustrated, were illustrated*) the use of mechanical appliances.

5. The kinetic energy of water (*will be converted, will convert*) into rotational energy of an electric generator.

6. The research on physics of atoms and molecular structure of objects (*is being done, is doing*) now.

7. When one form of energy (*transforms, is transformed*) to another one, some energy (*will be transformed, will transform*) into useless forms of energy.

III. Поставьте все возможные вопросы к следующим предложениям:

The law of conservation of mater was formulated by Lomonosov in 1748.
 The rotational energy of an electric generator is converted into electrical energy.

3. The two forces have been applied to different interacting forces.

I. Используя англо-русский словарь, переведите на русский язык следующие слова и словосочетания. Уточните их произношение по словарю.

to maintainto gain energytopto doubleequationto lose energybottomto passunitto includeonly(прил., наречие)wayas (наречие, союз)

II. Прочитайте и переведите интернациональные слова, уточнив их произношение по словарю.

to calculate, potential, standard, kilogram, second, scalar, factor, Greek, form, process, engineer, geometry, mathematician

III. Переведите следующие предложения, обращая внимание на разные значения выделенных слов:

1. Kinetic energy is a scalar quantity *as* it *only* has a magnitude and not a direction.

2. The work performed by a force can also serve *as* a measure of change in internal work.

3. *Only* mechanics can help to describe the changes of motion.

4. Kinematics is the *only* branch of physics which describes the motion with respect to speed, time and distance.

5. Force is the *only* dependent concept in mechanics *as* it is related to the mass of an object and the change of its velocity with time.

6. After a series of experiments the scientists needed a good *rest*.

7. Many concepts of modern physics *rest* on Einstein's theories.

8. An object *at rest* can be described as without velocity and acceleration.

IV. Соедините эквиваленты следующих слов и словосочетаний:

a.

1. due to body's motion

а. возводить скорость в квадрат

2. scalar quantity

b. максимальная кинетическая энергия

- 3. the most kinetic energy
- 4. at the top of the hill
- 5. to square velocity
- 6. to gain speed
- 7. to lose energy
- 8. to coin the term
- b.
- 1. у подножья холма
- 2. условная единица
- 3. одинаковая кинетическая энергия
- 4. удваивать массу
- 5. переходить от одного объекта к другому
- б. съезжать вниз по склону
- 7. увеличивать в четрые раза
- 8. получать потенциальную

энергию

- с. терять энергию
- d. за счет движения тела
- е. придумывать термин
- f. на вершине холма
- g. набирать скорость
- h. скалярная величина
- a. same kinetic energy
- b. to travel down the hill
- c. standard unit
- d. to gain potential energy
- e. to double the mass
- f. to pass from one object to another
 - g. at the bottom of the hill
 - h. to increase by four times

V. Из нижеприведенных слов выпишите пары антонимов:

to travel; scalar; to add; to exclude; to divide by 2; same; up; to rise; bottom; to gain; the most; different; to include; to subtract; to lose; to double; to stop; to fall; vector; the least; top; down

VI. Дополните пропуски в предложениях предложенными словами.

amount	magnitude	potential	down
falls	motion	kinetic	square
velocity	unit	gains	Joule
mass	equation	speed	loses
C	-	-	

force

1. An object that has ... -- either vertical or horizontal – has ... energy.

2. The ... of kinetic energy depends on the ... of the object and the ... of the object.

3. The ... shows that the kinetic energy of a body is directly proportional to the ... of its speed.

4. Unlike ..., acceleration and ... the kinetic energy is only described by

5. Like work and potential energy, the standard metric ... of measurement for kinetic energy is the

6. If a ball ... off the table its ... energy changes into kinetic energy.

7. As the car travels ... the hill it ... speed and kinetic energy and ... potential energy.

VII. Переведите на русский язык следующие словосочетания:

to maintain the same kinetic energy; an equation for calculating kinetic energy; other units; a scalar quantity; an important factor; to gain velocity; to lose potential energy; during the motion; the least kinetic energy; to double acceleration; to increase the mass by 6 times; in the form of a collision; to introduce a term

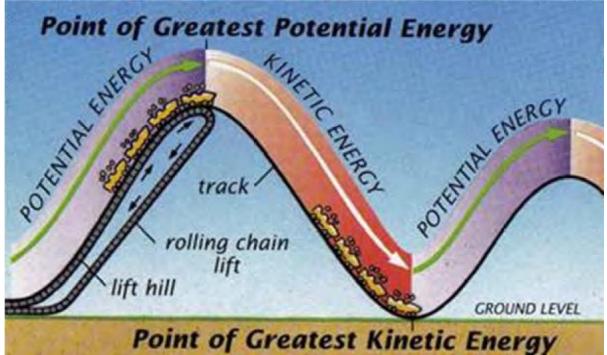
IX. Дополните предложения, используя подходящие по смыслу слова.

a) varies, varied, various, variation, variety

- 1. They decided to repeat the experiment for ... reasons.
- 2. The exhibition demonstrates a ... of shapes and sizes of instruments.
- 3. The acting force ... according to the equation $F=m \cdot a$.
- 4. Gradually ... motion is closely related to translational motion.
- 5. There is no ... between perpetual and constant states of motion.
- b) require, required, requirements
- 1. The ... space was 3.1 meters (*H*) \times 4 meters (*W*) \times 6 meters (*L*).
- 2. The job will ... a great deal of time and effort.
- 3. The new computer system will meet all our
- c) calculate, calculating, calculation, calculator, miscalculated
- 1. This ... machine can be used to solve difficult problems.
- 2. The abacus was a predecessor of a modern electronic
- 3. The equation $S=v \cdot t$ is used to ... the travelled distance.
- 4. The ... data spoilt the results of a very complex experiment.
- 5. If the first ... is wrong we will have to make one more.

Х. Прочитайте текст о кинетической энергии. Переведите интересные факты об этом виде энергии на русский язык.

Kinetic energy is the energy an object has due to its motion. As long as an object is moving at the same velocity, it will maintain the same kinetic energy. The kinetic energy of an object is calculated from the velocity and the mass of the object. As you can see from the equation below, the velocity is squared and can have a significant impact on the kinetic energy. Here is the equation for calculating kinetic energy (KE): KE = $\frac{1}{2} \cdot m \cdot v^2$ where m = mass and v =velocity. The standard unit for kinetic energy is the Joule (J). The Joule is the standard unit for energy in general. Other units for energy include the newtonmeter (Nm) and the kilogram meter squared over seconds squared (kg m2/s2). Kinetic energy is a scalar quantity, which means it only has a magnitude and not a direction. It is not a vector. Kinetic energy is due to an object's motion while potential energy is due to an object's position or state. When you calculate an object's kinetic energy, its velocity is an important factor. Velocity, however, has nothing to do with an object's potential energy. One way to think of potential and kinetic energy is to picture a car on a roller coaster. As the car travels up the coaster it is gaining potential energy. It has the most potential energy at the top of the coaster. As the car travels down the coaster, it gains speed and kinetic energy. At the same time it is gaining kinetic energy, it is losing potential energy. At the bottom of the coaster the car has the most speed and the most kinetic energy, but also the least potential energy.



Interesting Facts about Kinetic Energy:

 \Box If you double the mass of an object, you double the kinetic energy.

 $\hfill\square$ If you double the speed of an object, the kinetic energy increases by four times.

□ The word "kinetic" comes from the Greek word "kinesis" which means motion. Kinetic energy can be passed from one object to another in the form of a collision.

□ The term "kinetic energy" was first coined by mathematician and physicist Lord Kelvin.

XI. Дополните предложения, выбирая один из предложенных вариантов.

1. All moving objects have *potential / kinetic / both potential and kinetic* energy.

2. The *heavier / lighter* a thing is, and the *slower / faster* it moves, the *more / less* kinetic energy it has.

3. The kinetic energy is dependent upon the square of the *mass / acceleration / velocity*.

4. The unit used when measuring kinetic energy is called a *Kelvin / Joule / Newton*.

5. As a car on a roller coaster goes up hill, it *loses / gains / converts* kinetic energy.

6. The kinetic energy of a 6250 kg roller coaster car that is moving with a velocity of 18.3 m/s is $2.05 \cdot 105 / 3.05 \cdot 105 / 1.05 \cdot 105$ Joules.

7. The concept of kinetic energy dates back to the days of *Aristotle / Newton / Lord Kelvin*.

8. *Dynamic / Rotational / Translational* kinetic energy depends on motion through space and *rotational / static / translational* kinetic energy depends on motion centered on an axis.

XII. Согласитесь или не согласитесь со следующими утверждениями. Обоснуйте свой ответ.

- 1. Kinetic energy is the only type of energy that exists in the world.
- 2. Wind and water are examples of kinetic energy because they are moving.
- 3. Kinetic energy can be calculated as long as an object's velocity is known.
- 4. Joule is the only standard unit for energy in general.
- 5. The slower an object moves, the more kinetic energy it has.

6. When a body collides with another body, it transfers its kinetic energy to this body.

7. When an object's velocity doubles, the kinetic energy increases by 8 times.

8. The word *kinetic* comes from the Latin word *kinesis* which means velocity.



General understanding

XIII. Просмотрите текст еще раз и ответьте на вопросы.

- 1. How can the term kinetic energy be defined?
- 2. What examples of objects possessing kinetic energy can you give?
- 3. What does kinetic energy depend on?
- 4. The mass of a runner is 100 kg. He is running with the velocity of 8 m/s? How can his kinetic energy be calculated? What is it?
- 5. Which would have the greatest kinetic energy: a car driving down a hill, a person running down a hill or a ball rolling down a hill?
- 6. What is the SI unit of energy?
- 7. When is kinetic energy transferred from one object to another?
- 8. Can you create or destroy energy?



LESSON 12. Unit 3 Lesson 4. Potential Energy. Law of Conservation and Transformation of Energy. Pre-reading comprehension:

Active Vocabulary:

I. Переведите следующие предложения, обращая внимание на модальные глаголы и их эквиваленты:

A. 1. Forces must be acting but at angles to the movement.

- 2. Motion cannot change without an unbalanced force acting.
- 3. We could measure forces by means of a dynamometer.
- 4. In mechanics engineers have to deal with the concept of power.
- 5. A force may cause a change in the size or shape of a body.

6. Due to the road conditions and the traffic the driver will not be able to drive the car at a constant speed.

B. 1. Mechanics can be divided into kinematics, dynamics and statics.

2. The motion of very small bodies must be treated by using quantum mechanics.

3. Energy cannot be created or destroyed; it can only be converted from one form to another.

4. Heat may be converted into mechanical energy.

5. An opposing force must be applied to stop a moving body.

6. Newton's Third Law of Motion cannot be applied to a force acting at a distance.

7. Due to the road conditions and the traffic the car must not be driven at a very high speed.

C. 1. Sound can also be looked upon as a form of kinetic energy.

2. To really understand motion, you have to think about forces, acceleration, energy, work and mass.

3. One may compare linear motion to general one.

4. A machine will be able to do this work in a much shorter time.

5. Work cannot be done if the force does not produce a displacement.

6. When mechanical work is performed, there must be both force and displacement.

7. According to the law of energy conservation energy can neither be created nor destroyed, and can only be transformed from one kind into another.

I. Используя англо-русский словарь, переведите на русский язык следующие слова и словосочетания. Уточните их произношение по словарю.

to transform to create to relate to form elastic (сущ., прил.) to store energy to destroy precisely particular elasticity to stretch out to affect to convert to spend energy to follow to release

Прочитайте интернациональные слова, в случае необходимости их произношение и перевод уточните по словарю.

configuration, system, group, elastic, voltage, machine, universal, crystal, mechanism, technology, experiment, transmission

III. Переведите следующие предложения, обращая внимание на составные союзы.

1. The force acting on a body is related *both* to the mass of the body *and* the variation of its velocity.

2. Both motion and rest are fundamental ideas in physics.

3. Heavier substances usually require more heat to cause them *either* to melt *or* to boil.

4. Energy exists in all objects of life *either* living *or* non-living.

5. Energy can *neither* be created *nor* destroyed although its form can be changed.

6. For every force there is a reaction force that is *not only* equal in size *but* is opposite in direction.

7. Newton formulated his three basic laws of motion that *not only* explained the nature of motion *but also* became the foundation of classical mechanics.

8. We usually use energy in the form of mechanical energy *as well as* in the form of chemical one.

IV. Соедините словосочетания с их переводами.

a.

1. law of conservation а. физическое свойство 2. relative position of an object b. электромагнитная сила 3. physical property с. потенциальная энергия упругой деформации 4. energy of motion d. закон сохранения 5. electromagnetic force е. растягивать резинку f. энергия движения 6. to follow a law g. подчиняться закону 7. elastic potential energy 8. to stretch out an elastic h. относительное положение объекта b. 1. гравитационная потенциальная энергия a. transformation of energy b. particular kind of force 2. химические связи c. gravitational potential energy 3. влиять на свойство 4. определенный вид силы d. chemical bonds 5. точное количество e. physical phenomenon f. to affect a property 6. преобразование энергии 7. создавать новый вид энергии g. precise amount 8. физическое явление h. to create a new type of energy

V. Вставьте подходящие слова из предложенных ниже.

precisely	energy	follow	kinetic	associated
affect	potential	formation	elasticity	particular
original form	transformed	conve	rted p	roperties

- 1. ... is an ability of an object to return to its ... after being distorted.
- 2. When an object is moving its ... energy is ... to ... energy.
- 3. Chemical potential energy is ... with the ... of chemical bonds.
- 4. Physical ... always ... the use of a material.
- 5. In each individual case a ... type of energy is used.
- 6. All kinds of motion ... Newton's three Laws of Motion.
- 7. Energy can easily be ... from one form into another.
- 8. Any machine produces ... the same amount of ... that has been put into it.

VI. Назовите русские эквиваленты следующих словосочетаний:

relative motion of bodies; to change the state of an object; a physical system; particular type of work; rest mass potential energy; energy of motion; to stretch a spring; to destroy chemical bonds; the stored energy of position; a closed system; total amount of energy; to remain constant; physical or chemical changes

VII. Укажите способ словообразования следующих слов и переведите их на русский язык.

potential, conservation, various, existence, physical, configurator, configuration, physically, gravity, gravitational, chemical, chemist, precisely, equality, equally, universally, elasticity

VIII. Дополните предложения, используя подходящие по смыслу слова.

a) related, relative, relation, interrelated, relatively, relationship

1. All the objects in the Universe are in the state of ... motion.

2. Two independent experiments helped to get ... data.

3. The equation S = vt shows the ... between distance, velocity and time.

4. Physical quantities are ... to one another by mathematical equations.

5. The professor delivered some lectures on the ... between fundamental concepts of dynamics.

6. The water level in the vessel remained ... constant.

b) forms, formable, formation, transformations, transformed

1. In recent years the IT industry has undergone a number of

2. Energy can exist in different

3. Aluminum is a perfect ... material.

4. Potential energy is easily ... into kinetic energy.

5. The ... of hydrogen bonds in a water molecule increases its boiling point.

c) moves, movable, mover, immovable, movement, moving

1. Saturn is the slowest ... of all the planets.

2. This is the largest ... structure that has ever been created.

3. In the real world most ... is a combination of translational and rotational motion.

4. Rotary motion is anything that ... in a circle.

5. Always lock your bicycle to something ... like a railing or a lamppost.

6. Motion is the process of something ... or changing place, or even changing position.

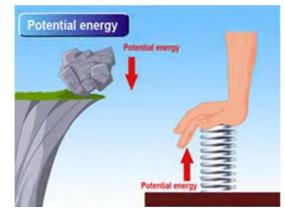
IX. Прочитайте текст о потенциальной энергии. Назовите основные виды потенциальной энергии. Информацию о законах сохранения энергии переведите на русский язык.

Potential energy is stored energy. Potential energy is the energy that exists by virtue of the relative positions (configurations) of the objects within a physical system. This form of energy has the potential to change the state of other

objects around it, for example, the configuration or motion.

Various forms of energy can be grouped as potential energy. Each of these forms is associated with a particular kind of force acting in conjunction with some physical property of matter (such as mass, charge, elasticity, temperature etc). For example, when at rest every

object has rest mass



potential energy; if the object is in a position that will be affected by gravity and to fall, it has gravitational potential energy.

Once an object is in motion, potential energy is converted to kinetic energy which is the energy of motion. Elastic potential energy is present in an object that can be stretched out and rebound like an elastic. The potential energy is stored when an elastic is stretched, and converted to kinetic energy when the elastic is released. Other types of potential energy include chemical energy which is related to the formation of chemical bonds, and elastic one expressed as voltage. Thermal potential energy is associated with the electromagnetic force in conjunction with the temperature of the object. If a given amount of energy is put into a machine precisely that very amount will be developed, neither more nor less. Energy can neither be created, nor destroyed although its form can be changed. In other words, when energy is spent there is still as much energy as before. Whenever energy in one form is expended, an equal amount of energy in some other form takes its place. This law is universally known and all physical phenomena follow it.

Х. Дополните предложения, выбирая один из предложенных вариантов.

1. Potential energy is the energy an object has due to its *gravity / position/ weight*.

2. A car on a hill has the most potential energy *half way down / at the bottom of / at the top of* the hill.

3. Gravitational potential energy is the energy of an object based on its *height* and mass / mass and speed / height and acceleration.

4. Elastic potential energy is stored when materials *vibrate / move up and down / stretch and compress*.

5. *Nuclear / Electric / Chemical* potential energy is the capacity for doing work based on the object's electric charge.

6. Energy *creation / distribution / transformation* is the change of energy from one form to another.

7. Our bodies convert *mechanical / chemical / electric* energy from food into mechanical and electrical energy to allow us to move.

8. According to the law of energy *conservation / losses / efficiency* energy is transformed from one form to another with the minimal losses.

XI. Являются ли данные утверждения верными. Обоснуйте свое мнение, используя фразы *согласия / несогласия*.

1. An object can store energy only as the result of its motion.

2. The forms of energy are often named after a related force.

3. Gravitational potential energy is the energy an object possesses because of its position in electric field.

4. Elastic potential energy is stored as a result of breaking an elastic object.

5. Potential energy can never be converted into kinetic energy.

6. Thermal potential energy depends on the electromagnetic force and the temperature of the object.

7. The amount of energy put into a machine is twice as much as the energy developed by the machine.

8. Only some physical phenomena follow the universal law of energy conservation.

🛹 h General understanding

XII. Просмотрите текст еще раз и ответьте на следующие вопросы:

- 1. What are kinetic and potential types of energy both related to?
- 2. What is potential energy?
- 3. What is each form of energy associated with?
- 4. How does the energy of a stone change as it falls from the top of the cliff to the ground helow?

the cliff to the ground below?

- 5. What object can be called elastic?
- 6. Is chemical energy always in kinetic or potential state?
- 7. Why does kinetic energy increase when potential energy decreases?
- 8. What energy transformation takes place when something burns?

LESSON 13. Unit 3 Lesson 5. Types of Energy Transfer. Pre-reading comprehension:

Active Vocabulary:

I. Используя англо-русский словарь, переведите следующие слова и словосочетания на русский язык. Уточните их произношение по словарю.

transfer (сущ., гл.) direct (прил.) to carry to interact to rise through (прил., предлог) fix (сущ., гл.) to expand to involve to occur

V. Дополните пропуски предложенными словами.

source	form	ns mole	cules	movement	
heat	object	direct	motion	ways	expand
interaction	l	thermal	transfer	carries	causes

1. There are many ... of energy, but there are only three ... of energy transfer.

- 2. Energy ... can be defined as the ... of energy from one place to another.
- 3. The ... of particles ... the energy release.
- 4. There is no ... contact between objects.
- 5. When air moves away from the ... of heat it ... the energy with it.
- 6. The ... of heated air
- 7. The hotter the ... the more ... it gives off.

8. The ... of atoms and molecules creates heat or ... energy.

VI. Переведите на русский язык следующие словосочетания:

average energy in the system; to be made up of atoms and molecules; temperature difference; a region of higher temperature; indirect contact between two objects; the only form of energy; electromagnetic radiation; molecular collisions; slower-speed particles; at normal room temperature; to cause displacement; a conductivity coefficient

VII. Назовите способ словообразования данных слов и переведите их на русский язык.

transference, movement, internal, external, microscopic, interaction, to solidify, directly, efficient, efficiency, efficiently, inefficient, heater, to preheat, to overheat, importantly, importance, to ionize

VIII. Заполните пропуски подходящими словами.

a) equal, equality, equalized, equals, equally

- 1. The temperature in the outer and inner layers has ... to a great extent.
- 2. The equation proves the ... of two mathematical quantities.
- 3. Two plus two ... four.
- 4. These both experiments are ... important for the research.
- 5. An object gains and loses an ... amount of energy.

b) physicist, physical, physics, physically

- 1. The course includes elements of chemistry, ... and engineering.
- 2. He got qualification of a nuclear
- 3. They carried out the experiment in the ... secure environment.
- 4. Heat and light are ... concepts.
- c) radiance, radiant, radiates, radiation
- 1. The Sun ... heat and light.
- 2. An astronomer can determine the ... of each star.
- 3. A considerable portion of heat is wasted by
- 4. ... energy is a form of energy that can travel through space.

d) conductive, conduct, conduction, conductor, non-conductor, semi-conductor

- 1. Thermal ... is the transfer of heat by the interaction of particles.
- 2. A ... is a substance that does not readily ... heat, sound and electricity.
- 3. Copper is a very ... material.

4. A ... is a material that allows electricity to move through it easily when its temperature increases.

5. Wood is a poor ... of heat.

IX. Прочитайте текст о способах передачи энергии. Переведите информацию о конвекции и излучении на русский язык.

The conversion of one form of energy into another, or the movement of energy from one place to another is called energy Energy is transferred through conduction, convection or

radiation. There are many forms of energy, but these are the only three ways in which energy is transferred to another object.

Conduction is the transfer of internal energy (microscopic kinetic and potential energy) from a region of higher temperature to one of lower temperature by the interaction of particles like atoms, molecules, ions or electrons in the intervening space. Conduction can only take place within an object or material or between two objects that are in direct or indirect contact with each other. Conduction is most efficient in solids because of the closed and fixed space between atoms. Convection is when a mass motion of fluid or air moves away from the source of heat while carrying the energy with it. The reason the heat rises is because once the air is heated, the molecules expand and become less dense, causing them to rise.

Radiation transfers occur

when an already heated object lets off its own heat to objects around it. The hotter an object is, the more infrared radiation it gives off. Another important note is that radiation does not involve the transfer

between particles, therefore, radiation is the only form of energy transfer that occurs in space.

Х. Прочитайте предложения, выбирая наиболее подходящий вариант.

1. Energy transfer is the *movement / creation / loss* of energy.

2. There are *two / three / four* ways in which energy is transferred to another object.

3. An area of *lower / greater* kinetic energy will transfer thermal energy to an area with *lower / greater* energy.

4. Conduction is most efficient in gases / liquids / solids.

5. *Convection / Conduction / Radiation* is the transfer of heat by motion of objects.

6. When a fluid is heated and then travels away from the source, it carries the *mechanical / thermal /sound* energy along.

7. All materials radiate thermal energy based on their *structure / properties / temperature*.

8. The *hotter / colder* an object, *no / the more / the less* thermal energy it will radiate.

XI. Согласитесь или не согласитесь со следующими утверждениями. Обоснуйте свой ответ.

1. Energy transfer is the exchange of kinetic energy between physical systems.

2. Energy is always transferred from a region of high temperature to another region of lower temperature.

3. The three fundamental modes of heat transfer are conduction, conversion and radiation.

4. Conduction is the direct heat transfer that only takes place within an object.

5. Ice melting in your hand can't be an example of conduction.

6. Convection is the transfer of energy between an object and its environment due to fluid motion.

7. Water boiling in a pan is a good example of convection.

8. Radiation as well as conduction and convection are based on a contact between the heat source and the heated object.



General understanding

ХП. Просмотрите текст еще раз и ответьте на вопросы.

- 1. How can energy transfer be defined?
- 2. What are the types of energy transfer?
- 3. In what cases can conduction take place?
- 4. Why are solids best conductors of heat?
- 5. What is convection?

6. Can you prove that warm air in the atmosphere is a good example of convection?

7. What is the main difference between radiation and two other types of energy transfer?

8. What are the examples of everyday radiation?



LESSON 14. Unit 4 Lesson 1. Scientific Breakthroughs.



Put the abbreviations next to their functional descriptions. What do the abbreviations stand for?

AI; RNA; XNA; NASA; DNA;	
• The American government organization concerned with spacecraft and space travel.	1. eg. NASA
• The particular structure and functions of every cell. Is responsible for characteristics being passed on from parents to their children.	2.
• An acid in the chromosomes of the cells of living things, which plays an important part in passing information about protein structure between different cells.	
• A type of computer technology that is concerned with making machines work in an intelligent way, similar to the way that the human mind works.	4.
• A synthetic alternative to the natural nucleic acids DNA and RNA as information-storing biopolymers (polymers produced by living organisms).	5.

2 Put the following words so that they make combination matching the given definition.

farm,	neural,	sedimentary,
leap,	degradation,	intriguing

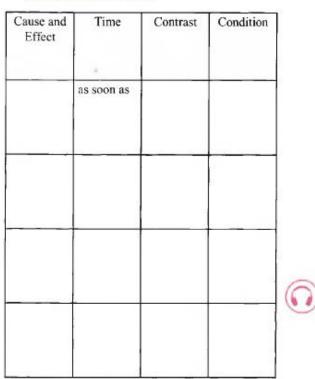
e.g. intriguing discoveries – smth new arousing people's curiosity or interest

- L _____ rock formed from sediment left by water, ice, or wind
- 2 resistant to ______ not easily or never becoming or being made worse or weaker
- server ______ networked computer servers typically used by organizations for the remote storage, processing, or distribution of large amounts of data
- 4 ______network a program or system, designed to imitate the human brain's method of functioning
- forward rapid development or evolution of the research
- 3 (T2) Listen to the speech about the latest achievements in science and complete the table.

Invention	Function	Presenter
Curiosity Rover	Scans the layers	NASA
Artificial nucleic acid		
	Recognize pictures	

- In groups of four or five, read predictions made by scientists for 2020-2040. Discuss the probabilities and add some from your field.
- Blood and organs donations will become unnecessary with the development of synthetic blood and artificial organs made from stem cell techniques.
- Electric cars will be able to travel 500 km on one battery charge.
- Robots for domestic activities, such as household chores or nursing care, will become common.
- Precision in financial and economic policies will significantly reduce economic fluctuations.
- A manned lunar base will be established.
- Ship and trains powered by fuel cells will become common.

5 Complete the table matching the adverbs and their role in a sentence.



ADVERBS: if, now that, as soon as, even though, whereas, when, even if, because, though, since, after, in case, only if, while, before, unless, although, whether or not, in the event that, as.

Adverb clauses are dependent clauses, they must be linked to an independent clause.

6 Fill in the gaps with the appropriate adverb.

- It began poring over the pages, _____ it scans the layers of sedimentary rocks, comprising Mount Sharp.
- more than 40 years, the subatomic particle was finally detected.
- _____water is essential to life, people poison it with chemicals from industry and agriculture.
- I didn't stop working until after midnight I was totally exhausted.
- We can see the light from the airplane flying high at night ____ we hear the plane ____ light travels faster than sound.

7 Match the words a-g and their synonyms 1-7.

- an expansion
- b. a curvature
- c. to verify
 - 4. bending

1. a crisis

- d. to encompass
 e. a blunder
- 5. to affirm, prove
- 6. a fault, mistake, slip
- f. a fluctuation
 g. a big crunch
- to include, contain

3. a swing, variation

2. an enlargement, growth

7. to mendo, et



Read and complete the text with the following sentences.

- Adam Reiss was quite surprised looking through the results — the expansion of the universe was not decelerating, but accelerating — it was expanding faster and faster!
- However, in 1922 Friedmann published a paper where he used Einstein's original equations without the cosmological constant term to show that the universe must be dynamical.
- It is known that Einstein showed, in his theory of general relativity, that gravity is due to the curvature of spacetime.
- 4. If the density were above a critical density, the universe would continue slowing down in its expansion due to the gravitational attraction of the galaxies for each other, and the whole universe would collapse in a big crunch at some future time.
- Read the statements and decide if they are true (T) or false (F).
- In the theory of Einstein the gravity owes to the curvature of space F
- The source of gravitational field had to include pressure and mass-energy density.
- Einstein proved that exactly pressure caused spacetime to bend.
- The gravitational repulsion cannot influence the universe expansion. _____
- The destiny of the universe could be related to a slowing down of the expansion rate.



The Accelerating Universe

Text by J. Richard Gott (an extract)

The 2011 Nobel Prize in Physics has been awarded to Adam Riess, Brian Schmidt, and Seal Perlmutter for their discovery of the accelerating expansion of the universe. It is one of the times when astronomers have won the Nobel Prize in Physics. What does this discovery mean? With is the accelerated expansion of the universe say important? a) He predicted that the Sun should bend light rays from distant stars passing near it. This effect was observed in 1919 and Einstein's prediction was verified. In developing his theory, he realized that the source of the gravitational field had to include pressure as well as mass-energy density. This is encompassed in something called stress-energy. When Einstein worked out the equations, they showed how stress-energy caused spacetime to curve. His equations guaranteed local energy conservation - cosmological constant. by

It starts with a big bang and expands. Space itself expands – a remarkabic concept. Galaxies move apart as the space between them expands. Einstein then called the cosmological constant his "biggest blunder." In 1981, Alar Guth proposed a theory of inflation noting that there was a quantum vacuum state with a positive energy density and a negative pressure causing a gravitational repulsion. The gravitational repulsive



effects of the negative pressure make the overall effect of this vacuum energy density and vacuum pressure repulsive. It is an accelerated expansion. The universe doubles in size every 10-35 seconds. Eventually, the quantum vacuum state decays, dumping its energy into the form of thermal radiation – and the big bang Friedmann model takes over. c)

If the universe was below that critical density, it would continue expanding forever. The fate of the universe could thus be determined today by measuring how fast the expansion of the universe was decelerating - how fast its expansion rate was slowing down. Two teams led by Saul Perlmutter and Brian Schmidt set out to measure the deceleration of the universe. d) The most likely explanation was that old cosmological constant term of Einstein! The two teams came to the same conclusion and reported their results in 1998. As the universe expands, dark energy stays at nearly constant energy density and, as the matter in the universe thins out, the dark energy begins to cominate. Once that occurs, the universe goes from an expansion that is slowing down to an expansion that is becoming faster and faster. In the future we expect the universe to begin to double in size approximately every 10 billion years.

(http://newswatch.nationalgeographic.com)

10 Sort out the instructions from the box for writing an abstract.

Divide the text into sections; make 4-10 full sentences; argue, prove or support with the additional information; use impersonal constructions; make a single paragraph; use acronyms, abbreviations

Do				Don't
e.g. make 4-10 full sentences		full		

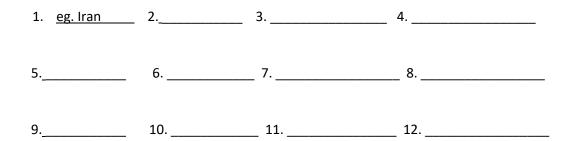
- 11 Write organizational stages for research paper abstract.
- b. defining main objectives or key features of the research paper –
- c. stating research methods –
- d. describing or giving a summary of the research results –
- e. giving a conclusion or recommendation -

12 Put the verbs in the brackets into appropriate tense forms in the piece of abstract writing given below.

In recent decades, the prevalence of obesity in America (increase) dramatically. Though it (attract) less attention, the demographic composition of the American population also (change) during this period. We (decompose) the increase in the average body mass index of the American population over 30 years and show that demographic changes (explain) a statistically significant but economically marginal amount of change. Our results (indicate) that groups' experiences (be) heterogeneous with younger women experiencing especially large gains in weight. We (uncover) some evidence consistent with the hypothesis that this can be at least partially (attribute) to increased labor force participation.



LESSON 15. Unit 4 Lesson 2. Oriental contribution. 1. Identify all oriental countries on the map. List the country names in the space provided below.



2. Look at the following items and guess where they were originated in.



Chess

Perfume

Porcelain

Syringe

Water wheel

3.(T3) Listen to the tape	and complete the table.
---------------------------	-------------------------

	INVENTIONS	TIME	PLACE	INVENTOR
--	------------	------	-------	----------

CHESS		
PERFUME		
PORCELAIN		
SYRINGE		
MECHANICAL		
WATER WHEEL		

4.Listen to the tape again and write down whether the following statements are true, false or not given.

1. Oriental people domesticated many pet animals.

2. The Chaturanda game is still used in India to teach military tactics.

3.Chess spread to Europe in the seventh century, as well as Persia and Arabia.

4. The idea of distilling flower oils for perfume was the basis of perfume

foundation in the 7th century.

5.Porcelain is a mixture of feldspathic rock and kaolin.

6. The porcelain manufacture secrets stayed hidden until the 18th century.

7. The first medical syringe was used by its founder for eye treatment purposes.

8. The Chinese Buddhist monk invented the first electrical clock in 1092.

9. The water wheel mechanical clock predicted the future of humankind.

5. Discuss the following questions.

1. Do you know any of the oriental ancestors to have been one of the flows to bring novelty to the world?

2. To what extend did their work contribute to the world civilization?

- 3 Listen to the tape again and write down whether the following statements are true, false or not given.
- 1. Oriental people domesticated many pet animals.
- The Chaturanda game is still used in India to teach military tactics.
- Chess spread to Europe in the seventh century, as well as Persia and Arabia.
- The idea of distilling flower oils for perfume was the basis of perfume foundation in the 7th century.
- Porcelain is a mixture of feldspathic rock and kaolin.
- The porcelain manufacture secrets stayed hidden until the 18th century.
- The first medical syringe was used by its founder for eye treatment purposes.
- The Chinese Buddhist monk invented the first electrical clock in 1092.
- The water wheel mechanical clock predicted the future of humankind.

4 Discuss the following questions.

- Do you know any of the oriental ancestors to have been one of the flows to bring novelty to the world?

- To what extend did their work contribute to the world civilization?

- 5 Work in pairs. Read and discuss the quote. Give your examples.
 - When you cease to make a CONTRIBUTION YOU BEGIN TO DIE. Eleanor Roosevelt



REPORTING VERBS

argue	contend	establish	object	recommend	support	
assert	contradict	examine	persuade	refuse		
assume	describe	find	propose	reject		
challenge	dispute	maintain	prove	remark		
claim	emphasize	note	purport	suggest		

6 Rewrite the sentences using above listed reporting verbs.

 Oriental inventors have created numerous things we take for granted in our daily lives. 	eg. Oriental inventors are claimed to have created numerous things we take for granted in our daily lives.
2. Ulugbek, a famous astronomer, compiled tables of sines and tangents, accurate to eight decimal places.	
 In 860, the three sons of Musa ibn Shakir published the Book on Artifices, which described a hundred of technical constructions. 	
 Oriental horticulture gave the world the fragrant flowers and herbs from which perfumes were extracted. 	
5. In the fifteenth century Vasco da Gama, exploring the east coast of Africa, new Malindi, was guided by an oriental pilot, Ahmed ibn Majid who used maps never seen by Europeans before.	

Read the text and match the passages and their subtitles.

cture	lture	phy	natic		phy	Ś	2
chite	rticu	iloso	athen	ience	ogra	trone	edici
A	Ho	Ph	Ma	Sc	ő	As	Ň
d							

ORJERTAL CORTRJEUTJORS TO CJVJLJZATJOR

The years between the seventh and thirteenth centuries mark a period in history when culture and learning flourished by new discoveries made in the sciences and arts which improved the life and condition of Man, and thousands of oriental contributions have become an integral part of human civilization.

- a. The Arabic sifr, or zero, provided new solutions for complicated mathematical problems. The Arabic numeral – an improvement on the original Hindu concept – and the Arab decimal system facilitated the course of science. Al-Khwarizmi, credited with the founding of algebra, was inspired by the need to find a more accurate and comprehensive method of ensuring precise land divisions so that the Koran could be carefully obcyed in the laws of inheritance.
- b. Al-Biruni, considered one of the greatest scientists of all time, discussed the possibility of the Earth rotation on its own axis – a theory proven by Galileo six centuries later. East astronomers such as al-Fezari, al-Farghani, and al-Zarqali added to the works of Ptolemy and the classic pioneers in the development of the magnetic compass and the charting of the zodiac.
- c. The famous scientist-philosopher known in Europe as Avicenna was Ibn Sina and his Canon was required reading throughout Europe until the seventeenth century. Avicenna did pioneer work in mental health, and was a forerunner of today's psychotherapists. He believed that some illnesses were psychosomatic, and he sometimes led patients back to a recollection of an incident

buried in the subconscious in order to explain the present ailment.

- d. Startling remnants of Arab architecture are particularly prevalent in Uzbekistan. The brilliant blue tiled dome of the Mosque of Bibi Khanum, Temur's (Tamerlane) favorite wife, catches the visitor's eye in Samarkand. Here, as well as in the complex of tombs called Shah-1-Zinda (the Living Prince), much of the old beauty is being returned to its former elegance through restoration
- e. Al-Idrisi, a twelfth century scientist living in Sicily was commissioned by the Norman King, Roger II, to compile a world atlas, which contained seventy maps. Some of the areas were therefore uncharted. Called Kitabal-Rujari (Roger's book), Idrisi's work was considered the best geographical guide of its time.
- f. The ancient oriental people were pioneers in botany. In the twelfth century an outstanding reference work, Al-Filahat by Ibn al-Awam, described more than five hundred different plants and methods of grafting, soil conditioning, and curing of diseased vines and trees.
- g. Al-Haytham (known in Europe as Alhazen) wrote a book in the tenth century on optics, Kitab Al Manazir. He explored optical illusions, the rainbow, and the camera obscura (which led to the beginning of photographic instruments). He also made discoveries in atmospheric refractions (mirages and comets, for example), studied the eclipse, and laid the foundation for the later development of the microscope and the telescope.
- h. Among the well-known philosophers of the medieval world were al-Kindi, who contributed to the work of Plato and Aristotle; al-Farabi, who made a model of Man's community; Avicenna (Ibs Sina), who developed theories on form and matter that were incorporated into medieval Christian Scholasticism; Ibn Khaldun, who expounded the cycles of a state in his Muqqadimah (Introduction)

LESSON 16. Unit 4 Lesson 3. Up- to-date devices.

Lesson 10

UNIT4

UP-TO-DATE DEVICES



- Look at the pictures and answer the questions.
- 1. What do you see on the photos and how would you describe them?
- 2. How topical were they 50 years ago? What about now?
- 3. What resemblances does the device on the photo



below bear to those on the right? 4. What devices are important for your professional life?

Match the words from A and those in B to 1 make word pairs. (Sometimes more than one version is possible). Discuss with your class which one is more/less common.

A	В		
Up to date	studies		
Innovative	changes		
Advanced	thinking		
Breakthrough	technology		
Cutting edge	advertising		
Labour-saving	equipment		
progressive	device		

(T10) Listen and fill in the blanks with 2 appropriate words and phrases from the box.

Scoff hand held hardware continued advancement spring to mind launched pad fragile

- 1. Ten years ago, I would have at anybody who dared to speak such a blasphemy.
- 2. A cell phone is one of the most popular gadgets being used among people of all ages.
- 3. Domestic appliances may not immediately..... when thinking about technological items.







- 4. Power cable production in Uzbekistan.
- 5. It is enough to on the top of the display to get any information you need.
- of the cell phones enables people 6. to avoid everyday life stresses.
- 7. It runs on a variety of computer including Intel clones and Apple Macintosh computers.
- 8. Shaver blades are and easily can shatter or break inside the cavity in which they are used.
- 3 Listen to the record and put the information below in the sequence they come in the text.
- 1. They threaten to make laptops and net books obsolete technology.
- Many users say that they can't manage their 2. professional life without them.
- 3. they Bluetooth. Mostly work with
- 4. Eventually it has become less in size but bigger in memory.
- This device makes rooms more convenient and 5. provides healthy atmosphere.
- It helps to be aware of missed calls and messages not taking it out of the pocket.
- 7. They are more resistant than older ones made of glass.

BENEFITS

- 4 Match the sentences in Ex.3 and definitions below.
- essential piece of hardware that people cannot be without
- https://www.intercontents.com/intercontents/interconten
- they become smaller and hold even more memory
- most models use Bluetooth wireless technology
- e gives an access to lots of information besides showing the time of the day only
- moductions aren't now as fragile as the old ones
- comfort making apparatus
- 5 Listen again and fill in the table.

Name of the	Used adjectives	Description
	Android	technological wonder
	wondrous piece of technology	become smaller and hold even more memory
	startling	use Bluetooth or Wi-Fi
	interesting and useful	connected to the Smartphone
	cheap, slim and light	Almost every device has one
	Comfort making	refreshes the air

Give the equivalent preposition in your own language.

b) against c) about/around d) = c) behind f) beneath g) to

- Complete the sentences using prepositions from Ex. 6.
- Devices should not be placed reach of small children.
- 2 You should not do it because it is the rules adopted by manufacturer.
- I The tourist hired a car in order to travel the countryside.

- The yacht was riding anchor in the bay.
- The man didn't have to pay for his car as it was provided, his company's expense.
- She is rather old-fashioned and the times.
- It was such an extremely bad thing to have done that it wascontempt.
- It stands reason that success requires hard work.
- 8 Complete the sentences with appropriate prepositions.

on	without	for	benea		
beside	behind under		off	by	of

- I can't stand the sound of bagpipes. It sets my teeth _____edge.
- Although after the accident the car was a complete write-off, he escaped ____ a scratch.
- 3. I put my money in the bank _____ safe-keeping.
- The office supervisor in charge of a number of people had twenty people _____ her.
- The train is _____ time and will make me late for my appointment.
- The man in a white coat said he was _____ his head and took him away.
- The sympathetic employer knew every one of his employees name.
- It is worthwhile keeping those old bits of string because they could be

use later.



9 Look at the photos and tell if you have any associations. Share your opinions about the gadgets you see.





10 Read the expressions below. Then read the text and match them and the words in bold.

- 1. something that increases in value or worth
- a person responsible for specified problems, harm, or damage
- 3. provide with a quality, ability, or asset
- 4. innovative or groundbreaking
- a gadget, especially the one, the speaker does not know or cannot recall
- a person who is responsible for planning and organizing
- 7. ammunition
- Complete the headline with an appropriate name.

economy and the modern gadget

By Dominic Basulto

For James Bond, the gadget was always frontand-center, as central to his persona as the martinishaken-not-stirred and the impossibly glamorous Bond girls. "The perfect gadget at the perfect time" appeared to be the unofficial mantra of Britain's intelligence agency-slash-underground R&D lab, which was always working on the next big gizmo () to prepare Agent 007 for battle with the world's

(___) to prepare Agent 007 for battle with the world's super-villains (___). The remote control, the homing device, the encryption machine, the car phone, the pager — yes, even the robotic dog — were not commonplace innovations when they first appeared in James Bond films, but they are now part of our everyday tech lexicon.

While it may be too much of a stretch to say that our conception of the modern smart phone was derived from the James Bond wristwatch - the high-end-technology-as-accessory you can take anywhere --- there's no denying that the smart phone enables its owner to take on the guise of James Bond as we travel anywhere in the world. The technology endows () us with the power to open satellite maps, send encrypted messages and understand foreign languages, all with the click of a button. There is now an app for just about anything, each one a hightech gizmo worthy of a super-spy. Part of the reason why we love new smart phone technologies so much is because they create the mystique that we associate with characters like James Bond, and they give us entrée to a world of high-tech magic.

Bond taught us to think big when it comes to innovation, and it was never "incremental" (__)

- 12 Fill in the gaps with the appropriate words from the text.
- Using the latest multimedia would improve the quality of any performance.
- b. Polyglots are usually _____ with tremendous abilities that in its turn _____ an _____ expanding of worldview.
- c. I'm doing my best in the way of education and tomorrow sees me
- d. Mr. X was the _____ behind the plan to acquire the newest _____.
- e. There are so many ______ to choose from and some are arguably better than others.

— it was always terribly "disruptive." (__) The name "James Bond" is synonymous with seeing technologies that we've never seen before. For Bond, the "killer app" was exactly that — something that could mean the difference between life and death. It could be the deadly briefcase in "Dr. No" — with its supply of tear gas and 40 rounds of *ammo* (__) or the *panoply* (__) of dangerous devices rigged up to his Aston Martin. At times, the "killer app" was actually the "survival app" — the one gadget that enabled Bond to elude his foes – like the jet pack in 1965's «Thunderball.»

No wonder governments around the world have attempted to capture the magic of Bond within their own R&D efforts. In-Q-Tel, the CIA's Virginiabased venture capital arm, is even named after Q, the *mastermind* (__) behind Bond's gadgets. In an effort to channel James Bond-style innovation from the private sector, Britain's real-life MI5 is now calling on small businesses to provide new ideas for innovative technologies for covert ops.

While only one of the James Bond films — «A View to a Kill» — actually revolved around Silicon Valley (a plot to gain complete control of the world's microchip market by flooding the Valley), each of them to some degree helped to create the modern gadget economy, where the most valuable tech companies have become the companies with the coolest tech. The modern gadget economy is one where we all love to talk about what's in our tech gear bag, and where we all, at some level, love to pull out the latest gizmo and impress our friends with a worldly sophistication worthy of Bond ... lumes Bond.

13 Rewrite the following sentences to replace vague language with precise language.

Example: Vague Sentence --- I think that there should be a faw against using too much water.

Precise Sentence --- It should be illegal

Lothink it may be true that robots are becoming more dever, because you can see the all around

You and me will be able to come at exactly ten at night.

Thousands types of technology were destroyed previous year.

I think that his gismo is not the best piece of machinery.

5. Tom is the worst learner in the group.

Friends always have the same objectives and share perspectives.

14 Rewrite the following sentences.

- I will start my work at exactly 10:30 in the morning.
- 2. We are better than everyone else at checkers.
- Karen is wearing extremely high quality boots.
- I just can't believe how incredibly fast time goes by when you are not doing something totally boring.
- Tom is a generous guy. ____
- 6. The twins are alike, perfectly identical.
- It's getting near the time that the show is going to start.

8.



MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION OF THE REPUBLIC OF UZBEKISTAN

BUKHARA ENGINEERING TECHNOLOGICAL INSTITUTE

"ENGLISH LANGUAGE" department

English

(Independent work for the third course students based on reading, listening, writing and speaking)

Shoyimqulova M.Sh.

Bukhara – 2017

Ushbu 3-kurs talabalarining mustaqil ishi uchun moʻljallangan uslubiy koʻrsatma Buxoro muhandislik texnologiya instituti "Ingliz tili" kafedrasi yigʻilishida muhokama qilindi va chop etishga tavsiya etildi.

Bayonnoma: №_____, ____ 2017 - yil

Tuzuvchilar:

Taqrizchilar:

Buxoro MTI "Ingliz tili" kafedrasi ingliz tili o'qituvchisi

Shoyimqulova M.Sh.

Buxoro Davlat Universiteti

"Ingliz tili va adabiyoti" kafedrasi

katta o'qituvchisi Fayzullayev O.M.

Buxoro MTI "Ingliz tili" kafedrasi

ingliz tili katta o'qituvchisi Kazakova D.G.

Ushbu uslubiy ko'rsatma 3- kurs talabalarining mustaqil ishi uchun moʻljallangan boʻlib, u o'qish, yozish, gapirish, eshitish malakalariga doir topshiriqlarni oʻzichiga oladi.

Ushbu 3- kurs talabalarining mustaqil ishi uchun moʻljallangan uslubiy koʻrsatma Buxoro muhandislik texnologiya instituti ilmiy kengashi yigʻilishida muhokama qilindi va chop etishga tavsiya etildi.

Bayonnoma №_____ 2017 - yil

Soʻzboshi

Bugungi kunda Oʻzbekiston Respublikasi Ta'lim tizimida bir qancha islohotlarni amalga oshirilmoqda. Bundan asosiymaqsad ta'lim tizimini rivojlangan davlatlar talablari darajasiga koʻtarish va oʻsib kelayotgan yosh avlodni har tomonlama yetuk qilib tarbiyalashdir. Har qanday sohani oʻrganishda mustaqil faoliyat olib borish yokiishlashsermahsulnatijaberadi. Ushbu oʻz isbotini topgan fikrni inobatga olgan holda Respublikamiz Oliy va Oʻrta Maxsus Ta'lim Vazirligi amaliy mashgʻulotlar bilan bir qatorda talabalarning mustaqil ishiga yanada koʻproq e'tiborni qaratmoqda.

Ushbu uslubiy ko'rsatma ham talabalarning mustaqil ishlarini bajarish bo'yicha topshiriqlardan tashkil topgan va 3- kurs talabalariga mo'ljallangan. Mustaqil ish variantlari fan bo'yicha o'tiladigan ish reja asosida tuzilgan bo'lib, ish dasturidagi mavzularga doir matnlarni va shu mavzular va matnlarni mustaqil ravishda mustahkamlash uchun o'qish, yozish, gapirish, eshitish malakalariga doir topshiriqlarni oʻz ichiga qamrab olgan. Uslubiy ko'rsatma talabalarning bilimlarini chuqurlashtirish va mustahkamlashni ko'zda tutib, ularni ishlab chiqish davomida ingliz tilida so'z va iboralarni chuqurroq o'rganishlariga yordam beradi. Tanlangan topshiriqlar talabalarda o'qish, yozish, gapirish, eshitish malakalarini rivojlantirish va mustahkamlashga yordam beradi.

Muallif

Contents

Term I
Independent work № 1
Variant 1
Variant 2
Variant 3
Variant 4
Variant 5
Variant 6
Variant 7
Variant 8
Variant 9
Variant 10
Variant 11
Variant 12
Variant 13
Variant 14
Variant 15
Independent work № 2
Variant 1
-
Variant 1
Variant 1 Variant 2
Variant 1 Variant 2 Variant 3
Variant 1 Variant 2 Variant 3 Variant 4
Variant 1. Variant 2. Variant 3. Variant 4. Variant 5.
Variant 1 Variant 2 Variant 3 Variant 4 Variant 5 Variant 6
Variant 1 Variant 2 Variant 3 Variant 4 Variant 5 Variant 6 Variant 7
Variant 1 Variant 2 Variant 3 Variant 4 Variant 5 Variant 6 Variant 7 Variant 8
Variant 1 Variant 2 Variant 3 Variant 4 Variant 5 Variant 6 Variant 7 Variant 8 Variant 9
Variant 1. Variant 2. Variant 3. Variant 4. Variant 5. Variant 6. Variant 7. Variant 8. Variant 9. Variant 10.
Variant 1. Variant 2. Variant 3. Variant 4. Variant 5. Variant 6. Variant 7. Variant 8. Variant 9. Variant 10.
Variant 1. Variant 2. Variant 3. Variant 4. Variant 5. Variant 6. Variant 7. Variant 8. Variant 9. Variant 10. Variant 11. Variant 12.
Variant 1. Variant 2. Variant 3. Variant 3. Variant 4. Variant 5. Variant 6. Variant 7. Variant 7. Variant 8. Variant 9. Variant 10. Variant 11. Variant 12. Variant 13.

Independent work № 1. Variant 1 Task I. Read and translate the text into your native language: ENGINEERING

Engineering is a science which deals with design, construction and operation of structures, machines, engines and other devices used in industry and every day life. That there is no single meaning of this word makes it sometimes difficult to find the proper Russian equivalents at once. The most widely used ones are: engineering, architecture, machine building, technics. The term 'engineering' is a modern one. However the art of building houses, palaces, temples, pyramids and other structures was known as far back as many thousand years ago. Now we call it 'civil engineering' It may be of interest for the students to learn that at the time of the Roman Empire there were already two branches of engineering: civil engineering and military engineering. The former included the building of houses, roads, bridges, etc., the latter the building of fortifications and military devices. It is still possible to find the remains of Roman structures not only in Italy but also in some other countries, the ones that were occupied by the Roman legions. Among those countries one may mention the territory of modern England which remained under Roman rule for about four centuries. As time went on the art of civil engineering was enriched with few achievements of science. It grew into a profession that required college training. Nowadays, civil engineering may be spoken of as an important branch of national economy. It deals not only with the building of houses, bridges, roads, tunnels, dams, water systems, etc., but also with the construction of railroads, underground railways, industrial structures, land, water and air transport, etc. It is well known that with the invention of the steam engine and the growth of factories a number of civil engineers became interested in the practical application of the science of mechanics and thermodynamics to the design of machines. The result was that they separated themselves from civil engineering and called themselves "mechanical engineers" It was that trend that laid the foundation for a new branch of engineering, the one that was called mechanical engineering.

Task 2. Put "wh" questions to the text.

Task 3. Translate into English. "Engineering" atamasi juda ko'p ma'nolarga ega. Eng keng tarqalgan ma'nolaridan biri "texnika"dir. 2. Texnikaning eng eski soxalaridan biri fuqarolik qurilishi hisoblanadi.U binolar ,ko'priklar,yo'llar,suv havzalari ,tunnel,temir yo'l qurilishi bilan bog'liqdir.3. Mashinasozlikning paydo bo'lishi bug' mashinasini ixtiro etilishi bilan bog'liq bo'lgan. Muxandis-mexanik turli mashinalarni loyixalaydi va quradi.Ular dvigatellarni,turbinalarni,dastgoh va konveyyerlarni loyixalaydi va yasaydilar.5. Texnikaning yana

bir muxim soxasi elektrotexnikadir.Uning rivojlanishi elektr soxasidagi yutuqlar bilan bog'liq. 6. XX asr o'rtalarida mashinasozlikning yangi soxalari:yadroviy texnika va koinot(kosmik) texnika paydo bo'ldi.Bu ikki soxa fan va texnikaning barcha soxalarining yutuqlariga asoslanadi.

Task 4. Listening	computers.mp ³ It's hard to believe	had computers a few years
ago. I wonder how	people lived. There must have	been paperwork. I can't
imagine writing eve	erything by hand. I	everything worked without computers.
We need computers	s today for everything. Hospita	lls, airports, the police nothing can work without
computers. I'm	ten times b	usier than now if I didn't have a computer.
Imagine	find	paper and an envelope and then walking
down the street	letter! I love n	y computer. It makes everything

_____ convenient. Sure, it freezes and crashes sometimes. Sure ______ data. But that's not often. Most ______ my computer is like my best friend.

Task I. Read and translate the text into your native language. Text. Modern Engineering

At present mechanical engineering occupies a prominent position among modern production processes. It is mechanical engineering that deals with the design and construction of steam engines, turbines, air conditioning and refrigeration devices. Conveyors, escalators and elevators are also designed by mechanical engineers. And again, it is the mechanical engineer that designs machine-tools for various operations and it is he who applies these machine-tools in various production processes. One must know that aeronautics is also one of the branches of mechanical engineering, the one that deals with the mechanics of moving bodies in fluid or air. Turning back to history, it is well to recollect that in the 19th century, with the development of the science of electricity, there appeared another branch of engineering-electrical engineering. Now the latter is divided into two main branches: communications engineering and power engineering. The former deals with minute quantities of electricity which are used for all kinds of communications, the latter-with the means for producing power. Thus, the electrical engineer is the one that designs radio, television and telephone equipment. The power engineer designs generators, switches, transformers, etc. In the middle of the 20th century there appeared other new branches of engineering. The former is based on atomic physics, the latter on all the achievements of modern science and engineering. It is impossible, however, to speak of present day engineering without mentioning chemical engineering. This deals with the processes and equipment which make it possible to change the state, energy content, chemical or physical composition of various materials. At present there are hundreds of subdivisions of engineering, but they all, at one time or another, branched off from civil, mechanical, electrical or chemical engineering.

Task 2. Give verbs corresponding to the following nouns. Construction, communication, application, invention, production, fortification, composition, foundation, refrigeration.

Task 3. Translate the following words

steam engines elevators turbines switches conveyors escalators fluid latter air-conditioning refrigeration devices physical composition mechanics machine-tools quantity production processes aeronautics branches mechanical engineering transformers moving chemical engineering communications engineering power engineering bodies electrical engineering.

	Task 4. Match professions and occupations				
1	mechanical engineering	a	Deals with the means for producing power.		
2	communications engineering	b	deals with the design and construction of steamengines,turbines, air -conditioning and refrigeration devices		
3	power engineering	c	designs radio, television and telephone equipment		
4	chemical engineering	d	deals with the building of houses, bridges, roads, tunnels, dams, water systems, the construction of railroads, underground railways, industrial structures, land, water and air transport.		
5	civil engineering	e	deals with changing of the state, energy content, chemical or physical composition of various materials.		

Task 4. Match professions and occupations

 UN ______. There are lots of arguments between countries, but that's normal. The biggest _______ to be between America, China and Russia. They ________agree. There are so many parts to the UN. There's the Security Council and the General Assembly. These are the ______ parts. But then there are the ______ like UNICEF and UNESCO.

Task I. Read and translate the text into your native language. *Text.* Engineering education

The education of an engineer extends over a wide range of knowledge: from pure science, and especially from what is known as engineering science to technology. The major portion of the field covered by the following branches: aeronautical, agricultural, chemical, civil, electrical, industrial, mechanical, metallurgical, and nuclear engineering. A civil engineer may aim at highway engineering, structural engineering or some other branch and his education will be influenced to some extent by choice, he has made. Similarly, a mechanical engineer may aim at automotive, machine-tool, aeronautical or general production engineering; an electrical engineer may aim at heavy current work, such as power supply, or at light current work, such as telephone communications, or at work in the field of electronics. Modern engineering demands a sound training in general sciences particularly in physics, mathematics and chemistry. It may be added that for certain industries a basic knowledge of biology is also essential. One can easily understand that the relative importance of the fundamental sciences depends on the corresponding branch of engineering. For example, an electrical engineer who wishes to specialize in communications or electronics needs an extensive knowledge of physics and mathematics, whereas for an agricultural engineer training in chemistry and biological sciences is more important. View on engineering education in the latter half of the 20th century emphasize the need for a broadening of the curriculum. It is recognized, too, that, especially in management, ability to deal skillfully with problems of human relations in sometimes as important as technical knowledge.

Task 2. Define the sentences	in Passive voice and analyze them
Task 3. Match the words and	definitions

1	Modern engineering	a	training in chemistry and biological sciences is more
			important.
2	electrical engineer	b	Needs wide knowledge of chemistry
3	agricultural engineer	c	needs an extensive knowledge of physics and mathematics
4	Chemical engineer	d	Needs training in mathematics, physics, drawing and etc.
5	civil engineer	e	demands a sound training in general sciences particularly in
			physics, mathematics and chemistry

Task 1. Read and translate the text into your native language: MODERN INDUSTRY

"A great mass" of something means a great amount. When the new method of manufacturing articles in great numbers was introduced, a new name was wanted for it and "mass production" was the one that came into use. In what ways does mass production differ from the older methods of manufacture? Formerly a skilled workman often made the whole of an article himself by hand. Articles made in this way could not be mass produced. Each article differed slightly, from the others; in every one there was something of the maker's individuality. The finished article was sold at a high price, the price representing the time and the skill of the worker who had made it. Mass production has reduced the cost of labour to a minimum. As new methods are invented and new manufacturing processes developed, output increases more and more. The aim of every factory is to reduce costs and increase output. Most of the articles of everyday use are mass produced. The buttons on your coat, your shoe-laces, pens and pencils are all very cheap because they are mass produced. Cigarettes are manufactured and sold by the million. Tobacco and paper are put into one part of a machine and endless cigarettes emerge at another. Another machine counts the cigarettes and packs them into boxes. From the time when the tobacco is put into the machine until the purchaser opens the box, no hand touches the cigarettes. In every factory that assembles complicated articles by mass production methods, there is a conveyor belt. As its name shows, this is a moving belt which conveys, or carries, the article to the workers. Each worker stands at a bench and the belt moves past him. He performs one operation and only one. He therefore becomes very skilled at doing this, and does it quickly. When he has done his job, he puts the article back on the belt and picks up another which he treats in exactly the same way. This is an extremely efficient method of manufacture. The result is that a complicated article is assembled speedily and economically. The conveyor method is used in most motor works. The chassis, or the frame of the car, is taken from a store. A gang of men, four on each side, quickly attach wheels to it taken from another store near them. When the wheels have been put on the chassis moves down the workshop to another gang of men who perform another operation. Above their heads is a kind of overhead railway which brings to them a heavy part of the engine. As it comes down, they guide it into its place in the chassis, put in the bolts, tighten the nuts and send the chassis farther on to another gang. Each gang does only one operation. At one place the whole body of the car comes down from above and is fixed into place. In turn the radiator lamps, battery and electric wiring are all tittered by expert workers, all of them skilled in one branch of the work. What started down the assembly line as a bare chassis soon rolls out of the works as a complete car ready for the road. The work of the management must be extremely efficient. All the different parts of a car have to be in place at the different points of the assembly line at the right time.

Task II. Translate the following words and word combinations.

modern industry, manufactured articles, skilled workman, mass produced, high price, reduced costs, to increase output, conveyor belt, efficient method, electric wiring, bare chassis, printing presses, overhead railway.

Task III. Speaking assignment."Scientific achievements of today".

 Task IV. Listening
 television.mp3
 What do you think? Is television good or bad? I loved it

 ______. My eyes were glued to the TV screen for hours and hours. I

 watched cartoons and other ______. It was good at the time, but maybe I

 _______ outside playing or doing something more useful. There's

______TV. There are so many programmes that you watch just because you're too lazy ______. A lot of people turn on the TV and sit in front of it all day or all night. ______ time! I think television programmes are getting worse. Reality TV and celebrity chat ______. The only good things on TV nowadays is the news, live sport and comedy shows. Plus an interesting

Independent work № 1. Variant 5

Task I. Read and translate the text into your native languageText. Uzbek automobile industry

The Plant will enable to put the emerging Uzbek automobile industry on the new level and will provide opening of new jobs. One of the largest aircraft building enterprises -V.Chkalov Aircraft Production Association (TAPOiCH)- is placed in Tashkent. Employing almost 10 thousands people, it looks like "a town in the town". In the second half of 1960 the largest airliners in the world "Antey" were produced here. Me»--At the end of 1993 the Association manufactured a modem turboprop 64-seat aircraft "11-114". It is well known that fuel consumption is one of the main indicators in modem aircraft construction. From this point of view the "II -114" aircraft consumes twice less fuel than the obsolete "An-24" and "Yak-40". The "TAPOiCH" which includes Andijan and Fergana skin-plants is one of the biggest aviabuilding Associations in the CIS. And the National Company "Uzbekistan Khavo Yullari" (Uzbekistan Airways) took a meritorious place in world aviation fellowship. How the President of Euromarket-Forum, professor Pier Mateyzen said, the National aviacompany "Uzbekistan Khavo Yullari" is well known on the Euromarket of avia-conveyance. In a condition of tough competition the aviacompany conquested solid position in avia business. Uzbekistan's aviacompany, which renewed its airplanes into western products makes new route-marches and active cooperates with another aviacompanies.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

a) Customs and traditions.

b) American holidays.

c) Holidays of GB.

Task III. Speaking assignment."Mass media"

Task IV. Listening

E-mail.mp3

E-mail certainly _______. I never used ______ many letters _______. In the good old days before computers, we wrote real letters, with paper and envelopes. I wrote one or two _______. But now, with e-mail, my in-box is never empty. There's always someone mailing me. I would

like	where I'm free of e-mail. The sa	ad thing is, very few mails
I get are interesting. I get _		l trying to sell me things I
don't want. I also get	from people asking me	
	Do this, do that, reply ASAP. It's t	oo much sometimes. The
	_ about e-mail is that you can get thin	gs done quickly. I can e-
mail a company in another	country and they can	in two
minutes.		

Task I. Read and translate the text into your native language. The belt is the most important element of a conveyor, not only because of its basic function within itself, but also because it is permanently in contact with the material to be conveyed. Esbelt, a manufacturer of thermoplastic conveyor belts, presents range of production. Esbelt carries out its activity in permanent contact with the market all over the world. This provides it with punctual and accurate information about the new needs continuously generated by technological advances. In most cases those needs make necessary the development of new types of belts. Esbelt meets this goal and for this purpose has a united team of people, who using its own technology, have always shown great creativity and an even greater efficiency in the solution of the problem,. Esbelt produces more than 60 different types of belts which are grouped in 8 series meeting practically every need of the market. 1. Febor series--Standard belts for indoor conveyance of packaged or bulk products, in environments not bearing special difficulties.

2. Breda series--Antistatic belts for conveyance of products in special conditions and environments.

3. Clina series --Belts with the basic feature of being atoxic essential to be in direct contact with foodstuffs.

4. Verna series--Especially appropriate belts for organic and aromatic products.

5. Espot series--Atoxic and antistatic belts.

6. Drago, keram series.-- Belts for heavy duty. They are good for the conveying of sharp objects.

7. Aster series.--Belts with their carrying side ambassed for elevation or descent of packaged or bulk products.

8. Runer series--Belts with corrugated sidewalls for increasing capacity..

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

a) A Russian explorer who made a study of Central Asia.

b) The life and activity of NikolayPrzhevalsky.

c) Works of N.Przhevalsky.

Task III. Speaking assignment."The most important cities of Britain".

Task IV. Listening



Telephones are	lives these days. W	hen I was growing up, I perhaps
used the phone once a wee	k. It was	when it rang. Everyone rushed
into the living room to find	d out who was calling. Of course,	phone
- the size of a footb	all. And you had to leave	it on the table because it
V	vall. Today, however, is a	Everyone has
a phone. Some people	I know have several. They cha	ange them every six months
	come out. Today's phones aren'	t really phones. They are like
personal	that have a phone. I'm wa	aiting
I'm sure it'll be here soon.		

Independent work № 1.Variant 7 Task I. Read and translate the text into your native language *Text. Changes in science*

Great changes take place in science and engineering. New branches of science appear: atomic physics, cybernetics, radio-astronomy. Nowadays people move on land much faster than the speediest horses. Powerful motors drive cars, diesel engines run trains from one country to another. Under water sportsmen swim swifter than the speediest fish. Underwater robots explore the sea bed at a depth of more than 4,000 metres. By means of remote control devices they change tools and lift weights. In air people fly hundred times faster than birds. Supersonic planes fly at twice the speed of sound. We live in the age of machinery, i.e. in the time when highly productive machines and up-to-date devices take the place of men for doing work. In industry and agriculture machines play a most important role. They do all the hard work in mills, factories, mines and farms. Machines help not only factory workers and farmers in their productive labour. They do part of scientists' and explorers' research work as well. Satellites circle the earth, spaceships explore the outer space. Mooncars carry out research programmes on the Moon. Electronic instruments-radars, lasers and masers represent the latest development of research equipment. They are of great help in all forms of scientific work. People enjoy these achievements thanks to the development of science and engineering. With the development of science and engineering a new man will appear—a man who will use his hands less and less, but employ his brains more and more.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

- a) Location of the USA.
- b) Commercial and industrial cities of the country.
- c) The structure of the government of the USA.

Task III. Speaking assignment."The youth life in our country".

Task IV. Listening.



I have a strange hobby. It's visiting factories. I'm really in	nterested th	nings
work and how they are made. I've learnt	on my factory visits. Factor	ries
are amazing. They are like mini cities. The thing that surp	brises how	
everything works together. Everyone knows exactly what	to do it. E	ven
the robots. Car factories are cool, but very noisy. A car as	sembly a g	giant
ballet dance with everything moving perfectly together. It	t's visit fac	tories.
All you have to their home page and see	if they have visiting times,	or

write to them. The best factories ______ ones that produce food and drinks. You always ______ .Unfortunately you don't ______ at car factories.

Independent work № 1.Variant 8 Task I. Read and translate the text into your native language *Text. Benjamin Franklin*

Benjamin Franklin (1706-1790) was an American printer, author, publisher and scientist. He was born in Boston, Massachusetts, on January 17, 1706. His father was a maker of soap and candles. From his school days Benjamin Franklin was greatly interested in science. In those days Leyden made his famous jar and Franklin very quickly understood that it could keep electricity. He invented a way of drawing the electric fire from the clouds by rods of iron on high buildings. He had invented the lightning-rod. In June 1752 he risked his life and the life of his son William, who helped him to prove that lightning is an electrical discharge. They made a kite of silk on a wooden frame with a string of metal wire. Standing in the open door of their house they flew it in a thunder-storm, when the rain was falling. At first nothing happened but as the kite string got wet from the rain, electricity began to flow. Sparks jumped between the key and the Leyden jar. The electric current could not flow along the kitestring till it got wet. Wet silk, like metal, is b good conductor of electricity. Dry silk is B non-conductor. Benjamin Franklin's lightning conductor is now used all over le world. He also invented many of the forms which are still used in electricity battery, semiconductor.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

- a) The great fibre crop of the South.
- b) A number of species of cotton ranging.
- c) Ploughing and cultivation of cotton.

Task III. Speaking assignment."The role Internet in our life" Task IV. Listening.



What	technology? Would we still be live	ing in caves? Probably. I			
think there are two					
computers. When we think	k about technology before computers, it				
	It was all mechanical. Things like steam	n trains and fridges. At			
the time, that	technology. But, today's technology is really				
cutting edge. It's the kind	soon as it hits the				
shelves. I love this. It's so	exciting seeing it all happen. I love				
technology we'll have in t	he future, and then buy	It's like buying			

technology from science fiction movies. I'd love to live to be 200 so I can see what technology ______.

Task I. Read and translate the text into your native language: THE LATHE

The lathe is one of the most useful and versatile machines in industry, and is capable for carrying out many machining operations. The main components of the lathe are the headstock and tailstock at opposite ends of a bed, and a toolholder between them which holds the cutting tool. The toolholder stands on a cross slide which enables it to move across saddle or carriage as well as along it, depending on the kind of job it is doing. The ordinary center lathe can accommodate only one tool at a time on the toolholder, but a turret lathe is capable of holding five or more tools on the revolving turret. The lathe bed must be very solid to avoid vibrations. The headstock incorporates the driving gear and a spindle which holds the workpiece and causes it to rotate. The cutting speed of the tool is an important factor. Tapered centres in the hollow nose of the spindle and of the tailstock hold the work firmly between them. A feed shaft from the headstock drives the toolholder along the saddle, either forwards or backwards, at a fixed uniform speed. This enable the operator to make accurate cuts and to give the work a good finish. Gears between the spindle and the feed shaft control the speed of rotation of the shaft, and the forward or backward movement of the toolholder. Centres are not suitable for every job on the lathe. The operator can replace them by various types of chucks, which hold the work between jaws, depending on the shape of the work and the particular cutting operation. He will use a chuck, for example, to hold a short piece of work, or work for drilling, boring, or screw-cutting. A transverse movement of the tool post across the saddle enables the tool to cut across the face of the workpiece and give it a flat surface. For screw-cutting the operator engages the lead screw, along screwed shaft which runs along in front of the bed and which rotates with the spindle. The lead screw drives the toolholder forwards along the carriage at the correct speed, and this ensures that the threads on the screw are of exactly the right pitch. The operator can select different gear speeds, or reverse the movement of the carriage and so bring the tool back to its original position. Lathes are now made with numerical control and with computer control. They work automatically according to programs the unit is called a machining centre.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

a) Prominent people of our country.

b) The first Uzbek poet (writer).

c) The scientists awarded by Noble.

Task III. Speaking assignment."Science in Britain".

 Task IV. Listening
 students.mp3

 Being a student
 ________. I don't think most students understand this. A lot of

 students complain they have no money and _____. They never complain that they have ______ time, don't have to go to work and have really long holidays. When students finish being students and go to work, they understand how _____a student. Being a student at high school ______. You have to study boring things and deal with things like bullying. Going to college or university is ______. Just ______ classes a week and lots of student parties. I'd love to be a student again. I know many people who'd like to be full-time students forever. All you need is _____.

Task I. Read and translate the text into your native language. MATTER.

It is well known that any matter is composed of large numbers of very small mass particles called molecules. They are in a state of continuous motion. In a solid they are closely packed and give to the solid its definite shape. In a liquid, the molecules have a weaker cohesion and travel about with some freedom, so that the liquid takes up the shape of the vessel in which it is contained. In a gas, the mo lecules are still more mobile and relatively far apart. The cohesive force is small and the gas fills its container and is easily compressed or expanded. When substances are heated the molecules move more intensely, and expansion or internal pressure arises. An atom is the smallest particle of matter and it generally exists only in combination with other atoms. Atoms consist of three kinds of particles-electrons, protons and neutrons, and the numbers of particles determine the kind of element. An electron has a negative electric charge. A proton is positively charged. A neutron is a chargeless mass. The neutrons and protons of an atom are linked together to form a compact nucleus, while the electrons travel in orbits round the nucleus like planets round the sun. The simple hydrogen atom has a single proton as nucleus and a single electron at planet. The atomic weight of an atom is the number of protons and neutrons it contains. The atomic number is the number of protons in the nucleus; normally the number of negative or positive charges is equal, and the atom is electrically balanced.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

a) Ulster is

b) The Irish population.

c) Cultural Traditions of this country.

Task III. Speaking assignment."Education in the USA"

Task IV. Listening



Standard of living is something _______ of us. We all want a better standard of living. We all do our best ______ to improve it. I'm quite happy with my standard of living. I'm not rich, I don't have expensive furniture (in ______ used furniture) and ______ holidays overseas. I don't ______ lot of money to have a good standard of living. As long as you are comfortable in your home and you can buy food _______ times a week, your standard of living _______. Mine is much better than 90 per cent of the world's population. This is ______ you, if you are reading or listening to this. We all need to think how lucky we are.

Independent work № 1. Variant 11 Task I. Read and translate the text into your native language *Text. Machine engineering industry*

Heavy industry takes the leading place in the industry of Uzbekistan and fuel energy, metallurgy, machinery engineering, construction and construction materials complexes are constituent parts of this industry.Machinery engineering takes the leading place in the industry of Uzbekistan. There have been created numerous machines, mechanisms and instruments in the plants and enterprises of this industry. A new model of cotton harvester machine was created by the Uzbek –Israil Joint Venture "Uzizmash "in 1994. It has many advantages over mechanical cotton harvester machines that were produced previously. In the town of Asaka a large center of automobile construction center was established jointly with South Korea. The "Uzdaewoo"Automobile Plant was built in short 3 years.It is a peculiar wonder of engineering.On July 19, 1996 the plant started its work with assembling of the "Damas", "Tiko", and "Nexia" automobiles. Now the plant produces a new model of Nexia and Matiz automobiles. In such a manner "Uzdaewoo" consolidated its position on outward market. Another important event took place in machine engineering industry in March 1999.Another Automobile Plant "SamKochavto", constructed on the joint basis, was put into operation in Samarkand.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

- a) Administration of Britain.
- b) Tasks of political parties.
- c) Numbers of chambers in Britain.

Task III. Speaking assignment."The school day in Uzbekistan".

Task IV. Listening Freedom.mp3

Freedom ______ thing. It seems to mean different things in different countries. People in ______ they have freedom, but I don't think so. We have to go to school, we have ______, we have to work, we have to do _______. That's not freedom. I'd say we have more freedom than _______ countries. There are many countries in the world where people _______. They can't leave the country, can't _______, and have to work 16 hours a day. I wonder what a society ________ if everyone was totally free to do anything they wanted. It would probably be _______.

Independent work № 1. Variant 12 Task I. Read and translate the text into your native language.*Text. Uzbek automobile industry*

The Plant will enable to put the emerging Uzbek automobile industry on the new level and will provide opening of new jobs. Production Association (TAPOiCH)- is placed in Tashkent. Employing almost 10 thousands people, it looks like "a town in the town". In the second half of 1960 the largest airliners in the world "Antey" were produced here. Me»--At the end of 1993 the Association manufactured a modem turboprop 64-seat aircraft "11-114". It is well known that fuel consumption is one of the main indicators in modem aircraft construction. From this point of view the "II -114" aircraft consumes twice less fuel than the obsolete "An-24" and "Yak-40". The "TAPOiCH" which includes Andijan and Fergana skinplants is one of the biggest aviabuilding Associations in the CIS. And the National Company "Uzbekistan Khavo Yullari" (Uzbekistan Airways) took a meritorious place in world aviation fellowship. How the President of Euromarket-Forum, professor Pier Mateyzen said, the National aviacompany "Uzbekistan Khavo Yullari" is well known on the Euromarket of aviaconveyance. In a condition of tough competition the aviacompany conquested solid position in avia business. Uzbekistan's aviacompany, which renewed its airplanes into western products makes new route-marches and active cooperates with another aviacompanies.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

- a) Types of education in Britain.
- b) Private education.

c) The differences between state and public schools.

Task III. Speaking assignment. "Schooling in Uzbekistan".

Task IV. Listening



smoking.mp³ Smoking is a terrible thing. There's _______ it. I don't know how cigarette companies can advertise their products. _______. Smoking is not cool. Last century, cigarette companies tried to make _______. They even told people that cigarettes were good for your health. ________. Everyone today knows that smoking is one of the _______ you can do. Unfortunately, cigarette companies are doing a good job of selling their _______. Smoking is on the increase in countries like China and _______ over Africa. This is sad. Once people get enough information about the dangers of smoking, perhaps millions will quit ______.

Task I. Read and translate the text into your native language. Fundamental physical laws

In their simplest form, the six fundamental physical laws are:

1. The law of conservation of matter and energy. Matter and energy can neither be destroyed nor created.

2. Law of combining weights. All substances combine in accordance with simple, definite weight relationship.

3. Ideal-gas law. The volume of an ideal gas is directly proportional to its absolute temperature and inversely proportional to its absolute pressure.

4. Avogadro's law. Equal volumes of perfect gases under identical conditions of temperature and pressure have the same number of molecules.

5. Dalton's law. The total pressure of a mixture of gases is the sum of the partial pressure which would be exerted by each of the constituents if each gas were to occupy alone the same volume as the mixture.

6. Amagat's law. The total volume occupied by a mixture of gases is equal to the sum of the volumes which would be occupied by each constituent at the same temperature and pressure as the mixture.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

a) Talented people of GB.

b) A great romantic English landscape painter.

c) The famous paintings of William Turner.

Task III. Speaking assignment."School day in the USA" Task IV. Listening



Safety is something we ______ carefully about. The world around us can ______ place. Even our homes ______. Think about all the electric wiring, gas pipes, chemicals in the building materials, etc. All kinds of things could happen. It's a good job we ______. Our governments make sure builders focus on safety. This is also true for the things we buy. You ______ small logo on electrical products that say the product is safe, and then there are instructions ______. Food safety is also something lots of people work on. It works. People rarely ______ the food we buy in shops. Maybe it's not such a dangerous

Task I. Read and translate the text into your native language: Three states of matter We know that the cohesion between the molecules of a solid body is very great. A solid body retains its forms. When a solid body is heated, the motion of its molecules becomes more rapid. The cohesion among the molecules weakens; the body expands on heating. On further heating, the movement of the molecules becomes still more rapid and the attraction between them diminishes. Finally, when the motion of the molecules has attained some velocity the molecules begin to move among other molecules in various directions, chaotically, in disorder. The cohesion has become very much weaker. The body is no longer a solid. It has been transformed into a liquid: it has melted. On cooling, the above described phenomena occur in exactly the reverse order. At some temperature the density is so great that the liquid becomes a solid body. During melting the bond between the molecules becomes considerably weaker than in the solid body. In order to separate the molecules from one another, I t is necessary to overcome attraction between them. If it necessary to perform work to destroy the bonds between the molecules. Overcoming the attraction, the molecules situated on the surface of a liquid escape from the liquid into the air. These are molecules or vapour. The higher the temperature of the liquid, the greater the number of molecules escape from the liquid. Hence, when a liquid is heated, the rate of evaporation is increased. The larger the surface of the evaporating liquid, the greater the number of molecules that can escape from the liquid at the same time. The velocity of the molecules increases in proportion to the temperature of the liquid and. finally, the velocity becomes so great that the formation of vapour goes on not only on the surface but through the liquid. Liquids whose molecules are weakly attracted to one another are easily evaporated. Such liquids are called volatile liquids. Less energy is required for their evaporation. Attraction between molecules of vapour is practically non-existent. As a result of this, molecules of vapour move in all directions, collide with one another and occupy a vast volume in comparison with the volume of the liquid from which they were formed. The state of substance depends on the velocity of its molecules.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

- a) The members of Royal Family.
- b) The head of Royal Family.
- c) The interests of Queen Elizabeth.

Task III. Speaking assignment. Types of schools in Britain.

 Task IV. Listening
 robots.mp3
 A long time ago, robots _______ fiction.

 Children loved looking at movies with robots. Today, robots are real, and
 _________. In the future, we will all have robots. They will vacuum the

 floor, wash the dishes, ________ our cars. I even think one day we'll have
 _________ making robots to help old people

 and to ________. It's still early days. I'd say we are another 20 to 30 years

 away from robots
 _______ in our lives. What will happen to us when the

Maybe one day we won't be able to tell robots and humans apart. Maybe ______ world.

Task I. Read and translate the text into your native language. Newton's laws of motion Inertia. – It is a matter of every day observation that bodies in a moving train tend to move toward the forward end when the train stops and toward the rear end when the train start; that is, bodies in motion tend to keep on moving, and bodies at rest to remain at rest. In view of observation of this sort Newton in 1686 formulated the following statement and called it the first law of motion: Every body continues to remain in its state of rest or uniform motion in a straight line unless impelled by external force to change that state. This property, which all matter possesses, of resisting any attempt to start it if at rest, to stop it if in motion, or any way to change either the direction or the amount of its motion, is called inertia.

Momentum. – The quantity of motion possessed by a moving body is defined as the product of the mass and the velocity of the body. It is called momentum. Thus, a 10-gram bullet moving 50000 centimeters per second has 500000 units of momentum. We shall always express momentum in C.G.S. units; that is a product of grams by centimeters per second. Newton's second law of motion was stated thus; Rate of change of momentum is proportional to the force acting and the change takes place in the direction in which the force acts. When a man jumps from a boat to the shore, we all know that the boat experiences a backward thrust; when a bullet is shot from a gun, the gun recoils, or "kicks".

Newton stated his third law thus: To every action there is an equal opposite reaction.

Task II. Writing assignment. Write a composition according to the following plan and make a conclusion giving your own opinion.

- a) The land of Blue Mountains.
- b) Beautiful wild forests of Tasmania.
- c) The red heart of Australia.

Task III. Speaking assignment." Institutes and Universities in Uzbekistan".

Task IV. Listening



I can't wait for retirement. I'm _______ early. I like my job, but I like staying at home and doing _______. Many people fear retirement. They worry about what they'll do. I'm not worried at all. I know I can _______. Retirement is a time to do all the things you never _______ because you were working. I have over 1,000 books on my reading list. I have hundreds _______ on the computer and lots of new hobbies. Early retirement for me would be 50. Most _______. Go or 65. I think 50 would be perfect. You're _______. You can still do lots of things. I _______ feels like to retire so young. To wake up every morning and never think about work.

Task I. Read and translate the text into your native language. SCREW FASTENINGS Machine parts are held together by parts: (a) working in tension, (b) working in shear, (c) creating friction, and (d) using both shear and friction forces. Types of Fastening.-All fastenings can be divided into two classes-disconnectable fastenings and permanent joints. Disconnectable fastenings, in turn, are effected by: (a) bolts and screws, (b) wedges, (c) dowel pins, (d) keys. Permanent joints are obtained by means of: (a) press fits, (b) shrink fits, (c) rivets, (d) welding, brazing and soldering and (c) casting. casting. Forms of Threads. - Screw fastenings are used for holding two or more machine parts together or for adjusting one part with relation to another. In screw fastenings the threads are made in several forms but are always of triangular-type single thread. Screw threads are made right-hand and left-hand. PINS-Geometrically pins can be divided into cylindrical pins, called straight pins, and conical or taper pins. Dynamically pins can be classified as those used only to locate the relative position of two parts when there is little or no force acting upon the pin, and those that fasten two or more parts together and are subjected to considerable stresses, which are mostly in shear but sometimes in bending. Locating pins are called dowel pins or simply dowels. A connecting **pin**, like a dowel, may be used either as a permanent connection or as a fulcrum for a movable joint. KEYS-Types of Keys. – The main function of a key is to transmit torque between a shaft and a machine part assembled on it. In most cases keys prevent relative motion, both rotary and axial. In some constructions keys allow an axial motion between the shaft and the hub, such keys are called feather or spline keys. In spite of the tendency to standardize there are many key types in use by various manufactures. According to various characteristics keys can be distinguished as straight and tapered; rectangular, dovetailed, chamfered round, and disk-shaped; radial and tangential; and (according to their use) for light duty and for heavy duty.

Task II. Writing assignment. Answer the following questions about "Westminster Abbey".

- 1. What kind of building is Westminster Abbey?
- 2. How and when was it founded?
- 3. What changes were done later?
- 4. What tradition does Westminster Abbey continue and who established it?
- 5. Where were great Englishmen buried and who are they?
- 6. What can one see in Westminster Abbey?

Task III. Speaking assignment."Outstanding scientists of Great Britain".

Task IV. Listening



It's amazing how radio ______. Everyone thought that television ______. It didn't. Then music videos and MTV came along. That didn't really affect radio either. _______ becoming more and more ______. You can tune in to almost any radio station in the world nowadays over the Internet. I'm ______ and can't live without it. I love radio phone-in shows. It's fascinating to hear callers _______ about the latest news. Even though I have a CD player in my car, more ______ I will listen to the radio. I like not having to choose what

to listen to. It's also useful to ______. One of my dreams as a kid was to be a DJ and play my favourite songs all day.

Task I. Read and translate the text into your native language. PRESS, SHRINK, AND FRICTION JOINTS

Definitions. – A press joint, also called a force joint, is obtained by forcing a shaft into a hole that is slightly smaller than the shaft. This is possible because of the elasticity of the materials which produces the grip that holds the hub and shaft together.

A shrink joint differs from a press joint chiefly by the method of assembling it. The hub is heated to expand its bore and to slip it on the shaft. When the hub cools down to the temperature of the shaft, the grip is produced in the same way as in the force joint. The shrink joint is also used to connect machine parts by means of special rings, anchors, and tie rods.

In a **friction joint** the holding grip is produced by the conical shape of the shaft end and the hub bore and by the pull of a nut, or by a slotted hub whose bore is smaller than the shaft and which is spread by a wedge when the joint is being assembled.

Comparison of Joints. – The assembling of a shaft and a hub by means of a press joint is simpler than that with a shrink joint especially if a hydraulic press of a sufficient capacity is available. Shrink joints are used mainly in places where it is difficult or impossible to assemble a press joint, as in the case of rings or anchors. On the other hand, shrink joints assemblies with the same interference as press joints give more than three times the holding power against both torsion and axial pull. This superior effectiveness is due to the absence of abrasion between the surfaces of the shaft and the hub during assembly. All three joints are used when machine parts must be connected more securely than can be accomplished with a key or screw joint, especially when they are subjected to shock or vibration.

Task II. Writing assignment. Answer the following questions about "St. Paul's Cathedral".

- 1. What is St. Paul's Cathedral?
- 2. Who was sir Christopher Wren?
- 3. What was the matter with the earliest, the second and the third churches?
- 4. What was the fate of the Cathedral in 1666?
- 5. What was happened during World War II?
- 6. Does this Cathedral exist, is now seen and used by people?

Task III. Speaking assignment."Brief history of the USA".

Task IV. Listening



quality_of_life.mp3

Quality of life is ______. It's something we all try to improve. I'm just ______ it is to improve your quality of life. The biggest things that ______ are are your job, house, holidays and friends. Of course there are others. It's quite difficult ______ things. If you don't like your job, it ______ to find a better one. My job really affects my quality of life. If it's really stressful, my ______ goes down. You also need somewhere nice to live. That can be difficult to change. It's important to find a home ______ home. Holidays can add a lot to your happiness, but we don't have lots of those. And then there are friends. They ______ quality of life.

Task I. Read and translate the text into your native language: Riveted joints

General Remarks. – Riveting has been the standard method of joining plates and structural parts before welding began to replace it with increasing rapidly. **Rivets.** – A rivet is a round bar consisting of an upset end called the head, and a long part called the shank. The rivet shank is heated to a red glow, inserted into one of the holes, and, while the head is held firmly against the plate by a heavy sledge, the projecting end is formed into a second head, called the point, by means of a hand hammer and set or by a press. Button heads are used for small rivets which are driven cold; pan heads are used chiefly in ship work; countersunk heads are used only in special cases, chiefly in structural work and below the water line in ships; the countersunk points weaken the plate so much that they should be used only when unavoidable; the others, including button heads, are used in boiler and structural work.

Task II. Writing assignment. Answer the following questions about "BuckinghamPalace".

- 1. What kind of palace is Buckingham Palace and when was it built?
- 2. By whom was BuckinghamPalace rebuilt later?
- 3. Who was the first queen to live there?
- 4. What is the sign that the queen is in the residence?
- 5. How do they know that the queen is absent from London?
- 6. What does arose the interest of visitors?

Task III. Speaking assignment. Alfred Noble.

Task IV. Listening



I hate pollution. It ______ angry. I think pollution is greed. People ______ the environment so they ______ to make lots of money. Big companies are the worst. They ______ polluting. They have the money to say they are "green". Pollution affects us all. We are all less healthy because of companies ______ or our rivers. Everybody needs to think about how we can ______ of pollution we create. Not using the ______ walk is one way. Turning off lights we don't need is another. Barack Obama says he's going ______ help the Earth. I really hope he does because if pollution gets any worse, we'll be in seriously big trouble.

Task I. Read and translate the text into your native language: Berings. A bearing is a machine part which supports a moving part and confines its motion. That part of a shaft which rotates in a bearing is called a journal. Bearings in which one rubbing surface slides over another are called plain bearings and may be divided into two classes: those with a continuous rotary motion and those with an intermittent motion. To the first class belong journal bearings, which carry a load acting at right angles to the shaft axis, and thrust bearings, which take a load acting in the direction of the shaft axis. To the second class belong bearings of parts having a rocking motion, as wrist pins, or a linear reciprocating motion, as crossheads. Bearings with a continuous rotary motion form the great majority of all bearings. Bearing Failures. - The failure or need of replacement of a bearing with sliding contact may be due to: (a) excessive wear of the bearing surfaces; (b) overheating; or (c) cracking of the bearing metal. Excessive Wear. – Wear is caused by metal-to-metal contact. It cannot be entirely eliminated but can be reduced by providing a sufficient bearing area and by adequate lubrication. Overheating, if not stopped in time, may cause either seizure of the journal if it runs in a hard-metal bearing or melting of the bearing surface if the bearing is lined with a metal having a low-melting temperature. Overheating is primarily caused by metal-to-metal contact. Lubrication decreases the danger of overheating. Cracking of the bearing metal is due to heavy, such as are taking place in the running gear of internal combustion engines when the compressive stresses in the bearing metal exceed its endurance limit.

Task II. Writing assignment. Answer the following questions about "Trafalgar Square".

- 1. Where is Trafalgar Square situated and why was it named so?
- 2. What do you know about national Gallery and National Portrait Gallery?
- 3. What people do during rush hours?
- 4. What kind of site is Trafalgar Square?
- 5. Where are masterpieces of all the European Schools of Painting?
- 6. What can one see in the Northeast corner?

Task III. Speaking assignment."Al – Khorazmiy is a great Uzbek mathematician".

Task IV. Listening

identity_cards.mp3

I'm not sure	about i	dentity card	s. There are	good an	d bad tł	nings a	bout
them. I think	they a	re a good thi	ng. It depen	ds on wł	nat the g	governi	ment
uses the information for. It also deper	nds on			databas	e is that	t keeps	s our
information. A lot of people think ID c	cards		•	They thi	nk the g	governi	ment
is trying to control	·	I'm not sure	that's true,	but it is	somethi	ng to t	hink
about a	and age, w	hen immigr	ation is a p	problem,	I think	c ID c	ards
Some co	ountries are	e using ID ca	ards as a on	e-stop ca	ard for e	everytl	ning.
The	driving	license,	medical	card	and	ID	all
That's a	a great idea	a. All			is to	make	e it a

passport and credit card.

Task I. Read and translate the text into your native language: Metal cutting processes and tools. GENERAL DESCRIPTION OF LATHES. Modern lathes are highly efficient, accurate and complex devices, capable of doing a great quantity and variety of work. Lathes are made in a wide variety of types and sizes, from the small precision lathe found in watch repair shops to the immense machine. The lathe consists essentially of a bed, headstock, tailstock and saddle. The Bed. – The main casting of the lathe is called the bed, and usually consists of a good quality grey iron casting of rigid design. It is provided with accurately machined ways, on which slides the saddle and the tailstock, and on which the headstock is located and bolted. The ways may be flat or of inverted V-type. Various lugs and brackets are integral with the casting for the mounting of other parts as required on the machine. The headstock is located true with the ways and bolted rigidly to the bed at the left-hand end. It carries the lathe spindle and back gear-box if the lathe is of the all-geared head type. The spindle is mounted in two large plain bearing, capable of adjustment, and provided with thrust washers to prevent end play. The nose of the spindle is provided with an external thread and register for attaching a face plate or a chuck back plate and a taper bore for the insertion of a centre. On the other end is mounted a gear to drive a train of wheels for driving the lead screw and the feed shaft. The tailstock consists of a casting fitted to the bed and capable of being firmly clamped to it at any position along its length. The casting is bored for a sliding sleeve which is moved axially by a handwheel at the right-hand end. The saddle consists of a casting designed to carry the tool post slide or slides, and is fitted to the ways of the bed so that it may slide along it without lateral movement. The front of this casting, called the apron, carries the gearing and controls for traversing the saddle towards and away from the headstock. The cross slide is mounted on the top of the saddle and must be at right angles to the bed. On the cross slide is mounted the tool slide. There are four main types, of headstocks, which are classified by the method of power application. They are the step-cone head, the geared head, the built-in motor-drive head, and the full hydraulic-driving head. The step-cone type of lathe is driven by a belt from an over-head countershaft, which has a step-cone pulley corresponding to the step cone on the lathe. A geared-head lathe is driven by a constant-speed motor usually located in the base of the lathe, or it may be driven by belt on a single pulley. A direct motor-drive geared head has the motor built directly into the headstock. A recent design of lathe uses a variable-speed hydraulic motor as a source of power. The motor is belted to the head by means of V belts. The hydraulic motor has a speed variation from zero to maximum speed by an infinite number of steps. Any working speed can be obtained by merely turning a dial that regulates the hydraulic motor.

Task II. Writing assignment. Answer the following questions about "TowerBridge".

- 1. When was TowerBridge built and how was it designed?
- 2. What does it happen when the bridge was lowered?
- 3. How many times a day this road was raised and lowered?
- 4. What did Parliament decide?
- 5. How many meters above the Thames are two walkways?
- 6. When could people cross by two walkways?

Task III. Speaking assignment."Abu ReykhanBeruni"

Task IV. Listening immigration.mp3 Immigration	a problem a long time ago.
Many countries welcomed immigrants because they	The USA, Australia
and Canada encouraged millions of people to	in their countries. Today,

however, immigration is becoming a problem. Many	countries control
immigration. At election time, it is	Immigration today is big business. Mor
and more people from poor countries want	rich countries. It is
nowadays because of cheap to	ransport and more

People risk their lives to get the chance of starting ______ in a rich country. This can cause anger in the countries immigrants go to. It is an issue that ______ forever, I think.

Independent work № 2. Variant 6

Task I. Read and translate the text into your native language: The main types of modern lathes

The Automatic Lathe is so designed that all of the tool movements are automatically controlled, although the work must be inserted and removed by an attendant. Turret Lathe. - The characteristic feature of a turret lathe is the turret which is mounted upon a carriage and contains the tools which are successively brought into the working position by indexing or rotating the turret. Many turret lathes also have systems of stops or gauges for controlling the travel of the turret carriage and cross-slide, in order to regulate the depth of a bored hole, the length of a cylindrical part or its diameter. Automatic Screw Machine. – The original field of the automatic screw machine was the making of screws. This field was quickly enlarged to include the making of all kinds of small nuts, washers, pins, collars, etc., and, at the present time, machines of this class are capable of a great variety of operations. Characteristic features of screw machines in general are means for automatically locating successive tools in the correct working position, the automatic changing of feeds and speeds and the presenting of new stock to the tools for a similar series of operations. These various movements, which are entirely automatic, are obtained principally from cams which are rotated at predetermined speeds. There are two general classes of screw machines: a single work-spindle and several work-spindles-usually four, five or six spindles.

Task II. Writing assignment. Answer the following questions about "Piccadilly Circus ".

- 1. What is the heart of West End and what kind of part is it?
- 2. What does it lie under the Circus?
- 3. What is there in the center, north and south of the Circus?
- 4. Where is Royal Academy of Arts?
- 5. Whose figures can you see in the clock?
- 6. What are the shopping centers of Oxford and Bond streets?

Task III. Speaking assignment."Geography of the USA"

Task IV. Listening information.mp3

We are living	information. That's what I keep hearing on
TV and reading in newspapers. We are	e information
technology that puts information at To get ahead, you	
need the latest information. I'm not really sure how much information we need. Our	
brains a cer	tain amount of information at a time. I
of us have information I'm	
sure before computers came along this didn't happen. One problem with computers is	

sure before computers came along this didn't happen. One problem with computers is

the amount of personal information online. I worry about putting _______ on different websites. Of coursethe ______ about computers is that we have so much information ______. That's ______.

Task I. Read and translate the text into your native language: Drilling machines Drilling machines which are used mainly for drilling holes in machine parts, are made in many different types designed for handling the various classes of work. The upright drilling machine is type most commonly used, and the name applied to this class indicates that the general design of the machine is vertical, and also that the drill spindle is in a vertical position. The radial drilling machine. - The main advantage of a radial machine is that the drill can be moved over the work to any desired position, so that a large number of holes can be drilled in the work without moving it. The sensitive drill is a small machine of light construction, which possesses sensitive qualities which are of value in drilling holes in delicate work. The **multiple-spindle type** is built in both vertical and horizontal design. It can perform a number of operations on a component without the necessity of changing tools. Gang Drills. - When a number of single-spindle drilling machine columns are placed side by side on a common base and have a common work table, the machine is known as a gang drill. Each spindle is independently controlled as to speed and feed so that a number of operations may be performed in succession and simultaneously upon the machine. In this machine work is moved progressively from one spindle to the next.

Task II. Writing assignment. Answer the following questions about "White Hall with Government Offices".

- 1. When was the Palace of White Hall founded?
- 2. What kind of center was it?
- 3. What is lined with many large Government buildings?
- 4. Who lived in the Palace?
- 5. What does it stand in the center of the roadway?
- 6. How is the British Government called?

Task III. Speaking assignment."Global problems"

Task IV. Listening



opinions.mp3

We all have opinions on everything. Some of us have _______. Others have notso-strong opinions. And then there are those who _______ no opinion, which _______ some kind of opinion. It's interesting how our opinions can be so different. Even on the _______. It's also interesting to see how your opinions change _______. My opinions of other people change a lot. You have first impressions of someone – ______ opinion. Then, as you get to know them, your opinions of them can change – _______. Whose opinion is right? I suppose it's the person who is strongest. They try to force their opinions on others. It's important to listen _______ opinions of other people.

Task I. Read and translate the text into your native: Milling machines.

Milling is the process of removing metal with rotating cutters. The essential features of most milling machines are a power-driven table on which the work is done, and a spindle carrying one or more multiple-toothed cutters, slots or grooves. The horizontal milling machine consists of a main casting in which is mounted the spindle and its gear drive, and the feed gear-box. On the front of this casting is a vertical V-guide on which is mounted the knee. The knee is raised or lowered by a telescopic jack screw. A saddle slide from front to back on V-guides on the top of the knee. The work table is mounted in V-guided on the saddle. The table is provided with movement in two direction at right angles to each other in the horizontal plane, and with vertical movement relative to the cutter, whose height is permanently fixed. The cutter is mounted on an arbor, and held in the desired position by spacing washers and a locking nut. The type of a cutter mainly used on the horizontal miller is what is known as a side and face cutter, that is, a cutter provided with cutting edges on both sides and on periphery. For large flat surfaces, roller milling cutters are used, having cutting edges in the form of helix about the axis of rotation.

Task II. Writing assignment. Answer the following questions about "The Tower of London".

- 1. When and who built the Tower of London?
- 2. How did the Tower served for a long period?
- 3. Was it also a prison?
- 4. Who was sent there at first?
- 5. What do you know about the Tower nowadays?
- 6. How is the Tower guarded according to tradition?

Task III. Speaking assignment."Global warming"

Task IV. Listening



How important ______ mobile phone? Do you really need it? In the 1980s there were no mobile phones. People ______ phone their family and friends and do business. Of course, there were more public telephones then. There was a telephone box ______ street corner. I wonder whether mobile phones ______ thing. For sure, they are very convenient, but they can ______. There's nothing worse than talking to someone and then ______ ten minutes while they answer their phone. I have even seen people ______ person chats on the phone for 30 minutes. How would _______

if you didn't have a mobile? Would you miss listening to other people's conversations on the train?

Task I. Read and translate the text into your native language. The Shaper.

A shaper is a machine that forms surface by successive reciprocating cuts of a tool over the work. The work is stationary with reference to the tool but moves laterally in small steps so that the successive cuts can be made. Although most of the work performed on shapers consists of plane horizontal surface, it is also possible to finish vertical and angular surface, and, with the proper tools and accessories, even curved surfaces may be machined. The size of a shaper is determined by the longest stroke of the ram. Shapers are driven by belt from a countershaft, by direct connected motor, or by hydraulic power. The Planer. Planers are essentially for machining plane surfaces which are larger than can be cut or reached on the shaper. The modern planer with modern electric controls has a high output. The planer has a reciprocating table which travels beneath a cross bar on which the tool heads are mounted. Normally one or two tool heads are mounted on the cross bar, but additional tools, generally for cutting vertical faces, may be mounted on the columns supporting the cross bar. The usual design comprises two vertical columns between which the table reciprocates. The cross bar is so mounted that it can slide vertically on these columns. All motions for feed or cut take place either by dropping the cross bar, moving the tool head across the cross bar, or lowering the tool holder mounted on the tool head. The first two of these motions are generally power or hand-operated but the last is often hand-operated only. The table is normally operated by some form of rack-and-pinion or spiral drive. Modern high-speed planers are now fully electrified.

Task II. Writing assignment. Answer the following questions about "Royal Greenwich Observatory".

- 1. What kind of is it and when was it founded?
- 2. What is the zero point for measuring longitude east and west?
- 3. How is the true time at Greenwich called?
- 4. When has the Observatory changed its location?
- 5. What is the former building of Observatory now?
- 6. Whose honour is it called?

Task III. Speaking assignment."Stargazing".

Task IV. Listening



Everyone wants a good lifestyle. I do too. I want a good job that ______ my house – I don't want to spend a long time on trains and buses. I also want a nice house ______. I like decorating and shopping for furniture. I also ______ so I can do stuff with them. My idea of a good lifestyle is ______ work, going to the gym or going out for a meal after work, and ______ with friends doing things or going places. ______ to have a holiday every year in another country.

I haven't ______ yet because I haven't got enough money. I'm a little jealous of my friend's lifestyle. She has everything and is always going ______ fun.

Task I. Read and translate the text into your native language Modern looms. Modern looms are of two types, those with a shuttle (the part that carries the weft through the shed) and those without; the latter draw the weft from a stationary supply. There are basically three kinds of shuttleless looms. The dummy shuttle, the most widely used, contains no weft but moves through the shed depositing a trail of yarn. A second type, the newest of looms, makes use of jets of air or water to force the weft through the shed. A third kind, called the rapier type and widely used in carpet weaving, uses steel rods to move the weft into the shed. The fundamental parts of all looms are the warp beam, a cylinder on which the warp threads are wound; heddles (rods or cords), each with an eye through which is drawn a warp thread; the harness, a rectangular frame set with a series of heddles operated to form a shed between the warp threads for the insertion of the weft threads; the reed, a comb like frame that pushes the filling yarn firmly against the finished cloth after each pick, or row; the breast beam, on which the cloth is rolled as it is constructed; and the shuttle, if it is not a shuttleless loom.

Vertical looms, such as the Navajo and some tapestry looms, developed from the practice of hanging the warp beam from a tree and holding the yarns taut with stones, pegs, or a weighted pole. The horizontal form, at first two poles holding the warp extended on the ground, was widely used for the Western European handloom and for the foot loom, the forerunner of the modern power loom. In the foot loom the harnesses were operated by treadles, leaving the hands free to pass and catch the shuttle. John Kay invented (1733) the automatic fly shuttle, and in 1760 his son Robert devised a drop box by which trays automatically brought bobbins of colored threads in line as desired. These aids to weaving encouraged inventions to speed up spinning, which in turn made faster weaving essential. Edmund Cartwright patented (1785) the first practical power loom, the basis of the modern loom with its multiplicity of automatic devices. By 1804, Joseph Marie Jacquard had perfected an attachment applicable to the power loom whereby any design might be woven on it. In the modern Jacquard, one repeat of the design is laid out on squared paper, then punched on cards that are laced into a continuous chain rotated on an overhead device. The cards are brought in contact with needles, each controlling a wire that lifts a heddle when the needle passes through a hold in the card. In the Lefier robot, a design made on copper with insulating paint is transmitted by electricity to needles that lift the heddles.

Task II. Writing assignment. Answer the following questions about "The BritishMuseum".

- 1. When was the BritishMuseum founded?
- 2. What is its one of the most interesting sections and how many books has it?
- 3. How many books and papers does the library receive a day?
- 4. What kind of collection has the library of BritishMuseum?
- 5. When did Caxton live and what did he make?
- 6. Who spent much time in the British museum library?

Task III. Speaking assignment."English countryside"

Task IV. Listening laws.mp3	Without laws the	OK, maybe the actual
Earth might not end, but	it would	end. We'd all end up fighting and killing
each other. It would become _	the stro	ngest, or perhaps the survival of the

nastiest. If there were no laws, people ______. There'd be no police or courts ______. Law is very important. It keeps order in our society. Our laws started thousands of years ago. Many of today's laws were ______. New laws need to be made every day. Especially in today's world, where the Internet is so important. It's very difficult to keep ______ with new developments. The latest area of law is intellectual property. It's important that people's ideas

Independent work № 2. Variant 11

Task I. Read and translate the text into your native language: The convective drying of food. The most immediate and promising at the moment is infrared drying of food products. Infrared radiation is due to excitation of solids and molecules, atoms in the body due to their thermal motion. In the absorption of infrared radiation irradiated body it increases the thermal motion of atoms and molecules, which causes it to heat. The energy transfer occurs from the body with great potential for the transfer of heat to the body with less potential. For foods (eg. dried fruits and vegetables), the depth of penetration of infrared is 6 -12 mm. At this depth penetrates a small portion of the radiation energy, but the temperature of the layer, which lies at a distance of 6-7 mm from the surface of the material is growing much more intense that when heated convection method. Short-wave infrared rays have a greater impact on food as due to the large penetration depth and better impact on the molecular structure of foods. Infrared foods such as workflow, based on the fact that the infrared radiation of a certain wavelength is actively absorbed by the water contained in the product, but not absorbed by the cloth dried product, so the moisture removal is possible at low temperatures (40-60 degrees Celsius), which gives almost exclusively to preserve vitamins and biologically active substances, natural color, flavor and fragrance products were dried. Equipment for drying fruits and vegetables, meat and fish, grains, cereals and other food and non-material based on the use of infrared radiation is the most promising at present. Drying of products using this technology allows you to save the content of vitamins and other biologically active substances in the dry product at 80-90% of the feedstock. After brief soaking (10-20). Past-drying the product restores all its natural organoleptic, physical and chemical properties and can be eaten fresh or subjected to any kind of preparation. Drying foods (drying fruits and vegetables, dried fish, meat, cereals, etc) in this way enables the production of various food preservatives fast food: the first, second, third meals, snacks, cereals, grains, fruit and vegetable powders that used in baking and confectionary industries, as a component of dry mixing baby formula. Compared to conventional drying, vegetables, processed infrared drying after recovery have good taste, as close to fresh. In addition, the powders, which are used for infrared drying, have anti-inflammatory, detoxicating and antioxidant properties. The use of products previous infrared drying in the dairy, confectionery, bakery industry provides an opportunity to expand the range of food products with specific flavor characteristics. Infrared provides products do not contain preservatives and other foreign substances, these products are not exposed to harmful electromagnetic fields and radiation. Needless infrared radiation is harmless to the environment human health, as well as using its equipment for drying fruit, drying equipment vegetables, meat, fish, grains, cereals, etc.

Task II. Writing assignment. Answer the following questions about "Hyde Park".

- 1. How do the Londoners call their Parks?
- 2. What are they?
- 3. What kind of park is Hyde Park?
- 4. Where do Londoners go in spring and summer?
- 5. What can Londoners do in Hyde Park?

6. What is inside the Park?

Task III. Speaking assignment."My first success".

MP3		
Task IV. Listening ^{internet.mp3} I think the Internet	is the greatest Think	
how it has changed the world. So much information	on is out there.	
changed my life. I can chat with friends, download	d music, buy books and	
I need for my homew	vork. It took days or	
any of these things before the Internet. I spend hours every day online. I think I		
too long. I'm sure	computer screen all day	
isn't good for my eyes. I think it's also	I need to exercise a little more.	
The only thing I don't like about the Internet	be dangerous. I don't really	
personal information	online, especially on	
sites like Facebook.		

Independent work № 2. Variant 12

Task I. Read and translate the text into your native languageText. Heavy industry

Machine engineering complex has been developing successfully. As a result of structural progress, the plants began to produce such new kinds of goods as: cars, TV sets, various modifications of bearings, video tape-recorders, the production of seeders increased, as well as other competitive goods. A new model of the cotton harvester machine, was created by the Uzbek-Israel Joint Venture "Uzizmash" in 199CIt has many advantages over mechanical cotton harvester machines that were produced previously. According to specialists' appraisal assessment, this machine, by its technical-operation and economic characteristics, can rank the world achievements of machine engineering. Oun the town of Asaka a large center of automobile construction center was established jointly with South Korearfhe "UzDaewoo" Automobile Plant was built in short 3 years. It is a peculiar wonder of engineering/On July 19,1996 the plant started its work with assembling of the "Damas", "Tico" and "Nexia" automobiles.nn this way a new branch of industry was set up in the Republic - automobile construction and Uzbekistanbecame the 28th automobile producing country in the world. In 1998 the automobile plant of our country became the first auto company that took a certificate among the CIS countries.

Task II. Writing assignment. Answer the following questions about "Stratford – upon – Avon, Shakespeare's birthplace".

- 1. What kind of town is Stratford upon Avon and what is its population?
- 2. Who was born here and when?
- 3. Where did William Shakespeare receive his early education?
- 4. What was Shakespeare's first narrative poem?
- 5. What did Shakespeare buy in 1597?
- 6. Why do people come to Stratford on April, 23?

Task III. Speaking assignment."The British Parliament"

Task IV. Listening



word on TV and read about
village – the global village. The
not shrink and it isn't a
t between
. Japanese car makers have factories in
thousands of people in China. That's
call centre jobs in India that
Globalization also means
country. Is globalization a good
·

Task I. Read and translate the text into your native: Machine Industry.

Difficulty obtaining capital U.S. machine-tool makers, like many small, mature manufactures, have had difficulty obtaining capital to purchase new machinery and finance export sales. The sources of this problem include high transaction coasts, lack of long-term relationships with banks, and the overcapacity and low profitability of this sector following the crisis in the early 1980.U.S. firms are at a further disadvantage in that their foreign competitors benefit from sustained government incentives to invest in advanced industrial equipment. Although the U.S. government has at different times offered temporary tax incentives that have stimulated demand for machine tools, these have not increased capital investment over the long term. Inadequate supply of skills and disincentives to invest in training. The skill levels of the industry's labor force are low compared with those of foreign counterparts. This skill gap is apparent from the poor basic qualifications of many existing workers, the collapse of the apprenticeship system that was the main source of skilled labour, and the lack of graduate engineers in this sector. In addition, the structure of labor markets and poor track records of government training programs have discouraged U.S. firms from making the major investment in worker training that have been made in Japan and Germany. Poor performance in translating technological research into market advantage. Despite its recognized lead in many areas of basic technological research related to machine tools, the United States was less successful than its main rivals in translating research success into commercially viable technologies. Among the reasons for the failure of the technology transfer process are generally weak links between universities and machine-tool firms; the focus of government research on the most sophisticated applications, which often have limited market potential; and the weak cooperation between machine-tool users and customers.

Unsophisticated domestic demand. Domestic users have generally been slow to demand the latest technologies. The major exception to this is in specialized tools for the defense industry, a market in which the U.S. machine-tool industry remains very competitive. Weak export capacity and infrastructure. There was a dramatic increase in worldwide demand for machine-tools in the latter half of the 1980s, which U.S. firms failed to capitalize on. Because of the lack of a strong export orientation, U.S. firms have barely penetrated the world's largest machine-tool markets. Firms ability to export has been hampered by a time-consuming export licensing regime, tight government of export regulations from the 1950s governing defense-related technologies, and an absence of export supports similar to those that aid firms in other countries.

Task II. Writing assignment. Answer the following questions about "The USA. The Statue of Liberty". 1.What kind of statue is it and what island is it on? 2. Whose work is it and what is made of? 3. What does the figure show? 4. What does the statue symbolize? 5. When did the statue present to the USA and become national monument? 6. What are the other the places of interest in New York?

Task III. Speaking assignment."Peoples who work hard have serious problems".

۲

Task IV. Listening english.mp ³ I'm	I have to speak in English.
I'm a little worried about making mistakes. I	confidence. Many
of my friends don't worry about mistakes. They	talk. They
always get their message across,	grammar is wrong. I think this

is the best thing to do. My teacher always says it's	best to If I
don't try to speak English, I'll never	use it when I need it. One
thing I started doing recently was talking	I have short
conversations with myself. I	. I also make short stories about people
and I do this in my room, of course. People would	
if I did it in class or on the	train.

Task I. Read and translate the text into your native language. *Text:* Energy Capacity to do work is called **energy**, and when the energy is (due to) motion it is called **kinetic energy**. A weight which has been lifted from the floor to the top of a table has had work on it; if we allow the weight to fall back again to the floor it will get velocity, and therefore kinetic energy. The energy was simply "stored up" in the weight when it was at rest on the table: it had energy due to its position on the table: and we call this energy potential. Or, potential energy is the energy of a mass due to its position. Water, at the top of a waterwheel, has potential energy.

As it falls it gradually loses this potential energy, but gets kinetic energy at the same time.

Forms of Energy – Any matter possesses energy. Hot steam is able to do work, and we may say that heat is a form of energy. Electric current, when passed through a motor, can do work. So electric current is a form of energy. A magnet can lift an iron nail; so magnetization is another form of energy. The burning of coal generates heat; and in burning, the coal undergoes a chemical change; such a change is called chemical action. Chemical action is a form of energy. Electric current makes the filament of an electric lamp white-hot and it gives out both light and heat; a part of the energy is in the form of light. Light, therefore, is a form of energy. Thus, energy exists in a variety of forms.

Task II. Writing assignment. Answer the following questions about "Pentagon. The National Gallery of Art".

- 1. What is the great art collections of the world and was it opened to the public?
- 2. How much does it measure?
- 3. What are the important features of the building?
- 4. What are exhibited in the Dutch, Spanish, Italian, British and American galleries?
- 5. What kind of building is Pentagon?
- 6. When Pentagon built and what wasthere inside it?

Task III. Speaking assignment."Regions and Cities of Uzbekistan"

Task IV. Listening



culture.mp3

I'm really interested in	other countries. I don't know why, but I
always think other cultures are more interest	ting culture. Every
time I travel, I learn wonderful, s	strange, amazing and interesting things
cultures. One of	the biggest surprises I had was when I went to
the USA as a child. I'm English	Americans had the same culture
as me. When I went to America I understoo	od Americans very
different people. Understanding the culture _	is very important. It
helps us all If ev	veryone really tried
other cultures, the world	more peaceful place. The world is
becoming smaller, so I	happening.

Task I. Read and translate the text into your native language *Text:* Textiles and Clothing

Together with footwear and leather, these products make a substantial contribution to the economy in terms of employment, exports and turnover. There are around 15. 000 textiles and clothing firms in Britain, including two of the world's largest Courtaulds Textiles and Coats Viyella. The modernization of factories and higher design standards have made these industries more competitive on world markets. Britain is famous for its woolen and worsted products and these part of the industry has recorded consistently high exports. Output of cotton and allied products is affected by growing competition from overseas. Britain is a leading producer of woven carpets. The clothing industry is labour intensive and involves about 8.000 companies. The Industry still supplies almost two -thirds of domestic demand in spite of intense competitions from overseas. The footwear industry is made up predominantly of small firms, again under great pressure from international competition. Textile Industry is occupied in processing of natural, artificial and synthetic fibres into material, threads and other articles. Manual manufacturing of weave and fabrics began in India and China long before of our era. During long period of time Textile Industry had a character of handmade manual production. After the World War II a great number of large textile enterprises were built and wide adoption of progressive technology, mechanization and automatization of production process was fixed.

Task II. Writing assignment. Answer the following questions about "The Golden Gate Bridge"

- 1. When was the Golden GateBridge opened?
- 2. What does CivicCenter complex include?
- 3. What is the commercial heart of the city?
- 4. How was the Union Square used for in old days?
- 5. Whose honour was erected the bronze figure of Victory?
- 6. When was it rut and why?

Task III. Speaking assignment.Uzbekistan Today. Task IV. Listening



remember, I've seen terrorism on the news. I grew up in London. In		
the 1970s, we had a lot of bombings and I	once. There has also been	
terrorism in other countries from Spain to Sri Lanka. But terrorism		
after 9-11. Suddenly there was a war on terror. The whole Western		
terrorist attacks. And they came. There were	hundreds in Bali and	
Spain and Iraq and London. Now Pakistan is	force of terrorism.	
When will it all stop? There when people	e are happy and can live a	

day without ______ people they don't know. So much would change in the world if this happened.

SOURCES

1. Кубарьков Г.Л., Тимощук В.А. "Сборник новых тем английского языка". Москва 2006.

- 2. A.Starkov, R.Dixon. "English for the students of technical schools". Москва 1992.
- 3. Т.И. Матюшкинагерки, Л.Л. Иванова, С.П. Балашова. "Учебник английского языка". Высшая школа. 1989.
- 4. А.С. Сушкевич, М.А. Маглыш. "English topics" 1998.
- 5. Muller V.K. "Modern English-Russian dictionary" Moscow 2001.
- 6. Butnik V.V. "Modern English-Russian polytechnical dictionary" Moscow 2001.
- 7. Smirnitsky A.I. "Russian-English dictionary".

8. Pacey, Amold (1991), Technology in world civilization: a thousand – year history, <u>MIT Press</u> pp. 40 – 1, <u>ISBN 0262660725</u>

9. "English – Russian – Uzbek Dictionary" Q. M. Musaev, M.Sh. Qudratov.

Uchjildliklug'at.Toshkent – 2001.

- 10. <u>www.spclc</u>.org
- 11. www.techTerms.com
- 12. <u>http://www.fileinfo.com</u>
- 13. <u>http://www.informaticsImagesandStockpictures</u>
- 14. <u>http://www.electronicpictures</u>
- 15. <u>http://www.Glossary</u> of computer terms
- 16. <u>http://en.wikkipedia.org</u>
- 17. www.discoveryschool.com
- 18. http://www.tolearnenglish.com



Glossary of terms of MECHANICS OF MACHINES

ABSOLUTE MOTION – Motion of a body in relation to some other body which is at rest.

ACCELERATION – Rate of change of velocity with respect to time, of a particle which is in motion. It is a vector quantity.

ADDENDUM – The radial distance from the pitch circle to the top of the tooth.

ANGULAR ACCELERATION – The time rate of change of angular velocity.

ANGULAR VELOCITY – The time rate of change of angular displacement of a point rotating about a fixed axis (expressed in radians per unit time) Angular velocity of a machine part is often expressed in revolutions per minute (RPM) and is denoted by n.

ANGULAR VELOCITY OF PRECISION – The rate of change in the direction of the plane of rotation of a rotating disc.

ARC OF CONTACT – The arc traced out along the pitch circle while one pair of teeth of gear wheels is in contact (divided into arc of approach and arc of recess).

BEVEL GEARING – Gearing arrangement in which the axes of the shafts connected by gears intersect.

CAM – A reciprocating, oscillating or rotating body which imparts reciprocating or oscillating motion to a second body, called the FOLLOWER with which it is in contact.

CAM PROFILE – The surface profile of the cam that decides the desired motion of the follower.

CENTRIFUGAL FORCE-Radial outward force acting on a body moving along a circular path with uniform velocity.

CENTRIFUGAL GOVERNOR – The effort of the governor is obtained from the change in centrifugal force on (usually) two rotating masses, known as balls, when an increase or decrease in the governor speed occurs.

CENTRIPETAL FORCE – The force that must act radially inward in order to constrain a particle to follow a curved path at uniform velocity.

CIRCULAR PITCH – Length of arc round the pitch circle between the corresponding points on adjacent teeth of a gear.

COMPLEX MECHANISMS – Mechanisms which have two or more floating links.

COMPOSITION OF VECTORS – Composition refers to the adding together of any number of vectors. The sum is called their resultant and the vectors are called the components of the resultant.

COMPOUND CHAIN – A kinematic chain in which there are more than four pairs.

COMPOUND GEAR TRAIN – A gear train containing compound gears *i.e.*, gears, two or more in number integral with one another being used on the same shaft.

COMPOUND PENDULUM – A rigid body suspended vertically so as to oscillate with small amplitude under the action of gravity.

CONSERVATION OF ENERGY – The total energy possessed by a system of moving bodies is at every instant constant, provided no energy is rejected to or received from a source external to the system.

CONSERVATION OF MOMENTUM – For a system of moving bodies which is not acted upon by any external forces, the sum of the moments remain constant.

CONTROLLING FORCE OF A GOVERNOR – The inward radial force exerted on each ball of a centrifugal governor by the arms, springs etc., which are attached to it.

CURVILINEAR MOTION – A translation in which points in the body move along curved path (motion of a wheel).

CYCLE OF MOTION – Motion of a mechanism when it moves through all its possible configurations and returns to its starting position. The time required for one cycle is called PERIOD.

CYCLOIDAL TEETH – Profile of the teeth formed by the locus of a point on a circle rolling on the inside (for the flank) and on the outside (for the face) of the pitch circle.

CYLINDRICAL CAM – Type of cam in which the motion of the follower is controlled by a path traced out on the surface of a cylinder which is rotating about its axis.

DEAD WEIGHT GOVERNOR – The governor in which the radius of the ball path is controlled by levers and weights, the latter being usually attached to the control sleeve.

DEDENDUM – The radial distance from the pitch circle to the bottom of the tooth space.

DIAMETRAL PITCH – Number of teeth per inch diameter.

DISC CAM – An irregular disc rotating about a fixed axis and imparting reciprocating or oscillating motion to a follower in a plane at right angles to the cam axis.

DYNAMICS OF MACHINES – Treatment with the forces acting on the parts of a machine and the motions resulting from these forces.

DYNAMOMETER – A device for measuring the forces or couples which tend to change the state of rest or of uniform motion of a body.

ELLIPTIC TRAMMEL – An instrument used for drawing ellipses.

ENERGY – Capacity for doing work.

EPICYCLIC GEAR TRAINS – Gear trains in which the axis of one or more gears moves relative to the frame. The gear at the centre is called the SUN, and gears whose axes move are called PLANETS. Also called PLANETARY GEARS.

EPICYCLOID – The locus of a point on the circumference of a circle which rolls outside a circular arc, without slipping.

FLOATING LINK – A link in a mechanism which does not have a fixed center of rotation (*e.g.*, coupler in a four bar linkage).

FORCE – The entity which when acts on a body can cause a change in its velocity or direction or both.

FRAME – That part of a machine which is stationary and which supports the moving parts.

FRICTION DRIVE – Drive in which the rotation of one body causes another body in contact with it to rotate due to sufficient friction between the bodies.

GEAR CLEARANCE – The radial distance from the top of the tooth to the bottom of the tooth space in a mating gear unit.

GEAR TRAIN – Unit composed of two or more gears in mesh for the purpose of transmitting motion from one shaft to another.

GOVERNOR – Device that controls the mean speed of an engine over a period of time, as distinct from the flywheel, which limits the fluctuation of speed during one cycle but is not able to prevent a change in mean speed from cycle to cycle.

GOVERNOR EFFORT – Mean force exerted at a sleeve due to a 1% change in speed of governor.

GOVERNOR POWER – Work done at the sleeve for a 1% change in speed, equal to the governor effort times the sleeve displacement.

GYROSCOPIC ACCELERATION – The rate of change of angular velocity of precision of a rotating disc.

HELICAL MOTION – Motion of a body in which each point in the body describes a helix. Helix is the locus of a point which rotates about an axis at a fixed distance and at the same time moves parallel to the axis.

HELICAL GEARING – A type of spur gearing in which although the axes of the shafts are parallel, the teeth are cut on helices instead of straight across the wheels parallel to the axis.

HIGHER PAIRS – Types of kinematic pairs, namely, two elements generally have line or point contact and the pair must be force closed in order to provide completely constrained motion.

HUNTING OF GOVERNOR – The governor is said to hunt if the engine speed is caused to fluctuate continually above and below the mean speed.

HYPOCYCLOID – The locus of a point on the circumference of a circle which rolls inside a circular arc without slipping.

IMPULSE – Time integral of the impulsive force acting on a body.

IMPULSIVE FORCE – Force that acts on a body for an extremely short interval of time and makes the body to move. Occur in collisions, in explosions, in the striking of a nail by a hammer or of a pile by a tup or monkey.

INERTIA GOVERNOR – Governor in which the position of the flyballs are affected by the rate of change of speed of the governor shaft.

INSTANT CENTRE-(1) A point in one body about which another body is rotating either permanently or at the instant (2) A point common to two bodies having the same linear velocity in both magnitude and direction in each.

INTERMITTENT MOTION MECHANISM – A linkage which converts continuous motion into intermittent motion (*e.g.*, indexing mechanism).

INVOLUTE – The locus of a point on a straight line which rolls, without slipping, on the circumference of a circle, or alternatively the locus of a point on the chord which is held taught and unwound from a cylinder.

INVOLUTE TEETH – The outline of a tooth traced out by a point on a chord unwrapped from a circle (known as base circle).

ISOCHRONISM OF GOVERNOR – A governor is said to be isochronous, if , neglecting friction, the equilibrium speed is the same for all radii of the flyballs.

KENNEDY'S THEOREM – Any three bodies having plane motion relative to one another have three instant centers, and they lie in a straight line.

KINEMATIC CHAIN – A group of links either joined together or arranged in a manner that permits them to move relative to one another.

KINEMATIC DIAGRAM – A scale drawing representing the machine so that only the dimensions which affect its motions are recorded.

KINEMATIC PAIR – Two bodies in contact, between which there is relative motion and this motion is completely constrained *e.g.*, turning pair, sliding pair, screw pair.

KINEMATICS OF MACHINES – A study of the relative motion of machine parts *e.g.*, displacement, velocity and acceleration.

KINETICS – Study which deals with the inertia force arising from the combined effect of the mass and the motion of the parts.

LINEAR ACCELERATION – The time rate of change of liner velocity.

LINEAR VELOCITY – The time rate of change of linear displacement of a point or body.

LINK-Name given to any body which has relative motion to another. Also called ELEMENT. A RIGID LINK is one whose deformations are so small that they can be neglected in determining the motions of various other links in a machine. A belt or chain is a FLEXIBLE LINK.

LOWER PAIRS – Types of kinematic pairs, namely two elements have surface contact and when relative motion takes place, the surface of one element slides over the surface of the other element.

MACHINE – A combination of resisting bodies, with successfully constrained relative motions, which is used for transmitting or transporting available energy so as to do some particular kind of work e.g., electrical motor, internal combustion engine.

MASS OF A BODY – The property of a body which determines its resistance to change its velocity.

MECHANISM – A constrained kinematic chain which means the motion of anyone link will give a definite, predictable motion to each of the others.

MODULE – Reciprocal of diametral pitch.

MOMENTUM – The product of the mass and velocity of a body.

NORMAL ACCELERATION – The time rate of change of velocity of a point in a direction normal to its path. This results from a change in the direction of its linear velocity.

OLDHAM COUPLING – A mechanism for connecting two shafts having parallel misalignment. The coupling transmits a constant velocity ratio.

PAIR – Two bodies in contact constitute a pair. LOWER PAIRING exists when two surfaces are in contact. HIGHER PAIRING refers to the contact which exists at a point or along a line.

PANTOGRAPH–Mechanism used to reproduce to an enlarged or reduced scale and as exactly as possible the path described by a given point.

PARALLEL MECHANISMS – Linkages which give parallel motion (*e.g.*, pantograph which is used for reducing or enlarging drawings and maps, also used for grinding cutting tools or cutting torches to duplicate complicated shapes).

PATH OF CONTACT – The path traced out by the point of contact between a pair of teeth (may be divided into approach and recess).

PINION – The small of the two mating gear wheels.

PITCH CIRCLES – Equivalent rolling circles for a pair of mating gears.

PITCH CIRCLE DIAMETER – The diameter of a circle which by a pure rolling action would transmit the same motion as the actual gearwheel.

PITCH LINE – The point of contact of two circles.

PITCHSURFACES–The cylindrical surfaces of the equivalent rolling circles for a pair of mating gears.

PLANE MOTION – A body has plane motion if all the points move in planes which are parallel to some reference plane (called plane of motion).

POSITIVE DRIVE - The drive that exists in a direct contact mechanism if motion of the driving link compels the follower to move (*e.g.*, cam and follower).

POWER – Rate of doing work or work done in unit time.

PRECESSIONAL MOTION – The change in the direction of the plane of rotation of a rotating disc.

PRESSURE ANGLE – Angle between the common normal and the tangent at the pitch point in a gear drive. Also called ANGLE OF OBLIQUITY.

QUICK RETURN MECHANISM – The mechanism used in machine tools such as shapers and power driven saws for the purpose of giving the reciprocating cutting tool a slow cutting stroke and a quick return stroke with a constant velocity of the driving crank.

RACK – A portion of a gear wheel which has an infinitely large number of teeth.

RACHETS – Mechanisms used to transform motion of rotation or translation into intermittent rotation or translation.

RECTILINEAR MOTION – A motion wherein all points of the body move in straight line paths (*e.g.*, piston motion).

RELATIVE INSTANTANEOUS CENTER – In the case of two bodies, it is the point about which either of them appears to turn (at that instant) if the other is considered fixed (*e.g.*, if two links in a mechanism are pinned together, the pin becomes the relative instantaneous center, if the two bodies are in pure rolling contact, the point of contact is the relative instantaneous center).

RELATIVE MOTION – A body has motion relative to another body only if there is a difference in their absolute motions.

RESOLUTION OF VECTORS – Resolution refers to the breaking down of a vector into any number of component vectors.

REVERTED GEAR TRAIN – The compound gear train in which the first and the last gears are coaxial (*e.g.*, units used in automobile transmission, lathe back gears, industrial speed reducers and in clocks).

ROLLING CONTACT – In a direct contact mechanism, rolling contact exists only if there is no sliding and hence the tangential components of velocities of the contact point on the two bodies are equal in magnitude and direction.

ROTATION – In rotation all points in a body remain at fixed distances from a line which is perpendicular to the plane of motion. This line is the AXIS OF ROTATION.

SCALAR QUANTITIES – Those quantities which have magnitude only (and no direction) *e.g.*, distance, area, volume and time.

SENSITIVITY OF GOVERNOR – Ratio of the mean speed to the speed range of the governor over its limits of operation.

SIMPLE AND COMPOUND MECHANISM – A simple mechanism consists of three or four links. All other mechanisms, or those consisting of more than four links are compound mechanisms. Compound mechanisms are usually made up of combinations of simple mechanisms.

SIMPLE GEAR TRAIN – A gear train in which there is only one gear on each shaft.

SIMPLE HARMONIC MOTION – A particle having rectilinear motion has simple harmonic motion if its acceleration is proportional to the displacement of the particle from a fixed point and is of opposite sign.

SKEW GEARING – Gearing arrangement in which the axes of the shafts connected by gears are non parallel and non intersecting.

SLIDING CONTACT – Sliding exists in a direct contact mechanism whenever the bodies have relative motion along the tangent through their point of contact.

SPEED – The rate of change of magnitude of displacement with respect to time.

SPHERICAL MOTION – A point has spherical motion if it moves in three dimensional space and remains at a fixed distance from some fixed point. A body has spherical motion if each point in the body has spherical motion.

SPIRAL GEARING – A type of skew gearing, but differs in one respect *i.e.*, the contact between pitch surfaces is point contact instead of line contact.

SPRING LOADED GOVERNOR – The governor in which the control of the flyballs is by springs operated directly on the balls or on the sleeve.

SPUR GEARING – Gearing arrangement in which the axes of the shafts connected by gears are parallel and the teeth are cut parallel to the axes.

STABILITY OF GOVERNOR – The governor is said to be stable if there is one equilibrium speed for each radius of rotation of the flyballs and this speed increases with the radius.

STATICS – Study which deals with forces which act on the various parts, when these parts are assumed to be without mass.

STRAIGHT LINE MECHANISMS – Linkages having a point that moves along a straight line or nearly along a straight line, without being guided by a plane surface (*e.g.*, Watts mechanism, Scott Russell mechanism).

TANGENTIAL ACCELLERATION – The time rate of change of velocity of a point in a direction tangent to its path. This results from achange in its linear velocity.

TRANSLATION – A body has translation if it moves so that all straight lines in the body move in parallel positions.

UNCONSTRAINED KINEMATIC CHAIN – An arrangement of links wherein for a given motion of one of the links, each of the others is not constrained to move in a definite predictable manner.

UNIVERSAL JOINT – Joint used to connect intersecting shafts (*e.g.*, Hooke or cardan joint).

VECTOR QUANTITIES – Those entities which have magnitude and direction. (*e.g.*, displacement, velocity, acceleration and force). Vector quantities are represented by a straight line with an arrow head (magnitude is represented by its length and direction by the arrow head).

VELOCITY – When a particle is in motion, the rate of change of its displacement with respect to time. It is a vector quantity.

VELOCITY RATIO OF GEAR TRAIN – Ratio of the angular velocity of the first gear in the train to the angular velocity of the last gear.

WORM GEARING – A form of special gearing in which the axes of the driving and driven shafts are usually at right angles and the velocity ratio is high, the driving gear being of smaller diameter.

WORK – Product of the force acting on a body and the displacement of the body caused by that force.

WORKING SURFACE–With respect to a gear, the working surface above the pitch surface is called the FACE OF THE TOOTH and that below the pitch surface is called the FLANK OF THE TOOTH

Glossary of terms of AUTOMOTIVE VEHICLES

ACCELERATOR – A pedal connected to the carburettor throttle valve of a motor vehicle, or to the fuel injection control where oil engines are used.

ACKERMANPRINCIPLE–Steering geometry in which the outer ends of the steering arms are bend slightly inward so that when the vehicle is making a turn, inside wheel will turn more sharply than the outer wheel. This principle produces toe out on turns.

ACKERMAN STEERING – Arrangement whereby a line extended from the track arms, when the wheels are set straight ahead, should meet on the chassis centre line

at 2/3 of the wheel base from the front, allowing inner stub axle to move through a greater angle than the outer.

AERODYNAMIC DRAG – is the air resistance to the motion of the vehicle. This consists of profile drag, induced drag, skin friction drag, interference drag, and cooling and ventilation drag.

AERODYNAMIC LIFT – is the vertical component of the resultant force caused by the pressure distribution on the vehicle body.

AIR BLEEDER – A device used to remove air from a hydraulic system. Types include a needle valve, capillary tubing to the reservoir, and a bleed plug.

AIR BRAKE – A braking system which uses compressed air to supply the effort required to apply brakes.

AIRFOIL – Device, similar to a stubby wing.

AIR RESISTANCE – The motion of an automobile is associated with the displacement of air particles, which requires some power of the engine. Air resistance depends on the size and shape of the vehicle body, speed of the vehicle and wind velocity.

AIR SPRING – Container and plunger are separated by air under pressure. When container and plunger attempt to squeeze together, air compresses and produces a spring effect. Air spring has been used in some suspension systems.

ALL WEATHER TYRE – A tyre designed to provide good traction on dry, wet and dirt and snow covered roadways.

ANTI DAZZLE MIRROR – One having a photoeltric control circuit which changes it from a fully reflecting condition to partial reflection from a glass air interface when actuated by the head lamp beam of a following vehicle.

ANTILOCK BRAKE SYSTEM (ABS) – If the brakes are applied so hard that the wheels tend to stop turning and thus a skid starts to develop, the antilock brake system comes into operation and partly releases the brakes. This makes the wheels continue to rotate. However, intermittent braking continues. But it is held below the point where the skid would start.

ANTIMIST PANEL – A panel fitted to the rear window enclosing a volume of still air between itself and the outer glass.

ANTIROLL BAR-Torsion bar mounted transversely in the chassis in such a way so as to counteract the effect of opposite spring deflections.

ARCH – The curve of a leaf spring. If the centre is lower than the ends, it is called positive arch, if the centre is higher than the ends, it is called negative arch.

ARCING (**brakes**)–Grinding new brake linings to the same diameter (arc) as that of the brake drum surface.

ASPECT RATIO – The ratio of the width to the length. On tyres, it is the fully inflated height divided by the cross section.

AUTOMOBILE – is a self propelled vehicle. The power required to propel the vehicle is supplied by the engine (also called prime mover). Scooters, motor cycles, cars, buses, trucks etc., are different types of automotive vehicles.

AUTOMATIC LEVEL CONTROL – A suspension system which compensates for variations in load in the rear of the car, positioning the rear at a predesigned level regardless

AUTOMATICTRANSMISSION–Apowertransmission system for road vehicles, in which the approximately optimum engine speed is maintained through mechanical or hydraulic speed changing devices which are automatically selected and operated by reference to the road speed of the vehicle.

AXLE – A cross bar supporting a vehicle on which one or more wheels turn.

AXLE (full floating) – Axle used to drive rear wheels. It does not hold the wheels on nor support them.

AXLE (semiquarter or one quarter floating) – Axle used to drive wheels, hold them on and support them.

AXLE THREE QUARTER FLOATING – Axle used to drive rear wheels as well as hold them on and support them.

AXLE FLANGE – A flat surface on the outboard end of the axle shaft to allow wheel attachment.

AXLE GEAR – A gear in the differential carrier that drives the driving wheels.

AXLE RATIO–Relationship or ratio between the number of times the propeller shaft or drive shaft must revolve to turn the axle shafts one turn.

AXLE SHAFT – The shaft used to transmit power from the differential to the wheels.

BACK LOCKING – The steering gear is so constructed that it is easy to turn the vehicle by steering wheel, but it is difficult to turn the steering wheel by turning the front wheels. This back locking prevents the bumps and shocks experienced by the wheel on the road surface from being transmitted to the steering wheel.

BACKING PLATE – A mounting plate that holds the brake shoes, cam lever, pivot pins and springs inside the brake drum.

BALL JOINT – Flexible joint utilizing ball and socket type of construction, used in steering linkage set ups, steering knuckle pivot supports etc.

BALLJOINTROCKERARMS–Rockerarmsthatinstead of being mounted on shaft, are mounted upon ball shaped devices on end of stud.

BALL JOINT STEERING KNUCKLE–Steering knuckle that pivots on ball joints instead on king pin of load.

BALL JOINT SUSPENSION – A type of front suspension, which does not use a steering knuckle. Instead, the wheel spindle is attached directly to the upper and lower suspension arms through ball joints. Allows movement up and down as well as rotation.

BALL STUD – Stud with a ball on end, commonly used in steering linkage to connect pitman arm to linkage, or to connect tie rods.

BALL AND TRUNNION JOINT – A type of universal joint which combines the universal joint and slip joint in one assembly.

BEAD (tyre) – Steel wire reinforced portion around a tyre opening that engages the wheel rim.

BELL HOUSING (clutch housing)–Metal (castiron or aluminium) cover that surrounds flywheel and clutch, or torque converter assembly.

BELL MOUTH – The taper of a brake drum.

BELTED TYRE – A tyre that is reinforced with a build up of cord under the tread area.

BENCH BLEEDING – Process of removing air from the master cylinder pressure area before installing it in the vehicle.

BENDIX TYPE STARTER – A self engaging starter drive gear. Gear moves into engagement when starter armature shaft starts spinning and automatically disengages when starter stops and engine speed increases.

BIAS BELTED TYRE – A tyre in which plies are laid on the bias, criss crossing each other, with a circumferential belt on top of them. The rubber tread is vulcanized on top of the belt and plies.

BINDERS – Compounds that hold the friction materials together in brake linings.

BLEEDING – Removing air, pressure, fluid etc. from a closed system as in the brake system or air conditioning system.

BLEEDING (brakes) – Removal of air from hydraulic system. Bleeder screws are loosened at each wheel cylinder (one at a time) and brake fluid is forced from master cylinder through lines until all air is expelled.

BLEEDING (steering) – A process by which air is removed from a hydraulic system (power steering) by bleeding off part of the fluid or operating the system to work without the air.

BODY–The assembly of sheet metal sections together with windows, doors, seats and other parts, that provides an enclosure for the passengers, engine and so on.

BODY PANELS – Sheets or panels of steel which are fastened together by welding to form the vehicle body.

BODY ROLL – The vehicle body leaning sideways as the vehicle turns.

BOGIE – A small truck, of short wheel base running on rails, commonly used for the conveyance of coal, gold or other ores, concrete etc.

BONDED BRAKE LINING – Brake lining that is attached to the brake shoe by adhesive.

BONNET – British term for car hood.

BOOSTER – Device incorporated in a car system (such as brake and steering), to increase pressure output or decrease amount of effort required to operate or both.

BORG WARNER OVER DRIVE – A method of reducing engine rpm in relation to road speed. The unit is attached at the rear of the gear box and operates through epicyclic gears. **BRAKE** – An energy conversion device that converts the energy of motion into heat

energy and thereby slows down or stops a moving vehicle.

BRAKE (disc type)–Braking system which uses steel disc with caliper type lining application. When brakes are applied, section of lining on the caliper piston on each side of the spinning disc is forced against the disc thus imparting braking force. This type of brake is very resistance to brake fade. Also called disc brake system.

BRAKE ANCHOR – Steel stud upon which one end of brake shoes is either attached to or rests against. Anchor is firmly affixed to backing plate.

BRAKE ANTIROLL DEVICE – Unit installed in brake system to hold brake line pressure when car is stopped on upgrade, and brake pedal is released. Antiroll device will keep brakes applied until either clutch is released or, as in some models, accelerator is depressed.

BRAKE BACKING PLATE-Rigid steel plate upon which brake shoes are attached. Braking force applied to shoes is absorbed by backing plate.

BRAKE BAND-Band faced with brake lining, that encircles a brake drum.

Used on several parking brake installations.

BRAKE BIAS – The stopping effort of the front wheels compared to that of the rear wheels.

BRAKE CALIPER – The hydraulic cylinder at the wheel used to apply the disc brake linings against the rotor.

BRAKE CLEARANCE – is the clearance provided between the lining and the drum or disc. Wear and tear of the lining increases this clearance and hence to be adjusted periodically.

BRAKE DRUM – Metal drum mounted to the vehicle wheel which forms the outer shell of the brake. Brake shoes when moved out or moved apart press against the rotating drum to slow or stop drum and wheel rotation.

BRAKE EFFECTIVENESS – is how effectively the brakes perform their function. This depends on the area of the brake lining, amount of pressure applied to the brake shoes, radius of the brake drum, vehicle wheel radius, coefficient of friction of braking surfaces and coefficient of friction between the tyre and the road surface.

BRAKE FADE – A reduction or fading out of braking effectiveness due to loss of friction between brake shoes and drum. This is caused by overheating (heat build up) from excessively long and hard brake application for instance, when coming down a long hill or mountain.

BRAKE FEEL – The reaction of the brake pedal against the drivers foot, that tells him how heavily he is applying the brakes.

BRAKE FLUID – A special non -mineral oil fluid used in hydraulic braking system. Never use anything else in place of regular fluid.

BRAKE FLUSHING – Cleaning brake system by flushing with alcohol or brake fluid. Done to remove water, dirt or any other contaminant. Flushing fluid is placed in master cylinder and forced through lines and wheel cylinders where it exits at cylinder bleed screws.

BRAKE LINE – Special hydraulic tube made of steel, plastic or reinforced rubber suitably designed to withstand extreme pressure without deforming. **BRAKE LINING** – A special high friction material made of asbestos and other materials bonded to brake shoes and brake pad plates. Brake lining produces friction and heat when it is forced against the brake drum or disc. **BRAKE PULL** – A condition in which the vehicle turns each time the brakes are applied.

BRAKE ROTOR – The brake friction surface that rotates at wheel speed designed for contact with the brake pads on disc brake assemblies.

BRAKE SELF ADJUSTERS – A cable operated device used to adjust brake shoes automatically.

BRAKE SHOES (disc brakes) – Flat metal pieces lined with brake lining which are forced against the rotor face. Also called brake pads.

BRAKE SHOES (drum brakes) – Arc shaped metal pieces lined with heat resistant fibre. When forced against the brake drum, stops wheelrotation.

BRAKE SHOE HEEL – End of brake shoe adjacent to anchor bolt or pin.

BRAKE SHOE TOE – Free end of brake shoe, not attached to or resting against an anchor pin.

BRAKING SYSTEM EFFICIENCY – is measured in terms of the rate at which brake will bring the vehicle to a stationary position from a given speed. It is expressed as the ratio of the vehicle deceleration rate to the acceleration due to gravity.

BREAKE (tyre) – Rubber or fabric (or both) strip placed under the tread to provide additional protection for main tyre carcass.

BULK HEAD – The structural part of the vehicle connecting the front of the floor assembly to the roof structure.

BUMPER – which is attached to the vehicle frame takes the shock of impact or collision and transfer the same to the frame. By this means, damage to engine parts, radiator, lamps etc. is avoided.

BUMP STEER – The steering effect caused by the suspension moving through its travel.

CALIPER – A housing for the hydraulic components of a disc brake system.

CAMBER – Tilting of the top of wheels from the vertical, when the tilt is outward, camber is positive.

CAMBER ANGLE – The outward (positive) or inward (negative) angle of the wheel centre line to absolute vertical.

 $\label{eq:carbon of the ball and socket} \textbf{CARDAN UNIVERSAL JOINT} - A universal joint of the ball and socket type.$

CARLIFT – An air, electrical or hydraulically operated piece of shop equipment which can lift the entire vehicle, or in some cases, one end of the vehicle.

CARRIER BEARINGS – Bearings upon which differential case is mounted.

CASING OF TYRE – The tyre casing, made of fabric or cord to which rubber is vulcanized. It is the outer part of the tyre assembly.

CASTER – The tendency of a wheel to follow the direction of the pivot movement. Tilt of the top of the king pin forward or backward from the vertical. When tipped forward it is called negative caster. Backward tilt from the vertical is called positive caster.

CASTER ANGLE – The rearward (positive) or forward (negative) angle of the steering axis to absolute vertical.

CENTRE STEERING LINKAGE – Steering system utilizing two tie rods connected to steering arms and to central idler arm. Idler arm is operated by drag link that connects idler arm to pitman arm.

CENTRIFUGAL CLUTCH–Ĉlutch that utilizes centrifugal force to expand a friction device on driving shaft until it is locked to a drum on driven shaft. The clutch comes into action as it spins faster.

CHANNELED – Car body lowered down around frame.

CHASSIS–Generally chassis refers to the unit that consists of frame, engine, front and rear axles, springs, steering and brake systems, controls, drive train and fuel tank. It is an assembly of mechanisms that make up the major operating part of the vehicle. In short, it is assumed to include everything except the vehicle body and fenders.

CLASSIC or NORMAL CONTROL TRUCK-has the engine located in front of the driver's cabin.

CLUTCH – Device used to connect or disconnect flow of power from one unit to another. In a vehicle, the mechanism in the power train that connects the engine crankshaft to or disconnects it from the transmission and thus with the remainder of the power train.

CLUTCH CHATTER – A shaking or shuddering of the vehicle as the clutch is operated.

CLUTCH DIAPHRAGM SPRING–Round dish shaped piece of flat spring steel, used to force pressure plate against clutch disc in some clutches.

CLUTCH DISC – Part of the clutch assembly splined to transmission clutch or input shaft, faced with friction material. When clutch is engaged, disc is squeezed between flywheel and clutch pressure plate.

CLUTCH DRAG – A problem in which the clutch disc does not come to a complete stop after the clutch pedal is depressed.

CLUTCH EXPLOSION – Clutches have literally flown apart (exploded) when subjected to high rotational speed. Scatter shield is used on competition cars to protect driver and spectators from flying parts in event clutch explodes.

CLUTCH HOUSING – A metal housing that surrounds the flywheel and clutch assembly. **CLUTCH LINKAGE** – The rods and levers that allow the driver to operate the clutch.

CLUTCH PEDAL – A pedal in the drivers compartment that operates the clutch.

CLUTCHPEDALFREETRAVEL–Specified distance clutch pedal may be depressed before throw out bearing actually contacts clutch release fingers.

CLUTCH PILOT BEARING – A small bronze bushing or ball bearing positioned in the crankshaft end or centre of flywheel, used to support outboard end of transmission input shaft.

CLUTCH PRÉSSURE PLATE – Part of a clutch assembly, that through spring pressure, squeezes clutch disc against flywheel thereby transmitting driving force through the assembly. To disengage clutch, pressure plate is drawn away from the flywheel via linkages.

CLUTCH SEMI CENTRIFUGAL RELEASE FINGERS – Clutch release

fingers that have a weight attached to them, so that at high rpm release fingers place additional pressure on clutch pressure plate.

CLUTCH SHAFT – The shaft on which the clutch is assembled, with the gear that drives the countershaft in the transmission on one end. It has external splines that can be used by a sychronizer drum to lock the clutch shaft to the main shaft for direct drive.

CLUTCH SLIPPAGE – A condition in which the engine overrevs during shifting or acceleration.

CLUTCH THROWOUT FORK – In the clutch, a Y shaped member into which is assembled the throwout bearing.

CLUSTER or COUNTER GEAR – Cluster of gears that are all cut on one long gear blank. Cluster gears ride in the bottom of transmission. Cluster provides a connection between transmission input shaft and output shaft.

- **COEFFICIENT OF FRICTION** An index of the frictional characteristics of a material.
- **COEFFICIENT OF ROLLING RESISTANCE** is numerically equal to the ratio of the force causing uniform rolling of the wheel to the normal reaction of theroad.

COIL SPRING CLUTCH – A clutch using coil springs to hold the pressure plate against the friction disc.

COLLAPSIBLE STEERING COLUMN-is the steering column which will collapse in its length due to the impact of the driver on to the steering wheel, on a front end crash. This safety device prevents the possibility of the driver getting injured.

CONE CLUTCH – Clutch utilizing cone shaped member that is forced into a cone shaped depression in the flywheel, or the other driving unit. Although no longer used in cars, cone clutch finds some applications in small riding tractors, heavy power movers etc.

CONSTANT VELOCITY JOINT – Two closely coupled universal joints arranged so that their acceleration and deceleration effects cancel out each other, resulting in an output driven shaft speed to be always identical with drive shaftspeed.

CONTACT PATCH – The part of a tyre that is in contact with the road surface. **CONTROL ARM** – A suspension member mounted horizontally with one end attached to the frame and the other end the knuckle or axle housing.

CORD – A string or thread that makes up the fabric used in tyreplys.

CORNERING WEAR – A type of tyre tread wear caused by taking turns at excessive speeds.

COUNTERSHAFT – Intermediate shaft that receives motion from one shaft and transmits it to another. It may be fixed (gears turn on it) or it may be free to rotate. In the transmission countershaft is driven by the clutch gear, gears on the countershaft drive gears on the main shaft when the latter are shifted into gear. **COWL** – Part of car body between engine firewall and front of dashboard.

CROSS SHAFT (steering) – Shaft in steering box that engages steering shaft worm. Cross shaft is splined to pitman arm.

CURB WEIGHT – The weight of the complete vehicle with its normal load, less driver and passengers but with a full tank of fuel, engine and vehicle oil and coolant.

CUT OUT – operates as an automatic switch which connects and disconnects the battery with the generator, according to the speed of the latter.

DAMPERS – are nothing but a piston in a cylinder filled with oil or gas. The damper restrains undesirable bounce of the sprung vehicle mass and restrains the wheel assembly from loosing ground contact by being excited at its natural frequency.

DASH BOARD – Part of body containing driving and control instruments, switches etc.

DEAD AXLE – Axle that does not rotate or deliver power but merely forms a base upon which wheels may be mounted.

DEDION – Rear axle set up in which driving wheels are attached to the frame by a central pivot. Differential unit is bolted to frame and is connected to the driving wheels by drive axles.

DEPENDENT SUSPENSION – Wheel connected through an axle member so that movement of one wheel moves the other wheel.

DIAGONAL SPLITBRAKE SYSTEM–Abrake system design that will allow application of brakes on one front wheel and a diagonally opposite rear wheel, when part of brake system fails.

DIAPHRAGM CLUTCH – Uses a diaphragm or conical spring instead of coil springs to produce adequate pressure required for keeping the clutch in the engaged position.

DIFFERENTIAL – A mechanism between axles that permit one wheel to turn at a

different speed than the other while transmitting power from the drive shaft to the wheel axles, when the vehicle is negotiating a turn.

DIFFERENTIAL CASE – A steel unit to which the ring gear is attached. Differential case drives spider gears and forms an inner boaring surface for axle and gears.

DIFFERENTIAL LOCK – The differential lock grips one or both of the side gears to the differential case. This prevents their rotation on the pins. This enables a larger torque to be transmitted to the gripping wheel than that to the slipping wheel.

DIRECT ACTING SHOCK ABSORBER – Type of shock absorber which shortens or lengthens in action. Also called telescopic shock absorber.

DIRECT DRIVE – Such as high gear when crankshaft and drive shaft revolve at same speed.

DIRECTIONAL STABILITY (steering) – Ability of vehicle to move forward in straight line with minimum of driver control. Vehicle with good directional stability will not be unduly affected by side wind, road irregularities etc.

DISC BRAKE – When the brake pedal is depressed, pads lined with friction material are forced towards one another. In doing so, they come in contact with the disc (attached to the wheel) which normally rotates between them. This provides braking effort.

DISC WHEEL – Wheel constructed of stamped sheet.

DIVE – The front wheel of the vehicle lowering during braking.

DOLLYBLOCKS-Blocks of metal, variously shaped and contoured, used to straighten body panels and fenders. The dolly block is held on one side of the panel while the other side is struck with a special hammer.

DOUBLE LEADING SHOE – A drum brake having two leading shoes and no trailing shoes. Each shoe has its own actuating mechanism and pivot.

DOUBLE PISTON CALIPER – A hydraulic brake caliper with two pistons and provision for applying hydraulic pressure equally to both pistons. The caliper body is fixed solidly.

DOWN SHIFT – Shifting to lower gear.

DOUBLE LEADING BRAKE – A drumbrake assembly with both front shoes self energized during forward wheel rotation.

DOUBLE REDUCTION AXLE – In the double reduction or tripple reduction type final drive, the required speed reduction is obtained in two or more steps. This enables higher torque to be available at the road wheels. In heavy duty and off highway vehicles, multiple reduction is used.

DOUBLE TRAILING BRAKE – A drum brake assembly with both shoes self energized during rearward wheel rotation only.

DRAG – To accelerate a vehicle from standing start, over course one fourth mile in length. Also used by some drivers when referring to challenging another driver to an acceleration race.

DRAG LINK – A steel rod connecting pitman arm to one of steering knuckles. On some installations, drag link connects pitman arm to a centre idler arm.

DRAGSTER – Car especially built for drag racing.

DRAG WHEEL – Special steering wheel used on some dragsters. Often consists of cross bar spoke and portion of rim on each end.

DRIP MOULDING – is a U shaped channel, added to the side rails of the roof panel. It catches water on the roof and direct it to the back of the car during raining.

DRIVE LINE or DRIVE TRAIN – Propeller shaft, universal joints etc. connecting transmission output shaft to axle pinion gear shaft.

DRIVE PINION – A gear in the differential connected to the drive shaft.

DRIVE or PROPELLER SHAFT SAFETY STRAP – A metal strap or straps, surrounding drive shaft to prevent shaft from falling to ground in the event of a universal joint or shaft failure.

DRIVE SHAFT – An assembly of one or two universal joints connected to a hollow tube and used to transmit torque and motion. A shaft in the power train that extends from the transmission to the differential and transmits power from one to the other. Also called PROPELLER SHAFT.

DROP CENTRE RIM – Centre section of rim being lower than two outer edges. This allows bead of tyre to be pushed into lower area on one side while the other side is pulled over and off the flange.

DROPPEDAXLE – Front axle altered so as to lower the frame of the vehicle. Consists of bending axle downward at outer ends (solid front axle).

DRUM BRAKE – A brake unit using curved brake shoes which press against the inner circumference of a metal drum to produce braking action.

DUALS-Two sets of exhaust pipes and mufflers one for each bank of cylinders.

DUAL BRAKE SYSTEM – Tandem or dual master cylinder to provide a brake system that has two separate hydraulic systems, one operating the front brakes, the other operating the rear brakes.

DUAL SERVO BRAKES – A drum brake assembly with both front and rear shoes, self energized during forward and rearward wheel rotations. **DUMMY AXLE** – provided in some vehicles increases the load carrying capacity of the vehicle. Wheels on the dummy axle can rotate freely.

DUNY BUGGY – Off road vehicle set up to run on sand.

ELLIOT TYPE AXLE – Solid bar front axle on which ends span or straddle steering knuckle.

EMERGENCY BRAKE – is the hand brake, operated by a lever, is used when the vehicle is left parked and prevents the vehicle from moving. The hand brake can be applied to stop the vehicle when the service brake fails.

EPICYCLIC GEAR – In the epicyclic gearing, at least one gear not only rotates about its own axis, but also rotates about some other axis.

EQUALIZER LINK – A common connector in the parking brake system that causes both rear brakes to be applied with the same cable tension.

EVASIVE MANEUVER – Rapid steering changes to avoid obstacles in the path of the vehicle.

EXPANSION TANK – A tank at the top of an automobile radiator which provides room for heated coolant to expand and give off any air that may be trapped in the coolant. Also used in some fuel tanks to prevent fuel from spilling from the tank because of expansion.

FADE (**brake**) – A condition that occurs when there is little braking effect with full brake pedal force.

FIFTH WHEEL – is the swivelling type arrangement at the rear of a tractor unit. The fifth wheel carries the front part of the semitrailer.

FINAL DRIVE – The final gear reduction between the engine and the drive wheels.

FIXED CALIPER DISC BRAKES – Disc brakes using a caliper which is fixed in position and cannot move.

FLOATING CALIPER DISC BRAKES – Disc brakes using a caliper mounted through rubber bushings which permit the caliper to float, or move, when the brakes are applied.

FLUIDFLY WHEEL-A liquid coupling used to transmit the engine effort (torque) to a clutch and transmission. This coupling is always a major part of the engine flywheel.

FOOT PRINT – Area of road that is in contact with the tyre.

FORWARD CONTROL TRUCK – has the engine either in or below the driver's cabin.

FORWARD EFFICIENCY – is the ratio of the amount of driver input torque which is available at the wheels to turn the same to the total amount of input torque from the driver at the steering wheel.

FOUR WHEEL DRIVE – Some cross country vehicles (Jeeps) have this arrangement. In this case, the engine power is transmitted to all the four wheels of the vehicle. The main advantage of this arrangement is the entire vehicle weight is available for traction.

FOUR WHEEL STEERING – Type of steering system in which all the four wheels of a vehicle are turned for steering.

FOUR SPEED TRANSMISSION – A transmission with four forward speeds or gear ratios.

FRAME – The assembly of metal structural parts and channel sections that forms the base and supports the engine and body and is supported by the vehicle wheels.

FRONT AXLE – In a vehicle, the front axle transmits the weight of the front part of the vehicle to the road surface through the front wheels. It also carries the mechanism for steering the vehicle. In the case of front wheel drive, it incorporates both steering and driving mechanisms.

FRONT END GEOMETRY – The angular relationship between the front wheels, wheel attaching parts, and vehicle frame. Includes camber, caster, king pin inclination, toe in and toe out on turns.

FULL FLOATING AXLE – An axle design usually used on heavy trucks where the vehicle weight is carried by bearings in the wheel hubs, or the drive wheels and the axles are used only to transfer driving torque.

GEAR – A wheel with teeth that engage or mesh with teeth of another wheel.

GEAR BOX – A unit which has a series of gears and shafts to vary the speed of the gearbox output shaft compared to the engine speed. This in turn increases the torque and thereby improves acceleration of the vehicle.

GEAR CLASH – A condition in which the gears grind during shifting.

GEAR RATIO – The ratio of the number of teeth on two gears to mesh with each other.

GENERATOR – is the device which converts mechanical energy from the automobile engine into electrical energy. When the generator is sufficiently turned by the engine, it furnishes electrical energy for all the vehicles circuits and replenishes the battery to keep it fully charged.

GRAVITY BLEEDING – A process used to remove air from the brake system using the natural height of the fluid in the master cylinder above the wheel cylinder.

GRIP COEFFICIENT – is numerically equal to the ratio of the force causing uniform wheel slip to the normal road resistance.

HALFAXLEDRIVESHAFTS–Twoinnumber, transmit the driving torque from the final drive and differential unit to the driving road wheels.

HANDLING – The ease of maneuvering a vehicle without slipping or skidding.

HARSHNESS – Bumpy ride produced by a stiff suspension.

HEEL – Anchor end of a brake shoe.

HOTCHKISS DRIVE – A rear suspension with open propeller shafts with two or three universal joints. Braking torques are transferred to the frame through links, control arms or leaf springs.

HORN RELAY – A relay connected between the battery and horns, when energized by closing of the horn button, it connects the horn to the battery.

HYDRAULICBRAKE – A brake system using hydraulic fluid, piston and cylinders to provide extremely high pressure for brake application.

HÝDRAULIC CLÚTCH – A clutch that uses hydraulic pressure to actuate the clutch. Used in heavy duty equipment and where the engine is away from the drivers compartment so that it would be difficult to use mechanical linkages.

HYDRAULIC CONTROL VALVES – A system of valves that senses driving conditions and automatically shifts the transmission.

HYPOID GEARS – Drive pinion and ring gears whose shape allows them to mesh off centre.

IMPENDING SKID – The tyre traction point at which any increase in side or tractive load will produce tyre skid.

INDEPENDENT SUSPENSION – A type of suspension system in which each wheel is independently supported by a spring. A suspension that allows up and down movement of one wheel without affecting the opposite wheel.

INNER TUBE (tyre) – The inside rubber tube assembled in the tyre casing, it maintains the air at sufficient pressure to inflate the casing and adequately support the vehicle weight.

INTEGRAL BODY – has the longitudinal and cross members of the chassis incorporated in the frame work of the load carrying body. With this arrangement, part of the load previously carried by the chassis, is diffused through the body structure.

ISOFLARE – A brake tube flaring method that upsets the tube and allows a strong, secure attachment when used with the proper tube nut and seal.

JOUNCE – A compression load on the springs as the space between the frame and the axle is reduced.

JOUNCE BUMPER – A rubber bumper used to absorb shock during full suspension system movement.

KING PIN – The steel pin on which the steering knuckle pivots, it attaches the steering knuckle to the knuckle support or axle.

KING PIN INCLINATION – Inward tilt of the king pin from the vertical.

KINGPIN OFFSET – is the distance between the centre of the tyre contact patch and intersection of the kingpin or steering axis with the ground. Kingpin offset is also called scrub radius.

KNOCK BACK – Slight axial movement that pushes the caliper pistons into their bore. This causes clearance between the brake lining and the rotor.

KNUCKLE – The part of the suspension that connects the control arms and supports the wheel spindle.

LATERAL LOAD (tyre) – The force on the side of the tyre tread.

LEADING SHOE – A brake shoe that has the drum rotating from the toe toward heel.

LEADING TRAILING BRAKE – A drum brake assembly having one shoe energized in either forward or rearward wheel rotation.

LEAF SPRING-A spring made up of a series of flat steel plates of graduated length, assembled one on top of another.

LEVEL CONTROL (automatic) – A suspension system which compensates for variations in load in the rear of the car, positioning the rear at a predesigned level regardless of load.

LIMITED SLIP DIFFERENTIAL – A differential allowing unequal torques to be delivered to the axle shafts.

LINKAGE POWER STEERING – A type of power steering in which the power steering units (power cylinder and valve) are an integral part of the steering linkage.

LORD LEVELING SYSTEM – A system used to level a vehicle that is heavily loaded.

LORD RANGE (tyre) – The amount of weight that can be safely carried by a tyre. It indicates the number of plies at which a tyre is rated. Load range B equals 4 ply rating, C equals 6 ply rating, and D equals 8 ply rating.

LUG – The flange stud on an axle or hub on which the drum and wheel are fastened.

- MCPHERSON STRUT SUSPENSION A suspension system in which both wheels are attached to a rigid rear axle housing.
- **MANUALLY OPERATED TRANSMISSION** A transmission that is shifted from one speed to another by the operator (driver).

MASTER CYLINDER – The liquid filled cylinder in the hydraulic braking system where hydraulic pressure is developed by depression of the brake pedal or movement of the brake lever.

MECHANICAL BRAKES – Brakes operated by mechanical linkage (cables and levers) between the brake pedal and the brakes at the car wheels.

METALLIC BRAKE LINING – A lining having metallic properties used to provide high temperature braking efficiency.

METERING VALVE – A valve that delays pressure build up to the front brakes of a four wheeled vehicle.

MINOR BRAKE ADJUSTMENT – Adjustment of brakes to compensate for brake lining wear.

MODULATOR – A vacuum canister mounted to the outside of the automatic transmission that senses engine load.

MULTIPLE DISC CLUTCH – A clutch that has more than one friction disc, usually there are several driving discs and several driven discs, alternately placed.

NEUTRAL STEER – A vehicle that will maintain the selected turn with no driver input.

NON DIRECTIONAL SENSE – Steering does not lead in any direction.

NON LOAD CARRYING BODY – In this, the loads on the vehicle are transferred to the suspension system entirely by a separate chassis. The body is isolated from the chassis deflection by rubber mountings.

ONE WAY CLUTCH – A clutch that holds in one direction but allows movement in another direction.

OVER DRIVE – A device in the power train of some vehicles that introduces an extra set of gears into the power train. This causes the propeller shaft to overdrive or drive faster than the engine crankshaft. Engine speed is thus reduced without reduction of vehicle speed.

OVER RUNNING CLUTCH – A type of clutch that will transmit rotary motion in one direction only, when rotary motion attempts to pass through in other direction, then the driving member over runs and does not pass motion to the other member.

OVER STEER – The tendency of a vehicle to turn sharper than the turn selected by the driver.

PANHARD ROD – A control rod that connects the frame on one side of the vehicle to the axle housing on the other side to keep the axle housing centred under the vehicle.

PARKING BRAKES – Mechanically operated brakes that operate independently of the (hydraulic) service brakes on the vehicle. They may be set for parking the vehicle or holding the vehicle against rolling. Also called an emergency brake.

PASCAL'S LAW – A principle of hydraulics which states that pressure at any point in a confined liquid is same in every direction and applies equal force on equal areas.

PEDAL BLEEDING – A method of removing air from the hydraulic system parts by applying the brake to raise the pressure in the system to help move the air through the system when the bleeder valves are opened.

PEDAL PULSATION – A rapid up and down movement of the clutch pedal during operation.

PITMAN ARM – That part of the steering gear which is linked to the steering knuckle arms of the wheels; it swings back and forth for steering.

PITMAN ARM STOPS – On some cars (particularly those using linkage power steering), stops are used to prevent excessive pitman arm movement and thus steering linkage movement.

PITMAN SHAFT – The shaft to which the pitman arm is attached in a steering gear.

PLANETARY GEARBOX – A system of gears used in an automatic transmission, a sun gear, planet gears, a carrier and a ring gear.

PLIES – The layers of cord fabric in a tyre carcass, each layer is a ply.

PLYSTEER – The tendency of a tyre to always turn in one direction as it rolls. This is the result of the way the tyre was constructed.

PNEUMATIC TYRES – Tyres that are filled with air to the required pressure.

POWER BOOSTER – A device used to increase the drivers brake pedal force going to the master cylinder, without an accompanying increase in pedaltravel.

POWER BRAKE–Conventional brake system that utilizes engine vacuum to operate vacuum power piston. Power piston applies pressure to brake pedal, or in some cases, directly to master cylinder piston. This reduces the amount of pedal pressure that the driver must exert to stop the vehicle. Also called POWER ASSISTED BRAKE.

POWER RACK – In the saginan power steering unit, a rack that meshes with a sector on the pitman shaft and transmits to the shaft, power from the power cylinder.

POWER STEERING – A device that uses hydraulic pressure to multiply the drivers effort as he turns the steering wheel so that less steering effort is required.

POWER TRAIN or DRIVE TRAIN – The group of mechanisms that carry the rotary motion developed in the engine to the vehicle wheels, it includes the clutch, transmission, drive shaft differential and axles.

PRESSURE CAP (radiator) – A radiator cap with valves that causes the cooling system to operate under pressure and thus at a somewhat higher and more efficient temperature.

PRESSURE PLATE – That part of the clutch which exerts pressure against the friction disc, it is mounted on and rotates with the flywheel.

PREVENTIVE MAINTENANCE – The systematic inspection, detection and correction of failures in a engine, or in a vehicle, either before they occur, or before they develop into major defects.

PRIMARY SHOE – A brake shoe moved by a wheel cylinder to apply the brake. **PROPELLER SHAFT** – A shaft in the power train that extends from the transmission to the differential and transmits power from one to the other.

PROPORTIONING VALVE – A valve used to maintain the correct proportion of fluid pressure between the front disc or drum brakes and rear drum brakes. Usually the rear brake pressure is a fraction of front brake pressure.

PUNCTURE SEALING TYRES AND TUBES-Tyres and tubes coated on the inside with a plastic material. Air pressure in the tyre or tube forces that material through holes made by punctures. It hardens on contact with the air to seal the puncture.

RACK AND PINION STEERING GEAR – A steering gear that uses a pinion on the end of the steering shaft which is meshed with a rack on the major cross member of the steering linkage.

RADIAL BIAS TYRE – A tyre in which the plies are laid on radially, or perpendicular to the rim, with a circumferential belt on top of them. The rubber tread is vulcanized on top of the belt and plies.

RADIAL PLY TYRE – Cords running directly across the tyre carcass from bead to bead.

RADIAL SPRING RATE – The amount of radial load required to deflect a tyre (one cm) unit distance.

RADIATOR – In the cooling system, the device that removes heat from the coolant passing through it, it takes hot coolant from the engine and returns the coolant to the engine at a lower temperature. The hot coolant is cooled in the radiator for recirculation.

RADIATOR PRESSURE CAP – The cap placed on the radiator filler tube which pressurizes the cooling system for more efficient operation.

RADIATOR SHUTTER SYSTEM – A system of engine temperature control used mostly on trucks, that controls the amount of air flowing through the radiator by use of a shutter system.

REACTION CONTROL – A feedback mechanism that gives the driver a feel of the amount of input effort being applied.

REAR AXLE ASSEMBLY – A system of gears and axles that transfers power from the drive line assembly to the driving wheels of the automobile.

REAR AXLE RATIO – The ratio between the drive pinion and the ring gear in the differential assembly.

REAREND TORQUE–Reactionary torque applied to the rear axle housing as torque is applied to the wheels; rear end torque attempts to turn the axle housing in a direction opposite to wheel rotation.

REBOUND – An expansion of a suspension spring after it has been compressed as the result of jounce.

RECAPPING – A form of tyre repair in which a cap of new materials is placed on the old tread and vulcanized into place.

RECIRCULATING BALL AND NUT STEERING GEAR – A type of

steering gear in which there is a nut (meshing with a gear sector) assembled on a worm, balls circulate between the nut and worm threads.

RELEASE LEVER – In the clutch, a lever that is moved by throw out bearing movement; the movement causes clutch spring pressure to be relieved so that the clutch is released or uncoupled.

RETREAD – A used tyre on which a new tread section is molded.

REVERSE FLUSHING – A method of cleaning a radiator or engine cooling system by flushing in the direction opposite to the normal coolant flow.

RIDE – The characteristic feel as one rides in a vehicle.

RIGID REAR SUSPENSION – A rear suspension system in which both wheels are attached to rigid rear axle housing.

RIM – The metal wheel on which the tyre is mounted.

RING GEAR – A large gear carried by the differential case, meshed with and driven by the drive pinion.

ROAD RESISTANCE – is the resistance of the road surface, which must be overcome when a vehicle travels along the road. This consists of friction between the tyre and road.

ROLLING RESISTANCE – is the resistance caused due to the deformation of the tyres and road, the friction of the tyres on the road surface and friction in the wheel bearings.

ROLL STEER – The steering effect as a result of body lean during a turn.

RUNOUT OF WHEEL – Lack of alignment of wheel or gear to the axle so that the wheel or gear runout or move out of alignment, as wheel or gear rotates.

SAFETY RIM – A type of wheel rim having a hump on the inner edge of the ledge on which the tyre bead rides. The hump helps hold the tyre on the rim in case of blow out.

SCRUB RADIALS – The distance on the road surface under the front tyre between an extension of the pivot axis and the centre of weight.

SCUFF – The tyre slide on the road surface during operation.

SCUFF TRAVEL-The amount of side travel of the tyre as the wheel moves from maximum jounce to maximum rebound.

SEAT ADJUSTER – A device to permit forward and backward (and sometimes upward and downward) movement of the front seat.

SECONDARY SHOE – A brake shoe that is operated by a primary shoe to apply brake.

SELF ADJUSTING BRAKE DESIGNS – Brakes that automatically compensate for wear of the brake linings.

SELF ALIGNING TORQUE – The natural tendency of the tyre to return to the neutral position after being turned.

SEMIMETALLIC BRAKE LINING – A brake lining combining both metallic and organic materials for improved braking performance.

SENSTRONIC BRAKE – **CONTROL** (**SBC**) – is basically a brake by wire system which eliminates the need for mechanical linkage between the brake pedal and brake master cylinder.

SEQUENTIAL GEAR BOX-is an electromechanical device that replaces the conventional gear shift mechanism and is bolted to the tunnel section or the floor of the car. It converts the conventional floor shifter to an electronically activated sequential shift system that is electronically controlled by microprocessors.

SERIES – The designation of a tyre aspect ratio.

SERVICE BRAKE SYSTEM– The main braking system of the vehicle which controls braking effect proportional to the drivers demand.

SHACKLE – Swinging support by which one end of a leaf spring is attached to the vehicle frame.

SHIM–Aslottedstripofmetalusedasaspacertoadjustfrontendalignment on many cars and to make small correction in the position of the body sheet metal and other parts.

SHIMMY – Rapid oscillations, in wheel shimmy, for example, the front wheel tries to turn in and out alternately and rapidly (a violent front wheel shake). This causes the front end of the car to oscillate or shimmy.

SHOCK ABSORBER – The assembly on the vehicle that checks excessively rapid spring movement and oscillations. A device placed at each vehicle wheel to regulate spring rebound and compression.

SHOE – The part of a brake that supports the lining.

SHORT LONG ARM SUSPENSION – A suspension system in which a long and a short control arms are used to support the wheel.

SINGLE LEADING SHOE – A drum brake having two shoes; one is leading another is trailing. Leading shoe tends to wedge itself into the brake drum and provides more braking action than the trailing shoe.

SINGLE REDUCTION AXLE – In the single reduction type final drive, the required speed reduction (say up to 7 to 1) is obtained in one step.

SIPES – Slits in the tyre tread to produce more blade surface for traction.

SKID – A tyre sliding on the road surface.

SKID CONTROL – A device that operates to prevent wheel lock up during braking and thus skidding.

SLIDING MESH GEAR BOX–The gear box consists of three shafts and a set of gears, gear selector mechanism and gear shift lever. Different gears are engaged by sliding the appropriate gears.

SLIP ANGLE – The angle between the tyre and the actual directional movement.

SLIP JOINT – In the power train, a variable length connection that permits the drive shaft (propeller shaft) to change its effective length.

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) – A professional

engineering society responsible for setting many vehicle standards used in the world today.

SPIN BALANCER – A car tyre balancer which turns the raised tyre at a road speed where imbalance can be detected by wheel shake.

SPINDLE (steering system) – A part of the steering knuckle assembly on which the front wheels are mounted.

SPONGY PEDAL – A brake pedal that feels soft or spongy.

SPRING FREQUENCY – Springs are also compared in frequency. Springs which return quickly to their original shape or oscillate rapidly after being deflected are said to have higher frequency than those that return or oscillate slowly.

SPRING RATE-The flexibility of a spring depends on the property called spring rate. It is defined as the weight in kg required to deflect it one cm. A soft spring has a lower rate than a stiff or inflexible spring.

SPRING SHACKLE – Provides a means for the leaf spring assembly to compensate for changes in its length.

SPRING SUSPENSION – The operating components of a spring suspension system, which absorbs the force of road shocks by flexing and twisting.

SPRUNG WEIGHT – That part of the vehicle which is supported on springs (the frame and body for example).

SQUIRM – The twist of the tyre tread in the foot print.

STABILIZER SHAFT – An interconnecting torsion bar between left and right lower suspension arms on a vehicle which reduces body roll on turns and adds stability.

STAR WHEEL – An adjustable link between the primary and secondary brake shoes.

STEER ANGLE – The angle the wheels are turned to from straight ahead.

STEERING AND IGNITION LOCK – A locking device that locks the ignition switch in the off position, and also locks the steering wheel so that it cannot be turned.

STEERING ARM – The arm attached to the steering knuckle to turn the knuckle, and wheel, for steering.

STEERING AXIS – The centre line of the ball joints in a front suspension system extended to the road surface.

STEERINGAXISINCLINATION-Theinwardtiltofthesteeringaxisor front wheel pivot from the vertical.

STEERING COLUMN – The housing that supports the steering shaft.

STEERING GEAR – That part of the steering system, located at the lower end of the steering shaft, that carries the rotary motion of the steering wheel to the vehicle wheels for steering.

STEERING KICKBACK – Sharp rapid movements of steering wheel as the front wheels encounter obstructions in road, the shocks of these encounters kickback to the steering wheel.

STEERING KNUCKLE – The front wheel spindle or stub axle which is supported by the king pin, so that it and the wheel can be turned for steering. Part of the front suspension system.

STEERING LINKAGE – Linkage that connects the steering gears to the front wheels.

STEERING RATIO – The number of degrees the steering wheel is turned divided by the number of degrees the vehicle wheels are turned.

STEERING SHAFT – Shaft extending from steering gear to the steering wheel.

STEERING STOPS – limit the angular deflections of the front wheels. They avoid rubbing of tyres against the frame or against the fenders which would cause undue wear and tear of the tyres.

STEERING SYSTEM – The mechanism that enables the driver to turn the wheel axles (usually the front) and thus turn the wheels away from the straight ahead position so that the vehicle can be guided.

STEERING WHEEL – The wheel at the top of the steering shaft in the drivers compartment which is used to guide or steer, the vehicle.

STONE SHIELD – is bolted to the radiator support and the fenders. It fits beneath the bumper of the car. It prevents striking of small flying stones on to the radiator grille and radiator and thus avoids their damage.

STOPLIGHTSWITCH–A switch applied by the master cylinder pressure that turns on brake lights.

STOPPING DISTANCE – is the distance in which a vehicle will be brought to rest from steady speed, when the brake is applied.

STREAMLINING – The shaping of an object that moves through a medium (such as air or water) or past which the medium moves, so that less energy is lost by parting and reuniting of the medium as the object moves through it.

STUMBLE – The term related to vehicle driveability, the tendency of an engine to falter and then catch, resulting in a noticeable stumble effect felt by the driver.

SUSPENSION – The suspension system supports the vehicle body and at the same time isolates the vehicle and its occupants from shocks and vibrations generated by the road surface. It also maintains steering control and stability at all times.

SUSPENSION ARM – In the front suspension, one of the arms is pivoted at one end to the frame and at the other to the wheel (steering knuckle) support.

SUSPENSION COMPLIANCE – Rearward and upward movement of the suspension when the tyre meets an obstacle on the road surface.

SUSPENSION GEOMETRY – The angular action of the suspension as it goes from its static position to the extremes of travel (compared to vertical lines).

SYNCHROMESH – A device in the transmission that synchronizes gears about to be meshed so that there will not be any gear clash. Also called SYCHRONIZER.

TACTILE SENSOR – A sensor that allows the vehicle operator to feel when a certain condition is reached. Disc brake pads are made to vibrate when worn to the point where replacement is necessary and this vibration is felt in the brake pedal.

TANDEM MASTER CYLINDER – is the unit installed in some large cars and commercial vehicles have a split hydraulic system with two separate cylinders and reservoirs in the master cylinder. This avoids the possibility of complete brake failure due to a fracture in the pipe line leading to one brake cylinder.

THROWOUT BEARING – Bearing operated by the clutch linkage used to disengage the clutch.

TIE RODS – In the steering system, the rods that link the pitman arm to the steering knuckle arms.

TILT STEERING WHEEL – A type of steering wheel which can be tilted at various angles, due to a flex joint in the steering shaft.

TOE – The leading edge of the brake shoe. The angle between the centre lines of the front wheels.

TOE IN – The turning in of the front wheels, wheels are closer together at the front than at the back of the wheels.

TOE OUT – The turning out of the front wheels, where wheels are farther apart at the front than at the back of the wheels.

TOE OUT DURING TURNS – Difference in angles between the two front wheels and the car during turns. Inner wheel, in a turn, turns out or toes out more. Also called steering geometry and cornering wheel relationship.

TORQUE CONVERTOR – A device in the power train consisting of three or more rotating members. It transmits power from the engine through a fluid to the reminder of the power train and provides varying drive ratios with speed reduction and increase in torque.

TORQUEDRIVE TRANSMISSION-A transmission similar to the power glide but lacking the self shifting ability.

TORQUE TUBE DRIVE – The type of rear suspension in which the torque tube surrounding the propeller shaft absorbs the rear end torque.

TORSIONAL LOAD – Loads on the brakes and suspension caused by torque.

TORSION BAR SPRING – A long, straight bar, fastened to the frame at one end and to a suspension part at the other.

TRACKING – The following of the rearwheels, directly behind, or in the tracks of, the front wheels.

TRACTIVE FORCE – The friction force in the contact patch that causes torque on the wheel.

TRAILING SHOE – A brake shoe with its anchor at the toe end.

TRAMP – Up and down motion or hopping of the front wheels experienced at higher speeds due to unbalanced wheels or to excessive wheel run out. Also called high speed shimmy.

TRANSAXLE – A drive assembly combining the transmission and final drive assemblies in one casing.

TRANSFER CASE – A unit located at the back of the regular gear box, in the four wheel drive arrangement. A pinion fixed to the gear box shaft, drives a wheel in the transfer case. The driven wheel in the transfer case has a differential which distributes the drive equally between the front and rear axles.

TRANSMISSION – The device in the power train that provides different gear ratios between the engine and rear wheels, as well as revers

TRANSMISSION DRAIN PLUG – A plug at the bottom of the transmission to drain the lubricant.

TRANSMISSION FILLER PLUG – A plug on the side of the transmission used to add transmission lubricant.

TRIM HEIGHT – Specified level, vehicle height above the road surface.

TRIPLE POINT JOINT – A universal joint using bearings on three axes to maintain a constant plane of drive, making it a constant velocity joint.

TUBED TYRE – Inside the tyre, there is an endless tube fitted with a valve. Air is forced through the valve and is retained inside the tube under pressure. The air acts as the cushioning medium.

TUBELESS TYRE – A tyre that has the air sealed between the rim and tyre and does not use an inner tube.

TURNING RADIUS – The relative angles of the two front wheels during a turn.

TWO DISC CLUTCH – A clutch having two friction discs for additional holding power used in heavy duty equipment.

TYRE – The casing and tube assembled on a vehicle wheel to provide pneumatically cushioned contact and traction with the road.

TYRE BEAD – The inner reinforced edge of a tyre that hold it to the wheel rim.

TYRE CARCASS – The main structural part of the tyre to which tread rubber is attached.

TYRE CONTACT PATCH – The part of a tyre that contacts the road surface making a footprint.

TYRE FOOT PRINT – The area on the road in contact with the tyre.

TYRE FORCE VARIATION-Changes in the tyres radial spring rate as it rolls under radial loads.

TYRE SLIP – A slight tyre slide while making a turn.

TYRE ROTATION – Changing the position of tyres on the automobile to evenout the amount of wear.

TYRE RUNOUT – The amount the tyre wobbles as it rotates.

TYRE SERIES – The groupings of tyre sizes having the same aspect ratio

TYRE TREAD – is that part of the tyre that is designed to run on the road surface. The tread rubber is grooved with a pattern that will provide maximum friction force, (which provides good traction and reduces the possibility of skidding) and minimum noise.

UNDER STEER – The tendency of the vehicle not to turn as much as the wheels are turned.

UNITIZED CONSTRUCTION – A type of automobile body and frame construction in which the frame and body parts are welded together to form a single unit

UNSPRUNG WEIGHT – That part of the vehicle which is not supported on springs (the wheels and tyres for example). The vehicle weight moved by variations in the road surface.

UNIVERSAL JOINT – The part of the drive line assembly that allows for a change in angle of the drive line as the vehicle goes over bumps.

VACUUM BRAKE – is the device in which the braking effect is due to the difference of pressures that acts on the opposite sides of a diaphragm. In this unit, one side of the piston or diaphragm is exposed to atmos- pheric pressure while the other side to a pressure which is below the atmospheric pressure.

VARIABLE RATE SPRINGS—provide a low rate for ordinary service and higher rate for heavy obstruction or loads. These consist of a conventional spring and below which is placed a small auxiliary spring with several leaves. Under heavy loads, the auxiliary or helper spring strengthens the main spring more and more as the main spring is compressed.

VARIABLE RATIO STEERING – A steering gear that provides a different ratio during parts of a turn.

WADDLE – A sideways vehicle shake due to a faulty radial tyre. Most noticeable when a vehicle moves slowly.

WANDER – A condition in which the vehicle does not follow a straight path and randomly drifts in one direction or the other.

WEIGHT TRANSFER – The changes in radial loads on the front and rear wheel tyres due to the centre of gravity location ring braking.

WHEELS–The wheels (wheel and tyre assembly) support the weight of the vehicle. The assembly provides ride quality, load carrying capacity, and vehicle handling characteristics.

WHEEL ALIGNMENT – The position of the front wheels in relation to the suspension and steering geometry.

WHEEL BALANCER – A device that checks a wheel, either statically or dynamically, for balance.

WHEEL BASE – Distance between center of the front wheel and center of rear wheels.

WHEELCYLINDER–In the hydraulic braking system, hydraulic cylinders placed in the brake mechanisms at the wheels; hydraulic pressure from the master cylinder causes the wheel cylinders pistons to move the brake shoes.

WHEEL FIGHT – The tendency of a steering system to be easily deflected by uneven road surfaces. Causes changes in toe that result in tyre wear.

WHEEL OFFSET – The distance between wheel attachment flange and the wheel rim centre plane.

WHEEL PACK BEARING – A preassembled self-lubricated bearing assembly used on the drive wheels with independent suspension.

WHEEL SIDEWAYS DISPLACEMENT – Sideways movement of the wheel as the suspension goes from jounce to rebound.

 $\label{eq:WHEELSIZES-are indicated by three measurements, namely rim diameter, rim width and flange height.$

WHEELSLIP – Sideways movement of the tyre tread across the foot print.

WHEEL RUNOUT – The amount the wheel wobbles as it rotates.

WHEEL TRAMP – Tendency of the wheel to move up and down so it repeatedly bears hard or tramps, on the pavement. Sometimes called high speed shimmy.

WIND SHIELD WIPER – A mechanism which utilizes a rubber blade to wipe the wind shield, it is either vacuum or electrically operated.



ЎЗБЕКИСТОН РЕСПУБЛИКАСИ ОЛИЙ ВА ЎРТА МАХСУС ТАЪЛИМ ВАЗИРЛИГИ

Рўйхатга олинди:

№ БД – _____ – 1.05

2018 йил "26" 05

Олий ва ўрта махсус таглим вазбрлиги

хорижий тил

ФАН ДАСТУРИ

(Барча таълим йўналишлари учун)

ТОШКЕНТ - 2018

 ЎзбекистонРеспубликасиОлийваўртамахсустаълимвазирлиги2018йил

 <u>"14"</u>июндаги<u>"531"</u>–сонлибуйруғининг1-иловасибиланфандастурирўйхатитасдиқланган.

 ФандастуриОлийваўртамахсус,
 касб-ҳунартаълимийўналишларибўйичаЎқувуслубийбирлашмаларфаолиятиниМувофиқлаштирувчикенгашнинг2018

 йил<u>"26"</u>майдаги2сонлимажлисбаённомасибиланмаъқулланган.

Фандастури Узбекистондавлатжахонтиллариуниверситетидаишлабчикилди.

Тузувчилар:

БоқиеваГ.Ҳ	-ф.ф.д., проф	ресссор, Ўз	бекистонда	влатжахонт	иллариуниверси	тети
Саматова Б.Р	-кафедра	мудир	и, Те	ошкент	давлат	юридик
	университет	и,Тилўргат	тишмаркази			
Турсунов М.М.	-каттаўқитувчи, Бухородавлатуниверситети					
Дадаходжаева М.С	-Инглизтили	ва адабиёт	ги кафедрас	И		
МурадкасимоваК.Ш.	-п.ф.н.	доцент,	Ўзбекист	ондавлатжах	сонтиллариунив	ерситети,
	немистили	ўқитувчиси	ſ			
Ширинова Р.Х	-ўқитувчи, Ў	, збекистон	давлат жах	он тиллари у	университети	
Исраилова Д.Ш.	-ф.ф.)	д., Ўзбе	екистон	миллий	университети,	Француз
	филологияси	и кафедрас	и профессој	ои		
Ўзбекистон миллий	университе	ти, Немис	филология	си кафедрас	и катта ўқитувч	иси
Тақризчилар:						
Хашимова Д.Ў	-Тошкент	давлат ю	ридик уни	верситети,	Тил ўқитиш	маркази
	профессор	и, п.ф.д				
Собирова Г. С.	-Тошкент	ахборот	технология	ялари унин	зерситети, Чет	тиллар
	кафедраси	катта ўқит	увчиси, PhD)		

Фандастури Ўзбекистон давлат жаҳон тиллари университети Илмий кенгашида кўриб чиқилган ва тавсия қилинган (2018 йил <u>"26"</u> апрелдаги 9-сонли баённома)

I. Ўкувфанинингдолзарблигиваолийкасбий таълимдагиўрни

Узлуксизтаълимтизимининг четтилларбўйичадавлаттаълим стандартидаги "Четтилларбўйичатаълимнинг барчабоскичлари битирувчиларининг тайёргарликдаражасигакўйиладиганталаблар"гамувофик олийтаълиммуассасаларининг ихтисослигичеттилибўлмаганфакультетлари

битирувчиларичеттилибўйичаВ2даражасиниэгаллашларибелгилабберилган.

Хорижий тил фан дастури мазмун-моҳиятига кўра умумий илмий (академик)тилкўникмалариниривожлантиришга қаратилган,талабаларнинг бўлғусикасбийфаолиятларида фойдаланадиган тилкомпетенцияларини ривожлантиришга мослаштирилган.Мустақилтаълимталабалардатилданэркин

фойдаланишкўникмавамалакалариниэгаллашмотивациясинишакллантиришва

ривожлантиришгақаратилган.

Ушбудастур"Хорижий тил"фаниниўқитишдавридаталабаларнинг умумий,академиквакасбгайўналтирилган тилкўникмавамалакаларини ривожлантиришга қаратилган.Хорижийтилниўрганишнингмустақилмулоқот (В2)даражаситалабаларда кўпроқакадемиквакасбгайўналтирилгантил кўникмалариниривожлантиришнитақозоэтади.

II. Ўқувфанинингмақсадивавазифаси

Хорижийтилниўргатишдан асосиймақсад-бўлғусимутахассисларда кундаликҳаётлари,илмийвакасбийфаолиятларида четтилиёкибирнеча тилларданэркинфойдаланувчимутахассисларни тайёрлаш.Шубиланбирга, улардаватанпарварлик ҳиссиниривожлантириш,мустақилизланиш,билимва кўникмаларини дарсданташқари,ОТМнибитирганларидан кейинҳам ривожлантириш малакалариниҳамдаумумбашарийвасоҳагаоидилмий

мавзулардамантикийфикрлашкобилиятлариниривожлантиришданиборат.

Ушбумақсадгаэришишучунқуйидагивазифаларилгарисурилади:

талабаларнинг нутқий(ўқиш, ёзиш, тинглаб тушуниш,гапириш),тил (лексик,грамматик),ижтимоий-маданийвапрагматиккомпетенцияларини ДТСи талабларигабиноанривожлантириш;

 илмий, касбийвамаиший фаолиятга боғлиқ мавзуларюзасидано ғзакива ёзмаравишдабаён этиш кўникмава малакалариниривожлантириш;

– умумбашарийвамиллийқадриятларбилантаништириш,маданиятлараро бағрикенгликва миллатларароҳамдўстликҳисларинисингдириш;

– илмий ва касбий фаолиятда кўлланиладиган термин ва атамаларни ўргатиш;

– талабаларнингилмий ва соҳавиййўналишлариданкелиб чиққанҳолда мустақилишлариниташкилэтиш.

Фанбўйичаталабаларнинг билим,кўникмавамалакаларигақуйида келтирилганталабларқўйилади.Давлаттаълимстандартларигакўра четтили бўйича В2даражабитирувчиларитайёргарлигидаражасигақўйиладиган талаблар асосидақуйидагикомпетенцияларниэгаллашкўздатутилган.

Лингвистиккомпетенция

Нутқийкомпетенция:

Тинглабтушуниш:

кенгкўламлинуткёкикатормураккабфикрларбаёнини;

маъруза,нутк,баёнот,тафсилотлийўрикномалар,илмийва ихтисослик такдимотлар,сўров ва

фикрларнингмохиятини;

эълонва хабарларни;

танишва нотанишконтекстдагимураккабаутентикнутқни;

ўрганилаётгантилэгасибўлгансўзлашувчиларнингсухбатёки мунозарасинингаксариятқисмини; радио,интернетва телевидениедастурлари,интервьюларнингаксарият қисминитушунаолади. *Гапириш:*

Диалог:

ўрганилаётгантилда сўзлашувчиларбиланмулоқотгакиришиш;

олдиндантайёргарликкўрилмаганжонлимухокамава мунозара юритиш;

ўзсохаларигаоид интервьюдаиштирокэтаолиш;

битимга келишув ёки муаммо ечимини топишда расмийлик ва хушмуомалаликданфойдаланиш;

расмиймухокамадоирасидаўзфикрвамулохазаларинианикифодалаш;

ўзхамкорларибиланмузокараюриштиш;

маълум масала юзасидан маданий тартибга амал килиб маълумот ёки илтифотсўраш;

мухокамалардаўз фикрлариниасослаш, ўзгартирибталкинэта олиш ва тузатиш;

расмийдоираларда(масалан,семинарва хоказолар)хосравишдасавол-

жавобқилиш.

Монолог:

маълуммавзубўйичаяхшитақдимотқилиш;

ўзсохасибўйичамаълумотларнианиква батафсилбаёнэтиш;

маълуммавзубўйичаоғзакимаърузақилиш;

мақола, маърузаёкимухокамаюзасидананиқ умумлашганхулосақилиш;

танишмавзугаоидқарашёкификрниривожлантириш,далиллар,мисоллар келтиришорқалиасослаш. *Ўқиш:*

танишва нотанишмавзулардагиматнларнингасосий/айримжиҳатларини;

ўзсохаларива қизиқишларигамосёзишмаларни;

жадвал, графикларнинг қисқаизохини;

мураккабномаларни;

махсусва мураккабёзмайўрикномава йўналишларни;

тезислар, маърузаматнлари, конференция дастурлари, мундарижава шу кабиматнларни;

касбий сохаларига оид макола ва маърузалардан тегишли маълумотни ажратаолади.

Ривожлантириладиган малакалар: Чет тилидаги материалларнинг

умумиймазмунинитушуниш,айриммаълумотларниолиш, тафсилотларни тушунишва

йўналишнианиқлашучунўқиш(белгилар,кўрсаткичларваб).

Ёзув:

Махсусрасмийва норасмийнома/хатлар;

шакланва мазмунантўғриташкиллаштирилганиншова маърузалар;

етарли даражада грамматик, мазмун жиҳатдан тўғри тузилган ва мос услубдагиилмиймақолалар; таклифлар,хулосалар,аннотацияларва тезислар;

зарур холдаўзсохаларибўйичабитирув малакавийишларёзаолиш.

Тил компетенцияси:

Лексик:

В2даражасидагилексиканиэгаллаш;

сўз ясалиши (қўшма сўзлар ва аффиксация), ўзлашма (байналмилал)ва ўзакдошсўзлар;

антонимлар, синонимлар ва бошқа умумлексик муносабатларни қўллай

олиш.

Грамматик:

ўтилганграмматик

материал(феълзамонлари,модалфеъллар,сифатва

равишларнингқиёсийдаражалари,детерминатив сўзлар,предлогларва ҳоказо)никундалик,илмийва соҳавийконтекстлардатўғриқўллайолиш.

Социолингвистиккомпетенция

 Ўзбекистонва
 тилиўрганилаётганмамлакатлармаданиятларимисолида

 (ижтимоийватаълимдоираларида)маданиятлараро
 мулоқотничукурроқ

 тушунибетишваунингмулоқотбиланбоғлиқхусусиятлари,
 жумладан,

 саломлашиш,мурожаатшакллари,хушмуомалаликваҳоказо;
 багататарара

турли маданиятлардаги коммуникациянинг новербал элементлари: хатти-

харакатлар,имо-ишораларустидаишлашнидавомэттириш;

электронмулокотларнингчеттилидаёзишхусусиятларинибилишваамалиётдакўллайолиш.

Прагматиккомпетенция такдимоткилишмахоратиниянадатакомиллаштириш;

фикрларниоғзакива ёзманутқдамантиқанифодалаш;

турлиижтимоий, таълимвамутахассислик доираларидамосравишдатилни тегишлирасмийшаклдак ўллашнианглаш;

мулоқотжараёнида нутқни бўлиш,аниқликкиритиш, бошқачаталқинэтиш, жумлаларнитузатиш,тўлдиришвабошқастратегияларини идрокэтишва амалиётдақўллайолиш.

III. Асосийқисм (амалиймашғулотлар)

Нутқиймавзулар

Ижтимоий мавзулар(атроф-мухит,маишиймасалалар,шахсвакасб психологияси,глобалмуаммолар)

Ижтимоий-маданий мавзулар(илмийвасоҳагаоидвазиятлардамаданий тафовутлар,дунёва тилиўрганилаётганмамлакатларнингмаданий,ижтимоий хусусиятлари)

Таълиммавзулари (таълимтизими,давомлитаълим, маърузалар,мақола,тезис ва илмийишларёзиш,ўқишва ўрганишстратегиялариваҳ.к.)

Интернет ва ахборот технологияларигаоид мавзулар. (жаҳон ва юртимиз миқёсидаги фанватехникаянгиликлари, ютуқлари, интернеттармоқларидан фойдаланиш)

Мутахассисликсохасигаоидмавзулар(сохайўналишлари, долзарб мавзулари,

масъулият, хужжатларюритиш, касбийэтика, музокаралар олиббориш, мутахассислик сохасидагиилмийваамалийютуклар, инновацион гояларва янгиликлар)

Грамматикмавзулар

Инглизтили:

-сифатва равишлар;

-келасипрогрессивфеъл;

-келаситугалланганфеъл;

-келаситугаллангандавомфеъли;

-аралашшартэргашгаплари;

-модалфеъллар– can't have, needn't have;

-хикояфеъллари;

-мажҳулнисбатлар;

-ўтгантугалланган;

-ўтгантугаллангандавомфеъллари;

-қўшмагаплар;

-ўзлаштирмагап;

-герундий, сифатдош, равишдошликурилмалар;

-wish;

-would(одатларниифодалаш,ўтганзамон).

Немистили:

-дарак, сўрок, инкоршаклдагифеълваот-кесимли соддагапларнинг кўлланилиши;

- буйруқмайли,инкоршаклинингқўлланилиши;

- аниқ,ноаниқартиклларнингқўлланилиши;

- модалфеълларнингқўлланилиши;

- феълнингшахссизшакллари;

- und,aber,den,oderбоғловчиларибиланбоғланувчиқўшмагаплар;

- dass,ob,wenn,wer,wie,was,woranбоғловчилиэргашганқўшмагаплар;

- шартмайлинингясалиши.

Французтили:

-дарак, сўрок, инкоршаклдагифеълваот-кесимли соддагапларнинг кўлланилиши;

- буйруқмайли,инкоршаклинингқўлланилиши;

- модалфеълларнингқўлланилиши;

- феълнингшахссизшакллари;

- мажхулнисбатнингқўлланилиши;

- герундий, сифатдош, равишдошликурилмаларнингя салиши.

IV. Амалиймашғулотларбўйичакўрсатмаватасиялар

Дастурталабалар учунбелгилабберилганВ2(ДТС)ваунданюқори

эркин

даражаларниэгаллашгақаратилган.Ушбударажагаэришишталабалардаилмий

васохавийфаолиятдаюзагакеладигантилбиланбоғлиқвазиятларда

мулоқотгакиришишларинива вазиятнисамаралиҳалқилишларинитаъминлайди.

Фандастуритилкафедралари томониданишчидастурлар,ўкув-услубий мажмуалар,ўкувкўлланмаларва дарсликларяратилишигаасосбўлади. Ишчи дастурлар асосида педагог ходимлар ўзларининг календар режалариниишлаб чикадилар.

Амалиймашғулотларниташкиллаштиришда дастурлардабелгиланган мавзуларасосидаталабаларнингилмийвасоҳавийэҳтиёжлариданкелибчиқибкенгайтирилган

вазифаларбелгилаболинадивауларюзасиданталабаларга белгиланганвазифаниўзлаштиришга қаратилганамалиймашғулотларрежаси тузилади.

Нутқий компетенциянинг тинглаб тушуниш, гапириш, ўқиб тушуниш, ҳамдаёзишкўникмавамалакаларидарсларда**интеграциялашганравишда**олиб

борилади.Мавзунингмоҳиятивамутаҳассисликҳусусиятларидан келибчиқиб,у ёкибукўникмава малакадарслардаасосийдеб олинади.

ТалабаларнибаҳолашОТМдабелгилангантартибасосида,жорий,оралиқва якунийназоратларвоситасидаамалгаоширилади.

IV. Мустақилтаълимвамустақилишлар

Чет тили фаниданмустақил ишларнингмақсади – амалиймашғулотлар давомидаолинганбилимвакўникмаларни янадамустаҳкамлашва такомиллаштиришданиборат.

Дарсмашғулотларида кўтарилганмавзуларниўзмутахассислик соҳаларига боғланганҳолдалойиҳаишлариниамалгаоширишлари, портфолиова тақдимотлар(слайд,ҳисобот,муаммоливазиятваҳ,з.кўринишида)тайёрлашлари кўздатутилади.

Ўқиш:амалиймашғулотларда ўтилганмавзуларюзасиданқўшимча материалларнимустақил ёки гуруҳлар билан ўқиш, таҳлил қилиш ва уларни ихтисосликларигабоғлаш.

Тинглаш: ўқитувчитомонидан белгиланган аудиоёкивидеоматериаллар биланишлаш.

Гапириш:тайёрлангантакдимотларни гуруҳолдидаоғзакитакдимэтиш, саволжавоблардаиштирокэтишва фикрбилдириш.

Ёзув:машғулотлардаёритилганмавзуларасосидаберилганёзмаишларни

амалгаошириш,портфолиоталабларига

қилиш, ёзмахисоботлар, тақдимотлар, соҳагаоид шакллартайёрлаш.

Мустақилишларнингмавзулариамалиймашғулотларда ёритилган

мавзуларгамосхолдабўлишилозим. Мавзуларталабаларнинг сохаларига боғланган

холдакенгрокёритилишиваёзмаёкиогзакитакдимот сифатида ўкитувчиларгатакдимэтилишилозим

VI. Асосийвақўшимчаўқувадабиётларҳамдааҳборотманбалари¹ Асосийадабиётлар

1.БоқиеваГ.Ҳ.,РашидоваФ.М.вабошқалар.Scaleup.Student'sbook.Course1,2,3.–Т.: FaфурFулом,2015.

2.БоқиеваГ.Ҳ.,РашидоваФ.М.вабошқалар.Scaleup.Workbook.Course1,2,3.–Т.: ҒафурҒулом,2015.

3.ШириноваР.Х.Французтили//Дарслик.-Т.:Саностандарт,2015(иккинчинашр, 2017)

4.АбдуллаевМ. Manual Español: Libro de Ejercicios, Libro de Estudiante, Libro de Profesor//Дарслик.–Т.: "Fanva texnologiya",2017

5.UteKoithan,HelenSchmitz,TanjaSieber.AspekteB1+.-Stuttgart:KlettVerlag, 2017.

6. Perlmann-Balme Michaela, Susanne Schwalb. Sicher B1+. – München: Hüber Verlag, 2012.

7.SandraEvans,AngelaPude,AnnaBreitsameter,JuliaBraun-PodeschvaFranzSpechtu.a.Menschen.DeutschalsFremdspracheA1-B1.Kurs-undArbeitsbuchmitAudioDVD-Rom. 2012-2016.Hueber Verlag GmbH tr Co. KG, 85737 Ismaning,Deutschland

Қўшимчаадабиётлар

- МирзиёевШ.М. Танқидийтаҳлил, қатъийтартиб-интизомвашаҳсийжавобгарлик– ҳарбирраҳбарфаолиятинингкундаликқоидасибўлишикерак. ЎзбекистонРеспубликасиВазирларМаҳкамасининг2016 йилякунларива 2017йилистиқболларигабағишланганмажлисидагиЎзбекистонРеспубликаси Президентинингнутқи.//Халқсўзигазетаси.2017йил16январь,№11.
- ЎзбекистонРеспубликасиВазирларМаҳкамасининг2013йил 8майдаги"Четтилларбўйичатаълимнингбарчабосқичларибитирувчиларинингтайёргарликда ражасигақўйиладиганталаблартўғрисида"ги124-сонлиқарори.

3. ЎзбекистонРеспубликасиВазирларМаҳкамасининг2017йил11августдаги"Таълим муассасаларидачеттиллариниўқитишнингсифатиниянадатакомиллаштиришчоратадбирларитўғрисида"ги610-сонлиқарори

4. ЎзбекистонРеспубликасиПрезидентининг2017йил 20 апрелдаги"Олийтаълим тизиминиянадаривожлантиришчора-тадбирларитўғрисида" гиПҚ-2909-сонлиқарори

5. "British Council - EQUALSCore inventoryfor general English". –CopyrightBritish Council/EAQUALS,ISBN:978-086355-653-1,2010.

7. АловитдиноваХ.,РаджабоваД. ваб.EnglishforESLandESPlearners.–Т.:ТМУ, 2012.

АдабиётларрўйхатигаОТМахборот-

ресурсмарказлариимкониятлари, соҳагаоидзамонавийманбаларваҳарбиртилхусусиятлариинобатгаолинганҳол дақўшимчаларкиритилишимумкин.Киритилганқўшимчаларишчидастурлардакелтирилади.

8. ИбрагимоваР.С. Французтили//Ўқувқўлланма.–Т.:Фанватехнология,2010.

9. ИшмухамедовР.АбдуқодировА.ПардаевА.Таълимдаинновационтехнологиялар (таълим муассасалари педагог-ўқитувчилариучун амалий тавсиялар). Т.: Истеъдод, 2008.

10.KerrP., JonesC. *Straightforward*. Intermediate. Student'sBook. 2ndedition.—Macmillan, 2007.

11.Scrivener J., Bingham C., Tennant A., Wasserman S. Straightforward Intermediate. Teacher'sbook– Macmillan,2007.

12. Tilbury A., Hendra L.A. *English Unlimited*. UpperIntermediate B2. Student's Book.– Cambridge University Press, 2011.

13. Tilbury A., Hendra L.A. *English Unlimited*. UpperIntermediate B2. Teacher's Book.– Cambridge University Press, 2011.

14. MicheleB., BeajouinP. ExpressionOrale2-B1.-CLEInternational, 2005.

15.Perlmann-BalmeM.,SchwalbD.,WeersS.*EMneuHauptkurs*(Kursbuch)–Hueber Verlag,2008.

16.IlseSander,BirgitBraun,MargirDoubeku.a.DaFkompaktA1-B1Kursbuchmit3Audio -CDs.ErnstKlett Sprachen.Stuttgart,2011.

17.BirgitBraun,Margir Doubek,AndreaFrater-Vogel u.a.DaFkompaktA1-B1 Übungsbuch mit 3Audio–CDs.ErnstKlettSprachen.Stuttgart,2011.

18.DaFkompaktA1-B1Grammatik.DeutschalsFremdsprachefürErwachsene.ErnstKlett Sprachen.Stuttgart,2012

19. УсмановаГ., МансуроваГ., ИшанкуловаН. Deutsch. Учебникнемецкогоязыка. – Т.: Фан, 2013.

20. Jordan, R. English for Academic Purposes. – Cambridge University Press, 1997

21."KirkhamL.,IriskulovA.,RashidovaF. AHandbookforteachersofFLwithreferenceto theCEFR.–Tashkent,2013.

Интернетсайтлари

- 1. <u>http://www.teachingenglish.org.uk/think/articles/listening</u>
- 2. <u>http://www.usc.edu/dept/education/CMMR/CMMR_BTSA_home.html#Resources_Begi_nningTeachers</u>
- 3. http://www.teachermentors.com/MCenter%20Site/BegTchrNeeds.html
- 4. http://www.inspiringteachers.com/
- 5. http://teachnet.org/ntpi/research/prep/Cooper/http://www.altteachercert.org/Mentoring.html
- 6. <u>www.examenglish.com</u>
- 7. <u>http://www.education.gouv.fr</u>
- 8. http://www.educnet.education.fr
- 9. <u>http://www.educationprioritaire.education.fr</u>
- 10.http://www.elodil.com/historique.
- 11.<u>http://www.edufle.net</u>
- 12.<u>http://www.francparler.info/accueil</u>
- 13.http://www.francparler.info/accueil
- 14.http://www.leplaisirdapprendre.com
- 15.<u>http://www.enseigner.tv(EnseigneravecTV5)</u>
- 16.<u>https://www.dw.com/de/deutsch-lernen/s-2055</u>17.<u>https://www.goethe.de/de/spr/ueb.html</u>
- 18.<u>https://deutschlernerblog.de/tipps-zum-deutschlernen/</u>
- 19. http://www.learn-german-online.net/learning-german-resouces/deutsch-via-internet.htm
- 20. https://www.alumniportal-deutschland.org/deutsche-sprache/online-deutschlernen/videos-und-interaktive-uebungen/



O'ZBEKISTON RESPUBLIKASI

OLIY VA O'RTA MAXSUS TA'LIM VAZIRLIGI

BUXORO MUHANDISLIK – TEXNOLOGIYA INSTITUTI

«Ro'yxatga olindi»

№

2019 yil «__»___

"TASDIQLAYMAN" quy ishlari bo'yicha prorektor dots. Xodjiyey Sh.M. 2019 yil 0

INGLIZ TILI FANINNING

ISHCHIO'QUV DASTURI

Bilim sohasi: 300000 – Ishlab chiqarish texnik soha

<u>Ta'lim sohasi:</u> <u>320000 – Ishlab chiqarish texnologiyalari</u>

Ta'lim yo'nalishlari:5321500Texnologiyalar va jihozlar (yengil sanoat
jihozlarini ta'mirlash va texnik xizmat ko'rastish)
yo'nalishi

	Talaba	aning	o'quv	yuklar	nasi, s	oat			Ser	nestrlar, 'soat
		I	Audito	riya m	ashg'	ulotlar	i,			
Ta'lim yo'nalishi (mutaxassislik) kodi va nomi	Umumiy yuklama hajmi	Jami	Ma'ruza	Amaliy mashg'ulot	Laboratoriya ishi	Seminar	Kurs ishi (loyihasi)	Mustaqil ish	v .	VI
5321500 Texnologiyalar va jihozlar (yengil sanoat jihozlarini ta'mirlash va	100	50	0 -	36	0	0	0	14	2	
texnik xizmat ko'rastish) yo'nalishi 5321504 - Texnologiyalar va jihozlar (mashinasozlik)		50	i.	36				14		2

5321504 - Texnologiyalar va jihozlar (mashinasozlik)

BUXORO-2019

Fanning ishchi o'quv dasturi O'zbekiston Respublikasi Oliy va o'rta maxsus ta'lim vazirligidagi № BD-1.05 raqam bilan ro'yxatga olingan va 2018-yil "14 "iyunda 531-sonli buyruq bilan tasdiqlangan namunaviy dasturi asosida tuzilgan.

Tuzuvchi:

Shoyimqulova M. Sh.

BuxMTI "Xorijiy tillar" kafedrasi katta o'qituvchisi

Taqrizchilar:

Kazakova D.G.

Fayzullayev O.M.

BuxMTI "Xorijiy tillar" kafedrasi katta o'qituvchisi

BuxDU "Ingliz tilshunosligi" kafedrasi o'qituvchisi

Fanning ishchi o'quv dasturi "Xorijiy tillar" kafedrasi majlisida (2019-yil, "" dagi "" – son bayonnoma) muhokama etildi va o'quv-uslubiy kengashiga tavsiya etildi.

	Nr	e,
"Xorijiy tillar" kafedrasi mudiri v.v.b:		dots. S.N.Nayimov

Ishchi o'quv dastur institutning o'quv-uslubiy kengashida ko'rib chiqildi va tasdiqlandi (2019-yil, "" dagi "1" – sonli bayonnomasi).

1. O'quv fani o'qitilishi bo'yicha uslubiy ko'rsatmalar.

Mustaqillik sharofati bilan O'zbekiston dunyo bozoriga chiqdi, xorijiy mamlakatlar, xalqaro tashkilotlar bilan bevosita hamkorlik qilmoqda. Ko'pgina boshqa sohalar kabi chet tillariga bo'lgan e'tibor ham tubdan o'zgardi. Zamonaviy til vaziyati eski tizimdagidan farq qiladi. Shu munosabat bilan xorijiy tilni, ayniqsa ingliz tilini o'rganish butunlay boshqacha tus olmoqda, til o'qitish jarayoni kengaymoqda. Oliy o'quv yurtlarida talabalarning ingliz tilidagi turli xil atamalarga, ingliz tilida ish yuritishga, o'qish, tinglab tushunish, gapirish, yozuv malakalarini o'stirishga katta ahamiyat berilmoqda.

"Ingliz tili" fani gumanitar fanlar tarkibida bo'lib uchinchi kurs talabalariga ikki semestr davomida o'tiladi. Fanni o'qitishdan ko'zlangan asosiy maqsad- ingliz tilida o'qishni, yozishni, tinglab tushunishni va Texnologiyalar va jihozlar (yengil sanoat jihozlarini ta'mirlash va texnik xizmat ko'rastish) va Texnologiyalar va jihozlar (mashinasozlik)mutaxassisliklariga doir mavzular bo'yicha muloqot qila olishni integrallashgan ingliz tili kursi va o'quv materiallari orqali rivojlantirishdir.

Ingliz tili fanini o'qitishdan asosiy maqsad og'zaki va yozma nutq yuzasidan talabalarga mustahkam bilim hosil qilish, ishlab chiqarishning, hayotning hamma sohalarida faol ijodiy faoliyat ko'rsata oladigan savodli va madaniyatli insonlarni tarbiyalab yetishtirishdir.

Fanni o'qitishdan yana bir asosiy maqsad o'quvchi talabalarga fan asoslaridan chuqur va mustahkam bilim berish, ularni amalda qo'llash malakalarini yaratishdir. Bu vazifani amalga oshirishda o'qitish jarayoni mas'uliyati davr talabi hisoblanadi.

No	Amaliy mashg'ulot mavzulari	Dars soatlari hajmi
	5 semestr	
1	Lesson 1. Mechanical engineering as a future	2
1.	profession	
2.	Lesson 2. Automotive engineering.	2
3.	Lesson 3. Automobile production.	2
4.	Lesson 4. Basic principles.	2
5.	Lesson 5. Force and load classifications	2
6.	Lesson 6. Scope of treatment.	2
7.	Lesson 7. Applied mechanics.	2
8.	Lesson 8. Properties of metals and their uses.	2
9.	Lesson 9. Where does the word "automobile" come	2
	from?.	
10.	Lesson 10. The early days of the automobile.	2
11.	Lesson 11. Cars: Passion or Problem?.	2

2. Amaliy mashg'ulotlar

12	Lesson 12. Planning for an environment-friendly	2
12.	•	2
	car.	
13.	Lesson 13. The changing expectations of	2
	automotive engineers.	
14.	Lesson 14. Alloys.	2
15.	Lesson 15. The history of the automobile.	2
16.	Lesson 16. The automobile life cycle.	2
	JAMI:	32 soat
	6 semestr	
1.	Lesson 1. What is Mechanics?	2
2.	Lesson 2. What is Mechanics?	2
3.	Lesson 3. What is Motion?	2
4.	Lesson 4. What is Motion?	2
5.	Lesson 5. Translational Motion.	2
6.	Lesson 6. Translational Motion.	2
7.	Lesson 7. Translational Dynamics.	2
8.	Lesson 8. Translational Dynamics.	2
9.	Lesson 9. Different Types of Energy.	2
10.	Lesson 10. Different Types of Energy.	2
11.	Lesson 11. Kinetic Energy	2
12.	Lesson 12. Potential Energy. Law of Conservation	2
	and Transformation of Energy.	
13.	Lesson 13. Types of Energy Transfer.	2
14.	Lesson 14. Scientific Breakthroughs	2
15.	Lesson 15. Oriental contribution.	2
16.	Lesson 15. Up- to-date devices.	2
	JAMI:	32 soat
	JAMI:	64 soat

4. Mustaqil ta'lim.

Talaba mustaqil ishni tayyorlashda muayyan fanning xususiyatlarini hisobga olgan holda quyidagi shakllardan foydalanish tavsiya etiladi:

- Darslik va qo'llanmalar bo'yicha fan mavzularini o'rganish;
- Tarqatma materiallar bo'yicha amaliy mashg'ulotlar qismini o'zgartirish;
- Avtomatlashtirilgan va nazorat qiluvchi tizimlar bilan ishlash;
- Maxsus adabiyotlar bo'yicha fanlar bo'limlari yoki mavzular ustida ishalsh;
- Yangi texnikalarni, apparaturalarni, jarayonlar va texnologiyalarni o'rganish;

- Talabaning o'quv ilmiy tadqiqot ishlarini bajarish bilan bog'liq bo'lgan fanlar bo'limlari va mavzularini chuqur o'rganish;
- Faol va muammoli o'qitish uslubidan foydalaniladigan o'quv mashg'ulotlari;
- Masofaviy (distansion) ta'lim;

"Ingliz tili " bo'yicha talabaning mustaqil ta'limi shu fanni o'rganish jarayoning tarkibiy qismi bo'lib, uslubiy va axborot resurslari bilan to'la ta'minlangan.

Talabalar auditoriya mashg'ulotlarida professor o'qituvchilarning yangi mavzuni tushuntirishlarini tinglaydilar, topshiriqlarini bajaradilar. Auditoriyadan tashqarida talaba darsga tayyorlanadi, adabiyotlarni konspekt qiladi, uy vazifa sifatida berilgan topshiriqlarni bajaradi. Bundan tashqari ayrim mavzularni kengroq o'rganish maqsadida qo'shimcha adabiyotlar o'qib referatlar tayyorlaydi hamda mavzu bo'yicha testlat yechadi. Mustaqil ta'lim natijalari reyting tizimi asosida baholanadi.

Uyga vazifalarni bajarish, qo'shimcha darslik va adabiyotlardan yangi bilimlarni mustaqil o'rganish, kerakli ma'lumotlarni izlash va ularni toppish yo'llarini aniqlash, internet tarmoqlaridan foydalanib ma'lumotlar to'plash va ilmiy izlanishlar olib borish, ilmiy to'garak doirasida yoki mustaqil ravishda ilmiy manbalarda foydalanib ilmiy maqola ma'ruzalar tayyorlash kabilar talabalarning darsda olgan bilimlarini chuqurlashtiradi, ularning mustaqil fikrlash va ijodiy qobiliyatini rivojlantiradi. Shuning uchun ham mustaqil ta'limsiz o'quv faoliyati samarali bo'lishi mumkin emas.

Uy vazifalarini tekshirish va baholash amaliy mashg'ulotlarni olib boruvchi o'qituvchi tomonidan har darsda amalga oshiriladi.

"Ingliz tili" fani bo'yicha talabaning mustaqil ta'limi shu fanni o'rganish jarayonining tarkibiy fanidan mustaqil ish majmuasi fanning barcha mavsularini qamrab olgan va quyidagi mavzular ko'rinishida shakllantirilgan.

Nº	Theme	Hour	Ball	Assignments	2.6. Form of fulfillment
TERM 5 Independent work 1	Variants 1- 15 on the themes of serving technological processes.	14	14	 Read and translate the text. Copy out 10 terms from the text in task 1 and explain their meaning. Answer the following question in details. Listen to the text and do exercises. 	Assignment 1 – oral and written. Assignment 2 – written. Assignment 3 – written. Assignment 4 – written.
Independent work 2	Variants 1- 15 on the themes of serving	14	14	1. Read and translate the text.	Assignment 1 – oral and written.

	technological processes.			 Copy out 10 terms from the text in task 1 and explain their meaning. Answer the following question in details. Listen to the text and do everyises 	Assignment 2 – written. Assignment 3 – written. Assignment 4 – written.
TERM 6 Independent work 1	Variants 1- 15 on the themes of serving technological processes.	14	14	 and do exercises. 1. Read and translate the text. 2. Copy out 10 terms from the text in task 1 and explain their meaning. 3. Answer the following question in details. 4. Listen to the text and do exercises. 	Assignment 1 – oral and written. Assignment 2 – written. Assignment 3 – written. Assignment 4 – written.
Independent work 2	Variants 1- 15 on the themes of serving technological processes.	14	14	 Read and translate the text. Copy out 10 terms from the text in task 1 and explain their meaning. Answer the following question in details. Listen to the text and do exercises. 	Assignment 1 – oral and written. Assignment 2 – written. Assignment 3 – written. Assignment 4 – written.

5. Fan bo'yicha talabalar bilimini baholash va nazorat qilish mezonlari. "Ingliz tili"fanidan talabalar bilimini reyting tizimi asosida baholash mezoni

"Ingliz tili" fani bo'yicha reyting jadvallari, nazorat turi, soni hamda bir nazoratga ajratilgan maksimal ball, shuningdek joriy nazoratlarining saralash ballari haqidagi ma'lumotlar fan bo'yicha birinchi mashg'ulotda e'lon qilinadi.

Fan bo'yicha talabalarning bilim saviyasi va o'zlashtirish darajasining DTSga muvofiqligini ta'minlash uchun quyidagi nazorat turlari o'tkaziladi:

• Joriy nazorat (JN) – talabaning fan mavzulari bo'yicha bilim va amaliy ko'nikma darajasini aniqlash va baholash usuli. Joriy nazorat fanning xususiyatidan kelib chiqqan holda amaliy mashg'ulotlarda og'zaki so'rov, test o'tkazish, suhbat, nazorat ishi, kollokbium, uy vazifalarini tekshirish va shu kabi boshqa shakllarda o'tkazilishini mumkin; • Yakuniy nazorat (YaN) – semester yakunida muayyan fan bo'yicha nazariy bilim amaliy ko'nikmalarni talabalar tomonidan o'zlashtirish darajasini baholash usuli. Yakuniy nazorat asosan tayanch tushuncha va iboralarga asoslangan test, yozma ish variantlari yoki og'zaki savol – javob shaklida o'tkaziladi.

Oily ta'lim muassasasi rahbarining buyrug'i bilan ichki nazorat va monitoring bo'limi rahbarligida tuzilgan kommissiya ishtirokida YaNni o'tkazish jarayoni muntazam ravishda o'rganib boriladi va uni o'tkazish tartiblari buzilgan hollarda, YaN natijalari bekor qilinishi mumkin. Bunday hollarda YaN qayta o'tkaziladi.

Talabaning bilim saviyasi, ko'nikma va malakalarini nazorat qilishning reyting tizimi asosidatalabaning fan bo'yicha o'zlashtirish darajasi ballar orqali ifodalanadi.

"Ingliz tili" fani bo'yicha talabalarning semester davomidagi o'zlashtirish ko'rsatkichi 100 ballik tizimda baholanadi.

Ushbu 100 ball baholash turlari quyidagicha taqsimlanadi:

JN I – 35 ball, JN II – 35 ball, YaN – 30 ball qilib taqsimlanadi.

III-kurs-5321500 Texnologiyalar va jihozlar (yengil sanoat jihozlarini ta'mirlash va texnik xizmat ko'rastish) va III-kurs 5321504 - Texnologiyalar va jihozlar (mashinasozlik) bakalavriat ta'lim yo'nalishlari uchun "Ingliz tili" fanidan

BAHOLASH MEZONI

O'zbekiston Respublikasi Oliy va O'rta Maxsus Ta'lim Vazirligining 2009 yil 11 iyundagi 204- sonli buyrug'iga asosan "Oliy ta'lim muassasalarida talabalar bilimini nazorat qilish va baholashning reyting tizimi " to'g'risidagi nizomga asoslangan holda ushbu baholash tizimi ishlab chiqarildi.

Ingliz tili fan bo'yicha talabaning mavsum davomidagi o'zlashtirish ko'rsatkichi 100 ballik tizimda baholanadi va bunda talabaning fan bo'yicha o'zlashtirish ko'rsatkichini nazorat qilishda quyidagi namunaviy mezonlarga amal qilinadi:

a) 86–100 ball uchun talabaning bilim darajasi quyidagilarga javob berishi lozim:

- chet tilidagi matn yuzasidan xulosa va qaror qabul qilish;
- ushbu matn yuzasidan ijodiy fikrlay olish;
- chet tilidagi matnning mohiyatini tushunish;
- matnni o'qish jarayonida tushunib olish va uni so'zlab berish.
- b) 71–85 ball uchun talabaning bilim darajasi quyidagilarga javob berishi lozim:
 - chet tilidagi matn yuzasidan mustaqil fikr yurita oilsh;
 - chet tilidan olgan bilimlarini amalda qo'llay bilish;
 - matnning mohiyatini tushunish;
 - matn yuzasidan tasavvurga ega bo'lish va uni so'zlab berish.
- c) 56-70 ball uchun talabaning bilim darajasi quyidagilarga javob berishi lozim:
 - chet tilidagi matnning mohiyatini tushunish;
 - matnni bilish va uni so'zlab berish;
 - matn yuzasidan tasavvurga ega bo'lish.
- d) quyidagi hollarda talabaning bilim darajasi 0-55 ball bilan baholanishi mumkin:
 - chet tilidagi matn haqida aniq tasavvurga ega bo'lmasa;

- matnni bilmasa.

Umumiy balning 70 bali joriy nazoratlarga (shundan 42 bali dars jarayoniga, 28 bali mustaqil ishlarga) va 30 bali yakuniy nazoratga ajratiladi.

Jami joriy baholash bali: 70

1-2 - Joriy baholash bali: 35

20–25 qoniqarli

26 – 30 yaxshi

31 – 35 a'lo

Dars jarayonida to'plagan bali: 21

12 - 14	qoniqarli
15 - 17	yaxshi

15 - 17 yaxs 18 - 21 a'lo 8-9 qoniqarli 10-12 yaxshi 13-14 a'lo

Mustaqil ishdan to'plagan bali: 14

JB da ushbu fanning har bir mavzusi bo`yicha talabaning bilimi va amaliy ko`nikmalarini aniqlab borish nazarda tutiladi va amaliy mashg`ulotlarda amalga oshiriladi.

Joriy baholash mezoni:

Kuzgi mavsumda 18 juft dars o'tkazilib, har bir dars maksimal2,3 balldan baholanadi:

2,0-2,3	a'lo
---------	------

1,7 - 1,9	yaxshi
-----------	--------

1,3–1,6 qoniqarli

Bahorgi mavsumda 18 juft dars o'tkazilib, har bir dars maksimal2,3 balldan baholanadi:

2,0-2,3 a'lo

1,7 – 1,9 yaxshi

1,3–1,6 qoniqarli

Yakuniy baholashda talabaning bilimlari ushbu fanning umumiy mazmuni doirasidan kelib chiqib ogʻzaki tarzda baholanadi . Yakuniy nazorat 15-20 ta variantlar asosida olinadi va har bir variant 4 ta koʻnikma asosida tuziladi.

Har bir topshiriq quyidagicha baholanadi:

Topshiriq:		ball		
a'lo	yaxshi	qoniqarli		
1–Reading	7	6	5	
2-Writing	7	6	5	
3-Speaking	7	6	5	
4 - Listening	9	7	6	
Jami:	30 - 2	26 25 - 22	21 - 17	
Yakuniy nazor	at topshirig'lari	ga berilgan javobl	ariga qo'yilgan o'zlashtirish	ı ballari

qo'shiladi va yig'indi talabaning yakuniy nazorat bo'yicha o'zlashtirish bali hisoblanadi.

6. Asosiy va qo'shimcha o'quv adabiyotlar hamda axborot manbalari Asosiy adabiyotlar:

5321504 - Texnologiyalar va jihozlar (mashinasozlik)yo'nalishiga fan bo'yicha o'quv-uslubiy ma'lumotlar

1. English for Mechanical Engineering И.П.Агабекян. П.И. Коваленко. "Английский для технических вузов". Ростов-на-Дону. "Феникс". 2012.

2. Mechanics. English for mechanical engineering students

3. Technical English. Students book and workbook. David Bonamy. Christopher Jacques. Longman. Pearson.

4. Scale up 3- kurs. Боқиева Г.Ҳ., Рашидова Ф.М. ва бошқалар. Scale up. Student's book. Course 1,2,3. - T.: Fафур Fулом, 2015.

5. Boqiyeva G., Rashidova F va boshqalar: «Scale up» Student's book course 3 : darslik Toshkent-2015 y.

6 Boqiyeva G., Rashidova F. va boshqalar «Scale up» Work book course 3 : darslik Toshkent-2015 y.

7. Boqiyeva G., Rashidova F. va boshqalar « Scale up» Teacher's book course 3: darslik Toshkent-2015 y.

Qo'shimcha adabiyotlar:

- 1. Качалова К.Н. «Практическая грамматика английского языка» Бишкек-1998. (2 ta)
- 2. Muhammad G'apporov "Ingliz tili grammatikasi" Toshkent-2006 (2 ta)
- 3. Martin Seviour "World Wise" Tashkent-1997. (7 ta)

4. Близниченко К.Л. «Английский язык» Пособие для технологических вузов. Москва-1991. (1 ta)

5. Shoyimqulova M.Sh., Ro'ziyeva N. "TJXK" yo'nalishi III kurs talabalari uchun ingliz tili fanidan uslubiy ko'rsatma. (10ta)

Internet saytlari:

- 1. http://iteslj.org/
- 2. http://iteslj.org/Techniques/Yang-Writing.html
- 3. http://iteslj.org/Techniques/Ross-ListeningComprehension.html
- 4. http://www.teachingenglish.org.uk/think/articles/listening
- 5. <u>http://www.usc.edu/dept/education/CMMR/CMMR_BTSA_home.html#Resources</u> <u>______BeginningTeachers</u>
- 6. http://www.teachermentors.com/MCenter%20Site/BegTchrNeeds.html
- 7. http://www.inspiringteachers.com/
- 8. http://teachnet.org/ntpi/research/prep/Cooper/
- 9. http://en.wikipedia.org/wiki/List_of_language_proficiency_tests
- 10. http://www.english-at-home.com/grammar/relative-clauses/



Unit 1. Lesson 1. Text: "Characteristics of technology". p. Listening task: Technology



Утвердительное предложение:
Полная форма Краткая форма
S+ have/has +V3 S've / S's + V3
S – подлежащее V3 – третья форма глагола, past participle
Отрицательное предложение:
Полная форма Краткая форма
S + have/has not +V3 S + haven't/hasn't + V3
Вопросительное предложение:
Have/Has + S + V3
Handout Put the verbs in brackets in the Present Perfect.
He (finish) training.
She (score) twenty points in the match.
We (watch) all the Champions League matches this season.
That's amazing! She (run) fifteen kilometers this morning!
She (buy) some really nice rollerblades!
Oh, no! I (lose) my money!
My mum (write) shopping list. It's on the kitchen table.
Dad, you (eat) my biscuit!
I'm tired. I (watch) three X-Files videos.
Hurry up! They (start) the film!
Mary (study) hard this year, so she'll pass her exams.
Oh no! She (drop) the plate!
The garden is very green. It (rain) a lot this month.
Jo has earache. He (have) it since 7 o'clock.
Brad (live) in Chicago since 1998.
Put the verbs in brackets in the Present Perfect.
I (not clean) my football boots.
They (not start) their meal.
I (not do) my homework.
He (not win) all his matches this year.
My brother and I (not see) any films this week.
It's my birthday party today. I (not invite) many people.
He (not wash) his hands. They're very dirty. Mum's really angry. We (not tidy) our room!
I can't play with my friends this evening. I (not finish) my homework. I (not visit) New York for three years.
Where's Alison? We (not see) her since yesterday.
Dad (not take) a holiday since last August.
John (not play) the violin since he was school.
Complete the sentences. Use for or since.
I've lived in Washington 1997.
Ben has studied English three years.

They haven't visited their grandparents _____ months. Julie's ill. She's been in bed _____ Tuesday. My dad has had his car_____ sixteen. It's been ten years_____ we moved to Oxford.



Handout

N LISTENING GAP FILL

What ________technology? Would we still be living in caves? Probably. I think there are two ________technology. The kinds before and after computers. When we think about technology before computers, it _______. It was all mechanical. Things like steam trains and fridges. At the time, that _______ technology. But, today's technology is really cutting edge. It's the kind of technology that _______ soon as it hits the shelves. I love this. It's so exciting seeing it all

happen. I love ______ technology we'll have in the future, and then buy

. It's like buying technology from science fiction movies. I'd love to live to be 200 so I can see what technology _____.

Unit 1. Lesson 2..

Text: Definition and usage of technologyListening task: The use of technology



K CORRECT THE SPELLING

Airplanes are <u>zaimnag</u>. How does something so big and heavy get off the ground? I'm always amazed at how the millions of <u>irfefendt</u> parts work together. Travelling by airplane is always a wonderful <u>peeixercne</u>. I don't care whether economy class is <u>radpcem</u> and has no space. I like playing with the in-<u>tghlif</u> entertainment system, especially now they have all the latest movies. I also love airplane food. Many of my friends say it's <u>dsgusiintg</u>, but I love it. I often ask the <u>pneaersgs</u> next to me if I can have the <u>rdstese</u> or roll they don't want. The only thing I don't like about planes is turbulence. When the airplane hits those air <u>pckseto</u>, I always worry we'll crash. But I once read that turbulence has never <u>asdceu</u> an airplane to crash.

Handout

Past Perfect Tense

I - Fill in the sentences with the <u>correct form (Past Perfect Tense)</u> of the appropriate verb, and then match the sentences to the pictures.

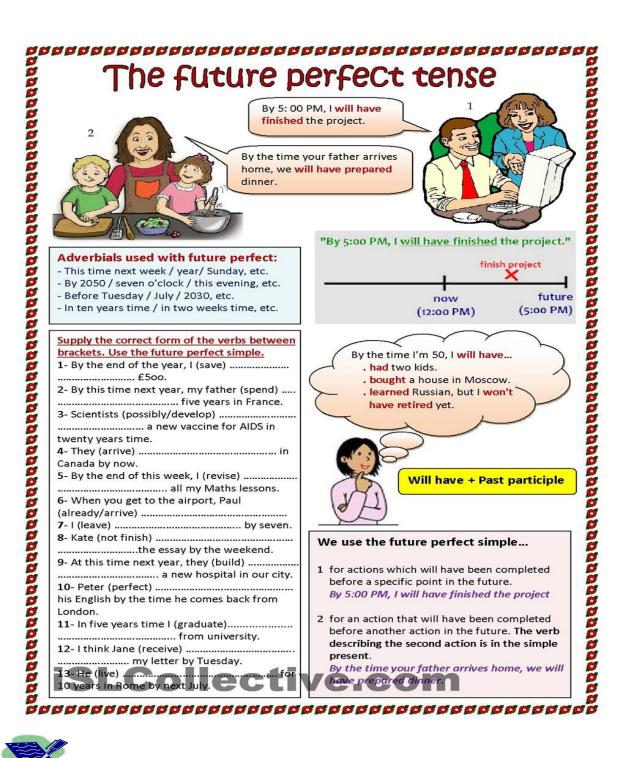
A) build B) cut	D) eat E) fail	G) feed H) get	J) kiss K) lock	M) play — N) send —		ALASTRA	
C) do	F) fall	I) get	L) lose	0) steal			
2) Mr K wanted	to sell the wat			before.		MARTIN	- Contraction of the second se
praised him. 4) Tom broke h	is leg after he			nglish, his parents through a rock.			
6) After you _		ittle Ben before an electric the front c	shock, you wer	e taken to hospital. vent to bed?		RAATCHES	MACTER
8) Hank starte 9) Marty met h	d dieting after iis friends afte	he r he		too much apple pie. his homework.			9
11) Jim			exam before h	ote a test? e passed it at last? coupons from the		MATTIN	and the
newspaper, she	did the shoppi	ng.		she got something			
from the tooth 14) After Hugh	۱ <u> </u>	hea		t a hat on its head.	SP		

B) empty C) fish	E) not light F) order	H) paint I) not put	J) read K) not repair L) not see	N) win
2) the 3) Robert ran 4) My son 5) Dan cooked 6) Gra	out of money afte the lobsters he	r he the muser r he the ca a book befo	um before they had that ndles before it got before	at computer. dark. re.
8) Joan caugh 9) After we garbage dump 10) I 11) Gav	t a cold after she . 	the school the school ne race before I	on v e rubbish, it was bag before my mum got there? the meal, the	varm clothes. taken to the warned me.
served her. 13) After Emi she went hom 14) Bo	lγ 2. b	a r	report in the studer iful picture before fore she went to the	nt newspaper, the sun set?

Unit 1. Lesson 3. Text: "The distinction between science, engineering and technology" Listening task



Handout



Handout

Science is one of the most important subjects we study at school. I loved it. I _______ interesting. Time in my science lessons went very quickly because I _______ on things and doing experiments. I _______ sciences, physics, biology and chemistry. I wish I continued studying science. I would love to be a scientist now. I think being a computer scientist _______. Science is so important for our life and our world. All of the world's problems can be _______. We can go to different planets because of science. I hope governments pump lots of money into science so we have more and better scientists in the future. It's interesting to think ______ science will be like.

Unit 2. Lesson 1. Text: "Engineering".Past Perfect Tense Examples



The past perfect tense is used to show that something happened before another action in the past. It can also be used to show that something happened before a specific time in the past.

How to Form The Past Perfect Tense

To form the past perfect tense you use the past tense of the verb "to have," which is had, and add it to the past participle of the main verb. For example: subject + had + past participle = past perfect tense.

Some examples of the past perfect tense can be seen in the following sentences:

- Had met: She had met him before the party.
- Had left: The plane had left by the time I got to the airport.
- Had written: I had written the email before he apologized.
- Had wanted: Kate had wanted to see the movie, but she did not have money for the ticket. Using Past Perfect Tense

There are several situations where the past perfect tense can be used. It is appropriate to use in the following ways. To show that an action happened before something else in the past:

- She stayed up all night because she <u>had received</u> bad news.
- They lost many of the games because they <u>had not practiced</u> enough.
- Anthony had met Ryan before you introduced him to us at the party.
- You had studied Italian before you moved to Rome.
- To show that an action happened before a specific time in the past:
- She <u>had established</u> her company before 2008.
- He <u>had never played</u> football until last week.
- They <u>had gotten engaged</u> before last year.
- I <u>had fallen</u> asleep before eight o'clock.

Keep in mind that past perfect tense makes it clear that one thing happened before another in the past. The order of events does not matter since the tense makes it clear which event happened first.

Another use of past perfect tense includes reported speech. Examples of this use include:

- The teacher asked if we had studied for the exam.
- The usher asked if we had purchased our tickets.
- My neighbor asked if we had seen her dog.
- The boss <u>had said</u> it would be a long meeting.

Past perfect tense can also be used to show dissatisfaction with the past. Examples of this use include:

- We wished we <u>had purchased</u> the winning ticket.
- I wished I <u>had told</u> the truth. Past perfect tense can also be used with the word "just." When combined, this makes it clear that the event was only a short time prior. Some examples of this include:
- She <u>had just left</u> the scene when the ambulance arrived.
- He <u>had just put</u> the dog on the leash when we got there.

*Note that the past participle of "to go" is "gone" and not "went" so that is used to form the past perfect form as well.

Examples of Past Perfect Tense

The following are more examples of past perfect tense in sentences. The past perfect tense is underlined in each sentence.

- I <u>had never seen</u> such a beautiful sunset before I went to the island.
- We were not able to stay overnight at the hotel since we <u>had not reserved</u> a room in advance.

- She had never been to the symphony before last night.
- Marc knew Philadelphia so well because he <u>had lived</u> there for five years.
- He understood the math test because he <u>had been tutored</u> all week.
- I did not have any cash because I had lost my purse.
- I had been to Mexico once before.
- If I <u>had seen</u> him, I would have told him the news.
- Before he did his homework, he <u>had stayed</u> after school for help.
- She <u>had lived</u> in California before moving to Texas.
- The cat <u>had chased</u> the bird before it flew out of the yard.
- We <u>had just called</u> home when my mom texted us about returning the car.
- She <u>had visited</u> several doctors before she found out what the problem was with her hand.
- If we <u>had called</u> ahead, we would not have needed to wait so long for a table.

Unit 2. Lesson 2. Text: "Metal working processes" Handout

I. Read and Translate the sentences.

a) 1. Science of material strength has given mankind efficient means for increasing production volume.

2. The Academy of Sciences is still coordinating the work of this research institute and its laboratories.

- б) 1. This engineer's report was followed by an intensive research work of others.
- 2. Heat energy is transmitted in two different ways.
- II. Write and underline Particle I и Particle II.
- 1. Nylon was the first synthetic fibre used in clothing.
- 2. This kind of treatment when used makes the metal heat-treatment.
- 3. The atom is built of negative electrons, positive protons and ordinary neutrons.
- 4. When worked by special substance this material will become more durable.

Handout

III. Translate the sentences and find modal verbs

- 1. One object may be larger than another one, but it may weigh less.
- 2. Mass can also be defined as a measure of inertia.
- 3. Man-made satellites had to use solar cells as a source of power.
- 4. Plastics should be reinforced by different kinds of fibres.

IV. Read, write and translate.

METALWORKING PROCESSES

Metals are important in industry because they can be easily deformed into useful shapes. A lot of metalworking processes have been developed for certain applications. They can be divided into five broad groups: rolling, extrusion, drawing, forging, sheet-metal forming.During the first four processes metal is subjected to large amounts of strain (deformation). But if deformation goes at a high temperature, the metal will recrystallize - that is new strain-free grains will grow instead of deformed grains. For this reason metals are usually rolled, extruded, drawn, or forged above their recrystallization temperature. This is called hot working. Under these conditions there is no limit to the compressive plastic strain to which the metal can be subjected. Other processes are performed below the recrystallization temperature. This is called cold working. Cold working hardens metal and makes the part stronger. However, there is a limit to the strain before a cold part cracks.

- a) 1. Chemical science is successfully solving many complex problems.
- 2. Quantum mechanics has greatly influenced the nuclear theory.
- б) 1. Today many polymeric materials are produced on a massive scale.
- 2. The results of experiments are greatly influenced by many factors.





-Unit 2. Lesson 3. Professional contentment.





Choosing a career biggest decisions we make in life. It used to be ______ career. People _______ a job when they that we were 18, 19 or 20 and _____ _____ same career for life. Their career path _____ straightforward. Nowadays, it is normal for people to change careers, five, six, seven times. New technology and globalization means things change quickly. We need _____ all the changes. I've had four different careers now. I to study and like moving from ______ another. It means life _____ boring. It's much better to keep learning different things in different careers. I what career I'll choose next. Perhaps one that doesn't



Professional vs. Amateur

Professional

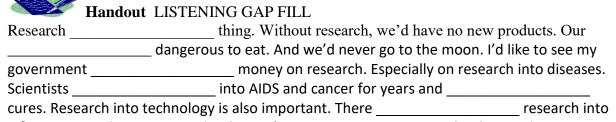
- Learns every aspect of the job.
- Carefully discovers what is needed and wanted.
- Keeps his/her work area clean and orderly.
- Looks, speaks and dresses like a professional.
 - Jumps into difficult assignments

 - Uses higher emotional tones: Enthusiasm, cheerfulness, interest, contentment.
 - Produces more than expected
 - Has a promising future

Amateur

- Skips the learning process whenever possible.
- Assumes what others need and want.
- Has a messy, confused or dirty work
- Is sloppy in appearance and speech.
- Tries to get out of difficult work.
- Is confused and distracted
- Uses lower emotional tones: Anger, hostility, resentment, fear, self-pity.

Produces just enough to get by. Has an uncertain future.



information and computer technology. It's ______ technology is changing. We

really need to spend more to research how global warming is affecting our planet. This ______ important research scientists ever do. Research to save the planet.

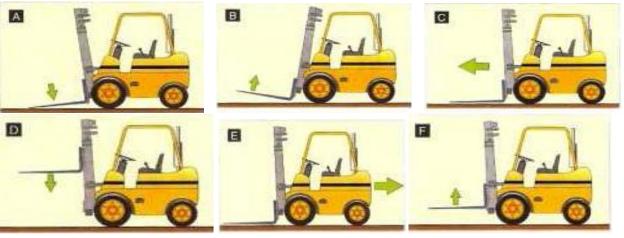
Unit 3. Lesson 1. Text: "Metal working and metal properties."



Read the manual. Write the letters (A-G) from the pictures next to the controls.

In the pictures, you can see the controls of the forklift truck. On the left is a lever. This is the direction lever $(1____)$. Push this lever forwards, and the truck moves forwards. Pull it backwards, and the truck reverses. Next, you can see steering wheel $(2____)$. This turns the truck to the left and right. At the top, on the right, you can see two levers. Push the left-hand lever $(3___)$ forwards and fork moves up. Pull it back, and the fork moves down. Push the right hand-lever $(4___)$ forward, and the fork tilts up. Pull it back, and the fork tilts down. At the bottom, on the right, you can see a lever. This is the parking brake $(5___)$. At the bottom, you can see two pedals. The LH pedal is the brake $(6___)$. The RH pedal is the accelerator $(7___)$.

Describe these movements of the truck. Use words from the manual. *Example: A. The fork tilts down*



I - Fill in the sentences with the <u>correct form (past simple)</u> of the appropriate verb, and then match the sentences to the pictures.

A) READ B) CATCH HA	SETSITSIT		
1) Mum _ <i>mashed up</i> _ after lur 2) The maid	ich the beds in the rooms.		
3) It 4) The bays 5) The fortune teller 6) Dave 7) The couple	after school. me my future. a slice of pizza.		
8) Tim 9) Dad 10) Dave 11) The ambulance	_ the table. _ a fairy tale to his children. a bath. the injured man to the hospital.		





Handout

The passive voice is used when we want to emphasize the action (the verb) and the object of a sentence rather than subject. This means that the subject is either less important than the action itself or that we don't know who or what the subject is.

My laptop was stolen. (The object – now the subject = My laptop / action= was stolen)

Passive: Napa Valley is known for its excellent wines.

Active: [Many people] know Napa Valley for its excellent wines.

Passive: Twenty civilians were killed in the bomb explosion.

Active: Someone killed twenty civilians in the bomb explosion.

The passive agent

When we know who the subject is, we put it at the end with by. We call this an agent. Passive: The Mona Lisa was painted **by Leonardo Da Vinci**. (agent =Leonardo Da Vinci)

Active: Leonaro Da Vinci painted the Mona Lisa.

Most writing instructors and editors recommend against using the passive voice, when possible. The reason for this is that when you use the active voice, your writing is clearer and less complicated.

Active: While Mr. Taylor was driving down Highway 101, a police officer pulled him over and gave him a speeding ticket.

Passive: While Mr. Taylor was driving down Highway 101, he was pulled over and given a ticket by a police officer.

If it's a long sentence and you know who the subject is, it's best to use the active voice. The passive is often used to report something or to state a fact.

Highway 15 was closed yesterday due to a serious road accident.

A lot of corn is grown in Iowa.

Forming the passive voice

The passive voice is not a tense in English. Each tense has its own passive voice which is created by using a form of the <u>auxiliary verb</u> to be + V3 (past participle)

The passive voice in each tense:

Tense	Auxiliary verb + sample V3 (past participle)	Examples
Present simple	am, is, are + made	Wine is made from grapes. Many cars are made in Japan.
Present progressive	am, is, are + being + sent	The document is being sent right now. I am being sent to work in the London office.
Past simple	was, were + invited	John was invited to speak at the conference. We were invited to Daniel and Mary's wedding.
Past progressive	was, were + being + washed	The dog was being washed when I got home. Their cars were being washed while they were in the mall shopping.
Future (will)	will be + signed	The contract will be signed tomorrow. The documents will all be signed by next week.
Future (going to)	am, is, are + going to be + built	A bridge is going to be built within the next two years. New houses are going to be built in our neighborhood.
Present perfect	has, have + been + sold	That start-up has been sold for \$5 million. The rights to his book have been sold for \$250,000.
Past perfect	had + been + hired	The new manager had been hired before John left the company. All the employees had hired before the store opened.
Future perfect	will + have been + finished	The car will have been loaded by the time he gets home. The crates will have been loaded by then.
Modals: can/could	can, could + be + issued	A passport can only be issued at the embassy. He said the documents could be issued within the week.

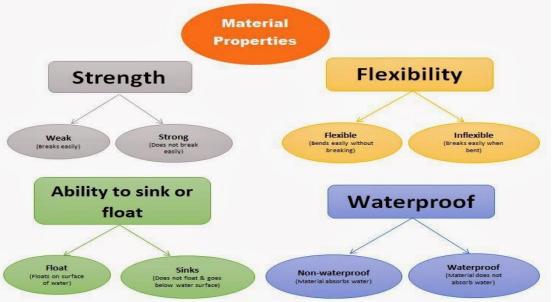
Tense	Auxiliary verb + sample V3 (past participle)	Examples
Modal: have to	have to, has to, had to + be + arranged	A babysitter has to be arranged for this evening. Joan's travel plans have to be arranged by December.
Modal: must	must + be + stopped	Criminals must be stopped before they commit crimes.

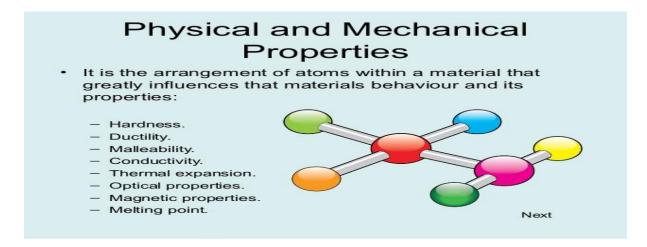
All of the rules for passive negatives and questions are the same as for the active voice. Note: <u>Verbs</u> that have no object (no one to "receive" the action) cannot be put into the passive, such as, arrive, come, die, exist, go, happen, have, live, occur sleep, etc.

Handout

Passive Voice – Exercises Fill in the correct passive form of the verb in parentheses. After the earthquake, aid was sent to the people of Haiti. (sent) The electricity was cut off because the bill hadn't been paid. (not pay) Penicillin _____ by Alexander Fleming in 1928. (discover) Statements _____ from all the witnesses at this moment. (take) _____ by an international ban on whaling. (must protect) Whales Both weddings _____ by Good Taste. (cater) A Picasso _____ from the Metropolitan Museum of Art.(steal) _ this washing machine _____ in Germany? (make) Tea _____ in China. (grow) When we reached the airport, we found that all the flights_____ due to the storm. (cancel) The fax until tomorrow morning. (not send) The soundtrack of a movie ______ always ______ after the filming is finished. (is/add) are being taken Answers: was discovered must be protected were catered Was/made had been cancelled was stolen is grown won't be sent is/added







Unit 4. Lesson 1. Text: "What is machines"

What Is a Machine?

- A machine is a device that allows you to do <u>work</u> in a way that is easier or more effective.
- Remember, in science, work is done on an object when the object moves in the same direction in which the force is exerted.
- The formula used to calculate the amount of work done on an object is:

Work = Force × Distance (expressed in Joules (J))



Machines are objects that make it easier for people to do work. Not all machines have lots of parts or motors. <u>Simple machines</u> have only one or two main parts. A shovel, a screwdriver, a knife, a broom, and even a slide on the playground are all simple machines. Let's learn about the six types of simple machines.



What is a Simple Machine?

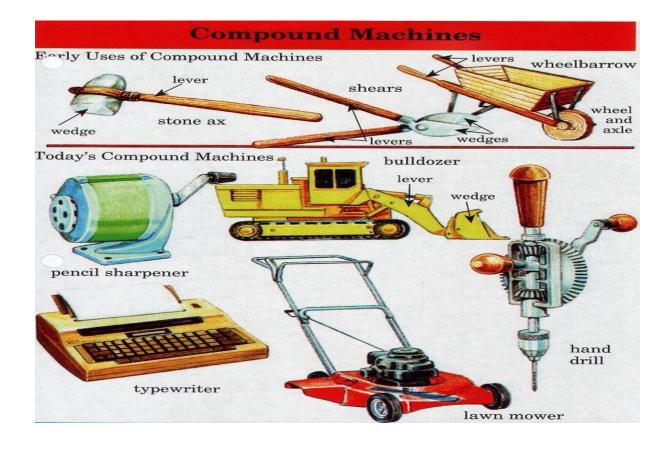
- A simple machine has few or no moving parts.
- Simple machines make work easier.
- Simple machine is a device in which effort is applied at one place and work is done at some other place.
- Simple machines are run manually, not by electric power.





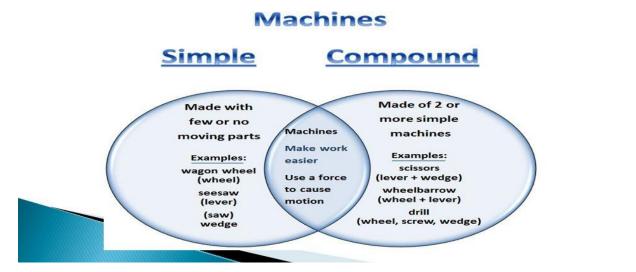
Compound Machine	Simple Machine
Wheel barrow	Wheel and axle Lever
Garden hoe / Stapler	Wedge Lever
Car Jack	Wedge Screw
Crane / Tow truck	Lever Pulley

Compound Machine	Simple Machine
Bicycle	Wheel and axle Pulley Lever Screw
Can opener	Wheel and axle Wedge Lever
Lawn Mower	Wheel and axle Screw Lever Wedge



SIMPLE AND COMPLEX MACHINES

 Simple machines, like ramps and levers, are simple. They have't got many parts. Complex machines, like clock, are complex. They have got lots of parts.



Finding Simple Machines at Home

RaMe _____

Remember the simple machines we reviewed in class:

Wedge	Lever	Wheels and Axle	Screw	Tulley	ୟ ିର ଙ୍ଗ କ	Inclined plane
R	<u>.</u>	1	/			

Find examples of these simple machines at home. If you are having trouble, remember to visit the website we went to at school that showed us everyday examples of these simple machines. http://www.edheads.org/activities/simple-machines/

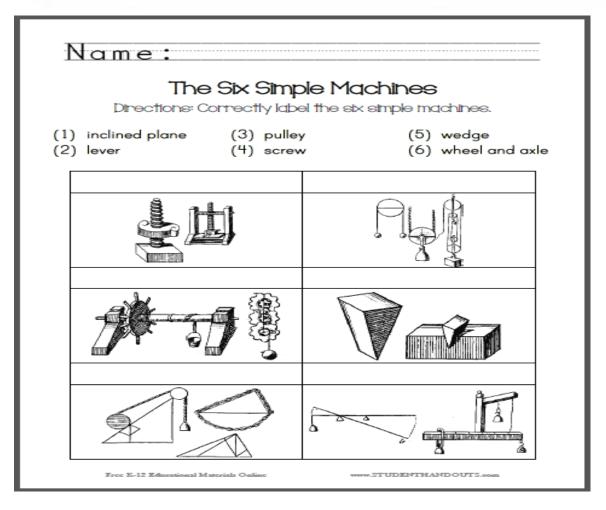
In each square, draw and name the simple machine, describe what the machine is used for, and label it.

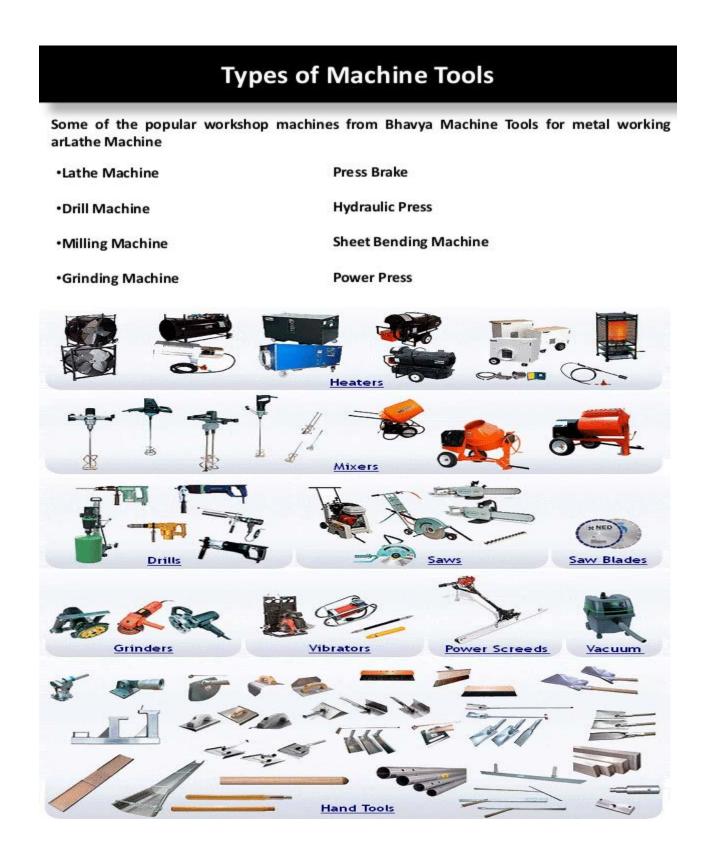
Name and Drawing:	Name and Drawing:	Name and Drawing:	Name and Deawing:
What is it used for?			
What type of simple machine			
is it?	is it?	is (17	is it?

SIMPLE MACHINES SORT

A simple machine is a non-motorized device that changes the direction of a force.

MACHINE	DEFINITION	EXAMPLES
	a rod balanced on a fixed point that can help lift a heavy weight with less effort	0.
wheel and AXLE	used to carry loads around easily, for long distances with less effort,	350 2
	any slope or ramp that makes it easier to lift something	*
	made of 2 inclined planes and used to push objects apart	
	an inclined plane wrapped into a spiral	States
PULLEY	uses wheels and a tope to raise, lower or move a load	P L





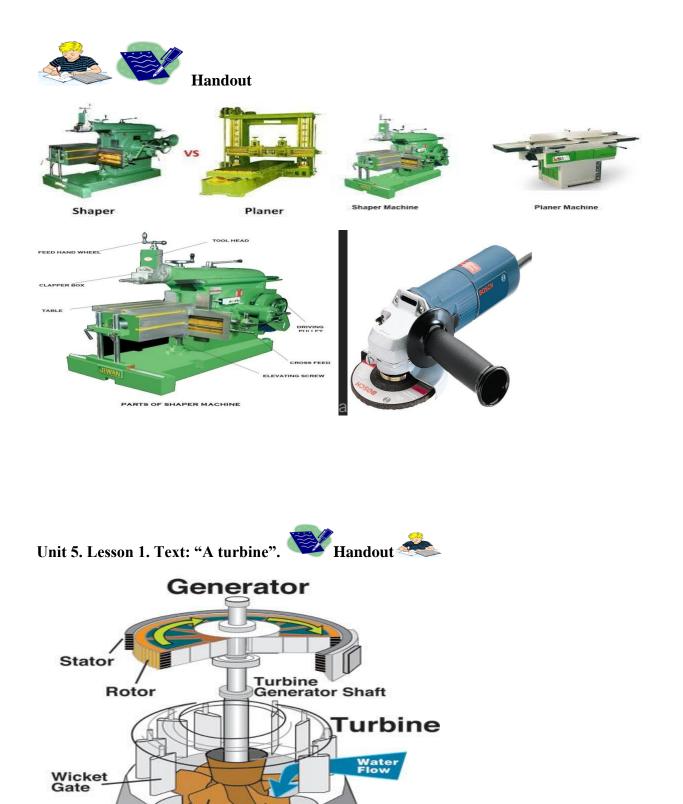


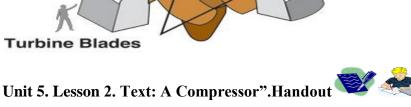
Unit 4. Lesson 3. Text: "Milling machines" (Drilling and boring machines.)





Unit 4. Lesson 4. Shapers and planers. Grinders".





COMPRESSOR

What is Compressor?

A compressor is a device that pressurize a working fluid, one of the basic aim of compressor is to compress the fluid and deliver it to a pressure which is higher than its original pressure.

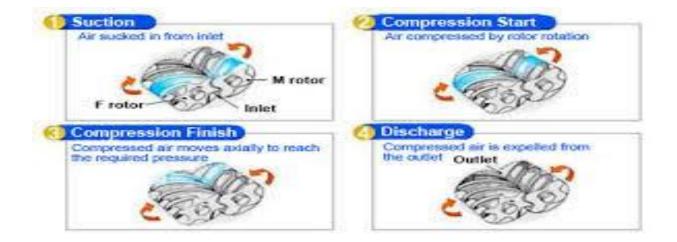
PURPOSE

To provide air for combustion

To transport process fluid through pipeline

To provide compressed air for diving pneumatic tools

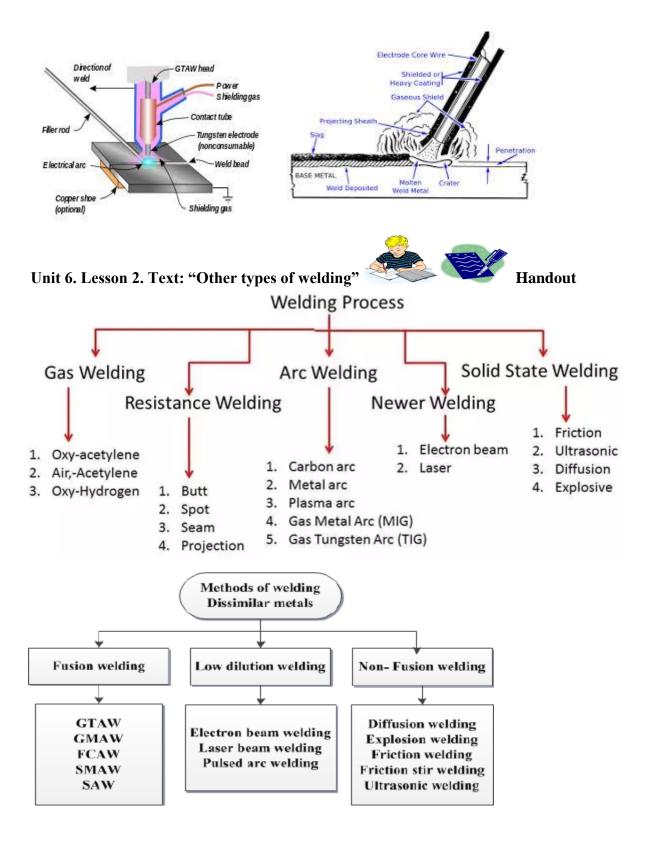
To circulate process fluid through certain process

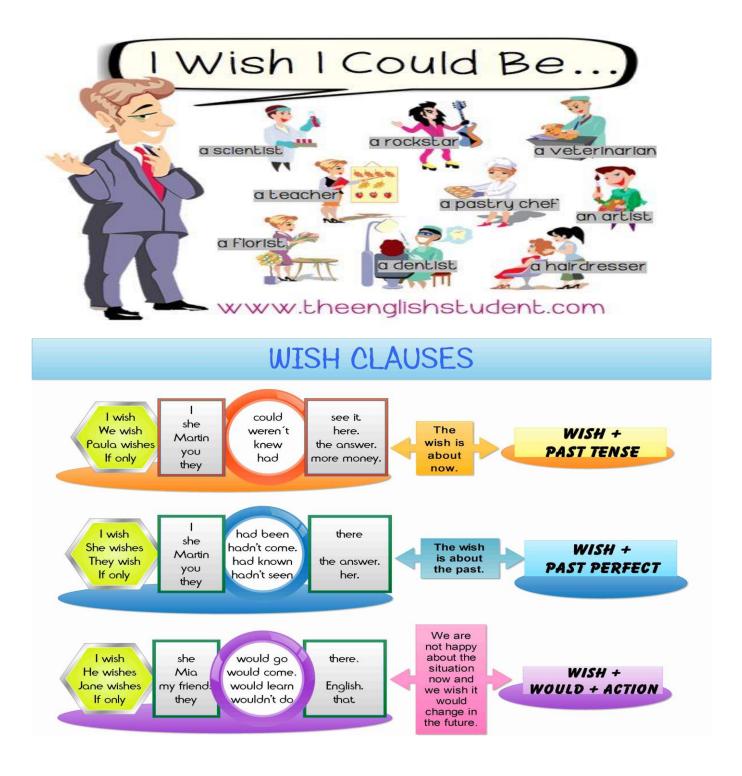


Compressor	Capac	Centrifugal type	
type	Screw	Reciprocating	Turbo
Compression principle	Compresses by rotating screw rotor	Compresses through the reciprocating motion of the piston	Compresses through centrifugal force using impeller rotation

Unit 6. Lesson 1. Text: "Welding.









The Story of Science....cont.

- These personal ambitions where <u>not singlehandedly</u> pursued by a person. Rather, they gained inspiration and impetus from the works of others before thema form of <u>fellowship</u>.
- Therefore, the <u>biography</u> of science must <u>not</u> be highlighted by big science personalities themselves, but by their immediate historical and political contexts (e.g., Inquisition and the Black Death).



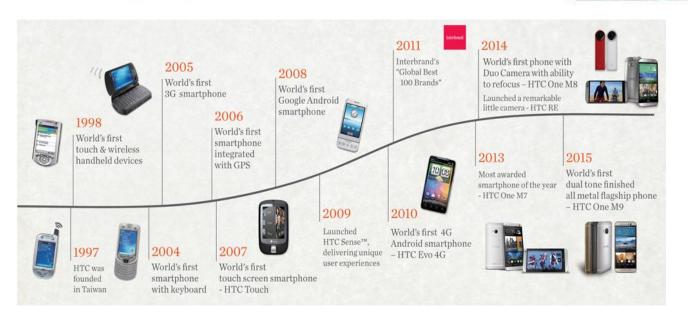
Big Idea 2 : The Characteristics of Scientific Knowledge

Description

A: Scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world; but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as art, philosophy, or religion.

B: Scientific knowledge is durable and robust but open to change.

C: Because science is based on empirical evidence scientists strive for objectivity. But as it is a human endeavor the processes, methods, and knowledge of science include subjectivity, as well as creativity and discovery.





TESTS

version-1

1.Put the correct prepositions.

The footwear industry is made up predominantly ... small firms again ... great pressure ... international competition.

a)to/under/to b)off/under/for c)of/under/fore d)of/under/from

2.Translate the following word. "steam"

a)bug' b)trubina c)tormoz d)arava

3.Answer the following question.

When Robert Stirling patented a new engine for pumping water out of mines and quarries?

a)in 1816 b)in 1817 c)in 1818 d)in 1819

4. Put the correct prepositions.

Newton ... 1686 formulated the following statement and called it the first law of motion.

a)on b)in c)till d)during

5.Translate the following word. "current"

a)valuta b)oqim c)qarshilik d)kurs

6.Complete the sentence. Capacity to do work is called...

a)matter b)lathe c)energy d)belts

7.Put the correct prepositions.

The unit is named ... Andre Marie ampere, a French scientist, who discovered a great number of facts ... electricity ... a hundred years ago.

a)by/about/after b)after/about/over c)to/in/over d)for/in/after

8.Translate the following word."resistance"

a)bosim b)oqim c)qarshilik d)masofa

9.Machine parts are held together by parts:

a)working in tension b)working in shear c)creating friction

d)all variants are right

10.Put the correct prepositions.

... what ways does mass production differ ... the older methods ... manufacture?

a)in/to/on b)on/from/to c)to/from/for d)in/from/of

11.Translate the following word. "petroleum"

a)gaz b)neft c)yog' d)benzin

12.Disconnectable fastenings, in turn, are effected by:

a)bolts and screws b)wedges and keys c)dowel pins d) all variants are right

13.Put the correct prepositions.

When the new method ... manufacturing articles ... great numbers was introduced, a new name was wanted ... it and "mass production" was the one that came ... use.

a)off/in/fore/into b)to/on/to/to c)of/in/for/into d)of/in/to/in

14.Translate the following word. "low"

a)past b)qonun c)baland d)sekin

15. Answer the following question. Who did build a full-size self-propelled vehicle?

a)Rudolf Diesel b)Trevithick c)Robert Stirling d)Newton

16.Put the correct prepositions.

One ... the earliest attempts to propel a vehicle ... mechanical power was suggested ... sir Isaac Newton ... 1680.

a)of/by/by/about b)off/on/by/in c)of/by/by/in d)of/in/by/in

17.Translate the following word. "purchaser"

a)sotuvchi b)xaridor c)ishchi d)boshqaruvchi

18. Answer the following question. Who invented the type of four-stroke cycle engine?

a)in 1866 Otto b)in 1860 Rudolf Diesel c)in 1816 Robert Stirling

d)in 1769 Nicolas Cugnot

19.Put the correct prepositions.

All the different parts ... a car have to be ... place ... the different points ... the assembly line ... the right time.

a)of/in/at/of/at b)off/in/in/off/in c)of/on/to/from/at d)from/in/at/for/to

20.Choose the antonym. "noise"

a)quiet b)sound c)cry d)uproar

21. Answer the following question. When Robert Stirling died?

a)in 1826 b)in 1868 c)in 1878 d)in 1816

22. Translate the following word. "transaction"

a)kelishuv b)kamchilik c)yetarli emas d)rag`batlantirmoq

23.Translate the following word. "noise"

a)tezlik b)shovqin c)manba d)suyuqlik

24.Choose the antonym. "low"

a)cheap b)high c)stooped d)shameless

25.Complete the sentence.... are now made with numerical control and with computer control

a)lathes b)belts c)energies d)clothing

26.Find the low of combining weights.

a)matter and energy can neither be destroyed nor created

b)all substances combine in accordance with simple, definite weigh relationship

c)a solid body retains its forms

d)all variants are right

27.Put the correct prepositions.

The lathe is one ... the most useful and versatile machines ... industry and is capable ... carrying ... many machining operations.

a)off/into/fore/out b)of/in/to/out c)of/in/fore/to d)of/in/for/out

28.Translate the following word. "inventor"

a)aravacha b)ixtirochi c)faylasuf d)tezlik

29.Choose the antonym. "purchase"

a)obtain b)buy c)sell d)get

30.Translate the following word."transaction"

a)kelishuv b)kamchilik c)yetarli emas d)rag`batlantirmoq

31.Put the correct prepositions.... in view ... observation ... this sort

a)on/to/of b)in/of/of/ c)in/off/off d)on/of/to

32.Choose the antonym. "failure"

a)unsuccessful b)loss c)breakdown d)victory

33. Complete the sentence. "a great mass" of something...

a)goes back several hundred years

b)resistance to the flow of an electron current throughout it

c)means a great amount

d)is determined by two things

34.Choose the antonym. "energy"

a)dullness b)power c)strength d)vigour

35. Complete the sentence. Newton's third law thus:...

A)everybody continues to remain in its state of rest or uniform motion in a straight line unless impelled by external force to change that state

b)the quantity of motion possessed by a moving body is defined as the product of the mass and the velocity of the body

c)rate of change of momentum is proportional to the force acting and the change takes peace in the direction in which the force acts

d)to every action there is an equal opposite reaction

36. Choose the synonym.		ynonym.	"attempt"
a)try	b)serve	c)listen	d)careful
1. Complete the sentence.		sentence.	In 1784 the Russian inventor Kulibin built
\ .1			1 \ 1 . 1 . 1 . 1 . 1 . 1 . 1

a)a three-wheeled carriage b)lathe c)belt d)automobile

2.Translate the following word. "ignition"

a)yukxona b)o't oldirish c)asboblar d)mufta

3.Choose the synonym. "spark"

a)darken b)flash c)dullness d)cover

4.Put the correct prepositions. Antistatic belts ... conveyance ... products ... special conditions and environments.

a)fore/off/in b)for/of/in c)in/from/to d)for/from/to

5.Translate the following word. "replace"

a)almashtirish b)tuzatish c)buzish d)ko'chish

6.Choose the synonym. "purchase"

a)sell b)market c)buy d)hawk

7. Choose the synonym. "vibrate"

a)make b)can c)quit d)shake

8.Put the correct prepositions. Attraction ... molecules ... vapour is practically non-existent

a)between/of b)among/off c)between/off d)among/of

9.Choose the synonym. "reverse"

a)uncover b)opposite c)prize d)remain

10.Put the correct prepositions. Tapered centers ... the hollow nose ... the spindle and ... the tailstock hold the work firmly ... them.

a)in/of/of/between b)in/to/in/among c)of/in/in/between d)of/of/of/among

11.Put the correct prepositions.

A transverse movement ... the tool post ... the saddle enables the tool to cut ... the face ... the work piece and give it a flat surface.

a)in/from/across/to b)of/across/across/of c)in/during/of/across d)across/across/of/of

12.Put the correct prepositions. The clothing industry is labour intensive and involves ... 8000 companies.

a)by b)from c)about d)to

13. Put the correct prepositions. We know that the cohesion ... the molecules ... a solid body is very great.

a)between/of b)among/off c)between/off d)among/of

14. Choose the antonym. "modern"

a)ancient b)new c)recent d)tolerant

15. Choose the antonym. "several"

a)certain b)none c)various d)different

16. Translate the following word. "increase"

a)shaxsiy b)hunarmand c)talab qilmoq d)rivojlanish

17.Answer the following question. What's the instrument which measures electrical values?

a) meter b) km c) cm d) liter

18.Answer the following question. What measures the current in amperes?

a)	Ammeter	b) meter	c) cm	d) liter
----	---------	----------	-------	----------

19.Answer the following question. Who is Andre Marie Ampere?

a) doctor b) scientist c) teacher d) artist

20.Answer the following question. What's amp?

a) Clock b) cat c) name d) abbreviation for ampere

21.Answer the following question. What does do voltmeter?

a) measure b) show c) play d) read

22.Complete the sentence. The invention in 1733, flying shuttle increased

a) the demand for yarn. b) a water wheel

c) the mechanization of spinning processes. d) the standardization of parts.

23.Complete the sentence. Then the water wheel began to replace....

a) of spinning processes. b) for woolen mills.

c) made of cotton imported from India. d) the steam engine.

24.Complete the sentence. By the middle of the 19 century hand weaving in the UK....

a) is almost entirely disappeared. b) of cotton imported from India.

c) of spinning processes. d) which drives the donkey.

25.Choose the synonym. "famous"

a)important b)necessary c)skilled d)popular

26.Put the correct prepositions.... medieval Europe, engaged ... mechanisms producing the master clock cases and manufacturers ... navigational and scientific instruments.

a)in/in/of b)of/in/in/ c)at/on/in d)of/in/at

27. Translate the following word . "craftsmen"

a) hunarmand b) talab qilmoq c) rivojlanish d) yaratmoq

28.Put the correct prepositions. One ... the most famous engineers, renowned ... the manufacture ... locks, was Joseph Brahma.

a)of/in/of b)of/of/in c)at/in/of d)in/in/of

29.Put the correct prepositions. It was one ... the earliest examples ... mass production with the standardization ... parts.

a)of/of/of b)in/of/in.....c)in/in/in d)at/in/of

30. Translate the following word. "widespread"

a)chaqqon b)aniqlik c)harakat d)keng tarqalgan

31. Translate the following word. "movement"

a) yalqov b)aniqlik c)harakat d)keng tarqalgan

32. Translate the following word. "comprehensive"

a)har tomonlama b)o`zlashtirmoq c)yetib olmoq d)dastlabki shart

33. Translate the following word. "samarasiz"

a)principle b)productivity c)unlikely d)inefficient

a)adopt	b)overtakec)	prerequisite	d)level	
35.Transla	te the following wo	ord."unumde	orlik"	
a)unlikely	b)productivity c) agriculture	d)principle	
36.Answer	the following ques	tion.Who is .	Alessandro Valt	a?
a) actor	b) writer		c) scientist	d) teacher
1.Answer t	he following quest	ion. Where is	from Alessand	ro Valta?
a) Spain	b) Italia		c) Uzbekistan	d) U.S.A
2.Answer t	he following quest	ion. What i	s atom?	
a) water	b) book		c) chemical thir	ng
d) the unit b	by which resistance	is measured		
3.Answer t	he following quest	ion. What do	es measure elec	trical power in watts?
a) meter	b) cm		c) wattmeter	d) amp meter
4.Answer t	he following quest	ion. Which c	one of these is th	ne biggest one?
a) galvanon	neter b)) millimeter	c) micro	meter d) a b c
5. Choose t	the appropriate and	swer.		
By m	iddle of 18 centu	ıry, England	became lead	ing capitalist country.
a) the/ the/t	he b)a/the/	(the c)th	ie/a/the d)an/the/the
6. Choose t	the appropriate and	swer.		
	improvements to the of the 19 century.	eir 1800 piec	e made in 1454,	and they remained in use until t
a)the/the	b)a/the c	a)a/a d)	the/an	
7.Put the c	orrect prepositions	5.		
This was du	ie the fact that E	ngland had	. then moved	. a static traditional.
a)to/by/fror	n b)at/by/from	c)in/from/by	d)in/at/	Ъу
8.Put the c	orrect prepositions	S. Where c	oal relatively	y cheap get along.
a)to/is	b)is/to	c)in/to	d)is/in
	orrect prepositions	•	ere large and exp	pensive machines, it very
a)is/by	b)by/is c)i	in/is	d)at/in	
u)15/0y	, ,			
· •	te the following wo	ord."level"		

11.Translate the following word."transaction"					
a)kelishuv b)sotib olmoq c)kamchilik d)rag`batlantirmoq					
12.Translate the following word."disadvantage"					
a)kamchilik b)rag`batlantirmoq c)yetarli emas d)sarosima qilmoq					
13.Translate the following word."oddiy,tabiiy"					
a)discourage b)failure c)link d)unsophisticated					
14.Translate the following word. "birlashtirmoq"					
a)inadequate b)discourage c)failure d)link					
15.Translate the following word. " rag`batlantirmoq "					
a)transaction b)purchase c)disadvantage d)stimulate					
16.Complete the sentence. An ammeter must have a resistance.					
a) very law b) high c) normal d) law					
17.Answer the following question. What was used before cigarettes?					
a) chocolate b) tobacco c) marihuana d) juice					
18.Answer the following question. What does mean (a great mass)?					
a) problem b) news c) great amount d) useless things					
19.Answer the following question. What is the aim of the factory?					
a) make money b) increase output c) to recluse costs d) a, b,c					
20.Answer the following question. Which is old cigarette or tobacco?					
a) both of them b) none of them c) cigarette d) tobacco					
21.Choose the synonym. "stimulate"					
a)arouse b)activate c)refresh d)a,b,c.					
22.Choose the antonym. "purchase"					
a)acquire b)obtain c)procure d)sell					
23.Choose the antonym. "level"					
a)rough b)hilly c)dishonest d)a,b,c.					
24.Choose the synonym. "light"					
a)easy b)heavy c)difficult d)serious					
25.Choose the synonym. "model"					
a)example b)pattern c)style d)a,b,c					
26.Choose the synonym. "transaction"					

a)achieve b)pattern c)style d)a,b,c						
27. Put the correct prepositions. The footwear industry is made up predominantly small firms again great pressure international competition.						
a)to/under/to b)off/under/for c)of/under/fore d)of/under/from						
28.Answer the following question. What's the most important element of a conveyor?						
a) rule b) nothing c) belt d) style						
28.Answer the following question. What is esbelt?						
a) manufacturer of thermoplastic conveyor belts						
b) medicine c) book d) technical thing						
29.Complete the sentence. By 1733 they had purchased 110,						
a) from a static traditional. c) the beginning of the 19 century.						
b) impossible to produce. d) including 14 for export.						
30.Complete the sentence. These have not increased capital investment						
a) over the long term. c) for machine tools.						
b) in the early 1980. d) industrial equipment.						
31.Complete the sentence. Inadequate supply of skills and disincentives						
a) to invest in training. c) for machine tools.						
b) over the long term. d) in advanced industrial equipment.						
32.Complete the sentence. labor force b) Inadequate supply of skills						
are low compared with those of foreign counterparts. c) The sources of this problem						
a) The skill levels of the industry's d) Difficulty obtaining capital						
33.Complete the sentence technological research into market advantage.						
a) Poor performance in translating						
b) Despite its recognized						
c) This skill gap is apparent						
d) Inadequate supply of skills						
35.Translate the following word. "transaction"						
a)kelishuv b)kamchilik c)yetarli emas d)rag`batlantirmoq						
36.Translate the following word."purchase"						
a)sotib olmoq b)kamchilik c)rag`batlantirmoq d)yetarli emas						



O'ZBEKISTON RESPUBLIKASI OLIY VA O'RTA MAXSUS TA'LIM VAZIRLIGI

BUXORO MUHANDISLIK – TEXNOLOGIYA INSTITUTI

"Ingliz tili" kafedrasi

"TASDIQLAYMAN"

O'quvuslubiyboshqarmaboshlig'i

_____ dots. Sh.M. Xodjiyev

Barcha kurslar uchun ingliz tili fanidan

baholash mezoni

Buxoro – 2018

Barcha fakultetlar 3– kurs bakalavrlari uchun "Ingliz tili" fanidan BAHOLASH MEZONI

1-2 mavsum

O'zbekiston Respublikasi Oliy va O'rta Maxsus Ta'lim Vazirligining 2009 yil 11 iyuldagi 204sonli buyrug'iga asosan "Oliy ta'lim muassasalarida talabalar bilimini nazorat qilish va baholashning reyting tizimi " to'g'risidagi nizomga va "Oliy ta'lim muassasalarida talabalar bilimini nazorat qilish va baholashning reyting tizimi to'g'risidagi nizomga o'zgartirish va qo'shimchalar kiritish haqida" O'zbekiston Respublikasi Oliy va O'rta Maxsus Ta'lim Vazirining 2010 yil 26 avgustdagi 1981-1-sonli buyrug'iga asoslangan holda ushbu baholash tizimi ishlab chiqarildi.

Ingliz tili fan bo'yicha talabaning mavsum davomidagi o'zlashtirish ko'rsatkichi 100 ballik tizimda baholanadi va bunda talabaning fan bo'yicha o'zlashtirish ko'rsatkichini nazorat qilishda quyidagi namunaviy mezonlarga amal qilinadi:

a) 86–100 ball uchun talabaning bilim darajasi quyidagilarga javob berishi lozim:

- chet tilidagi matn yuzasidan xulosa va qaror qabul qilish;
- ushbu matn yuzasidan ijodiy fikrlay olish;
- chet tilidagi matnning mohiyatini tushunish;
- matnni o'qish jarayonida tushunib olish va uni so'zlab berish.
- b) 71-85 ball uchun talabaning bilim darajasi quyidagilarga javob berishi lozim:
 - chet tilidagi matn yuzasidan mustaqil fikr yurita oilsh;
 - chet tilidan olgan bilimlarini amalda qo'llay bilish;
 - matnning mohiyatini tushunish;
 - matn yuzasidan tasavvurga ega bo'lish va uni so'zlab berish.

c) 55-70 ball uchun talabaning bilim darajasi quyidagilarga javob berishi lozim:

- chet tilidagi matnning mohiyatini tushunish;
- matnni bilish va uni so'zlab berish;

- matn yuzasidan tasavvurga ega bo'lish.

d) quyidagi hollarda talabaning bilim darajasi 0-54 ball bilan baholanishi mumkin:

- chet tilidagi matn haqida aniq tasavvurga ega bo'lmasa;
- matnni bilmasa.

Umumiy balning 70 bali joriy nazoratlarga (shundan 42 balli dars jarayoniga, 28 bali mustaqil ishlarga) va 30 bali yakuniy nazoratga ajratiladi.

Jami joriy baholash bali: 70

1-2 - Joriy baholash bali: 35

- 20–25 qoniqarli
- 26 30 yaxshi

31 – 35 a'lo

Dars jarayo	nida to'plagan bali: 21	Mustaqil ishdan to'plagan bali: 14		
12 - 14	qoniqarli	8-9	qoniqarli	
15 - 17	yaxshi	10 - 12	yaxshi	
18 - 21	a'lo	13 - 14	a'lo	

JB da ushbu fanning har bir mavzusi bo`yicha talabaning bilimi va amaliy ko`nikmalarini aniqlab borish nazarda tutiladi va amaliy mashg`ulotlarida amalga oshiriladi. Joriy baholash mezoni:

Kuzgi va bahorgi mavsumda 18 juftdan dars o'tkazilib, har bir dars 2,3 balldan baholanadi

,, a'lo ", yaxshi ", qoniqarli" 2,3 - 2,0 1,9 - 1,7 1,6 - 1,3

Yakuniy baholashda talabaning bilimlari ushbu fanning umumiy mazmuni doirasidan kelib chiqib og'zaki tarzda baholanadi . Yakuniy nazorat 15-20 ta variantlar asosida olinadi va har bir variant 4 ta ko'nikma asosida tuziladi.

Har bir topshiriq quyidagicha baholanadi:

Topshiriq:		ball	
		a'lo	yaxshi qoniqarli
1–Reading	7 - 6	6 - 5	5 - 4
2-Writing	7 - 6	6 - 5	5 - 4
3-Speaking	7 - 6 6	5 - 5	5 - 4
4 – Listening	9 - 8 7	7 - 6	5 - 4
Jami:	30 - 26 2	25 - 21	20 - 16

Yakuniy nazorat topshirig'lariga berilgan javoblariga qo'yilgan o'zlashtirish ballari qo'shiladi va yig'indi talabaning yakuniy nazorat bo'yicha o'zlashtirish bali hisoblanadi.

Barcha fakultetlar 3-kurs bakalavrlari uchun "Ingliz tili" fanidan mustaqil ishlarni

BAHOLASH MEZONI

Ingliz tili fani bo'yicha talabaning mavsum davomidagi mustaqil ishlari 28 ballik tizimda baholanadi va baholashda quyidagi namunaviy mezonlarga amal qilinadi:

O'zlashtirish ko'rsatkichi 86-100%

Fanni o'quv dasturiga kiritilgan mavzular bo'yicha mustaqil ish materiallarini to'liq o'zlashtirganda, o'z xatolarini talaba o'zi tuzata bilgan holda. Fanga qiziqishi, yaratuvchanligi, yangi texnika-texnologiyalarga intilishi, murakkab topshiriqlarni bajarishga harakatchanligi, internet orqali olingan yangiliklarni tahlil etib bilganligi.

O'zlashtirish ko'rsatkichi 71-85%

Fanni o'quv dasturiga kiritilgan mavzular bo'yicha mustaqil ish materiallarini to'liq izohlab bergan, ba'zi ahamiyatga ega bo'lmagan xatoliklarga yo'l qo'ygan va xatoliklarni o'qituvchi ko'rsatmasi asosida tuzata olgan holda. Fanga qiziqish, yangi texnika-texnologiyalarga qiziqishini namoyon etishi, murakkab topshiriqlarni bajarishga intilishi.

O'zlashtirish ko'rsatkichi 55-70%

Fanni o'quv dasturiga kiritilgan mavzular bo'yicha mustaqil ish materiallarini to'liq izohlanmagan, fanni boshqa qismlarini o'rganishga xalaqit bermaydigan ayrim ahamiyatga ega bo'lmagan xatoliklarga yo'l qo'ygan, bu xatoliklarni o'qituvchi yordamida tuzatilgan hollarda. Fanni o'rganishda yangi texnika-texnologiyalarga qiziqishi passivligi, murakkab topshiriqlarni bajarishga intilishi yo'qligi.

O'zlashtirish ko'rsatkichi 55% dan past

Fanni o'quv dasturiga kiritilgan mavzular bo'yicha mustaqil ish materiallarini to'liq bilmagan, tizimlashtirilmagan, tuzatib bo'lmaydigan xatoliklarga yo'l qo'ygan holda.

Mustaqil ish baholash bali: 14

8 - 9 "qoniqarli" 10 - 12 "yaxshi" 13 – 14 "a'lo"

1-2 mustaqil ishlarda 4 ta topshiriq bo'lib, u quyidagicha baholanadi.

Task:

		"a'lo"	"yaxshi"	"qoniqarli"
1	-	4	3,5	2,5
2	-	3	2,5	2,0
3	-	3	2,5	2,0
4	-	4	3,5	2,5
Jam	ui:	14	12	9

ball

Baholash mezoni "Ingliz tili " kafedrasida muhokama qilindi va 28- avgust 2018 yil № 1 sonli yigʻilish bayoni bilan tasdiqlandi.



III-kurs-5321500Texnologiyalar va jihozlar (yengil sanoat jihozlarini ta'mirlash va texnik xizmat ko'rastish) yo'nalishiga fan bo'yicha o'quv-uslubiy ma'lumotlar

- 1. И.П.Агабекян. П.И. Коваленко. "Английский для технических вузов". Ростов-на-Дону. "Феникс". 2012.
- 2. Technical English. Students book and workbook. David Bonamy. Christopher Jacques. Longman. Pearson.
- 3. macmillan-visual_dictionary-do-it-yourself
- 4. Качалова К.Н. «Практическая грамматика английского языка» Бишкек-1998. (2 ta)
- 5. Muhammad G'apporov "Ingliztiligrammatikasi" Toshkent-2006 (2 ta)
- 6. MartinSeviour "WorldWise" Tashkent-1997. (7 ta)
- 7. Близниченко К.Л. «Английский язык» Пособие для технологических вузов. Москва-1991. (1 ta)
- 8. Shoyimqulova M.Sh., Ro'ziyeva N. "TJXK" yo'nalishi III kurs talabalari uchun ingliz tili fanidan uslubiy ko'rsatma. (10ta)

www.gov.uz

www. teachingenglish.com

www.mes-english.com

www.bbc.co.uk

www.onestopenglish.com

www.usingenglish.com

http://www.esl-lounge.com/premium/

http://www.facebook.com/learn english conversation/

http://www.twitter.com/#!ESL conversation

http://www.youtube.com/user/ESL conversation

www.bbc.co.uk