

**MINISTRY OF HIGHER AND SECONDARY SPECIAL EDUCATION OF
THE REPUBLIC OF UZBEKISTAN
BUKHARA ENGINEERING-TECHNOLOGICAL INSTITUTE**

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ENGLISH FOR OIL AND GAS INDUSTRY STUDENTS

BUKHARA – 2021

**O`ZBEKISTON RESPUBLIKASI OLIY VA O`RTA MAXSUS TA`LIM
VAZIRLIGI
BUXORO MUHANDISLIK-TEXNOLOGIYA INSTITUTI**

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**ENGLISH FOR OIL AND GAS INDUSTRY
STUDENTS**

60721800-“Neft va gaz ishi (faoliyat turlari buyicha)”, 60720900 - “Neft-gazkimyo sanoati texnologiyasi” va 60721100- “Neft va gazni qayta ishlash texnologiyasi”

bakalavriat ta`lim yo`nalishida tahsil olayotgan talabalar uchun darslik

Toshkent – 2021

Sh.B.Yusupova

Annotatsiya

Darslikning asosiy maqsadi nofilologik yo'nalishda tahsil olayotgan talabalarning ingliz tilidagi nutq faoliyatining mutaxassislik, kommunikativ ko'nikmalari bo'yicha berilgan matnlarni o'qish va tushunishdir.

Ushbu darslikni yaratishda muallif neft va gaz sanoati sohasiga oid bo'lgan xorijiy adabiyotlar va internet resurslaridan samarali foydalangan. Mashqlar va vazifalar to'rt til ko'nikmalariga asoslangan: o'qish, yozish, tinglash va gapirish. Darslikning har bir qismi matndan oldingi mashqlar, autentik matnlar va matndan keyingi mashqlarni o'z ichiga oladi. Mashqlar tizimi o'qilgan matn materialining semantik mazmunini tushunish va maxsus terminologik so'z birikmalarini faol o'zlashtirish ko'nikmalarini rivojlantirishga qaratilgan.

Darslik O'zbekiston Respublikasi Oliy va o'rta maxsus ta'lim vazirligi tomonidan tasdiqlangan namunaviy dastur asosida tayyorlangan bo'lib, 60721800- "Neft va gaz ishi (faoliyat turlari buyicha)", 60720900 - "Neft-gazkimyo sanoati texnologiyasi" va 60721100- "Neft va gazni qayta ishlash texnologiyasi" ta'lim yo'nalishida tahsil olayotgan talabalar uchun mo'ljallangan.

Аннотация

Основной целью учебника является развитие навыков чтения и понимания оригинальных текстов по специальности, коммуникативных умений различных видов речевой деятельности студентов технического вуза. В книге использованы материалы из оригинальной зарубежной технической литературы по нефтегазовой отрасли и Интернет-ресурсов. Упражнения и задания основаны на четырех языковых навыках: чтении, письме, аудировании и разговорной речи. Каждая часть учебника включает предтекстовые упражнения, аутентичные тексты и посттекстовые упражнения, содержащие большое количество терминологической лексики. Система упражнений направлена на развитие навыков понимания смыслового содержания прочитанного текстового материала и активного усвоения специальной терминологической лексики.

Учебник подготовлен на основе типовой программы, утвержденной Министерством высшего и среднего специального образования Республики Узбекистан, и предназначен для студентов, обучающихся по направлениям 60721800 - «Нефтегазовое дело (по видам деятельности)», 60720900 - «Технология нефтегазохимической промышленности» и 60721100 - «Технология переработки нефти и газа».

Annotation

The main purpose of the textbook is to develop the skills of reading and understanding original texts on the specialty, communicative skills of various types of speech activity of students of technical universities. The book uses materials from original foreign technical literature on the oil and gas industry and Internet resources. The exercises and tasks are based on four language skills: reading, writing, listening and speaking. Each part of the textbook includes a pre-text exercises, authentic texts and post-text exercises containing a large number of terminological vocabulary. The system of exercises is aimed at the development of skills in understanding the semantic content of the read text material and the active acquisition of special terminological vocabulary.

The textbook is based on the standard program approved by the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan, and is designed for students studying in the 60721800 - "Oil and Gas Business (by activity)", 60720900 - "Technology of oil and gas chemical industry" and 60721100 - "Technology of oil and gas processing".

Taqrizchilar:

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FOREWORD

In connection with the transition to a new level of education, the requirements for the language training of students, language proficiency in the field of professional communication have increased. The main task of the textbook is the development of technical thinking and communication skills, which must be formed for the successful implementation of the process of teaching a foreign language at a technical university.

The development of technical thinking and communication skills includes not only fluency in the language units of a given foreign language, but also the correct construction of sentences in accordance with the grammatical norms of the target language, recognition of grammatical formulas and their use in speaking.

This textbook is designed for students with grammatical and initial lexical knowledge on the topic 60721800 - "Oil and gas business (by type of activity)", 60720900 - "Technology of the petrochemical industry" and 60721100 - "Technology of oil and gas processing" and contains more detailed information on the profile in a foreign language. Texts on a given topic are accompanied by a list of new vocabulary, as well as exercises for them, aimed at consolidating the lexical and grammatical material reflected in the texts.

The material in the textbook is arranged in such a way that the new vocabulary, which is consolidated in subsequent lessons, is located in front of the texts, which allows you to return to it throughout the course.

Lesson 1. WHAT IS CRUDE OIL?



Interesting facts

WHAT IS PETROLEUM?

4. The word 'petroleum' is derived from the Latin *petra* (which means rock) and *oleum* (which means oil). It is commonly used to refer to crude oil, but it may also refer to other related hydrocarbons.

WHAT IS CRUDE OIL?

1. *Crude oil* is an organic liquid substance often found below the Earth's surface.

2. It is made up of thousands of molecules composed of different hydrogen and carbon atoms. Such compounds are called *hydrocarbons*.

5. Some hydrocarbons are gaseous, rather than liquid. Methane is the most common example of these hydrocarbon gases. This is the kind of natural gas that we most often use in our kitchens at home.

3. These hydrocarbons also contain different proportions of impurities like oxygen, sulphur, nitrogen and heavy metal atoms.



Reading

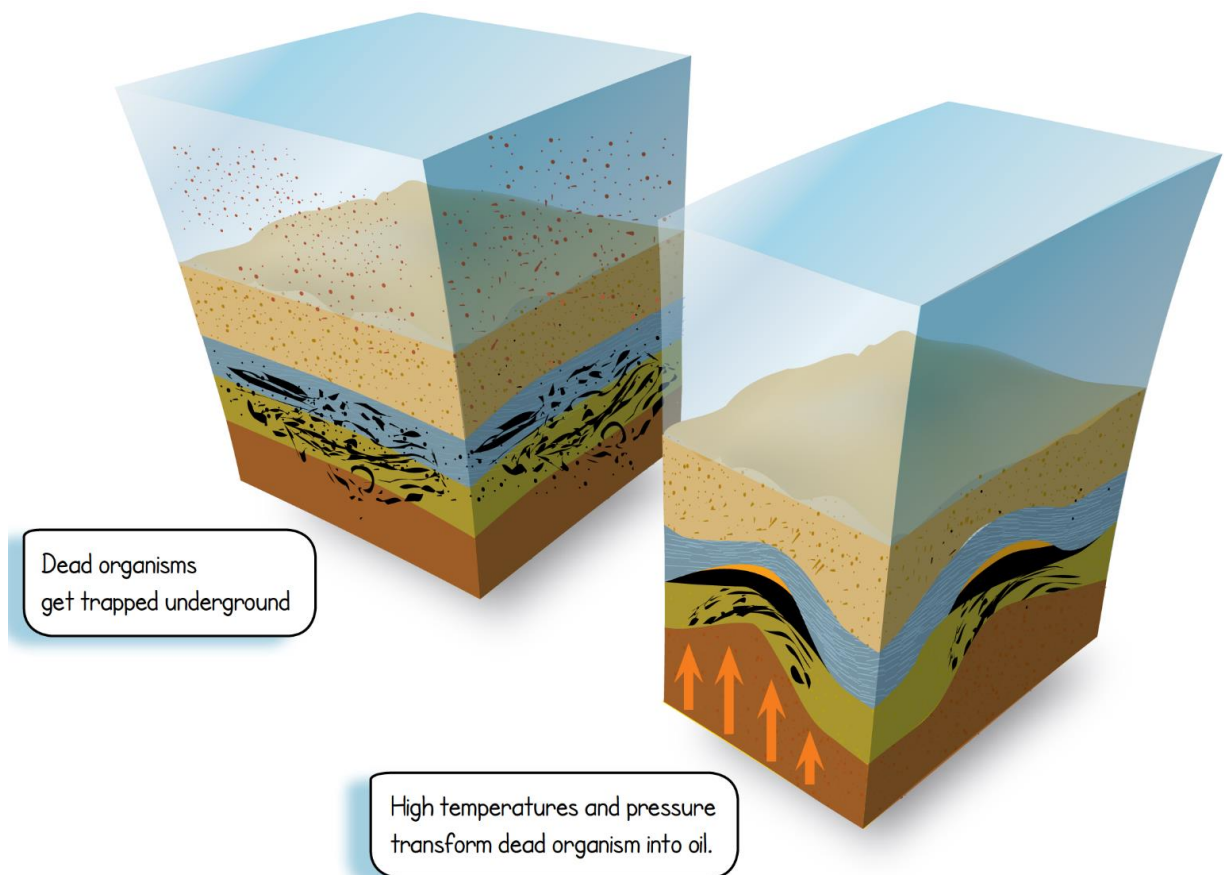
Crude oil is highly flammable and is an excellent source of energy. Its ‘sister’ hydrocarbon, natural gas, is another source of energy. Oil is called a ***non-renewable energy*** source because it cannot be replenished.

Petroleum deposits are often found in natural underground reservoirs called oil fields. The oil in these fields can then be extracted by drilling and pumping.

How is oil formed?

Oil is formed from the accumulation of hydrocarbons. Hydrocarbons accumulate naturally, thousands of feet below the surface of the Earth, from the decomposition of organic materials like plants and marine animals which died during the Palaeozoic Era (between 245 and 544 million years ago).

Trapped beneath the ground under enormous pressure and high temperatures, these hydrocarbons were compressed and eventually transformed into crude oil after millions of years.



1. True/False/NG according to the text.

1. Oil is formed from the accumulation of hydrocarbons.
2. Petroleum deposits are sometimes found in natural underground reservoirs called oil fields.
3. The word 'petroleum' is derived from the Greek *petra*.
4. Oil is called a ***non-renewable energy*** source because it cannot be replenished.

2. Answer the questions according the text.

1. What is crude oil?
2. Why Oil is called a non-renewable energy?
3. What is petroleum?
4. How is oil formed?
5. What is methan?



Listening

Conversations

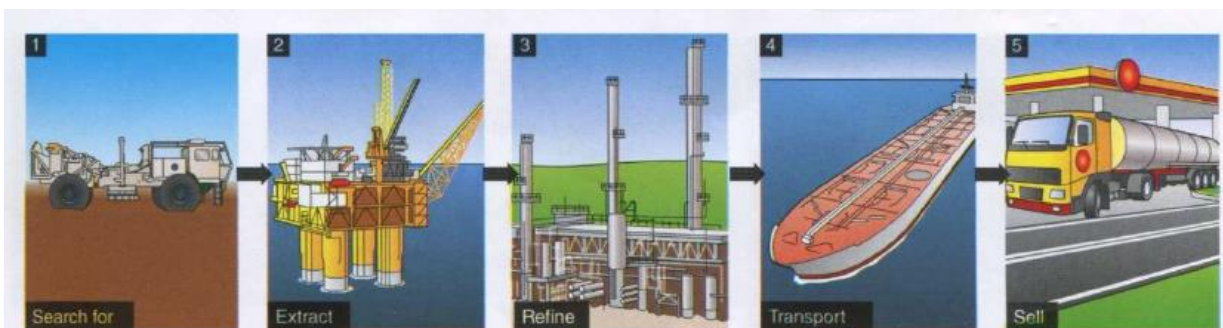
1. Listen and read 🎧.

Match the texts 1-5 with the pictures A-E.

1. Hi. My name is Bakhodir Farmonov. I am from Bukhara. I am a driver.
2. Hello. My name is Nodirjon Akhmedov. I am from Fergana. I am a roustabout.
3. I am Rustam Erkinov, from Kashkadarya. I am an engineer. Nice to meet you.
4. Hi, I am Lola Akhmedova. I am from Karaulbazar, Bukhara. I am a radio operator.
5. Hello. I am Ravshan Karimov from Tashkent. I am a seismic operator.



2. 🎧 Listen. Write the names under the photos.



Speaking.

1. Practice the conversation in pairs.

A: What is your name?

B: BakhodirFarmonov

A: Where are you from?

B: I am from Bukhara.

A: What do you do?

B: I am a driver.

2. Practice in pairs. Ask and answer questions about Nodirjon Akhmedov, Rustam Erkinov, Lola Akhmedova and Ravshan Karimov. Then find a different partner and repeat.

Vocabulary

1. Complete the table.

Name	Job	Work location
Bakhodir Farmonov		
Nodirjon Akhmedov	<i>roustabout</i>	
Rustam Erkinov		<i>refinery</i>
Lola Akhmedova	<i>radio operator</i>	
Ravshan Karimov		

2. Are these sentences True(T) or False (F)?

1. Bakhodir is a driver. He drives a road tanker.
2. Ravshan works on an oil rig.
3. Nodirjon is a roustabout.
4. Rustam is an engineer at a refinery.
5. Lola is radio operator on an oil rig.

Language spot

Imperative sentences

Instructions	
We use the infinitive without to to give instructions .	Turn on the lights.
	Turn off that phone.
	Stand up.
	Sit down.
We add please to make the instructions more polite.	Please don't touch .
	Please turn on the lights .
	Sit down, please.

3. Complete the instructions with the words in the box.

Bring	be	turn	keep	put	touch
-------	----	------	------	-----	-------

1. _____ off the phone.
2. _____ the box here.
3. _____ careful.
4. _____ the cables on the truck.
5. _____ an eye on the road.
6. Don't _____ the flask.

4. Match the verbs 1-5 with the nouns a-e.

- | | |
|----------|-----------------|
| 1. Turn | a) the gauge |
| 2. Close | b) the pressure |
| 3. Read | c) the valve |
| 4. Write | d) the wheel |
| 5. Check | e) the flanges |

5. Put these words in the correct order to make sentences.

1. near / don't / window / the / stand

2. here / bring / my / please / coffee

3. explosives / careful / the / be / with

4. put/ boots / table / the / on / don't / your

5. mobile / don't / phone/ touch / the

6. door / put / jacket / the / your / behind

Lesson 2. A BRIEF HISTORY OF OIL INDUSTRY.



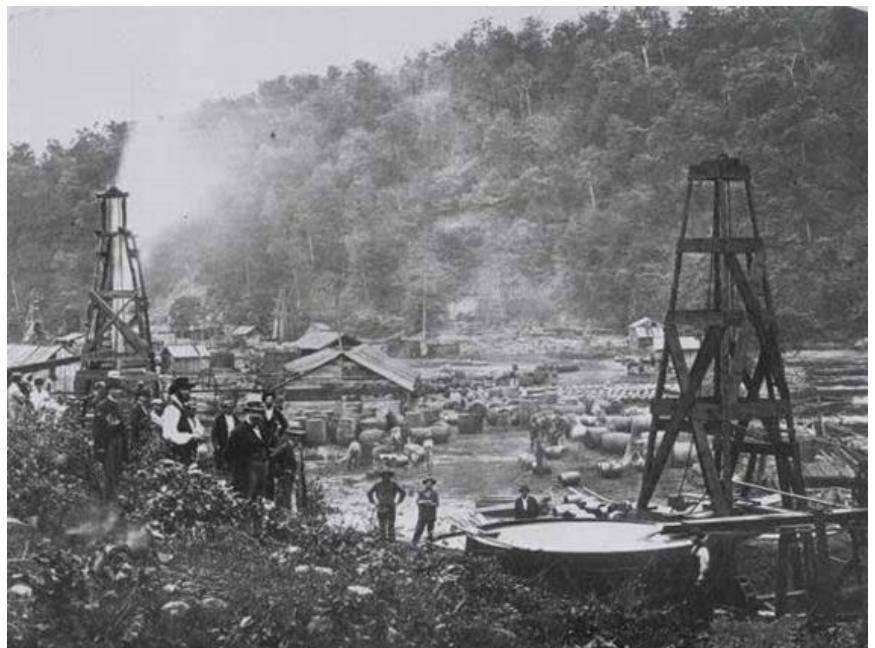
Reading

The world's first oil wells were drilled in China around the 4th century AD. The Chinese used simple bamboo poles to drill these wells. The dark, sticky material they extracted was then used primarily as a source of fuel. In later centuries, oil was found across Asia and Europe.

Sometimes it accumulates in natural pools above the ground. Travellers and settlers used the mysterious black liquid for fuel, as well as for medical treatment.

The modern oil industry began in the mid-19th century.

On August 27, 1859, Colonel Edwin Drake discovered the first underground oil reservoir near Titusville, Pennsylvania (USA), after drilling a well only 21 metres (69 feet) deep. The oil flowed easily. It was also easy to work with and distil.



This oil was known as a paraffin type of oil.

Drake worked for the Pennsylvania Rock Oil Company, which wanted to use the oil to light street lamps. Drake's well initially produced 30 barrels of oil per day (b/d). (One barrel is equal to 159 litres or 42 US gallons). Its success marked the beginning of the modern oil industry.

Oil soon began to receive more attention from the scientific community. After some research, a variety of products were eventually developed from crude oil. For example, kerosene for heating was one of the first products.

Soon other products (like gasoline and diesel to run engines) were also on the market. In 1890, the mass production of automobiles began creating a huge demand for gasoline and pushing companies to find more oil fields.

1. True/False/NG according to the text.

1. The Chinese used simple bamboo poles to drill these wells.
2. The modern oil industry began in the beginning of 19th century.
3. In 1990, the mass production of automobiles began creating a huge demand for gasoline and pushing companies to find more oil fields.
4. One barrel is equal to 159 litres or 42 US gallons.
5. Drake's well initially produced 60 barrels of oil per day (b/d).

2. Answer the questions according the text.

1. When and where Colonel Edwin Drake was discovered the first underground oil reservoir?
2. Who used simple bamboo poles to drill oil wells?
3. Where did Drake work?
4. When did the modern oil industry begin?
5. How much oil did Drake's well produce per day?

Language spot

a / an / the

*Bobir is **a** technician in **an** oil company.*

*There's **a** man in **the** control room.*

*Bobir speaks to **the** man by radio.*

***the** UAE, Iran, **the** US, and Uzbekistan.*

» Go to **Grammar reference**

Read the staff list and complete the sentences with a, an, the, or nothing.

Jizzakh Petroleum

Technical Department – staff list

Manager: Ikrom Akhmedov (Uzbekistan)

Technicians: Greg Ford (US)
Pierre Dupont (France)

1. Jizzakh Petroleum is _____ small oil company.
2. Ikrom is _____ manager in the company.
3. Ikrom is _____ manager of _____ technical department. He is from _____.
4. Pierre is _____ technician in _____ department. He is from _____ France.
5. Greg is _____ American technician.

Pronunciation

1. 🎧 Listen and repeat.

- | | | |
|---------------------------|---------|------------|
| 1. A, H, J, K | 4. I, Y | 7. U, Q, W |
| 2. B, C, D, E, G, P, T, V | 5. O | |
| 3. F, L, M, N, S, X, Z | 6. R | |

2. Say the letters in alphabetical order.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

3. Work in pairs. Ask and answer.

1. How do you spell your first name?
2. How do you spell your family name?

4. Ask and answer about words on this page.

Example

A. *How do you spell team?*

B. *T-E-A-M*

Number talk

1-199

1. Count 1-25 around the class.
2. Count in tens: 10,20,30, etc. to 90.
3. Study the information and say the numbers.

How to say numbers

Telephone and reference numbers

01238 = oh one two three eight

(0 = oh or zero)

Quantities

13 = thirteen 30 = thirty 33 = thirty-three

100 = a hundred (or one hundred)

101 = a hundred and one

4. Say these numbers

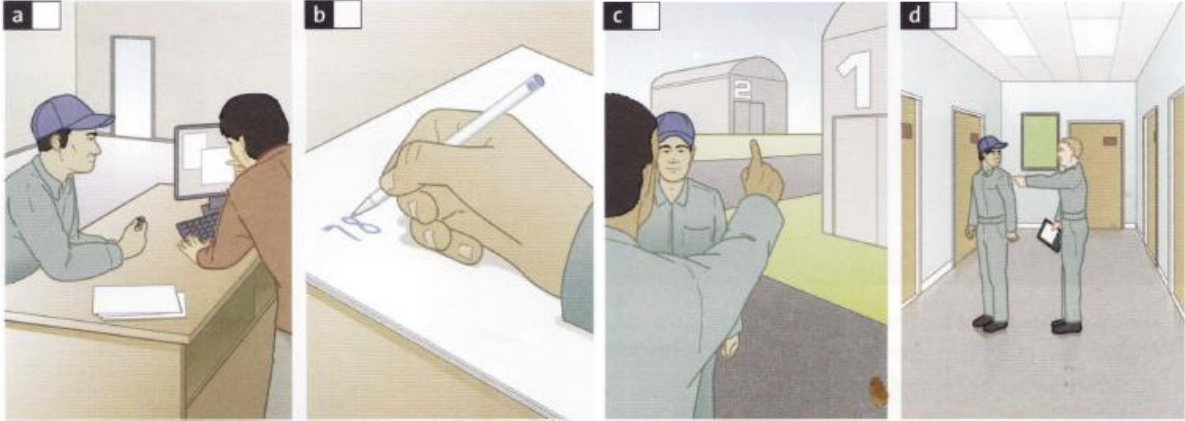




Listening

Conversations

1. 🎧 Listen to four conversations. Number the pictures.



2. 🎧 Listen again and complete the information.

1. The store is in building _____ in room _____
2. The technician needs _____ bolts.
3. The part number is _____.
4. His employee number is _____.
5. The store phone number is _____.

3. Look at the listening script on p.125.

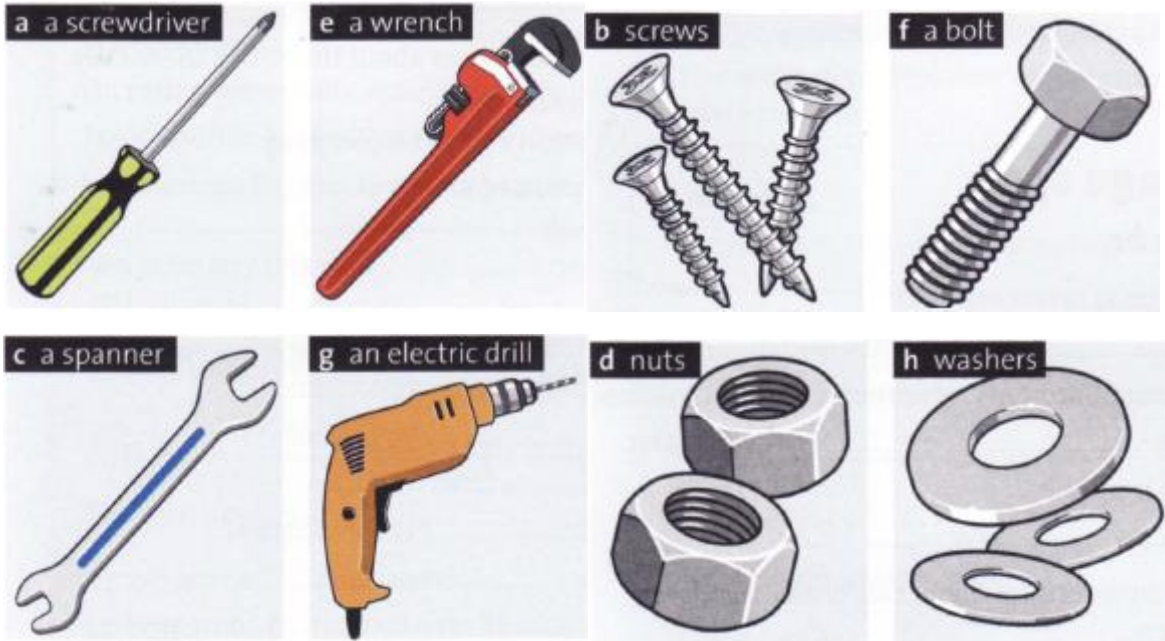
1. Do you understand it? If not, ask the teacher.
2. Work in pairs. Practise the four conversations.
3. Choose useful words or phrases to learn.

Useful phrases – getting repetition
Could you say that again, please? Sorry?
What's that again?

Vocabulary

Tools and hardware

1. Which of these do you have at home?



2. Practise this conversation.

A. *What's this in English?*

B. *It's a screwdriver.*

A. *What are these?*

B. *They're washers.*

3. Work in pairs. Point at the pictures, covering the labels, and have similar conversations.



Speaking

Checking

1. Look and listen. Then practice the conversation in pairs.

- A. What's in the box?
 B. There are some bolts.
 A. How many?
 B. Twenty.
 A. Good. What's the part number?
 B. PD790.
 A. What's that number again?
 B. PD790.
 A. The list says PD798. They're the wrong bolts.



Project

Work in small groups. Find out about some oil and gas employers in your country.

Ask people. Look on the internet.

Write a few sentences about them. Use these cues.

1. Company name
2. Information about the company

Useful words

big /small

IOC(International Oil Company) /NOC(National Oil company)

foreign / local

operating company /service company

3. Other information

Language spot

The verb be

» Go to **Grammar reference**

1. Study the tables in the Grammar reference then complete the conversations.

1. Where _____ you from?

- I _____ from Uzbekistan.
2. What _____ her nationality?
She _____ Chinese.
3. BP an American oil company?
No, it _____ American. It's British.
4. _____ Gazprom and Rosneft British companies ?
No, they _____. They _____ Russian.
5. Are you from the US?
No, we _____. We _____ from Uzbekistan.

2. Complete the questions about this book. Use *is there* and *are there*.

1. How many pages _____ in this book?
2. How many units _____?
3. _____ a word list at the back?
4. _____ a contents list at the front?
5. _____ six or eight pages per unit?

3. Ask and answer the questions above.



Writing

Completing a form

1. Read the information. Then write the dates in number form.

Writing dates

On forms, we usually write dates like this:

14/06/2010 or 14/06/10 or 14.06.2010 or 14.06.10.

In American English, the month comes first: *06/14/2010*

1. 4th February this year _____.
2. 17th November last year _____.

2. 🎧 You are starting a new job today: you are a fire officer in the Fire and Safety Department. Listen to your manager and complete the form.

Remember!

Names, titles, and nationalities begin with a capital letter.

First name _____

Family name _____

Employee no. _____

Manager _____

Department _____

Job title _____

Nationality _____

Date of birth (dd/mm/yyyy) _____

Telephone no. _____

Email _____

Signature _____

Date (dd/mm/yyyy) _____

Key words

Adjectives

foreign

international

offshore

onshore

Nouns

control room

drilling company

oilfield

oil well

operating company

plant

service company

team

technician

Verbs

operate

supply

Lesson 3. FACILITIES AND PROCESSES.

1. Match the definitions 1-6 and the highlighted words and expressions in the text.

1. Sectors	a. petrol / gasoline and diesel oil, for example
2. Upstream	b. oil under the ground, usually dark brown
3. Crude oil	c. bring out or make
4. Fuel	d. parts of an industry
5. Downstream	e. the part that gets oil and gas out of the ground
6. Produce—	f. the part that makes and sells useful products



Reading

The oil and gas industry facilities and systems are broadly defined, according to their use in the oil and gas industry production stream: Exploration Includes prospecting, seismic and drilling activities that take place before the development of a field is finally decided.

Upstream Typically refers to all facilities for production and stabilization of oil and gas. The reservoir and drilling community often uses upstream for the wellhead, well, completion and reservoir only, and downstream of the wellhead as production or processing. Exploration and upstream/production together is referred to as E&P.

Midstream Broadly defined as gas treatment, LNG production and regasification plants, and oil and gas pipeline systems.

Refining Where oil and condensates are processed into marketable products with defined specifications such as gasoline, diesel or feedstock for the petrochemical industry. Refinery offsites such as tank storage and distribution terminals are included in this segment, or may be part of a separate distributions operation.

Petrochemical These products are chemical products where the main feedstock is hydrocarbons. Examples are plastics, fertilizer and a wide range of industrial chemicals.

2. Answer these questions about the text.

1. What do scientists try to find?
2. Do drillers always find hydrocarbons?
3. What do companies do before development?
4. Why do they build pipelines ?
5. Which words mean
 - a. difficulties? pr _____
 - b. carry to another place? tr _____
 - c. move continuously? f _____

3. Cover this page and look at the flow chart. Make two sentences about each steps.

Example

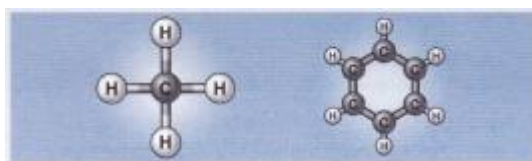
Step 1 is exploration. Scientists study...

How do oil companies find oil and gas?

The first step is exploration. Scientists study rocks and do scientific tests. They look for rocks that can hold hydrocarbons.

What are hydrocarbons?

Oil and gas are made of hydrogen (H) and carbon (C). So we call them hydrocarbons.



Do scientists find hydrocarbons?

No, they don't. They choose a good place for the next step: drilling. Drillers drill a well, and they sometimes find hydrocarbons.

Does production start immediately after drilling?

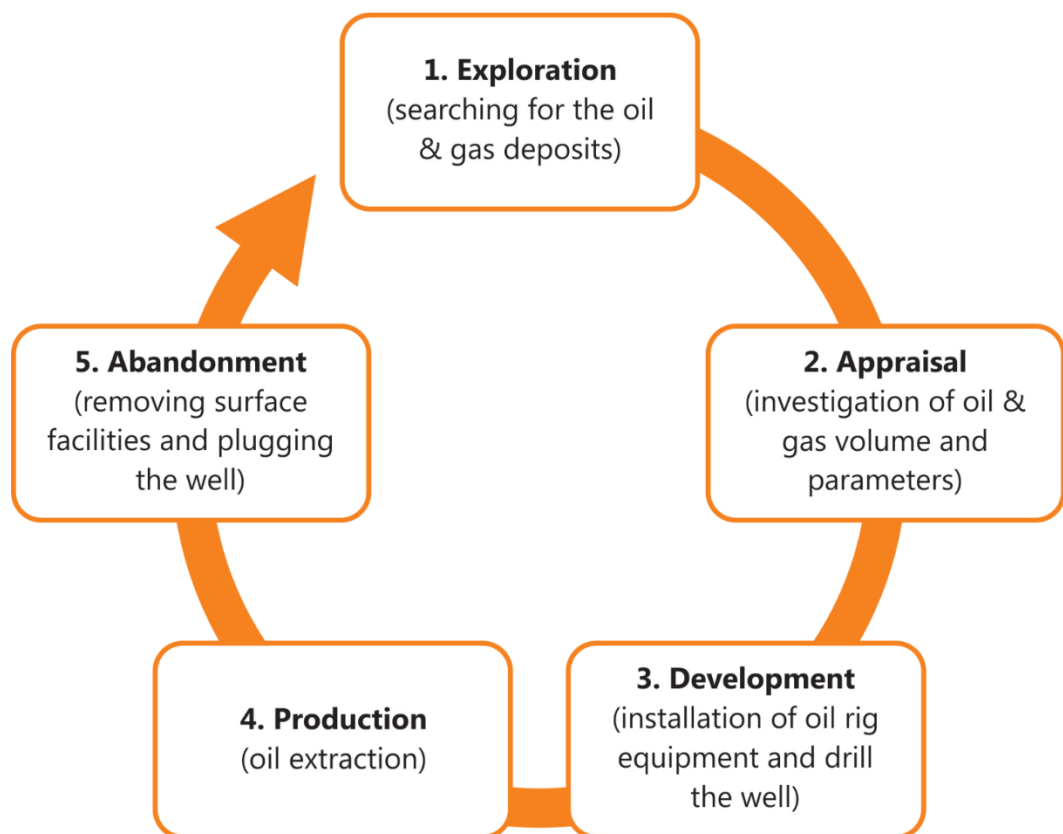
No. First the company does more tests and asks 'How much oil is there?' and 'Are there any problems?' If the results of the tests are good, they go to the next step: development.

What does development mean?

It means they prepare for production. For example, they build a pipeline to transport the oil.

How long does development take?

From a few weeks to many years. Then production starts. Crude oil and / or gas flow from the well and along the pipeline.



data (n) information, especially numbers
record (v) write data or enter data on a computer
skills (n) things that you can do well, for example, computer skills, languages, football

Vocabulary

Some upstream jobs

1. Match the jobs with the descriptions. Which jobs are in pictures in this unit?

Jobs

- | | |
|-------------------|---------------------------|
| 1. crane operator | 5. maintenance technician |
| 2. driller | 6. pipe-fitter |
| 3. geologist | 7. production operator |
| 4. geotechnician | 8. roughneck |

Descriptions

- a. studies rocks
- b. operates equipment to help geologists
- c. supervises a drilling crew
- d. works in a drilling crew under the driller's supervision
- e. operates a machine for lifting and moving heavy things
- f. fits pipes to make a pipeline
- g. services and repairs machines and equipment
- h. checks and operates production equipment



2. At which step or steps in the upstream process does each person usually work?

Look again at the flow chart on p.10.

Language spot

do and does, and Wh- questions

*Do you work outside? Yes, I **do**.*

*Does he test rocks? No, he **doesn't**.*

*I **don't** like working long hours.*

*He **doesn't** work in an office.*

1. Choose the correct words to complete the rules.

- | | | |
|--------|-------------------------|------------------------------|
| 1. Use | <i>do and don't</i> | with <i>I, you, we, they</i> |
| | <i>does and doesn't</i> | |
| 2. Use | <i>do and don't</i> | with <i>he, she, it</i> |
| | <i>does and doesn't</i> | |

2. Choose the correct word to complete the questions.

1. *Do / Does* roughnecks work in offices?
2. *Do / Does* a driller supervise a drilling crew?
3. *Do / Does* a production operator fit pipes?
4. *Do / Does* a well test operator test rocks?
5. *Do / Does* geologists test wells?
6. *Do / Does* maintenance technicians repair things?

3. Ask and answer the questions in 2.

Example

A. *Do roughnecks work in offices?*

B. *No, they don't.*

4. Can you say these words correctly?

How	Where	When
Which	Who	Why

5. Which two letters do they all have?

6. Make questions and answers. (You need one or two words for each gap.)

1. **A.** _____ Kamol work?
B. He _____ in Uzbekistan.
2. **A.** _____ he work for?
B. He _____ for a Uzbek oil company.
3. **A.** _____ many hours per day _____ you work?
B. I _____ eight hours a day.
4. **A.** _____ you start in the morning?
B. I _____ at seven o'clock.
5. **A.** _____ geologists do?

- B. They_____ rocks and do scientific tests.
6. A. _____ country_____ he work in?
B. He_____ in Russia.
7. A. Why_____ they like the job?
B. _____ it because the money is good.
8. A. How_____ oil companies find hydrocarbons?
B. _____ drill wells.



» Go to **Grammar reference**



Speaking

Talking about jobs

1. Work in pairs. Student B, answer Student A's questions about Akmal Zaripov.
Then ask about Andrea Farrell and complete the information.

	Akmal Zaripov	Andrea Farrell
		
Company	a Uzbek oil company	
Job	driller	
Where	Uzbekistan	
A typical day	supervise the drilling crew	
Hours per day	12	
Start and finish	7 a.m. to 7 p.m.	
Like	good money	

2. Student A, tell the class about Igor. Student B, tell the class about Andrea.

Example

Akmal Zaripov works for a...

He's a... in...

On a typical day,...

He works... hours

He likes...

Saying numbers

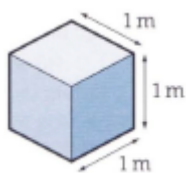
In American English, the and is sometimes left out: two hundred nine (209). In British English, the and is always used: two hundred and nine (209).

Number talk

Measuring oil and gas

1. Read the information and say the examples.

We can measure oil and gas in **cubic metres (m^3)**.



= 1 cubic metre (1 m^3)

Example

This field produces 100,000 cubic metres of gas per day (m^3/d).

We use **litres (l)** for small quantities.

$1 \text{ m}^3 = 1,000 \text{ l}$

Example

Oil flows through the pipe at 10 litres per second (l/s).

US **barrels (bbl)** is another common measure.

1 barrel = 159 litres

Example

This field produces 600,000 barrels of oil per day (bbl/d or bpd).

2. Say these quantities.

- a. 100 l b. 50 bbl c. 170 m^3 d. 12 l/s e. $28 \text{ m}^3/\text{hr}$

How to say large numbers

3. Read and say the numbers.

209 = *two hundred and nine*
 380 = *three hundred and eighty*
 3,000 = *three thousand*
 4,444 = *four thousand four hundred and forty-four*
 500,000 = *five hundred thousand*
 560,000 = *five hundred and sixty thousand*
 6,000,000 = *six million*
 7,000,000,000 = *seven billion*

4. Say the numbers that the teacher writes.

5. Work in pairs. Student A, look at p.106. Dictate the numbers to Student B.

Student B, listen and write the numbers.

6. Change roles. Student B, look at p.112.



Listening

Some big numbers

1. Look at the table and guess the approximate numbers.

Oil: the world uses...	a. _____ bbl/d
	b. _____ l/d
	c. _____ l/hr
Number of oil and gas fields in the world	d. _____
The biggest field (Ghawar)	
location	e. _____
size	f. _____
oil production (bbl/d)	g. _____



oil production (m ³ /d)	h. _____
gas production (m ³ /d)	i. _____

2. 🎧 Listen and complete the table in 1.
3. Make a sentence about each item in the table.

Project

Find out about oil and / or gas fields in your country. Then write about them, answering the questions.

1. How many fields are there?
2. Which is the biggest field?
3. Where is it?
4. How big is it?
5. How much oil and / or gas does it produce per day?



Writing

Spelling: *e* – the most common letter

1. The letter *e* is the most common letter in English.

Which of these words need an *e* at the end?

- | | |
|-----------------|------------------|
| 1. wher_____ | 5. operator_____ |
| 2. problem_____ | 6. company_____ |
| 3. writ_____ | 7. prepar_____ |
| 4. operat_____ | 8. pipelin_____ |

2. Which words need an *e* before the *s*?

- | | |
|-----------------|-------------------|
| 1. produc_____s | 5. supervis_____s |
| 2. work_____s | 6. ask_____s |
| 3. start_____s | 7. find_____s |
| 4. studi_____s | 8. lik_____s |

3. Say where the *e* must go.

Example

geologist: *between the first g and the o*

- | | |
|-------------|---------------|
| 1. oil fild | 5. drillr |
| 2. companis | 6. mony |
| 3. machin | 7. xploration |
| 4. equipmnt | |

4. Complete the words with *ee* or *ea*.

- | | |
|----------------|---------------|
| 1. upstr_____m | 5. n_____d |
| 2. w_____ks | 6. betw_____n |
| 3. thr_____ | 7. h_____vy |
| 4. sixt_____n | 8. w_____ring |

5. Work in pairs. Find words with e in this unit.

Ask How do you spell...?

Key words

Adjectives

downstream
upstream

Nouns

barrel
crane operator
cubic metre
development
driller
exploration
fuel
geologist
hydrocarbons
pipeline
production
rock
roughneck

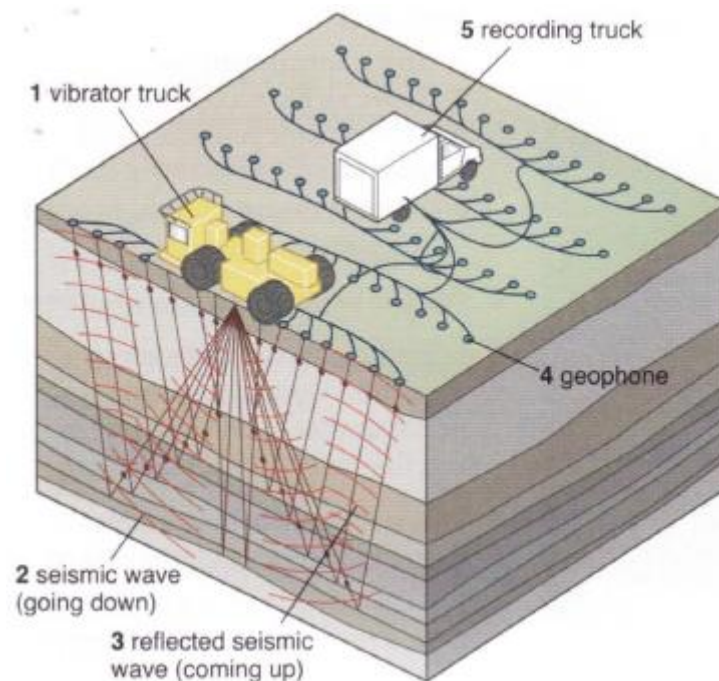
Lesson 4. EXPLORATION TECHNOLOGIES.



Reading

Seismic exploration

1. Where do you find an oil trap? What is in it and why?
2. Study this diagram. What do you think the trucks and the geophones do?



3. Read the text. Write T (true) or F (false).
 1. Oil companies make maps of the surface.
 2. Seismic waves can't go through rocks.
 3. Vibrator trucks make seismic waves.
 4. One rock layer reflects all the waves.
 5. Geophones send electrical signals to the recording truck.
 6. The geophones produce 3D maps.
4. The word they is in the text nine times. It can mean different things in different sentences. Find every they and say what it means.

Example

In paragraph 1, they means oil companies.

5. Look at the labels (1-5) in the diagram above and explain the process.

Begin: Vibrator trucks make seismic waves. The waves go...

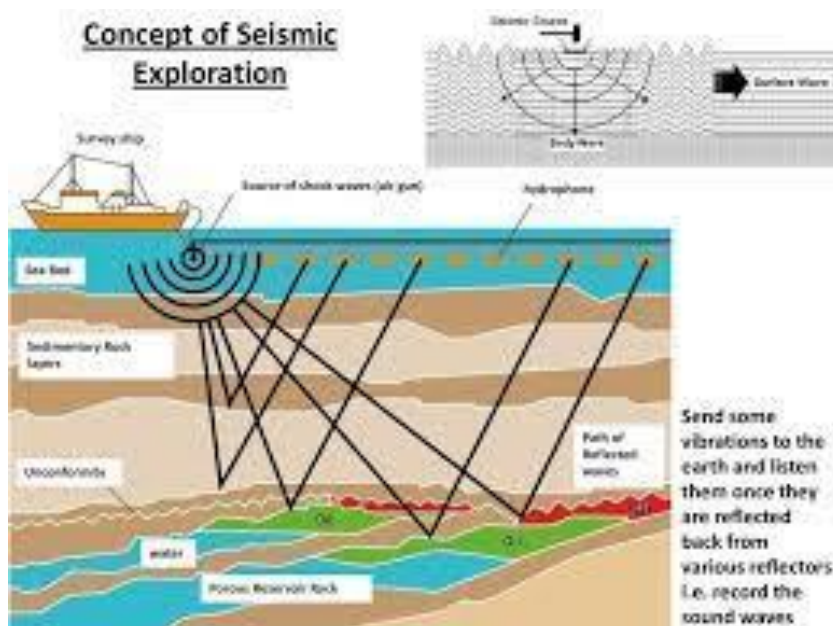
6. Look at the diagram of seismic reflection at sea and explain that process.

Exploration is almost like detective work. It requires looking for clues, careful observation of ground conditions, taking notes of different information and the evaluation of survey data. This is the job of petroleum **geoscientists**, who are experts on rocks.

Petroleum geoscientists working at oil companies begin looking for places where there might be oil. They look for signs that may indicate the presence of hydrocarbons underground and are responsible for determining the best places to drill.



They start by examining the shapes of different underground layers of rock. They have to use special tools in order to ‘see’ the rocks underground. Thus, using advanced technology— and special tools like aerial photography, satellite pictures and specialized machines that measure variations in the Earth’s gravity and magnetic fields — geoscientists try to identify likely crude oil fields.



Oil can also be found underground at the bottom of the sea. In this case, special ships are used to look for these underwater oil fields.

Geoscientists use several special technical tools – such as sound

waves used in **seismic technology** — to form a clear picture of underwater rock layers.

But the only way to be absolutely sure that there is oil in the ground is simply to drill a well. This is a big gamble because not all wells result in the discovery of oil. It may take the drilling of many different wells until a new oil field is found. This costs a large amount of money because sophisticated equipment is needed and many people need to be hired.

That is why the geoscientists then supply all their survey data to the economists and financial planners at the oil companies, who help make the decision whether or not to drill exploratory wells.

CPS (Global Positioning System) A GPS unit tells you your exact position on Earth. It can also show you the way to other positions, **sat nav (satellite navigation)** A sat nav unit uses GPS to show the way on a map. Many cars have these units.

Pronunciation

1. 🎧 Listen to these sentences. Underline the stressed words as in the example.

Example

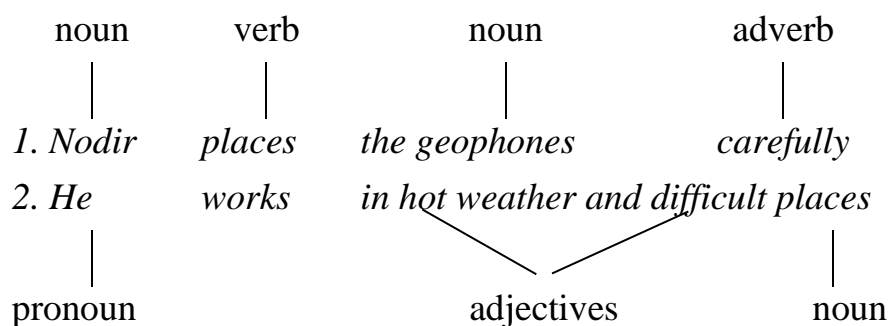
We must put the geophones in the right place.

1. That's very important.
 2. So we all have a GPS unit.
 3. The GPS tells you your exact position.
 4. We read the data carefully to get the position right.
2. Practise saying the sentences above.
3. In English, we stress the most important words (important = important for understanding). Is this the same in your language?
4. Which words would you stress in these sentences? Underline them.
1. This job can be hard work.
 2. You're walking a lot and carrying heavy things.
 3. So you must be fit.

4. I like the job.
 5. I like it for two reasons.
 6. I love being outside and seeing different places.
 7. And I like working in a team.
 8. And the money's good too.
 9. That's three reasons, isn't it?!
5. 🎧 Listen to the sentences in 4. Did you underline the same words? Discuss any differences

Language spot

Words in sentences



Nodir and *He* = the SUBJECT

geophones = the OBJECT in sentence 1

There are three kinds of sentence:

Questions (e.g. *Who is he?*)

Statements (e.g. *He is Nodir*)

Imperatives (e.g. *Stop!*)

1. What kind of word is each underlined word? What kind of sentence is it?

Example

Don't forget your GPS.

Forget is a verb. The sentence is an imperative.

1. Faisal usually does the work quickly.
2. He likes it, and the money is good.
3. It's very hot in the desert in summer.

4. Is my new radio in the truck?
2. Find examples of these rules in 1. Is the rule different in your language or the same?
 1. The subject is before the verb in statements.
 2. Adjectives are usually before nouns or after be.
 3. Adverbs are never between a verb and an object.
 4. The subject can be a noun or a pronoun, but we don't write both. *Nodir - he likes his job.*)
 5. Phrases about times and places usually go at the end of a sentence.
 6. Imperatives don't usually have a subject.
3. Look at the words in brackets. Where must we put them to make correct sentences?
 1. (porous) We find oil and gas in rocks.
 2. (reflect) Mirrors light waves very well.
 3. (badly) Black things reflect light waves.
 4. (every day) He works outside.
 5. (exact) What's your position?
4. In the sentences below, change the underlined words to the correct pronoun.

	Subject pronouns	Object pronouns
Singular	<i>I, you, he, she, it</i>	<i>me, you, him, her, it</i>
Plural	<i>we, you, they</i>	<i>us, you, them</i>

Example

Mr Azizov wants to talk to you and me. → He wants to talk to us.

1. Nodir is helping Ali and Khamid.
2. The drivers can talk to the man by radio.
3. My friends and I don't like hot weather.
4. Mr Ali has a message for me and all the technicians.

5. The woman in HR has the forms.

5. Put these words in the correct order to make sentences.

1. the / him / is / talking to / geologist
2. read / carefully / the / data / seismic
3. can / me / help / you ?
4. have / I / at the refinery / a job
5. job / a / good / and / it / it's / I / like

» Go to **Grammar reference**



Writing

Writing sentences

There are eight sentences in the paragraph below. Separate the sentences and write the paragraph correctly.

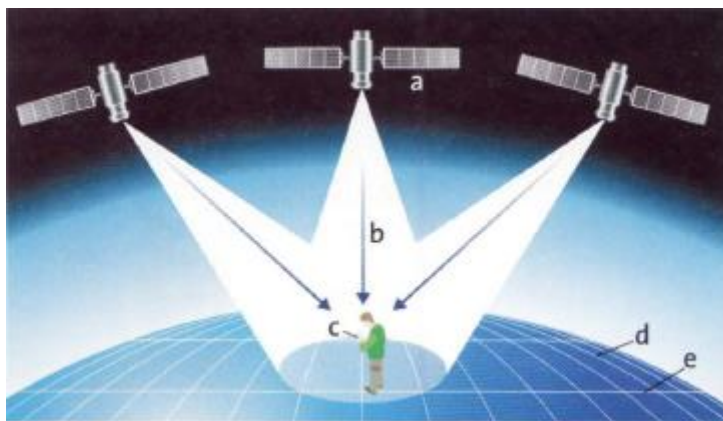
sentences always begin with a capital letter statements always have a full stop at the end questions have a question mark imperatives have a full stop or sometimes an exclamation mark why is this important it is important because it helps us to understand sentences some nouns always have capital letters too the names of people and places are two examples

Number talk

Global positioning

1. Match the words in the list with a-e in the diagram.

latitude longitude receiver satellite signal



2. Look at the screen of this GPS receiver. What do the following mean? Say them correctly.



3. Find these words in the glossary at the back of this book. Then complete the radio conversation.

bearing coordinates heading position waypoint

You What's your _____¹ now?

Faisal My _____² are 18.5415 degrees by 54.9220 degrees.

You How far is the next _____³?

Faisal Just 46 metres.

You What's your _____⁴?

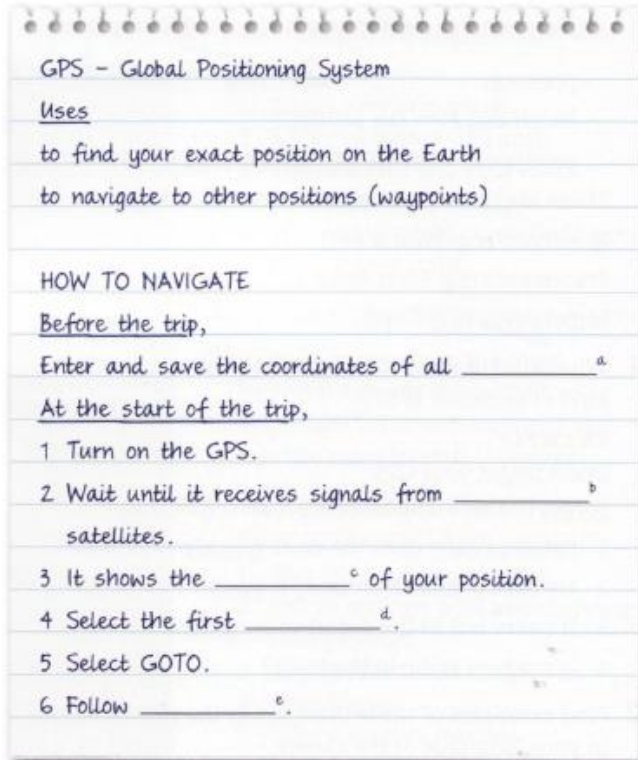
Faisal 347 degrees. But the correct _____⁵ is 322, so I must go left 24 degrees.



Listening

How to use GPS

1. 🎧 A trainee is learning how to use GPS. Read the notes, then listen to the trainer and complete the notes.



2. Work in pairs. Student A, cover the trainee's notes. Tell B how to use GPS, using the notes below.

Student B, listen and help if necessary. Then change roles.

NOTES

1. Before your trip,...
2. At the start of the trip,...
3. Wait until...
4. Then it shows...
5. Select ...
6. Select...
7. Follow...



Speaking

Discussing specs

1. Read the specs (specifications) and make a question about each one.

Examples

How many channels does it have?

What are the dimensions?

The T60 two-way radio

channels: 6

dimensions: 54 x 140 x 25 mm

weight: 190 g

colour: black



material: plastic

maximum range: 18 km

battery life: 36 hours

water resistant: no

shock resistant: yes

sand and dust resistant: yes

separate clip-on microphone: no

display screen: no

controls: channel selector knob, volume control, on/off switch, press-to-talk button

Useful language: dimensions

1m × 2m × 4m

= One metre by two metres by four metres.

Key words

Adjective

seismic

Nouns

bearing

coordinates

geophone

heading

layer

position

signal

truck

vibration

wave

waypoint

Verbs

convert

record

reflect

Look back through this unit. Find five more words or expressions that you think are useful

Lesson 5. DOWNSTREAM



Interesting facts

1. SO WHAT HAPPENS AFTER WE FIND OIL?

Once oil starts flowing, it needs to be extracted in large volumes and then taken to special sites where it is treated carefully before being transported internationally.

2. Crude oil is found and produced from a well. More hard work is needed in order to get the crude oil to the marketplace and to turn it into products that can be used easily by consumers.

3. The ***downstream sector*** is the part of the oil industry involved with purifying crude oil and refining it into different products.

5. The process through which crude oil is purified and treated to remove unusable substances is called refining. This process is also used to separate oil into different usable petroleum products.

4. It also involves the transportation and marketing of crude oil and its products.



1. Read and discuss the questions. Learn the **bold** words.

Reading

The downstream sector - what do you think?

Workers in the downstream sector make useful products from crude oil and natural gas. They **transport** these products and sell them.

1. Which of these things are made from oil or natural gas?



2. Can you name ten more things containing oil products?

3. Crude oil goes from the well to a **refinery**. Refineries **separate** crude oil into **light** and **heavy** products, such as petrol (light) and asphalt (heavy).

These men work at an oil refinery. Are they opening a valve or checking data?

4. Gas and oil products get to us by sea, by road, by rail, and by pipeline. This driver transports petrol by road to **petrol stations** (Am E = filling stations).

In this picture, is he **loading** or **unloading** petrol?



collecting data? / testing pipes

4. she now? / in the manager's office

talking to the manager? / waiting for him

5. We often use the Present Continuous for greetings and asking about progress, like the following examples.

1. *How are you doing?*

2. *How's it going?*

3. *How are you getting on?*

2 and 3 are usually about work or learning. 1 can be a general greeting. Some typical answers are

Fine, thanks.

OK, thanks.

OK, but I'm having trouble with...

Stand up! Greet three different people.

Vocabulary

Computers and control panels

1. Match the words with a-к in the pictures.

button

hand-held computer

keypad

screen

control panel

key

knob

switch

gauge

keyboard

mouse



2. Work in pairs. Use the table below to ask and answer questions.

What's the thing	above	the knob	on the left?
What are the things	below	the screen	on the right?
	next to		
	in		
	on		

Example

A. *What's the thing above the keyboard?*

B. *That's a screen.*

3. You are having problems. Make sentences with the verbs in brackets.

Example

The screen (not work) → *The screen isn't working.*

1. The screen (show) an error message.
2. The gauge (not work) properly.
3. The computer (make) a strange noise.
4. Some of the keys (not work).
5. The red light (flash).



Listening

Telephone calls and messages

1. What do you think people do in these departments in a company?

Technical Support

Human Resources (HR)

2. 🎧 Listen to conversation 1. Write T (true) or F (false).

1. Omar wants to speak to Mike.
2. George is not working today.
3. There is a problem in the control room.

3. Mike is reporting the phone call. Is the information correct?



4. 🎧 Listen again. Then report the call, but give more information.

5. 🎧 Listen to conversation 2 and find the mistake in this written message.



Writing

Messages

1. Write messages for George in Technical Support, like the example.

(Notice the changes: *I* → *he*; *him* → *you*.)





2. Write messages for Karim Otabekov in Human Resources.



Speaking

Making and taking calls

1. Choose the correct words.

A. *Goodbye / Hello*¹. Technical Support.

B. Hi. Is *it / that*² Olim?

A. No. *This / That*³ is Ali speaking.

B. Can I *speak / say*⁴ to Oilm, please?

A. He's *talking / talks*⁵ to the manager right now. Can I take / get⁶ a message?

B. Yes. *This / That*⁷ is Andrew Watts at I from⁸ Human Resources.

A. Andrew Watts *at / from*⁹ HR.

B. Yes. I want to talk to George *about / on*¹⁰ the new computers for our office.

B. What's your *phone number / number phone*¹¹?

A. 3745.

B. OK. *I'll give /I give¹²* him the message.

A. *Thank / Thanks¹³* you.

2. Work in pairs. Practise the conversation.

3. Work in pairs. Student A, you work in Technical Support. Go to p.107. Student B, you work in Human Resources.

Conversation 1

Phone George in Technical Support. Thank him for repairing your computer. It is working well.

Conversation 2

Answer the phone. The caller wants Faisal Hamdi, but he is having lunch.

Complete this message.

Message	
To:	_____
From:	_____
Of: (company/department):	_____
Message:	_____ _____ _____ _____
Date:	_____ Time: _____



Reading

NEWS

1. Work in two groups, A and B. Read your group's news item. Find answers to these questions.

1. What is going up? Where?

2. Why?

PETROCHEMICALS – A CHANGING WORLD

The top producers of petrochemicals are countries in North America and Europe. But this is changing. Now many countries in Asia and the Middle East are building new petrochemical plants, and petrochemical production is going up fast in these countries.

Saudi Arabia, for example, is hoping to be the number 3 producer in the petrochemical world in 2025.

This is good business because petrochemicals sell at higher prices than crude oil. It is good for employment too. Populations in Asia and the Middle East are going up, so these countries need new jobs for their young people.

GAS – GOING UP

Oil and gas companies are planning to increase world gas production by 50% before 2030.

Big gas producers like Russia, Saudi Arabia, Qatar, Iran, and the UAE are increasing their production fast. Gas production in Africa, Europe, Asia, and the Americas is growing too.

Why are they doing this? Gas is becoming more important for many reasons. Petrochemical plants use a lot of gas, and the petrochemicals industry is growing. Oil is very expensive, so many other industries prefer gas too. CO₂ is bad for the environment, and gas produces less CO₂ than oil so many power stations around the world are changing their fuel from coal to gas.

2. Tell the other group about your news item.
3. Look at these sentences from the news items. Then complete the sentences below about yourself.

Saudi Arabia, for example, is hoping to be the number 3 producer in the petrochemical world in 2025.

Oil and gas companies are planning to increase world gas production by 50% before 2030.

1. I'm hoping to...
2. I'm planning to...

Pronunciation

1. 🎧 Listen and underline the stressed part in these words.

Two-part words	Three-part words	Longer words
1. Europe	7. company	16. petrochemical
2. Qatar	8. industry	17. environment
3. business	9. Africa	18. refinery
4. because	10. example	
5. Iran	11. producer	
6. prefer	12. important	
	13. UAE	
	14. CO ₂	
	15. Middle East	

2. Practise saying the words above correctly.

3. Can you say these words correctly?

Two parts	Three parts
1. countries	8. expensive
2. prices	9. Arabia
3. people	10. employment
4. before	11. increasing
5. produce	12. separate
6. reasons	13. chemicals
7. per cent (%)	14. ethylene

- 🎧 Listen and check.

4. Work in pairs. Take turns reading sentences from the news items aloud. Use the correct word stress.

Number talk

Calculating



1. Match the words with the keys on the calculator.

1. plus /add
2. minus / subtract
3. times / multiplied by
4. over / divided by
5. equals
6. per cent
7. point
8. square root

2. 🎧 We can do simple calculations in our heads. Listen and write the calculations.

Example

A. *What's seven point two five times three?*

B. *That's twenty-one point seven five.*

You write: $7.25 \times 3 = 21.75$

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | |

Check the calculations. Are they correct?

3. Look at the calculations in 2 and practise the conversations.

4. Say the calculations for these questions.

1. Li is working three twelve-hour night-shifts this week. How many hours is she working this week?
2. A petrol tanker has 18,500 litres of petrol in it now. It can carry 30,000 litres on the road. How much more petrol can the driver load into the tanker?
3. How many 8,000-litre tanks do you need for 32,000 litres of oil?

4. A refinery produces 6.2 million litres of petrol per day and 10.75 million litres of other products. What is the total daily production?

Key words

Adjectives

heavy

light

Nouns

chemical

department

Human Resources

petrochemical

processing plant

product

refinery

shift

Technical Support

valve

Verbs

load

separate

unload

Look back through this unit. Find five more words or expressions that you think are useful.

Lesson 6. SAFETY EQUIPMENT

1. Point to these parts of your body. Say and learn:

ears eyes face feet fingers hands head

2. Look at the personal protection equipment (PPE). Complete the sentences below.



1. A hard hat protects your _____.
2. A face guard protects your _____.
3. Boots protect your _____.
4. _____ protect your ears from noise.
5. _____ protect your hands.
6. _____ protect your eyes.
7. A _____ protects you from smoke and dangerous fumes.
8. A _____ protects you from a fall.

3. Look at the pictures in this unit. What PPE are the people wearing?



Reading

Safety signs

1. Talk about the signs. Use these words.

COLOURS

black blue green red white yellow

SHAPES

O a circle  a rectangle  a square Δ a triangle

Example

It's a blue and white circle.



2. Read the text about safety signs. Write these four headings in the correct places.

- a. Green and white squares or rectangles
- b. Black and yellow triangles
- c. Red and white circles
- d. Blue and white circles

Safety signs: colours and shapes

Safety signs are very important because the oil and gas industry has many hazards. (*Hazards* = possible dangers like electricity, chemicals, hot things, gas, machines, noise, falling objects, and slippery surfaces).

There are four main kinds of safety sign:

1. _____.

These signs warn us about hazards. The signs give warnings like *Danger!* *Overhead crane* or *High voltage*.

2. _____.

These signs usually have a red band across them. They tell us we must not do things. For example *Do not smoke here* or *Do not switch off this machine*.

3. _____.

These signs tell us “You must wear or do the thing in the picture”. For example *Wear goggles* or *Read the instructions before you use the machine*.

4. _____.

These signs give information about safety. For example, they tell us *This way to the emergency exit* or *Lifejackets are here*.

3. What does each sign mean in 1?

Example

Sign number 1 means “Wear goggles”.

4. Look at the list of hazards in paragraph 1. Say why they are hazardous.

Example

Electricity can give you a dangerous shock.

Useful words

noun

shock

verbs

burn cut damage

hit injure poison



Speaking

What does it mean?

1. Work in pairs. Practise this dialogue.

A. *What does the blue sign mean?*

B. *Which one?*

A. *The one with a man and a book. Can you see it?*

B. *Yes. That means “Read the instructions before you use the machine”.*

2. When you have finished

1. check your spelling

2. underline and learn the new words.



attach (v) fit together

estimate (v) calculate approximately

prepare (v) make ready

1 tonne = 1 metric ton = 1,000 kg

1 ton (Am E) = 2,000 lbs

1 ton (Br E) = 2,240 lbs

Number talk

Weights and measures

1. Write these abbreviations next to the correct words.

cm g k km m mm t

1. grams _____ 5. centimetres _____

2. kilos _____ 6. metres _____

3. tonnes _____ 7. kilometres _____
 4. millimetres _____

2. Can you pronounce these words correctly?

What's the ... ?

How... is it?

length

long

width

wide

height

high

depth

deep

weight

heavy

speed

fast

🔊 Listen and check.

3. Say what we use these measures for.

Example

(length) *We measure the length of pipes and cables.*

4. Look at the pictures in It's my job. Estimate the length, width, and weight of the pipe, and the height of the rig.

Example

A. *How long is the pipe?*

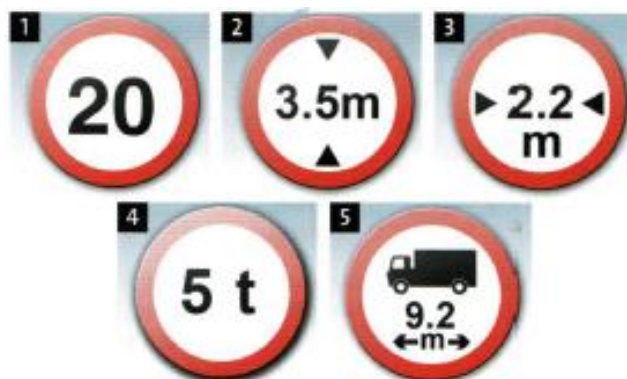
B. *About two metres, I guess. What do you think?*

A. *Maybe 2.5 metres.*

5. Say what these signs mean.

Example

1 Maximum speed twenty kph.



Vocabulary

Which kind of word?

1. Read the sentences. Which **bold** words are

a. nouns? b. verbs? c. adjectives?

1. He's a **good** crane operator.

2. He **operates** a crane.

3. He is **Uzbek**. He **lives** in **Uzbekistan**.

2. Write the words in the correct places in the table.

calculate

driller

hazard

protect

safety

wide

Nouns	Verbs	Adjectives
width		1
2		safe
3		hazardous
protection	4	
calculator, calculation	5	
drill,6	drill	

3. Choose the correct word.

1. This old machine isn't *safe* / *safety*.

2. He's an *Italy* / *Italian* engineer.

3. Can I use your *calculate* / *calculator*, please?

4. Refineries *produce* / *product* useful things from crude oil.

5. There are *hazards* / *hazardous* in my job.

6. How *depth* / *deep* is the well?

7. This company is a good *employ* / *employer*.

Learning words

When you learn a new word, always think *Which kind of word is it?*

4. What other questions can you ask about words?

1. ...mean?
2. ... pronounce it?
3. ... a noun or a verb?
4. ...spellit?
- 5 ... stressed part?

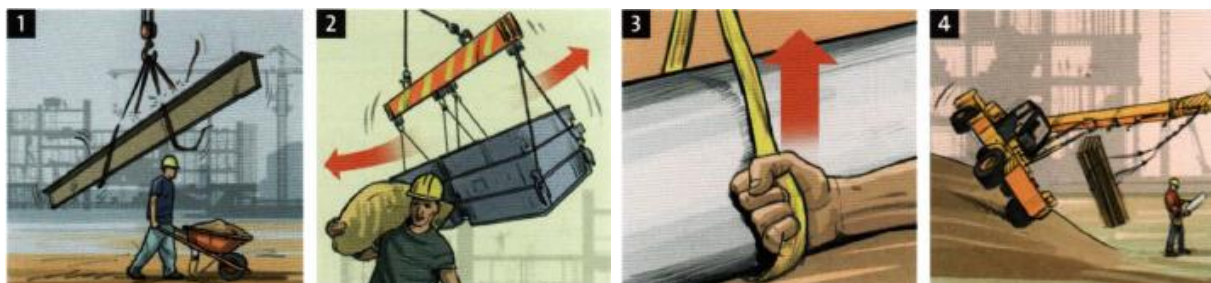
Look at the glossary at the back of this book. Which of these questions does it answer?



Listening

A toolbox talk

1. What is happening in the four pictures?



2. 🎧 Listen to a supervisor talking to trainees about safety. Which hazards in **1** do they talk about?

3. 🎧 Can you complete the rules? Listen again and check.

1. _____ under the load.
2. _____ to stop a swinging load.
3. _____ where you put your hands.
4. The hand signal for Emergency stop is



5. _____ always have radio contact with the crane operator.
4. How can you warn the men in pictures 1-4?

Example

1. *Look out! The load's falling!*

Language spot

Modal verb: can

1. Study this table and complete the conversation.

I	can	lift 70 kilos.
He	can't	
<div style="text-align: center;"> </div>		
Can	you	lift 70 kilos?
	he	

- A. _____¹ the crane lift 25 tonnes?
- B. No, it _____². It _____³ lift 25 tonnes, but it
 _____⁴ lift 20 tonnes.



2. Work in pairs. Have similar conversations.
1. Can the tank hold 600 litres?
 2. Can the bridge take a six-tonne truck?

3. Can the helicopter lift 7,000 kilos?
4. Can the crane do 30 kph?



3. Study situations 1 and 2. What can you say in situations 3-6?

1. asking permission



2. asking for help



3. You want to use your friend's phone. Ask him.
4. You are very hot. You want to take off your PPE. Ask the supervisor.
5. You must carry a heavy pipe. Ask someone to help you with it.
6. You don't know how to use the safety harness. Ask the supervisor to show you.

Modal verb: must

4. Explain these notices with *must* or *mustn't*.

Example

You mustn't touch these switches.



Writing



Spelling and notices

1. Add vowels (a, e, i, o, u) to make words.

1. pr_____tect
2. faceg_____rd
3. s_____rf_____ce
4. d_____ng_____r
5. _____m_____rg_____ncy
6. c_____rcl_____
7. tr_____ngl_____
8. r_____ct_____gl_____
9. h_____z_____rd
10. t_____ _____ch

2. Your boss wants you to write short safety notices (3-5 words maximum). Read his instructions.

1. Where should you put each notice?
2. Write big notices like the notices on p.26.

1. "This surface is slippery. We don't have a sign, so we must write a notice. Can you write it, please?"
2. "This machine isn't safe, so people mustn't use it. Put a notice there, please".

3. “Some boxes are blocking the fire exit. We mustn’t block fire exits. Move the boxes and put a notice up”.
4. “Some visitors don’t wear hard hats. They think that visitors don’t need hard hats. But they must wear them”.



Key words

Adjective

slippery

Verbs

damage rule

injure

protect

warn

Nouns

crane

emergency

fumes

hazard

rigger

safety

shock

sign

signal

Look back through this unit. Find five more words or expressions that you think are useful.

Lesson 7. DRILLING. TYPES OF RIG.



Reading

Read the information and identify the types of rig shown in the picture.

There are many varieties of drilling rig suitable for different conditions. To decide what kind of rig to use you have to think about different factors. An important factor in offshore drilling is the ocean depth.

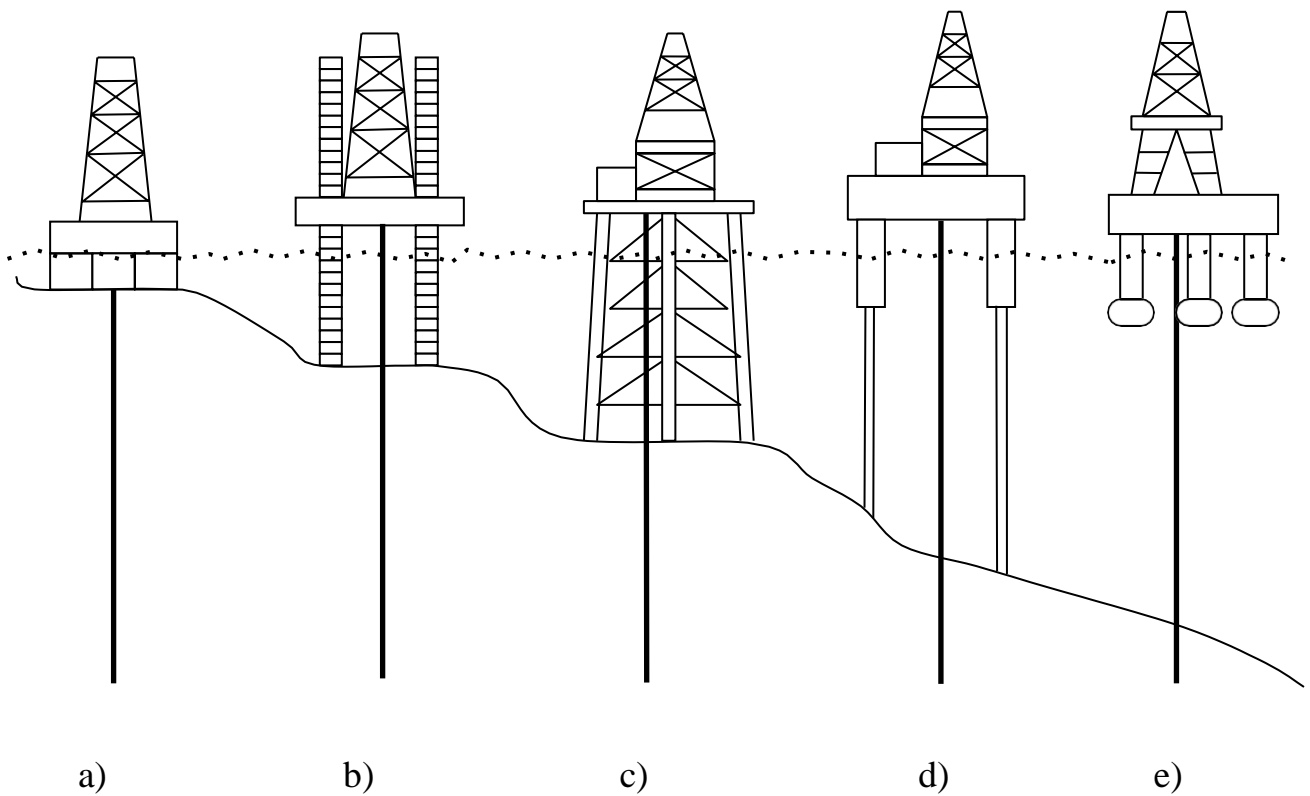
Fixed Platform: this kind of rig is suitable for deeper waters (usually 50-300 feet). It is a permanent structure with the drilling rig installed on an underwater jacket (steel structure).

Barge Type: this kind of rig is a flat bottomed barge, suitable for shallow waters. The derrick is over a moon pool in the centre of the barge.

Semi-submersible: this kind of rig is suitable for deep water operations (usually 200- 1,500 feet). The rig is supported by floating pontoons submerged under the water.

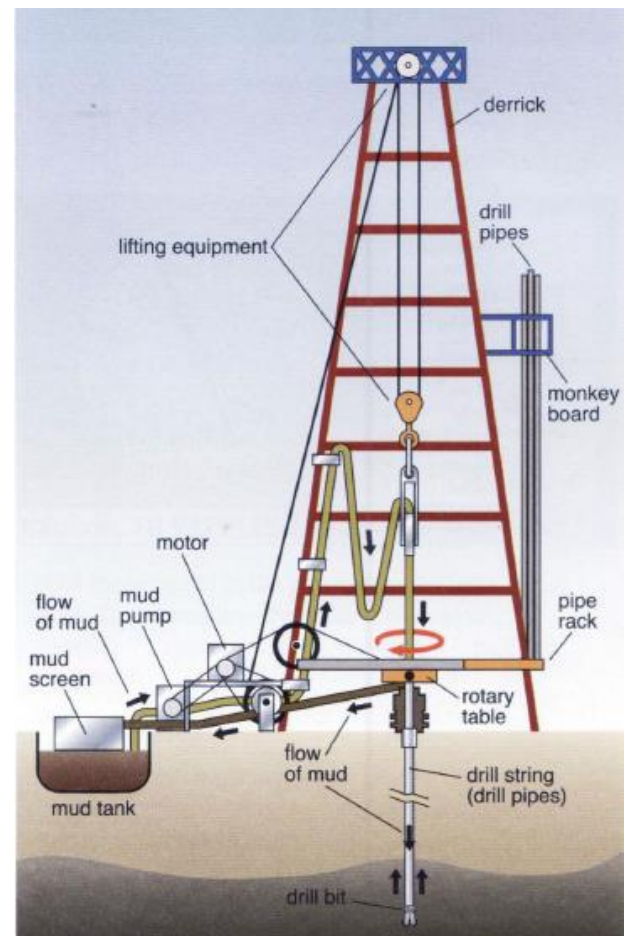
Tension Leg Platform: this kind of rig is similar to a semi-submersible rig but it is attached to the ocean floor by tensioned steel cables.

Jack up: this kind of rig is suitable for shallow to medium waters. It has supporting legs that can be raised, or „jacked up“, when it moves to another location.



1. Study these simplified diagrams and the words. Then discuss the questions below.

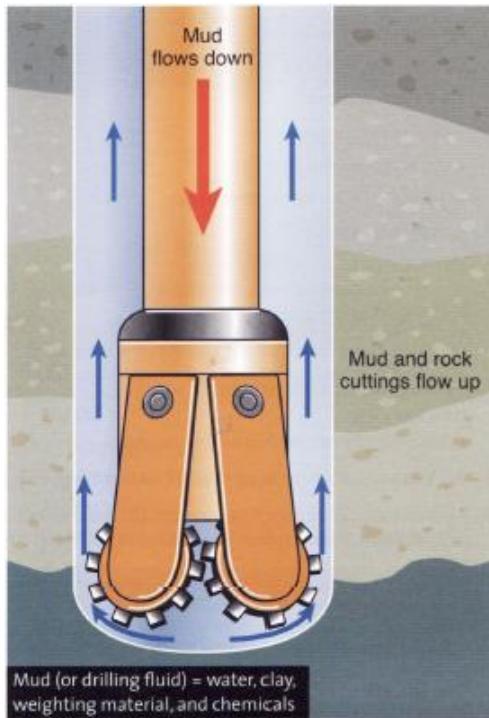
1. Which part rotates and drills through rock?
2. What is between the bit and the surface ?
3. Where do the pipes stand before they go into the hole?
4. What tall thing supports the lifting equipment and the drill string?
5. What does the rotary table do to the drill string?
6. What is mud?
7. Which machine sends mud down



to the bit?

8. What comes up to the surface with the mud?

9. For deep wells, the derrick must be very strong. Why?



2. Complete the description of the mud process.

Use words from the diagrams.

Drilling mud is a mixture of water, clay, and other materials. The _____¹ pumps mud from the _____² into the top of the drill string. The mud flows down inside the _____³ to the bit. It cleans and cools the _____⁴. Then it flows up the hole and carries _____⁵ up with it. The mud and cuttings go to the _____⁶. The mud screen separates the cuttings from the mud. The mud flows through to the _____⁷ below.

3. 🎧 Listen and check your answers above.

4. Can you guess: how deep is the deepest well in the world? Find out later in this unit.

Reading

A drilling crew

1. Read the text. Then answer the questions. Which person / people

1. are usually the youngest and most junior?
2. is usually the oldest and most senior?
3. need to be strong? Why?
4. is not afraid of high places?
5. must watch gauges or screens carefully? Why?
6. needs a desk and a telephone? Why?

2. Choose the correct words. Explain your choices.

1. Roustabouts do_____work.
a. skilled b. hard c. desk
2. Roughnecks usually prepare the_____.
a. drill string b. mud c. hole
3. Derrickmen should wear_____.
a. face guards b. glasses c. a safety harness
4. The driller helps the crew to_____.
a. learn b. clean equipment c. lift things
5. The rig manager_____new equipment.
a. makes b. repairs c. orders

People in a typical drilling crew.

Roustabouts are often the youngest people in a drilling crew. They clean, maintain, and move equipment and help the other workers. Roustabouts want better jobs, so they work hard, listen carefully, and learn fast.

Roughnecks are like roustabouts, but they are more skilled. They work on the drilling floor. They connect the heavy drill pipes and put them into the hole, or



they disconnect the pipes as they come up out of the hole.

The **derrickman** works high up on the monkey board about 25 metres above the floor. He guides the top part of the drill pipe. At other times, he helps the mud engineer (or “mud man”): he checks the mud and maintains the pump. The mud must not be too thick or too thin, and the pump must keep working.

The **driller** supervises and trains the drilling crew, and he controls the drilling equipment. For example, he operates the motor that lifts the drill pipes. He controls the speed of the drill, which must not be too fast or too slow. On very

modern rigs, the driller sits in a special driller's chair. The chair has joystick controls and display screens - like a computer game.

The **rig manager** or **toolpusher** is the most senior person in the drilling crew. He is usually the oldest and most experienced person too. He makes sure the crew has all the right equipment. He is responsible for their safety and for paperwork



The **mud pump** is one of the largest and heaviest parts of a drilling rig, and one of the most difficult parts to transport.

Listening

Problems and solutions

1. Can you give some examples of thin fluids and thick fluids?

Examples

Thin Thick

water honey

2. What is drilling mud and what does it do? Use the words in the list.

Nouns

bit clay cuttings mixture water

Verbs

bring clean cool lubricate

3. 🎧 Listen to these conversations at a drilling rig and complete the problems.

Problem 1 _____¹ aren't coming up to the surface

Why? The mud is too thin

Solution Make it thicker

How? Add _____² kilos of clay

Problem 2 The _____³ is very noisy.

Why? The mud is too_____ ⁴.

Solution Make it thinner.

How? Add_____ ⁵ litres of water.

Problem 3 The drilling floor isn't _____ ⁶.

Why? There's a lot of _____ ⁷.

Solution _____ ⁸ the floor

How? With _____ ⁹.

4. 🎧 Listen again and complete all the information.

Language spot

Adjective forms

1. Match the opposites.

- | | |
|--------------|---------------|
| 1 thick | a narrow |
| 2 long | b light |
| 3 heavy | c thin |
| 4 wide | d low |
| 5 noisy | e short |
| 6 big | f cold |
| 7 deep | g small |
| 8 high | h weak |
| 9 strong | i shallow |
| 10 hot | j quiet |
| 11 difficult | k approximate |
| 12 important | l safe |
| 13 dangerous | m easy |
| 14 exact | n Unimportant |

2. Read the examples and answer the questions,

a. *The mud is **too thin***

b. *The mud isn't **thick enough**.*

c. Make it **thicker**.

d. Make it **more** viscous.

1. Which sentences have the same meaning?
2. Why do we say *thick + er* but *more + viscous*?

» Go to **Grammar reference**

3. Complete the conversations about problems.

1. Problem: a small wrench

A. The wrench isn't _____.

B. We need a _____ one.

2. Problem: a short bolt

A. The bolt is _____.

B. I'll get a _____ one.

3. Problem: a dangerous job

A. This job is _____.

B. Yes. I want a _____ job.

4. Problem: cold water

A. The water isn't _____.

B. It should be _____.

5. Problem: a narrow walkway

A. The walkway is _____

B. We must make it _____

4. Complete the questions, changing the word in brackets to *more* + adjective or adjective + *-er*.

1. Which is (difficult): maths or English?
2. Which is (long): a kilometre or a mile?
3. Which is (important): speed or safety?
4. Which is (cold): Canada or the USA?
5. Which is (dangerous): fire or H₂S gas?
6. Which is (big): Russia or China?

Now discuss the questions.

5. Read the examples and answer the questions below.

The comparative form (-er / more):

Who is **older**: Jack or Hamid?

And who is **more experienced**?

The superlative form (-est / most)

Who is **the oldest** person here?

Who is **the most** senior person in the crew?

1. Which form compares only two things?
 2. Which form means “Number 1” of many things?
6. Complete the sentences. Use the superlative form of the adjectives in the list.

big deep dirty experienced junior old

1. Roustabouts are the _____ people on an oil rig and they do the _____ jobs.
2. The toolpusher is usually the _____ and the _____ person on a rig.
3. The _____ well in the world is 10,685 metres. The well is in the Gulf of Mexico and belongs to BP, one of the _____ International Oil Companies.

Pronunciation

1. 🎧 Listen to these words. Can you hear the /r/ sound? Underline the r if you can hear it. If the r is silent, cross it out.

- | | | | |
|---|-----------|---|---------|
| 1 | roughneck | 5 | crew |
| 2 | dirty | 6 | operate |
| 3 | senior | 7 | control |
| 4 | older | 8 | heavier |

2. Look at these words and tick (/) the correct boxes.

letter r + sound	examples	/r/	/r/
r +vowel sound	<i>drill, strong</i>	✓	—
r +consonant sound	<i>hard, works</i>		



Speaking

Giving safety advice

1. The pictures are from a safety manual for drilling crews. Which person is

- | | |
|---|---|
| 1. wearing loose clothes? | 8. using a broken tool? |
| 2. standing under a load? | 9. climbing without a safety harness? |
| 3. running up or down steps? | 10. doing the right thing: lifting correctly and keeping his back straight? |
| 4. eating near chemicals? | |
| 5. handling chemicals without PPE? | |
| 6. walking below people working? | |
| 7. standing between a wall and a moving load? | |

2. Say what might happen in each situation.

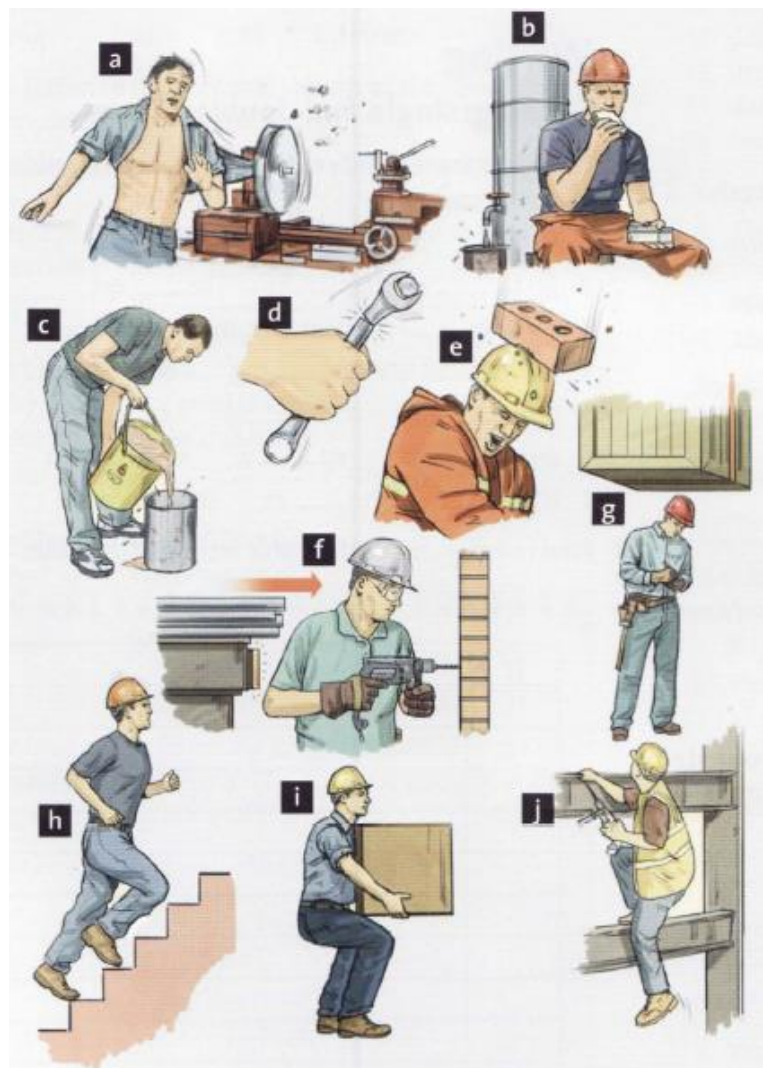
Example

Machines might catch his loose clothes and injure him.

3. Work in pairs. You work in a drilling crew. You are looking after a new person in the crew. Take turns advising him.

Example

You shouldn't wear loose clothes because machines might catch them



Vocabulary

Understanding instructions

1. Underline the verbs that tell you what to do.

Example

I want you to load the truck.

1. Clean the floor.
 2. Climb up to the monkey board.
 3. You need to tighten that loose bolt.
 4. I want you to dig a hole.
 5. Those boxes shouldn't be on the floor. Move them now.
 6. Unload those pipes from the truck.
 7. See those pipes? Stack them on the rack.
 8. Guide the pipe into position.
 9. Today you're painting the tank.
 10. Connect the new hose to the pump.
 11. Pour this chemical into the pipe.
 12. The bit might be damaged. Inspect it carefully.
2. Explain or mime the meaning of each underlined verb.
 3. Work in pairs. Student A, say instructions. Student B, say "OK" and mime the action.

Project

1. Read the questionnaire. Discuss the reasons for each question.
2. Which are the three most important questions? Give your opinion.

The screenshot shows a web browser window with the address bar displaying <http://www.oiljobs.com/quiz.html>. The page title is "Is drilling the job for you?". Below the title is a table with two columns: "My partner" and "Me". Each column contains 12 rows of questions, each with three radio buttons labeled 3, 2, and 1. The questions are numbered 1 through 12. At the bottom of the table, it says "TOTAL out of 36".

	My partner	Me
1 Do you like working outside?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
2 Can you work outside in very hot or very cold weather?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
3 Are you good at operating and repairing machines?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
4 Do you like working in a team?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
5 Can you listen carefully and follow instructions?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
6 Can you teach other people how to do things?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
7 Are you strong?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
8 Are you happy about climbing and working high up?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
9 Is shift work OK for you?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
10 Are you a non-smoker?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
11 Are you careful about safety?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
12 Can you live away from your family and friends?	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1	<input type="radio"/> 3 <input type="radio"/> 2 <input type="radio"/> 1
TOTAL out of 36		

3. Work in pairs. Ask and answer the questions. (3 = Yes; 2 = Maybe; 1 = No)
Then add up your score. Is drilling the job for you and your partner?

Key words

Adjectives

thick (= viscous)

thin

Nouns

derrick

derrickman

drill bit

drill string

motor

mud

pump

roustabout

toolpusher

Verbs

connect

disconnect

guide

tighten

Look back through this unit. Find five more words or expressions that you think are useful

Lesson 8. OIL PIPELINES



Interesting facts

4. All large modern oil fields have direct connections to major pipelines. Without these pipelines, it would be impossible for oil and oil products to reach consumers.

1. Oil pipelines are made from steel. They usually have an inner diameter of about 10 to 120 cm (about 4 to 48 inches) and can run for hundreds or thousands of kilometres.

2. Advances in technology are constantly improving the size and strength of these pipelines.

5. ROADS AND RAILWAY

Oil products are also transported from storage centres to distribution areas on specialized railway tankers and trucks. These are large, long and have special storage units to protect against accidents.

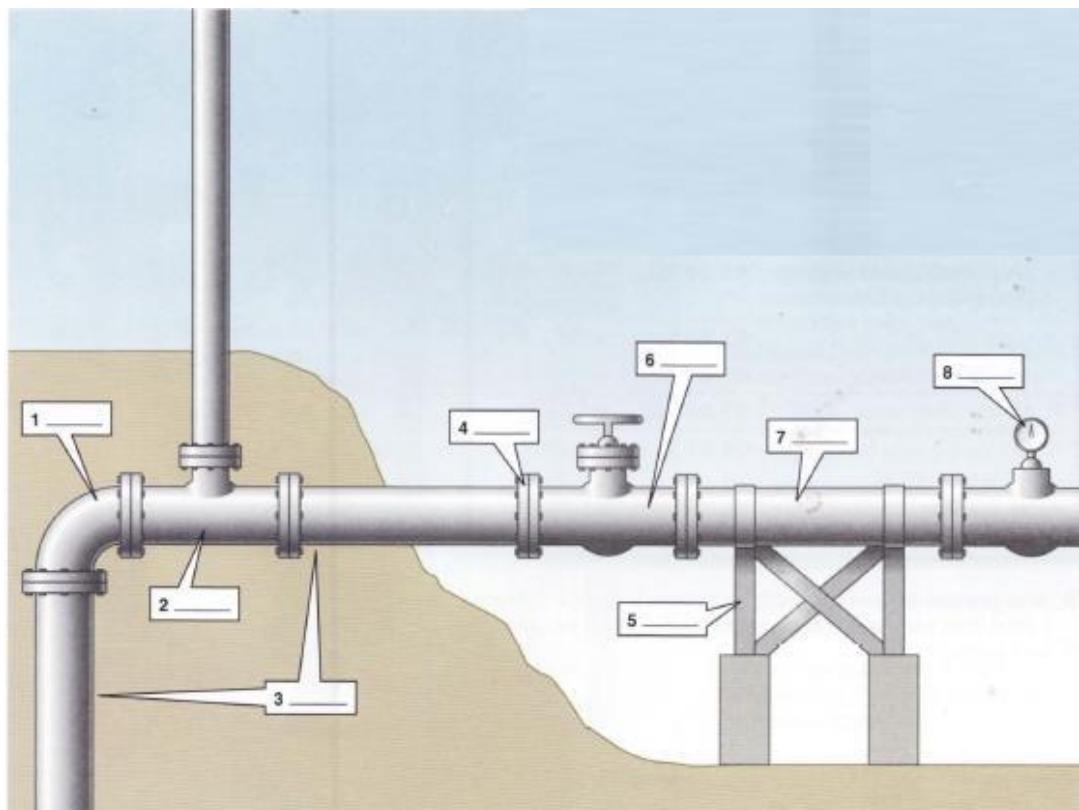
3. Although pipelines are less flexible than other forms of transportation, they are the safest, most efficient and most economical way to move oil.

1. Match the names with 1-8 in the picture.

- a. flanged joint
- b. tee
- c. valve
- d. elbow
- e. pipe support
- f. flow meter
- g. underground pipeline
- h. section of pipe

2. Are there any pipes near where you are right now? What do the pipes carry?
What size are they?

3. Are there any major pipelines in your country? Can you name some world-famous pipelines?



Reading

Inspection and cleaning

1. Draw a picture of a pipe. What can go wrong? Draw or write three problems.

2. Match the bold words with their meaning.

- | | |
|------------------------------|----------------------|
| 1. cause problems | a. stop the flow in |
| 2. reduce oil flow | b. look carefully at |
| 3. block the pipeline | c. make plans for |
| 4. inspect pipes | d. make less |
| 5. design tools | e. make |

3. Read the text. Complete the sentences.

1. D_____ reduce the flow of oil.
2. PSG makes t_____ that clean pipes.
3. Workers use a l_____ to put the device in the pipe.
4. The device has d_____ and b_____. They clean the pipe.
5. Workers take the device out at the r_____
6. A q_____ is a price for a job.

4. Pipelines can measure anywhere from 6 to 48 inches (15-120 cm) in diameter. In order to ensure their efficient and safe operation, operators routinely



inspect their pipelines for corrosion and defects. This is done with sophisticated pieces of equipment known as “pigs.” Pigs are intelligent robotic devices that are propelled down pipelines to evaluate the interior of the pipe. Pigs can test pipe thickness, roundness, check for signs of

corrosion, detect minute leaks, and any other defect along the interior of the pipeline that may either restrict the flow of gas, or pose a potential safety risk for the operation of the pipeline. Sending a pig down a pipeline is fittingly known as “pigging.” The export facility must contain equipment to safely insert and retrieve pigs from the pipeline as well as depressurization, referred to as pig launchers and pig receivers.

Loading on tankers involves loading systems, ranging from tanker jetties to sophisticated single- point mooring and loading systems that allow the tanker to dock and load the product, even in bad weather.

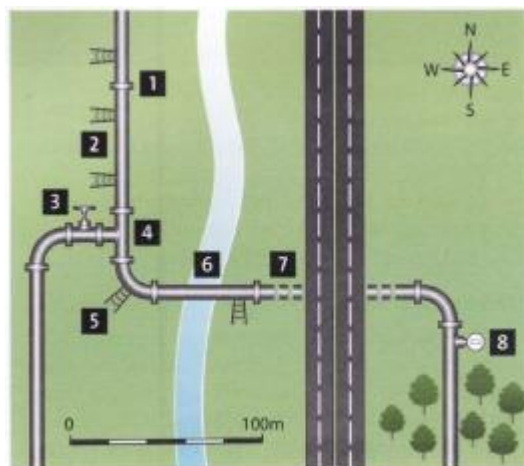


Speaking

Describing a pipeline

1. Match the descriptions with the numbers on the map.

- At the motorway, the pipe goes underground.
- There's a flow meter just before the pipeline goes into the forest.
- There's an elbow, then the pipeline goes east.
- There's a valve near the tee.
- There's one section of pipe over the river.
- There are two straight sections joined by a flanged joint.
- There are two pipe supports under this section.
- The pipeline goes south for about 100 metres. Then there's a tee.



melt (v) to become or make sth liquid as a result of heating
ethanol (n) ethyl alcohol, often made from plants, and then used as biofuel - it can be added to petrol / gasoline
insulate (v) to protect sth with a material that prevents heat, sound, electricity, etc. from passing through

Vocabulary

Welding

Read the text and look at the picture. Answer the questions.

- What problems can arc rays cause?

2. What problems can smoke cause?
3. What problems can sparks cause?
4. Why is leather good for protection?
5. What do welders wear to protect their faces?

Welding is joining two pieces of metal together by making them very hot. One type of welding machine uses electricity to make a very hot spark called an arc. The arc melts the pieces of metal and they join together. Welding makes smoke, sparks, and a type of light called arc rays.



Welding hazards

- Sparks can cause fires.
- The electricity that makes the arc can also shock or burn you.
- Arc rays can burn skin (like sunburn) and eyes.
- Smoke can hurt your eyes, nose, and mouth. It can also cause problems with breathing.

Welding protection

Welders wear a helmet that protects their eyes and head. They also wear leather shoes and leather gloves to protect their hands and feet from sparks, arc rays, and hot metal. Leather is made from the skin of animals. It is very strong and it doesn't melt.



Listening

Welding hazards and precautions

1. Look at the picture. Match the names with the parts.

a. gas cylinder	d. cylinder cap
b. valve	e. cart
c. regulator	



2. Match each sign with a warning

1. Don't drop the cylinder!
2. Be careful. Don't trip and fall.
3. Secure the gas cylinder.
4. This could explode.
5. Use the ventilation fan.



3. ⚠️ Listen to the health and safety officer talking to a team of welders and pipe-fitters. Number the welding hazards in the order you hear them.

- | | |
|------------------|--------------------|
| a. gas cylinders | d. smoke |
| b. arc sparks | e. electric shock |
| c. arc rays | f. trips and falls |

4. Match each hazard (a-f) in 3 above with a precaution.

1. Weld dry.
2. Always move it safely.
3. Cover up skin and eyes.
4. No pockets!
5. Know the material we're welding.
6. Keep the work area clean and tidy.

5. ⚠️ Listen again. Tick (✓) the pieces of safety equipment you hear.

- | | | | |
|--------------------|--------------------------|-----------------------|--------------------------|
| 1. safety glasses | <input type="checkbox"/> | 7. respirator | <input type="checkbox"/> |
| 2. welder's helmet | <input type="checkbox"/> | 8. boots | <input type="checkbox"/> |
| 3. face guard | <input type="checkbox"/> | 9. ventilation system | <input type="checkbox"/> |
| 4. gloves | <input type="checkbox"/> | 10. ear protectors | <input type="checkbox"/> |
| 5. cotton trousers | <input type="checkbox"/> | 11. safety harness | <input type="checkbox"/> |
| 6. welding jacket | <input type="checkbox"/> | 12. leather shoes | <input type="checkbox"/> |

6. What safety precautions do you take when you drive a car, or ride a motorcycle or bicycle?

Language spot

Countable and uncountable nouns

Most nouns have singular and plural forms.

cylinder – cylinders, spark – sparks, material – materials

We call these countable nouns. We can use *a*, *some*, *the*, and *many* with countable nouns.

I have a cylinder.

I see some sparks.

We need the material.

How many cylinders are there?

Some nouns have only one form.

smoke, skin, water

We call these uncountable nouns. We do not use *a / an* or *one, two, three* etc. before uncountable nouns. We use *some* and *much*.

There's some water on the floor.

How much oxygen have we got?

» Go to **Grammar reference**

1. Choose the correct words to complete each sentence.

1. We switch off *equipment / an equipment*.
2. There are six main *hazard / hazards* for welders.
3. Gas *cylinder / cylinders* can explode.
4. Never look at *spark / the spark*.
5. Hot sparks can burn *clothes / a clothes* and start fires.
6. *Smoke / A smoke* from welding can be dangerous.
7. Use *cart / a cart*.
8. We always know *material / the material* we're welding.
9. Cover *skin / a skin* and eyes.
10. Don't stand in *water / a water*.

2. Use the words in the list to complete the sentences. Then tick (✓) U (uncountable) or C (countable), brush deposits ethanol eyes information oil shock smoke steam welder

	U	C
1. Rolling water makes_____.	<input type="checkbox"/>	<input type="checkbox"/>
2. I have some_____.	<input type="checkbox"/>	<input type="checkbox"/>
3. I had wet feet and got a_____.	<input type="checkbox"/>	<input type="checkbox"/>
4. The _____ cleans the pipe.	<input type="checkbox"/>	<input type="checkbox"/>
5. My car holds five litres of_____.	<input type="checkbox"/>	<input type="checkbox"/>
6. The arc ray burned my_____.	<input type="checkbox"/>	<input type="checkbox"/>
7. I work as a _____ in Brazil!	<input type="checkbox"/>	<input type="checkbox"/>
8. Don't breathe the _____!	<input type="checkbox"/>	<input type="checkbox"/>
9. There are some _____ in the pipe	<input type="checkbox"/>	<input type="checkbox"/>
10. _____is a biofuel.	<input type="checkbox"/>	<input type="checkbox"/>

3. Complete the sentences with much or many.

- How _____ oxygen cylinders are there?
- How _____ petrol is there?
- We can't weld here. There's too _____ water on the floor.
- We have 100 nuts and 200 bolts. There are too _____ bolts!
- How _____ time have we got?
- There are eight of us. That's too _____ people for one truck.

Number talk

Measuring pipes

1. Use the words to complete the text.

diameter inside length radius thickness

$C = \text{circumference}$

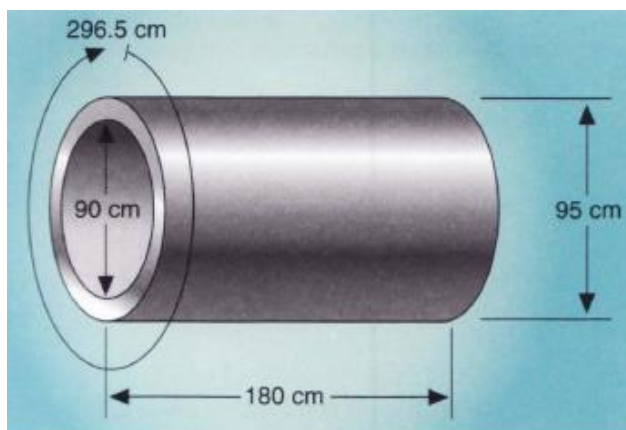
$D = \text{outside } \underline{\hspace{2cm}}^1$

$B = \text{_____}^2 \text{ diameter (bore)}$

$S = \text{pipe wall } \text{_____}^3$

$L = \text{_____}^4$

$r = \text{inside } \text{_____}^5 (B/2)$



$$V = \pi r^2 \times L$$

(Volume equals pi r squared times length.)

- V = volume (the amount of fluid a pipe can hold)
- $\pi = 3.141$ (pronounced pi)
- r^2 = radius squared ($r \times r$)

2. Read the formula and the notes. Write and do the calculations. Remember to convert all measurements to metres.

Example

$$L = 12 \text{ m}, \quad r = 0.5 \text{ m}. \quad V = \text{_____} \text{ m}^3$$

We write

$$3.14 \times 0.5 \times 0.5 \times 12 = 9.42 \text{ m}^3$$

We say

Three point one four times point five times point five times twelve equals nine point four two cubic metres.

$$1. L = 12.4 \text{ m}, \quad r = 22 \text{ mm}. \quad V = \text{_____} \text{ m}^3$$

$$2. L = 565 \text{ m}, \quad r = 550 \text{ mm}. \quad V = \text{_____} \text{ m}^3$$

$$3. L = 22.3 \text{ km}, \quad r = 1.2 \text{ m}. \quad V = \text{_____} \text{ m}^3$$

$$4. L = 640 \text{ km}, \quad r = 1.8 \text{ m}. \quad V = \text{_____} \text{ m}^3$$

3. 🎧 Listen and check your answers.
4. Practise saying calculations. Student A, go to p.108. Student B, go to p.113.
5. 🎧 Listen and check your answers.
6. Look at the picture in 1. Answer the questions about the pipe.
1. How long is it?

2. How thick is the wall?
3. What's the bore?
4. What's the outside diameter?
5. What's the pipe's circumference?
6. What is its volume?

Key words

Nouns

circumference
deposit
diameter
flow
inspection
length
radius
regulator
thickness
volume

Verbs

block
cause
design
inspect
reduce

Lesson 9. OIL AND GAS INDUSTRY OF UZBEKISTAN.



1. Study the map and discuss the questions.

1. Where is your country on the map?

2. Which regions are these countries in?

a. Russia

e. China

b. Pakistan

f. Iran

c. Turkmenistan

g. Kazakhstan

d. Uzbekistan

h. Kyrgyzstan

3. Can you name ten more oil-producing countries?

4. Do you know the words to describe the nationalities for those countries?

Examples

an Uzbek worker

a Russian oil company

2. Read the sentences about Uzbekistan. Make sentences about your country.

1. There is a big oil and gas industry in Uzbekistan.
2. There are oilfields and gas fields.
3. There are not many offshore wells.
4. There are many onshore fields.
5. They are in the north and the east.
6. There is a big onshore field in the south.



Reading

1. Read about **Oil and Gas industry of Uzbekistan.**

1. Uzbekistan occupies an area of 448.900 sq.km. Most part of the country consists of plains. The population of 34, 2 million people live for 37% in urban area's and for 63% in rural area's.



Tashkent, the capital, is the largest megapolis of Central Asia, with a population of 2,7 million people.

Uzbek nationals make up the most part of the population, consisting almost 80%. Uzbekistan is a multi-ethnic republic, over a 125 nationalities and races live here.

The subsoil of the country contains deposits of natural gas and oil, brown and hard coal, gold, copper, tungsten and bismuth.

Oil industry is one of crucial components in the country energy supply. Due to economic policy of the sovereign Republic of Uzbekistan oriented on

fundamental development of fuel and energy complex the state gained the oil and gas independence and importation of crude oil was stopped in 1995.

According to the Energy Intelligence source “Uzbekneftegaz” State Holding Co nowadays is on the 11th position in the world on gas production and among top 100 world leading oil and gas enterprises. Furthermore, “Uzbekneftegaz” is one of the largest producer of energy resources in the Central Asia region with producing capacity over 70 million tones of crude oil annually.

1. True/False/NG according to the text.

1. Our country’s energy supply highly depends on oil industry.
2. “Uzbekneftegaz” State Holding Co. in the present time is on the highest point on gas production in the looked.
3. “Uzbekneftegaz” State Holding Co. is among the best world leading oil and gas enterprises.
4. “Uzbekneftegaz” produces over 70 million tones of refined oil perennially.

2. Answer the questions according the text.

1. What is the territory of Uzbekistan?
2. How many people live there?
3. What is the capital of Uzbekistan?
4. What company is one of the largest producer of energy resources in the Central Asia region?
5. How much crude oil does it produce annually?

Language spot

Comparative sentences

1. Match the phrases with the mathematical symbols.

1. A is bigger than B.
2. A is as big as B.
3. A is not as big as B.

$A < B$ $A > B$ $A = B$

2. 🎧 Listen to these four sentences from the text. Notice the rhythm and stress.

Practise saying them fluently

1. Offshore work is more hazardous than onshore work.
2. The platform is as big as a football field.
3. The top of the derrick is higher than a twenty- storey building.
4. Drilling platforms are not as big as this.

3. Compare these things. Use your knowledge and opinions and the adjectives in brackets.

Example

boats – helicopters (fast) → *Boats are not as fast as helicopters.*

1. helicopters – boats (fast)
2. crude oil – petrol (heavy)
3. drilling rigs – production platforms (large)
4. safety – speed (important)
5. gas – oil (useful)

4. Some adjectives have irregular comparative forms:

good-better-best bad-worse-worst

Compare these things. Give your own opinions.

Example

physical work – office-based work → *Office-based work is better than physical work.*

1. very cold weather – very hot weather
2. nice work – good pay
3. an offshore job – an onshore job

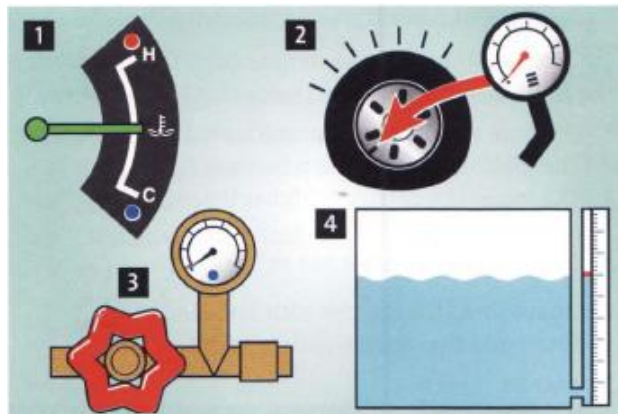
» Go to **Grammar reference** p.121

Number talk

Measuring and adjusting variables

1. Match these variables with the four gauges.

<u>Variable</u>	<u>Some common measurement units</u>
pressure	1 bar = 100 kilopascals (kPa) 10 bar = 1 megapascal (mPa)
temperature	degrees Celsius (°C)
level	per cent (%) or metres (m)
flow	cubic metres per minute (m ³ /min)



2. Complete these short conversations with the correct variables and units. Then practise saying them.

- A. What's the _____ of fluid in this tank?

B. It's 2.1m. That's 70% full.
- A. What's the reading on the _____ gauge?

B. 12 m³/min. Is that lower than usual?
- A. The water's hotter than normal. What's the exact _____?

B. The gauge says it's 98 _____.
- A. The pump _____ is 24 bar now.

B. It shouldn't be as high as that. It should be 2mPa. That's 20 _____.

3. Give instructions with *Increase* or *Reduce*.

Example

15 bar → 20 bar

Increase the pressure to 20 bar.

1. 20 bar → 15 bar
2. 60°C → 65°C
3. 14 m³/min → 10 m³/min
4. 70% → 95%
5. 2.1 m → 0 m

electricity (noun)
electric/electrical/electronic (adjectives)

Vocabulary

Electricity and circuits

This is a multimeter. Dave uses it to test electrical circuits and measure these variables.

Variables	Units
current (I)	amps (A)
resistance (R)	ohms (Ω)
voltage (V)	volts (V)

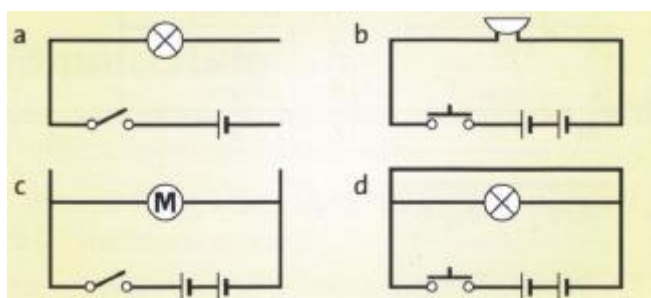


1. How are these equations useful? Give examples.

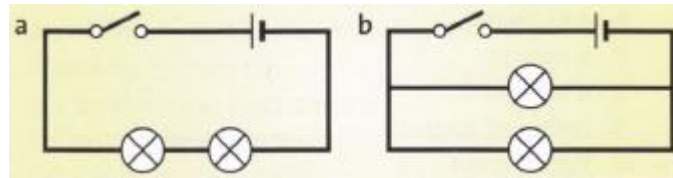
$$V = IR \quad I = V/R \quad R = V/I$$

2. Look at the circuits a, b, c and d. Match these components with the symbols.

battery buzzer cell lamp motor
on-off switch push switch wire



3. Describe each circuit above. Can the circuit work or not? Say why. (A circuit must be *complete* and have no *short circuits*.)
4. Match the descriptions with the correct circuits.
 1. a cell, a switch, and two lamps in parallel
 2. a cell, a switch, and two lamps in series



If one lamp fails in the series circuit and in the parallel circuit, what happens to the other lamps? Why?

5. Work in pairs. Draw a circuit. Do not show anyone. Student A, describe your circuit. Student B, listen and draw your partner's circuit. Then swap roles.



Writing

A leave request form

1. Read the information and the form.

Then answer the questions.

Dave (see It's my job) has a cousin, Dan. Dan is getting married next Saturday. Dave should work that day, but he wants to go to the wedding. So he must request leave. He must complete this form and give it to the supervisor of the Maintenance crew (name: Martin Olsen)

Leave request form	
Employee name	
Department	
Supervisor	
Type of absence requested (please tick one): <input type="checkbox"/> Sick <input type="checkbox"/> Personal Leave <input type="checkbox"/> Maternity / Paternity <input type="checkbox"/> Other	
Dates of absence From _____ to _____	
Reasons for absence: _____ _____ _____	
Employee's signature _____ Date _____	

1. What should Dave write in the department box?
 - a. Production
 - b. Maintenance
 - c. Transport
 2. Which word means “not being at work”?
 3. Which type of absence should he request?
 4. What are the dates for next Saturday and Sunday?
 5. What can he write in the reasons box?
2. Complete the form for Dave.



Listening

Radio conversation



1. Read about using two-way radios. Then discuss the questions.
 - Most two-way radios have a PTT (Press-to-talk) button. Press it and talk. Then say “Over” and release the button.
 - Words can be difficult to hear. So speak clearly in short sentences. People often use easy-to-hear words like Negative (No) and Affirmative (Yes).
 1. How is using a radio different from using a phone?
 2. Why are words sometimes difficult to hear?
2. 🎧 Listen to a radio conversation between two offshore workers: Martin in the control room and Dave, a technician. Underline the correct words.
 1. Dave is in the *process* / *well head* / *utilities* area.
 2. Dave must find gauge *P324* / *BD24* / *PD24*.
 3. The reading on the gauge is *3* / *5* / *9* bar.

4. The reading in the control room is *higher / lower / the same*.
5. *Dave / Martin / They* will diagnose the problem.
3. 🎧 Listen again for these phrases. Then say what they mean.

Managing the conversation	Understanding and responding
1. This is (Name).	1. Affirmative
2. (Name.) Do you read?	2. Negative.
3. Go ahead (Name).	3. Say again.
4. Stand by.	4. That's correct.
5. Out.	5. Check.

4. Work in pairs. Practise the conversation.

Vocabulary

The international radio alphabet

We often need to spell out words, names, and codes on the radio and the phone. Some letters are difficult to hear correctly, for example P, B, V, and E. The international spelling alphabet solves this problem.

1. 🎧 Listen and repeat.

A	Alpha
B	Bravo
C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Juliet

N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey

K	Kilo
L	Lima
M	Mike

X	X-Ray
Y	Yankee
Z	Zulu

2. You don't need to understand the words, but it may help you to remember them.

Find

1. people (9)
2. countries and cities (3)
3. letters from the Greek alphabet (2)
4. dances (2)
5. a sport
6. a building
7. a month
8. a weight
9. reflected sound
10. light waves
11. clothes
12. a drink
13. a Spanish word for mountains
14. an exclamation: "Well done!"

3. 🎧 Listen and complete.

1. Employee name: _____
2. Part number: _____
3. Building: _____
4. Web address: _____

4. Spell these items clearly using the radio alphabet.

1. Part nos: B20 and P24
2. Company name: AFS
3. Employee name: Vazy
4. helicopter no. G-CAND

Pronunciation

Clusters are groups of consonants, such as str, ct, xtr. They can be difficult to pronounce correctly

1. 🎧 Listen to these words. Notice the sounds in the **red** parts. Tick (✓) the true sentences.

There are no extra sounds between the red letters. ☐

Some of the red letters sound weaker than normal. ☐

- | | | |
|-----------------------|-----------------------|------------------------|
| 1. instr ument | 5. foxt rot | 9. inst all |
| 2. inspect | 6. offsh ore | 10. equipm ent |
| 3. platf orm | 7. prod uction | 11. volts |
| 4. stand by | 8. electr ic | 12. departm ent |

2. 🎧 Listen again and repeat the words.

3. Work in pairs. Practise these phrases.

1. an offshore production platform
2. Stand by, Foxtrot One.
3. It's an electrical instrument.
4. I'll install the equipment.
5. fifty volts or sixty volts

Key words

Nouns

area
circuit
gauge
instrument
level
platform
pressure
training

variable

well head

wire

Verbs

adjust

go ahead

increase

stand by

Lesson 10. BUKHARA PETROLEUM REFINERY

1. Match the definitions 1-10 and the highlighted words and expressions in the text.

1. Crucial-	a part or element of a larger whole, especially a part of a machine or vehicle
2. Component –	decisive or critical, esp. in the success or failure of something
3. Supply –	in a natural or raw state; not yet processed or refined
4. Oriented –	a place, person, or thing from which something comes or can be obtained
5. Crude –	provide with something needed or wanted
6. Source –	If someone is oriented towards or oriented to a particular thing or person, they are mainly concerned with that thing or person.
7. Enterprise-	available assets
8. Resource –	a project or undertaking, typically one that is difficult or requires effort
9. Capacity –	once a year; every year
10. Annually –	the ability or power to contain, absorb, or hold



Reading

Modern petroleum refinery was launched on 22 August 1997 in Karaulbazar area of Bukhara district, which immediately took one of the leading positions in the oil industry. Engineering and construction were accomplished in cooperation with the TECHNIP company (France).

The launch of the enterprises equipped according to the high technology standards gave a new phase to oil-refining industry development in Republic of Uzbekistan.

Bukhara Petroleum refinery technological cycle is completely automated process. Continuous analysis of the process running and management provides implementation of the distributed control system.



Bukhara Petroleum Refinery is a part of JV “Uzneftmahsulot”. The Enterprise refines up to 2.5 million tones of crude oil, condensate and gas oil annually providing advanced refining of row stock.

There are some licensed technological processes have launched at the enterprise including.

- *Atmospheric distillation FIN (France)*
- *Catalytic reforming FIN (France)*
- *Sweetening of refined oil Merykem (USA)*
- *Hydrofining of gas oil JGS Corporation (Japan)*
- *Sulfur Extraction Comprimo (Holland)*

Bukhara petroleum refinery output includes up to 10 types of products inclusive gasoline, diesel oil, fuel, hydrocarbon liquefied gases, black oil, kerosene, hydrocarbon solvent, sulphur.

Offload carry out by rail transport equipped by special system of draining and filling of oil products.

2. True/False/NG according to the text.

1. Bukhara Petroleum refinery technological cycle is completely automated process.

2. Bukhara petroleum refinery output includes up to 15 types of products.
3. The Enterprise refines up to 2.5 million tones of crude oil.
4. Continuous analysis of the process running and management doesn't provide implementation of the distributed control system.
5. "Uzbekneftegaz" State Holding Co. in the present time is on the highest point on gas production in the looked.

Language spot

The Passive

- We use Passive verbs to explain actions or processes.

*The crude oil **is refined** in the refinery.*

- Sometimes you can choose to use the Active or the Passive.

*The pipes **take** the oil from the ships. (Active)*

*The oil **is taken** from the ships by the pipes. (Passive)*

» Go to **Grammar reference**

1. Choose the correct word.

1. The trees *hide* / *are hidden* the refinery.
2. The refinery is *managed* / *manages* from the admin block.
3. Some products *leave* / *are left* the refinery in tankers.
4. Kerosene *is taken* / *takes* to the airport by a pipeline.
5. The crude oil *is refined* / *refines* in the distillation towers.
6. Tankers *unload* / *are unloaded* their oil at the jetty.
7. The crude oil stores / is stored in the tanks.
8. The distillation towers *are distilled* / *distil* the crude oil.

2. Tick (✓) the sentences in 1 that are passive

earth (v) (Br E) connect an electrical device with the ground.
Am E = ground

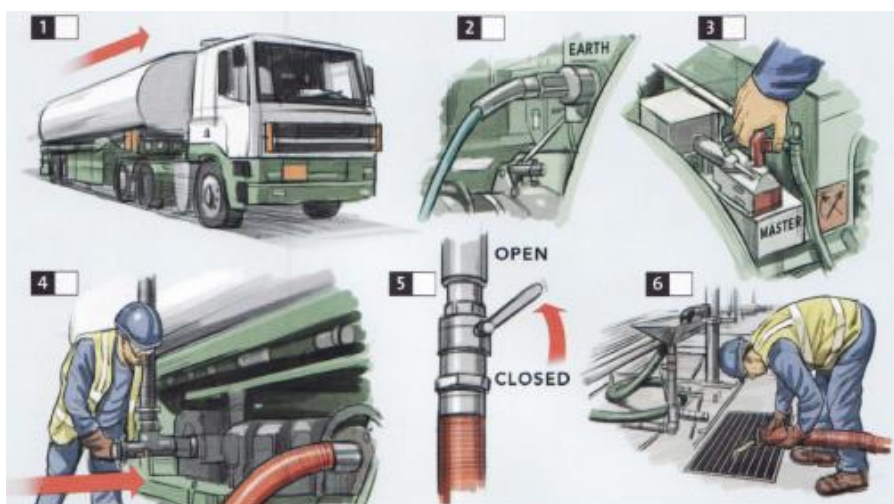
transport emergency card (n) a card with information about what a lorry driver should do in case of an emergency. It also includes information about the product that is carried.

3. Match the actions with the pictures.

- a. Check the transport emergency card.
- b. Connect the pipes.
- c. Drain the hoses.
- d. Load the tanker.
- e. Earth the tanker.
- f. Switch off the master switch.
- g. Drive the tanker into the loading area.
- h. Drive the tanker out of the loading area.

4. Complete the sentences. Explain how a bulk tanker is loaded safely. Use the Passive.

1. First, the tanker _____.
2. Then the tanker _____.
3. Next, the _____.
4. After that, the _____.
5. Then _____.
6. Next _____.
7. After that, _____.
8. Finally, _____.





monitor (v) to watch and check sth over a period of time in order to see how it develops, so that you can make any necessary changes
production (n) amount of a product that is made, for example 14.5 million litres of petrol per day
troubleshoot (v) find and correct problems in a mechanical, electrical, or electronic system

Number talk

Temperature

1. Match the numbers with the words.

- | | |
|--------------------------|---------------------------------|
| 1. -40°C | a. minus forty degrees Celsius |
| 2. 0°C | b. thirty-seven degrees Celsius |
| 3. 45°C | c. zero degrees Celsius |
| 4. 37°C | d. one hundred degrees Celsius |
| 5. 100°C | e. forty-five degrees Celsius |

2. 🎧 Listen and check your answers.

3. Complete the sentences with the temperatures in 1.



1. _____ °C is an average summer temperature In Saudi Arabia.
 2. Ice melts at _____ °C.
 3. Water boils at _____ °C.
 4. Normal body temperature is _____ °C.
 5. _____ °C is a cold winter day in Alaska
4. Take the temperature quiz. Complete the sentences with the numbers in the list.

-42 200 250 400 600

1. In a refinery, crude oil is heated to about _____ °C.
2. Asphalt usually boils at more than _____ °C.
3. The boiling point of LP gas is usually about _____ °C.
4. Petrol often boils at _____ °C.
5. The boiling point of kerosene is usually about _____ °C.

1. 600; 2.400; 3. 42; 4. 200; 5. 250



Reading

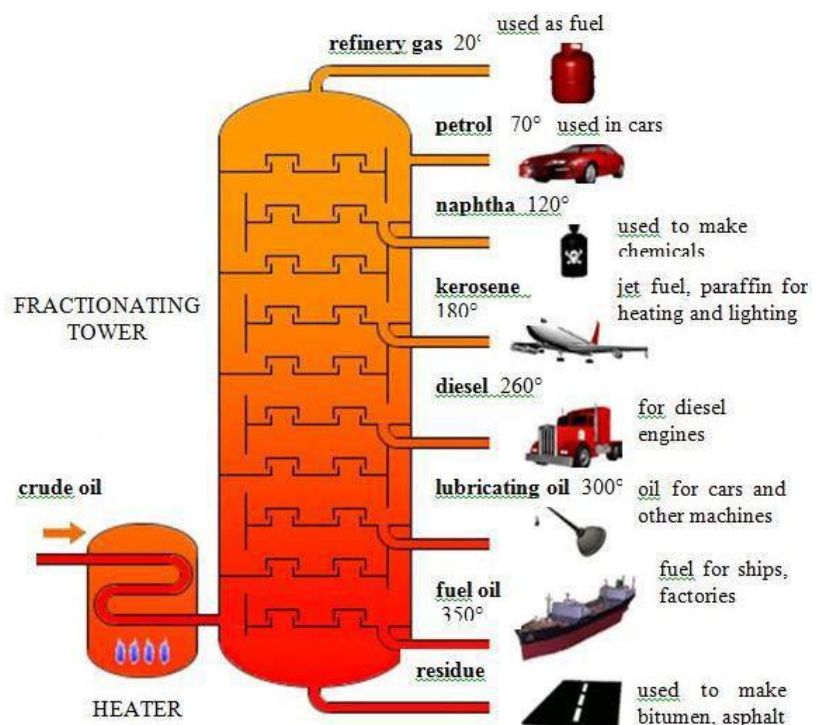
FRACTIONAL DISTILLATION

1. Can you explain how an oil refinery works?
2. Read the text. Use the words in bold to label the picture (1-5).

FRACTIONAL DISTILLATION

All refineries perform three basic functions:
separation, conversion and treatment.

Separation- In this phase, a refinery heats crude oil to different temperature levels.



Different parts of crude oil have different boiling points. As the temperature rises, these different parts or fractions are separated. This is done inside distillation towers.

The lightest fractions, which include gasoline and Liquefied Petroleum Gas (LPG), vaporize quickly and rise to the top of the distillation towers. There they condense back into liquids. The medium-weight fractions, which include kerosene and diesel oil distillates condense in the middle of the distillation tower. The heaviest liquids (called residual oils) have the highest boiling points and leave through the bottom of the distillation tower.

Refineries also use chemical agents called **CATALYSTS**. These help refine oil further by either removing carbon or adding hydrogen.

Refining methods are constantly being improved. A variety of complex operations are now used which have improved their output. Refineries today turn more than half of every barrel of crude oil into gasoline. One barrel is equal to 159 litres (42 US gallons). This is a big advance from only 70 years ago when only 41 litres (11 gallons) of gasoline were produced from each barrel of crude.

3. Answer the questions.

1. Which product has a boiling point of about 350°C?
 2. Which is lighter, petrol or kerosene?
 3. Which is the heaviest product on the picture?
 4. What three vehicles does the text mention?
4. Work in pairs. Close your book. Draw a picture to explain fractional distillation.

Write sentences to explain the process.

Useful language

First... Next... Then ... After that... Finally...



Writing

Explaining a process

1. Write a paragraph that explains a process.

- A paragraph is a group of sentences that explain an idea.

Look again at the process you explained in Speaking. Write a paragraph that explains the process (loading a tanker train at a refinery or loading a bulk tanker at sea).

2. Compare your paragraphs with other students'. Did you say the same things?

Project

1. Find information on an oil refinery in your country.
 - Where is it?
 - How much oil does it process?
 - How is crude oil delivered to the refinery?
 - How are petroleum products taken away from the refinery?
2. Oil is sometimes measured in a 42-gallon barrel (about 159 litres). In a typical barrel of crude, how much will be refined into petroleum gas?
 - petrol?
 - kerosene?
 - petrodiesel?
 - fuel oil?
 - asphalt?
 - other products?

Key words

Nouns

asphalt

boil

bulk tanker

degrees Celsius (°C)

fractional distillation

fuel oil

furnace

gas

kerosene

liquid petroleum gas (LPG)

petrodiesel

Adjective

solid

Verbs

earth

melt

refine

Lesson 11. NATURAL GAS

1. Match sentences 1-5 with pictures a-e.

1. The Tupolev Tu-155 transport aircraft can be powered by Liquefied Natural Gas.
2. Gas-fired power stations generate electricity.
3. Some cities fuel buses with natural gas because it burns cleanly.
4. Homes all over the world use natural gas for cooking and heating.
5. Natural gas is used to make ammonia for fertilizer. Fertilizer is food for plants.

2. Answer the questions.

1. How is power generated in your country?
2. Do you use gas for cooking? How does the gas get to your home?
3. Are there any gas-powered cars or buses in your town or city?
4. What plants do farmers in your country grow?
5. Why is natural gas a good fuel for a plane?

3. Complete the sentences using the list.

NH₃ CH₄ LNG

1. Natural gas is mostly _____ - methane.
2. _____ stands for liquefied natural gas.
3. The chemical symbol for ammonia is _____.

Vocabulary

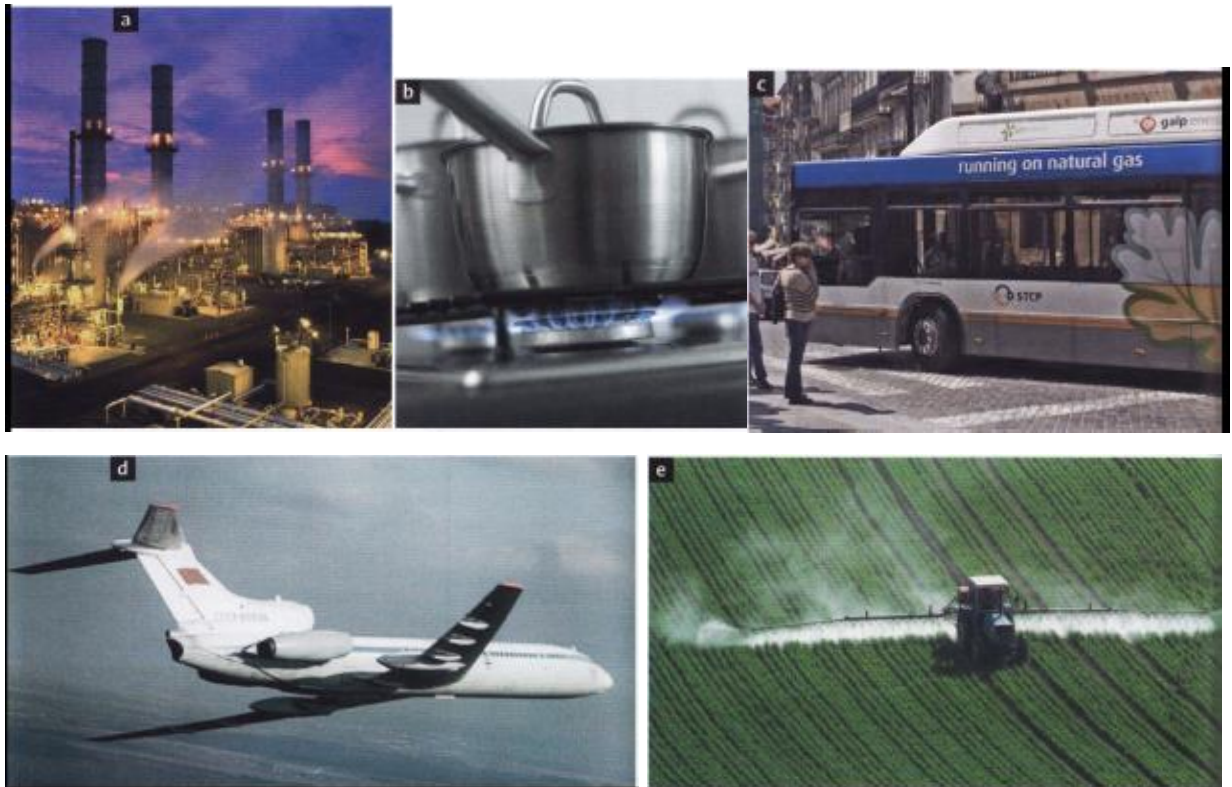
Gas production and distribution

1. Complete the table

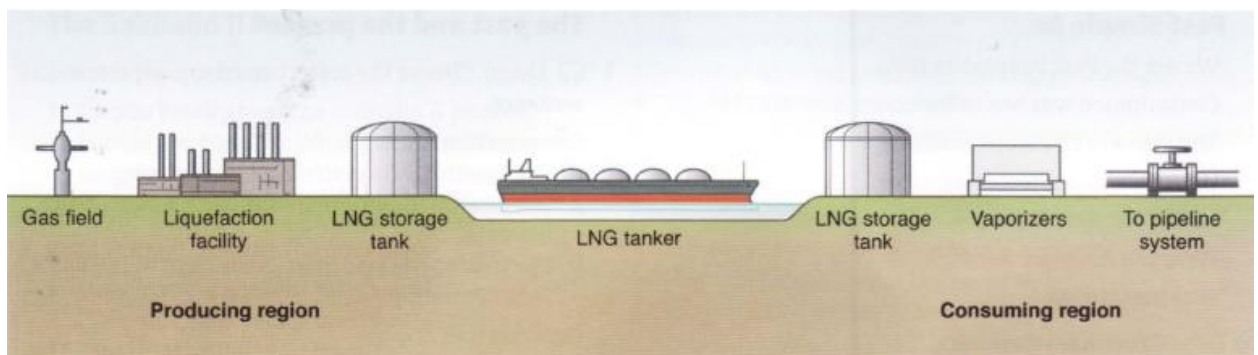
<i>verb</i>	<i>noun (process)</i>	<i>noun (substance)</i>
vaporize	vaporization	1
liquefy	liquefaction	2

3	production	product
consume	4	
5	storage	
transport	6	
7	pipe	

2. 🎧 Listen and check your answers.



3. Look at the picture. Use words from 1 to complete the sentences.



1. The gas field p_____ gas
2. It comes out of the ground as a v_____.

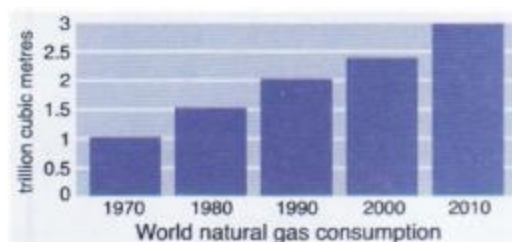
3. The liquefaction facility l_____ the gas.
 4. The gas is now a l_____. It goes into the tanks
 5. The tanks s_____ the gas.
 6. Tankers t_____ the liquid gas from the producing region to the consuming region.
 7. The gas goes from the tanker into tanks for s_____.
 8. The vaporizers v_____ the gas.
 9. The pipeline system p_____ the gas to consumers.
 10. Homes, businesses, power stations, and so on c _____ the gas.
4. Look at the picture again. Complete the sentences using the words in the list.
- | | | | |
|-------------|----------------|--------------|---------|
| consumption | liquefaction | pipes | product |
| production | transportation | vaporization | |
1. _____ happens in the consuming region.
 2. _____ happens between the gas field and the storage tanks.
 3. Fertilizer _____ uses natural gas.
 4. In the tanker, the _____ is liquid.
 5. _____ is the final step in the process.
 6. In the picture, a tanker is used for gas _____.
 7. The gas travels to consumers through _____.
5. How many things can you name for each category?
1. Things that are stored in tanks.
 2. Things that are transported by ship.
 3. Things that travel through pipes.
 4. Things that are produced in one region and consumed in another.
 5. Things that are sometimes liquid and sometimes vapour.

Number talk

Talking about a bar chart

1. Can you say these numbers aloud?

1. 1970 (year)
 2. 2002 (year)
 3. 1.5 trillion m³
 4. 2.000.000.000 m³
2. 🎧 Listen and check your answers.
3. Look at the chart. Complete the sentences with numbers.



1. 2000 consumption was a little less than _____ trillion cubic metres.
 2. Consumption in 1970 was _____ m³.
 3. 1980 consumption was higher than _____ consumption.
 4. Consumption in _____ was 2.000.000.000.000 m³.
4. Answer the questions.
1. About how much does consumption Increase in ten years?
 2. Can you guess 2020consumption?
 3. Can you guess 1960 consumption ?

Language spot

Past Simple be

We use the Past Simple like this:

*Consumption **was** one trillion cubic metres in 1970.*

*They **were** in China last month.*

*We **weren't** busy yesterday.*

*I **wasn't** at work last week.*

***Were** you busy last week?*

***Was** the ship late?*

» Go to **Grammar reference**

1. Write sentences in the Past Simple.

1. The gas is stored in tanks.

2. Ahmed isn't late.

3. She's in Saudi Arabia.

4. Ian and Matt aren't in the office.

5. I'm in the workshop.

6. You aren't in Russia.

7. We aren't busy.

8. The gas isn't liquid.

9. Klaus is in Germany.

10. She isn't from Qatar.

2. Make questions in the Past Simple.

1. you / a student / last year?

2. your friends / at your house / last week ?

3. your teacher / at work / last Saturday ?

4. you and your classmates /at the library / last night?

3. Now answer the questions in 2.



Listening

The past and the present

1. 🎧 Listen. Choose the correct word to complete each sentence.

Conversation 1

1. The meeting was *yesterday* / *this morning*.
2. The new operations manager *was* / *wasn't* at the meeting.
3. The new operations manager *is* / *was* at the Ras Tanura refinery.

Conversation 2

4. They *are* / *were* busy.
5. There *is* / *was* a big problem.
6. The level gauge *was* / *wasn't* faulty.

Conversation 3

7. They *are* / *were* on their way to the warehouse.
8. The cable trays *are* / *aren't* ready.
9. It *was* / *wasn't* on the materials report.

2. 🎧 Listen again. Check your answers.

3. Number the sentences. 1 = now, 8 = the longest time ago.

- a. There was a meeting yesterday.
- b. He was at Ras Tanura from 2000 to 2008.
- c. We're busy.
- d. There was a big problem this morning.
- e. The cable trays were ready last Friday.
- f. I was in Dubai last month.
- g. He was in Ecuador last year.
- h. Consumption was one trillion m³ in 1970.

4. Answer the questions.

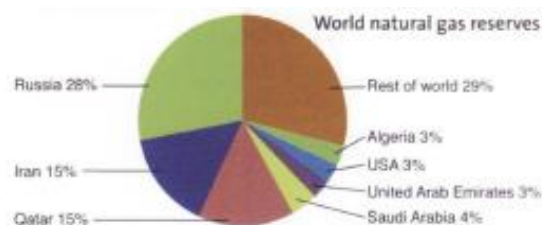
Useful expressions

last Monday last month in 2000
last week this morning yesterday

1. When were you busy?
2. When was your last holiday?
3. When were you ten years old?
4. When were you at a restaurant?
5. When was your last exam?

5. Work in pairs. Talk about the past. Ask and answer the questions in 4.

earthquake (n) violent shaking of the ground
reserves (n) gas and oil the ground



Reading

GTL

1. Answer the questions.

1. Do you know about the **GTL (Gas to Liquid)** project?
2. Look at the pictures. What places and things can you see?
3. What can you say or guess about the project?

Uzbekistan's golden road to the future with environmentally friendly energy resources

Uzbekistan GTL intends to be one of the most advanced energy plants in the world in production of high quality **fuels facilitating** in the least impact on atmosphere air, to deliver a cleaner **transport** future and support economic growth and development.

Access to affordable energy drives growth and



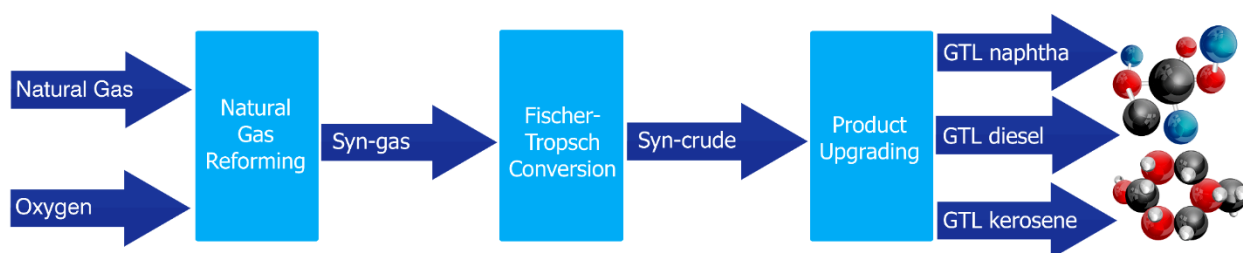
prosperity. In English, OLTIN YO'L means 'Golden Road' and the project will help set Uzbekistan on a golden road to a clean and **sustainable energy** future, and drive development.

Using Uzbekistan's natural gas, Uzbekistan GTL will produce some of the cleanest and most advanced transport **fuels** in the world – reducing emissions while adding one of the world's most **advanced technologies** to Uzbekistan's already impressive energy industry.

In partnership with Sasol of South Africa, Uzbekneftegaz is delivering one of the most ambitious energy projects in the world today. Uzbekistan GTL will set new standards for fuel performance and demonstrate the exciting opportunities Uzbekistan has.

GTL Technology

The core of Uzbekistan GTL technology is the Sasol Slurry Phase Distillate Process™ (SPD Process). This is a three-step process. In the first step, natural gas is combined with oxygen to form a syngas. This syngas is then subjected to a Fischer-Tropsch conversion to produce a **waxy syncrude**. Finally, this syncrude is cracked down to produce the final products.



Knowledge of GTL technology has existed for over 100 years but has only been widely used in the last 20 years. The successful development of new, more stable, cheaper catalysts has reduced the size of GTL plants to the level of deposits, and increases in motor fuel prices have made such processing complexes highly cost-effective.

Previously, projects utilizing GTL technology were profitable only with sufficiently large feedstock volumes (1.4-2.0 bcm of gas per year). Now, sustainable profitability of GTL plants starts at 50.0 million m3 of gas per year.

2. Guess the meaning of the words in bold. Use your dictionary if necessary.
3. Are there LNG facilities in your country? What are they? Where are they?

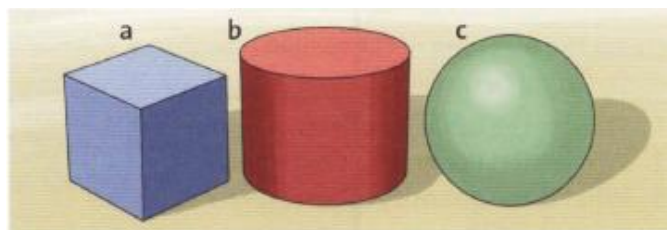


Speaking

Describing equipment

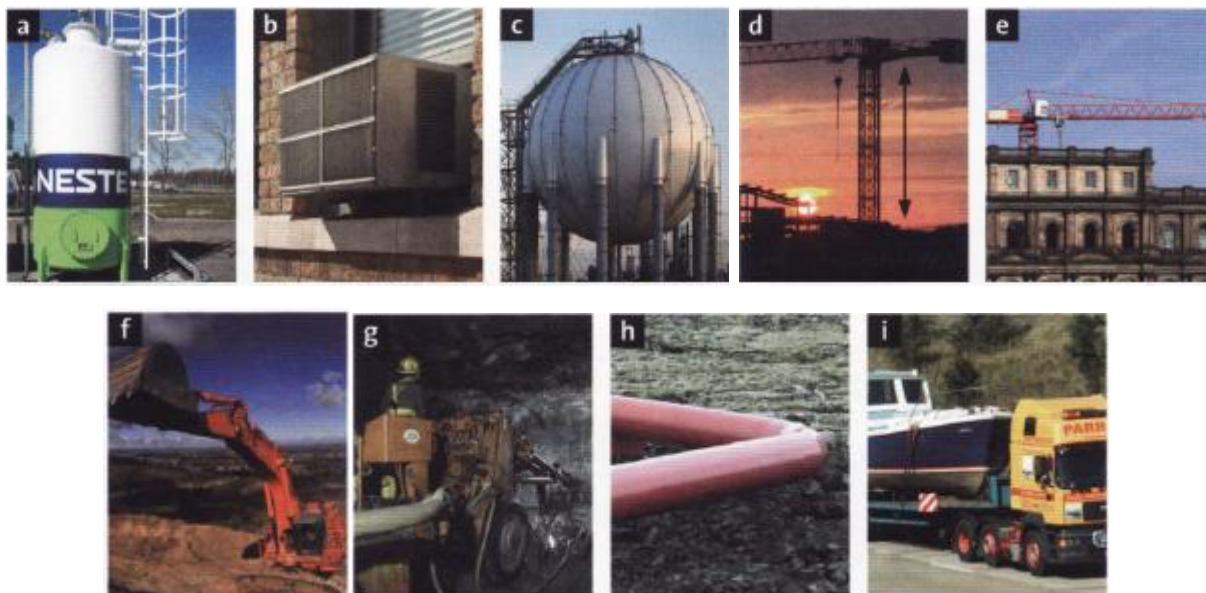
1. Match the shape with the name.

1. a cylinder
2. a sphere
3. a cube



2. 🎧 Listen and check your answers.
3. Match each description with a picture.

- | | |
|--------------------------------|----------------------------|
| 1. It's above-ground. <u>f</u> | 6. It's on a truck. _____ |
| 2. It's cuboid. _____ | 7. It's spherical. _____ |
| 3. It's cylindrical. _____ | 8. It's underground. _____ |
| 4. It's horizontal. _____ | 9. It's vertical. _____ |
| 5. It's at a 90° angle. _____ | |



4. 🎧 Listen and check your answers.
5. Practise describing equipment. Student A, go to p.109. Student B, go to p.113.

Useful language

Shape	Orientation	Location
cylindrical	vertical	on a tanker
spherical	horizontal	on wheels
cuboid		above ground
		underground

Project

Biogas is a source of energy that doesn't come from petroleum. Find out about others.

Key words

Adjectives

above-ground

cuboid

cylindrical

horizontal

liquid

spherical

underground

vertical

Nouns

ammonia

liquefied natural gas (LNG)

methane

vapour

Verbs

consume

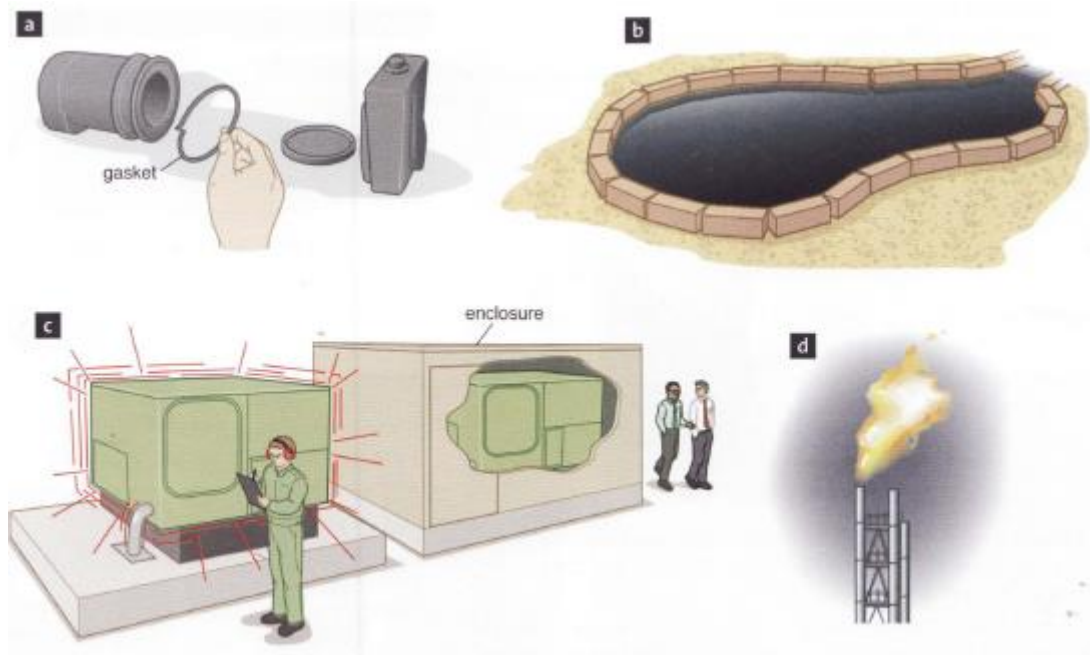
liquefy

vaporize

Lesson 12. THE IMPACT OF OIL ON THE ENVIRONMENT

1. Look at these pictures. Which shows

1. an oil spill? 2 noisy equipment? 3 broken equipment? 4 a gas flare?



2. Which of the above can lead to

1. noise pollution? a,c,d

3. soil pollution?



2. water pollution?

4. air pollution?

3. Match each solution below with a picture in 1.

1. Reduce the noise.

3. Repair it.

2. Make it safe. Clean it up.

4. Limit or stop it.

Language spot

Past Simple

We use the Past Simple to talk about the past.

Positive: *We started cleaning up last night.*

Negative: *We didn't start cleaning up last night.*

Question: *Did you start cleaning up last night?*

» Go to **Grammar reference**

1. Complete each sentence with a word from the list.

Use the Past Simple.

arrive burn go have start

Example

We started cleaning up last night.

1. The crew _____ at 6.30.
2. The refinery fire _____ for three days.
3. I _____ to college in Abu Dhabi.
4. When we opened the flow, we _____ a lot of problems with the new pipeline.

do make see start stop

Example

Did you start cleaning up last night?

5. Did we _____ a phone call to head office this morning?
6. Did they _____ work at three o'clock yesterday because of the bad weather?
7. Did you _____ a training course in the UAE last summer?
8. Did he _____ Khaled and Sami yesterday?

2. Make sentences 1-4 in 1 negative.

Example

We started cleaning up last night. → *We didn't start cleaning up last night.*

1. _____
2. _____
3. _____
4. _____

3. Make questions. Use the Past Simple.

1. you / about / Did / the / learn / oil / at / industry / school / ?
2. industry / Why / you / did / choose / oil / the / ?
3. tools / school / Did / use / you / power / at / ?
4. you / How / learn / did / oil / about / jobs / ?
5. did / lessons / When / you / English / begin / ?

4. Work in pairs. Ask and answer the questions.

prevent (v) to stop sb from doing sth; to stop sth from happening

procedure (n) a way of doing sth, especially the usual or correct way

protection programme (n) a plan to work in a way that keeps animals and the environment safe

technique (n) a particular way of doing sth, especially one in which you have to learn special skills

Vocabulary

Preventing and dealing with eco-hazards and incidents

- An eco-hazard is something that can harm the environment: people, plants, animals, water, earth, air.
- An incident is something that happens, an event: a fire, a gas leak, an oil spill, a collision, an accident.

1. Match sentences 1-6 with pictures a-f.

1. The fire started early this morning.
2. After the rig explosion, we improved our equipment and safety **procedures**.
3. We followed the usual procedure. We reported the spill immediately.

4. There was a gas leak. We wore hazmat suits when we checked the damage.
5. The field is under a beautiful beach, so we used special drilling **techniques**.
6. Our company has a wildlife **protection programme**. We studied the grey whales before we started drilling.

2. Complete the sentences with words from 1.

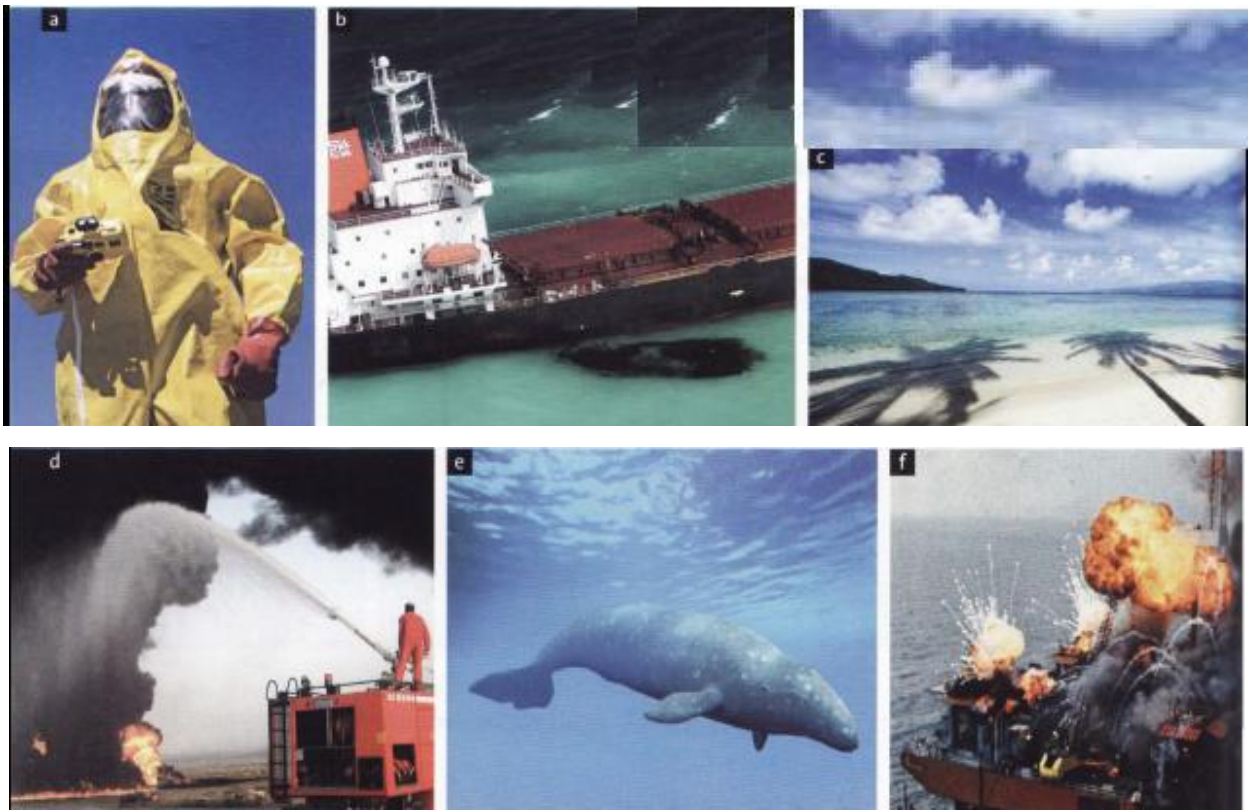
Incidents

1. There was a f_____. We put it out quickly.
2. There was an e_____. It destroyed the rig.
3. There was an o_____ s_____. We lost 10,000 litres.
4. There was a g_____ l_____. We closed the main valve and made the area safe.

Preventing incidents

5. There are whales in the area, so we have a w_____ p_____ p_____.
6. We follow s_____ p_____. It's the best way to prevent accidents.
7. We use s_____ d_____ t_____. We can get oil and protect nature

3. Check your answers with a partner.





Reading

Climate change

1. What environmental problems can oil drilling cause?
2. Look at the picture. What do you think it shows?

Combustion of anything high in carbon, including petroleum and natural gas, produces carbon dioxide. Carbon dioxide is one of many greenhouse gases.

A **greenhouse gas** is one that is able to capture and hold significant amounts of thermal energy within its chemical bonds. The bonds of greenhouse gases are flexible, enabling them to absorb thermal energy, increasing the temperature of the atmosphere. Many scientists believe that increasing levels of carbon dioxide in the atmosphere, caused in large part by fossil fuel use, are having long-term effects on the global climate.

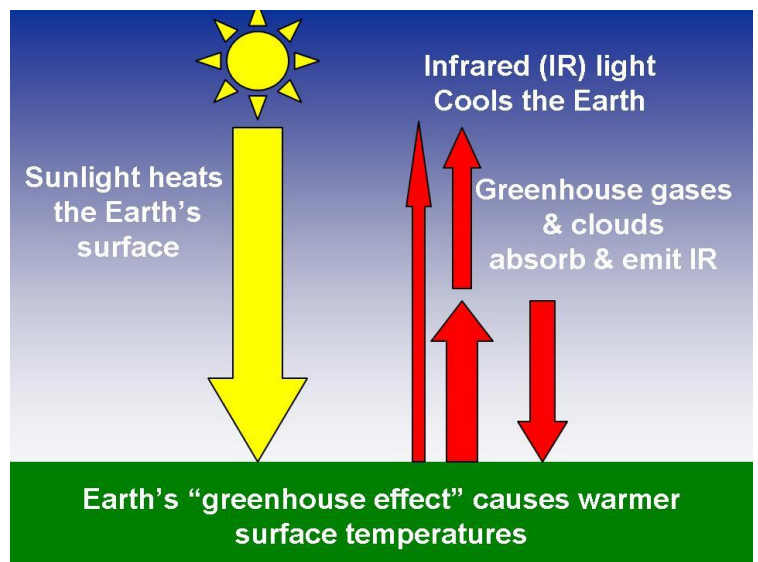


Figure 1—The radiant energy from the sun is absorbed and transformed to thermal energy on Earth.

Greenhouse gases in the atmosphere absorb thermal energy. When more greenhouse gases are present, more thermal energy is absorbed.

Climate change is a global concept. Emissions from all of the nations of the world contribute to the global climate.

3. Read the text. Answer the questions.
 1. What is combustion?
 2. What do you think about greenhouse effect?

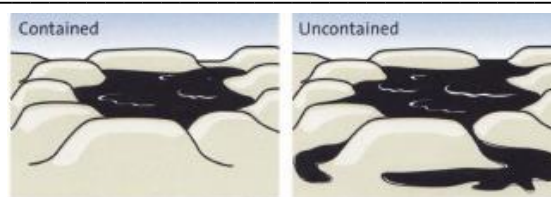
3. What is greenhouse gas?
4. What is the cause of greenhouse effect?

How many years passed between discovery and drilling?

3. What special drilling technique did British Gas use?
 4. How far did some of the drilling go?
4. Find twelve Past Simple verbs in the text. Circle them.

Note: the Past Simple of *can't see* is *couldn't see*.

injury (n) harm done to a person's or animal's body
bund (Br E) = berm (Am E)



Listening

Problems and solutions

1. What can you see in the picture?
2. Listen to the conversations. Match each conversation with a problem.

Conversation

1. _____
2. _____
3. _____

Problem

- a. a leak
- b. an oil spill
- c. a noisy compressor



3. Choose the correct word in each sentence.
 1. a. *It's happen* / *It happened* last night.
 - b. *We closed* / *close* the main valve.

2. a. **Did it *work* / *worked*?**
b. **It *work* / *worked* very well.**
3. a. ***It's started* / *It started* two days ago.**
b. **I *wait* / *waited* all day yesterday.**
4. 🎧 Listen and check your answers.

Pronunciation

1. 🎧 Listen. Tick (✓) the sound of the *-ed* ending.

	<i>verb+id</i>	<i>verb+t</i>	<i>verb+d</i>
1. happened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. closed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. finished	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. worked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. started	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. waited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. 🎧 Listen again. Check your answers.
3. Work in pairs. Read aloud the three conversations for Listening on p.129.



Speaking

Reporting an incident

1. 🎧 Listen. Write T (true) or F (false).

1. There's an oil spill.

2. It's between tanks 10 and 12.

3. There are no injuries.



4. About 200 litres of oil spilled. _____
 5. The spill is not contained. _____
2. Work in pairs. Role-play reporting an incident. Student A, go to p.109. Student B, go to p.114.



Writing

An environmental incident report

Complete the report form. Use the words in the list.

no immediate risk 27 March 20,000 litres
 Fazwan Area, Pipeline 32, Station 6 16.30
 no damage after clean up sand pipeline leak

Environmental Incident Report	
Date of incident:	_____ 1
Time reported:	_____ 2
Location:	_____ 3
Type of incident:	_____ 4
Volume of oil:	_____ 5
Damage to: plants / wildlife / water / soil /	_____ 6
Risk assessment:	_____ 7
Possible environmental damage:	_____ 8

Project

Horizontal drilling protects the environment. Learn about other ways the oil industry protects the environment.

- double-hulled tankers
- re-planting after drilling
- safe disposal of drilling mud

Key words

Adjectives

dangerous

environmental

noisy

Adverbs

carefully

safely

Nouns

contractor

danger

eco-hazard

enclosure

explosion

incident

noise

risk assessment

Verbs

clean up repair

Lesson 13. WORKSHOP OPERATIONS

1. Look at these two workshops. Which one is

1. neat and tidy?

2. messy?

3. safer?



2. In which workshop is it

1. easy to lose tools?

2. easy to find tools?

3. easy to work?

3. Read the workshop rules. For each rule, find an example in picture a where the rule has been broken.



4. Is your room at home tidy or messy?

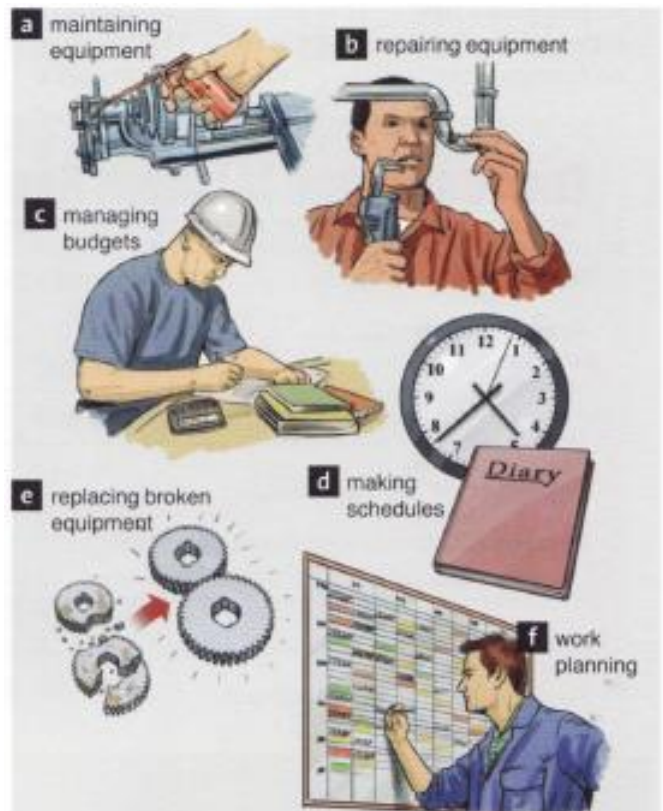


Listening

Workshop responsibilities

1. Match each workshop responsibility with an explanation.

1. dealing with money
2. organizing times and dates
3. making broken things work
4. taking care of machines, for example oiling them
5. organizing people, equipment, and jobs
6. taking out damaged parts and putting in new parts



2. 🎧 Listen. Which responsibility (a-f above) are they talking about in each conversation?

- | | | |
|----------|----------|----------|
| 1. _____ | 3. _____ | 5. _____ |
| 2. _____ | 4. _____ | 6. _____ |

3. 🎧 Listen again. Check your answers.

1. Work in pairs.
2. Name something that you have repaired.
3. Name something that you have replaced.
4. Name something that you maintain.

In this unit

- workshop rules and responsibilities
 - managing the workshop
 - power tools and their functions
 - saying what's been done
 - precision measurements
 - writing a job card
-



Reading

MANAGING THE WORKSHOP

1. What are smart ways to manage a workshop?
2. Read the text and see if your ideas were mentioned.
3. Find words in the text that mean
 1. able to do a lot of work
 2. an area where only one person may work
 3. part of a tool that protects workers' fingers, hands, eyes, etc.
 4. a danger or risk.
4. Match the opposites.

1. organized	a. dirty
2. clean	b. disorganized
3. clear (instructions)	c. cluttered
4. clear (workbench)	d. unsafe
5. safe	e. unclear
5. Choose three words from 4. Write one example sentence for each word. Talk about something you know.

Example

My desk at home is very cluttered.
6. Tell a partner.



MANAGING THE WORKSHOP

A workshop manager's day is filled with problems: broken equipment in difficult locations; expensive repairs on small budgets; people working closely together using powerful tools and equipment.

There will always be problems, but smart workshop management can make work easier, quicker, and safer.

Ten top tips

- Keep the workbenches clean and clear. A clean workshop is safer. It makes workers more productive.
- Keep the floors clean and dry.
- Create safety zones around large tools. The person who is using the tool can be inside the line. Others must stay outside the line.
- Use good lighting over work areas.
- Always put tools away after using them.
- Use guards on tools. Be sure that workers have and use personal protection equipment (PPE).
- Give clear work instructions for working safely. Tell workers what to do and how to do it.
- Take care of your workers. Maintain all machinery and tools. Stop using unsafe machines or tools.
- Spend time with your workers. Learn how they work. Everyone works differently. You may get some good ideas by watching.
- Watch for possible hazards. Use equipment and materials that can keep your workers safe.

A clean, organized workshop prevents problems

Vocabulary

Power tools and their functions

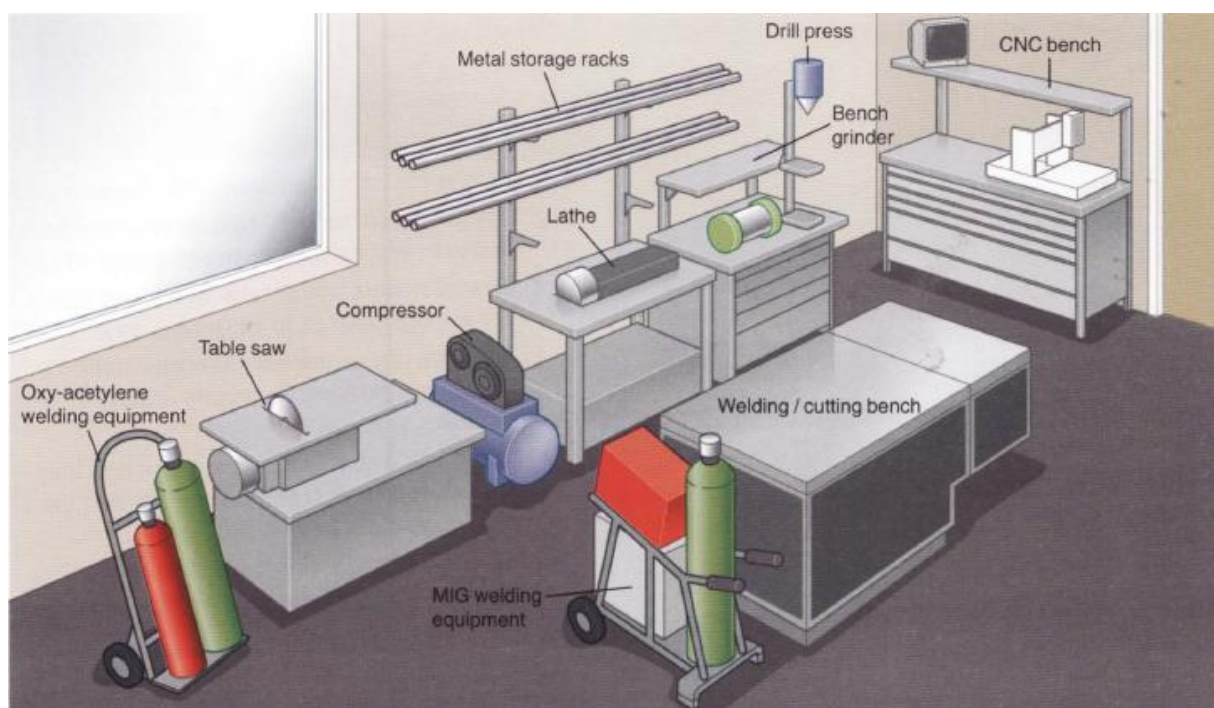
1. Match each function with a picture.

- | | |
|-------------|------------------------|
| 1. grinding | 4. designing |
| 2. cutting | 5. turning and shaping |
| 3. welding | 6. drilling |





2. Work in pairs. Can you match each function above with a power tool or tools in the workshop picture below?



Measure twice, cut once.

Old saying

3. Complete the table.

Tool	Function
oxyacetylene equipment	welding and cutting metal
t _____ ¹ saw	cutting wood and metal
lathe	t _____ ² and shaping metal
storage rack	s _____ ³ pieces of metal

bench g _____ ⁴	grinding
drill press	d _____ ⁵
CNC bench	d _____ ⁶ and making metal parts
cutting and welding b _____ ⁷	working on cutting and welding jobs
MIG equipment	w _____ ⁸

4. Check your answers with a partner.
5. Unscramble the names of the portable power tools.

1. redgirn _____
2. lilrd _____
3. was _____



6. Work in pairs. Take turns asking and answering questions.

Example

- A. What do you do with oxyacetylene equipment?
- B. We weld and cut metal.

Language spot

Present Perfect

We use the Present Perfect

- to talk about recent actions.

- A. *Have you finished the work on the compressor?*
- B. *We've replaced the gaskets, but we haven't put the new bearings in.*
- A. *Has Ahmed phoned?*
- B. *No, he hasn't.*

- to talk about our lives.

A. *Have you ever **used** a drill press?*

B. *No, I've never **used** a drill press. **Have** you?*

A. *Yes, I **have**.*

» Go to **Grammar reference** p.122

1. Use the cues. Make Present Perfect sentences.

1. you finish welding ?

2. we do the grinding

3. you and Ahmed paint it?

4. we not paint it

5. they build the base?

6. they not finish base

7. they check the inside?

8. Simon check inside

9. they not repair the valve

2. Tell a partner. Do you have any experience with the tools in Vocabulary? Which tools have you used?

Example

A. *Have you ever used a drill press?*

B. *No, I've never used a drill press. Have you?*

A. Yes. I have.

tolerance (n) the *amount by which the measurement of a value can vary without causing problems*

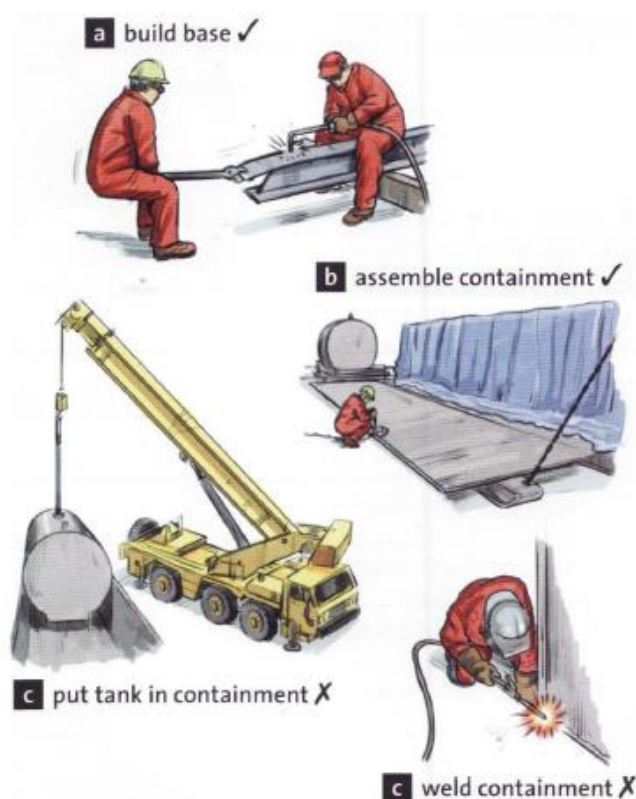


Speaking

Saying what's been done

Work in pairs.

1. You are responsible for building an oil tank containment. You will build it in the workshop area then deliver it by truck to the site. Your manager telephones and asks you some questions. Look at the pictures. Answer the questions in full sentences. Use the Present Perfect. It is Tuesday.



2. Now it is Wednesday. You have left another worker (Student A) in charge of the containment project. Call them. Ask questions using the Present Perfect.

1. do grinding?
 2. checked inside the tank?
 3. attached the cover?
 4. put the tank on the truck?
3. Now tell Student A three things you have done today and three things you haven't done today.

Number talk

Precision measurements

1. How do you say it? Read the words aloud.

1 mm	one millimeter
2 mm	two millimeters
1 μm	one micron
2 μm	two microns
0.001 mm	point oh oh one millimetres
0.025 mm	point oh two five millimetres
\pm	plus or minus

2. 🎧 Listen and check your answers.
3. Read the information. Answer the questions.

- 1 mm = 1,000 μm
- 1 μm = 0.001 mm
- A CNC milling machine has a tolerance of $\pm 25 \mu\text{m}$.
- The width of a human hair is 100 μm .
- The diameter of a pinhead is 1 mm.
- The length of a normal mosquito is 10 mm.

1. What is one hundred microns?
2. What is plus or minus twenty-five microns?
3. What is one millimetre?

4. What is about one centimetre?
 5. How much is one micron in millimetres?
 6. How much is one millimetre in microns?
4. Match the pictures with the measurements.

3-8 μ m

5mm

100 μ m

10mm



Writing

A job card

1. Read the note. Answer the questions.

1. What's the problem?
2. What has Roger asked Simon to do?
3. How long will the job probably take?

Simon,

The discharge hose in the bulk tanker loading area, bay 3, is leaky. Could you check it, please? Take a spare valve with you. Go over there at 8.00 tomorrow (Wednesday 12 April) morning. You should finish by 11.00. I've already done the paperwork (risk assessment, permit to work).

Thanks,

Roger

2. Use the information from the note. Complete the job card.

JOB CARD

Job card number: 2727505B

Area location: Bulk tanker _____¹, bay 3

Tasks: Check _____² valve on discharge hose

Materials required: Spare _____³

Scheduled start (date, time): _____⁴

Scheduled finish (date, time): _____⁵

Risk assessment: ☐ yes ☐ no⁶

Permit to work required: ☐ yes ☐ no⁷

Approval

Signature: Roger Briggs

Date: 11 April 20—

Assigned to: Simon Meeks

3. Now it's 8.10 on Wednesday. Answer the questions.

1. Has Roger done the risk assessment?
2. Has Simon started the job?
3. Has Simon finished the job?

Key words

Adjectives

broken
cluttered
messy
precision
tidy

Nouns

budget
containment
micron
responsibility
schedule
workbench

Verbs

maintain

manage

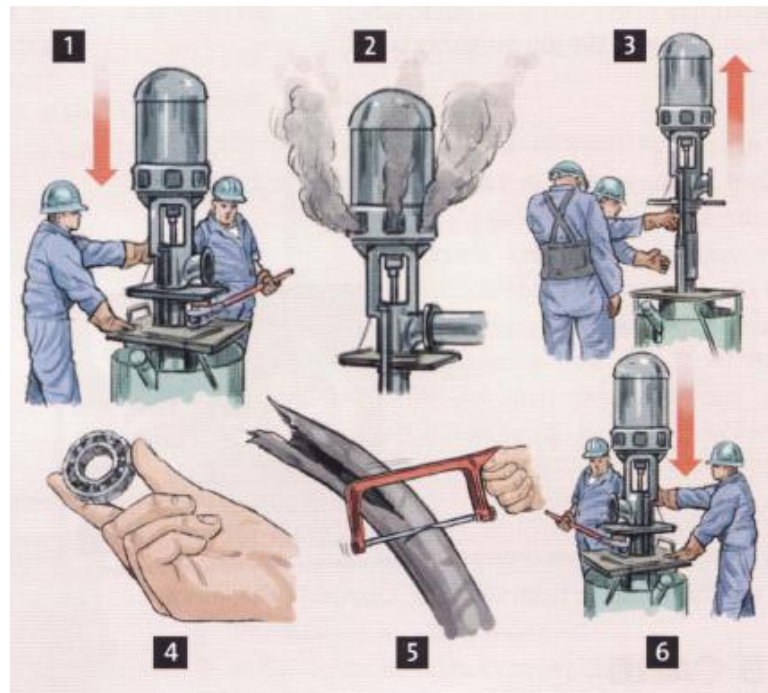
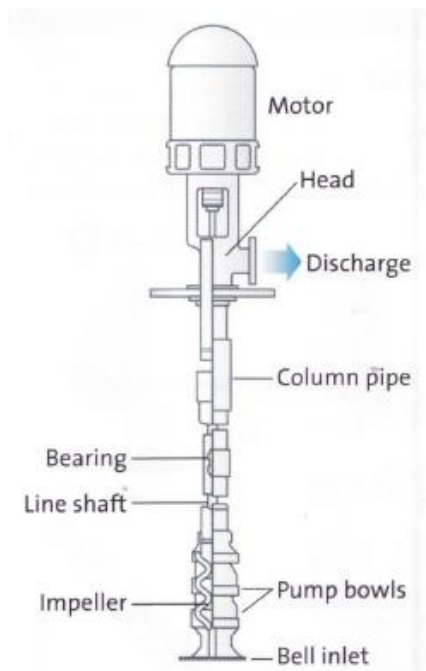
organize

replace

Lesson 14. REPAIRS AND MAINTENANCE

Work in pairs. Match the sentences with the pictures.

- a. We repaired the hose.
- b. The pump stopped working.
- c. We installed the pump.
- d. We reinstalled the pump.
- e. We replaced the bearing,
- f. We removed the pump.

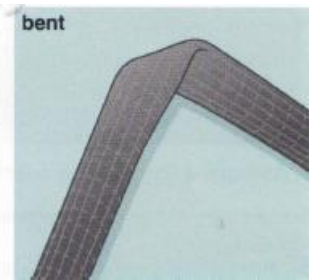
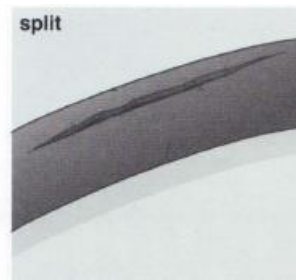
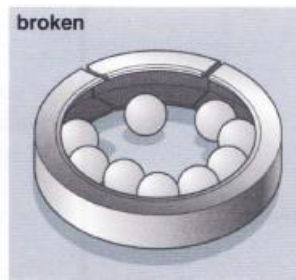
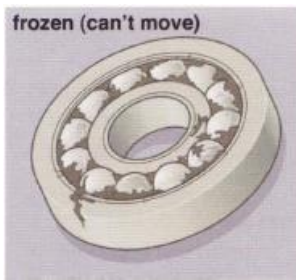


Vocabulary

Problems and solutions

1. 🎧 Listen to the conversation. Choose the correct word.

- | | |
|---------------------------------------|------------------------------------|
| 1. The bearing was frozen / broken. | 3. The hose was / wasn't replaced. |
| 2. The bearing was / wasn't replaced. | 4. The hose was split / bent. |



2. 🎧 Listen again and check your answers

3. Look at the pictures in Kick off. The conversation happens after which picture?

In this unit

- describing problems and solutions
- using will future
- routine maintenance
- planning the day's work
- recording repairs

4. Look at the pictures. Find the things.

1. a belt

4. a copier

7. a tank

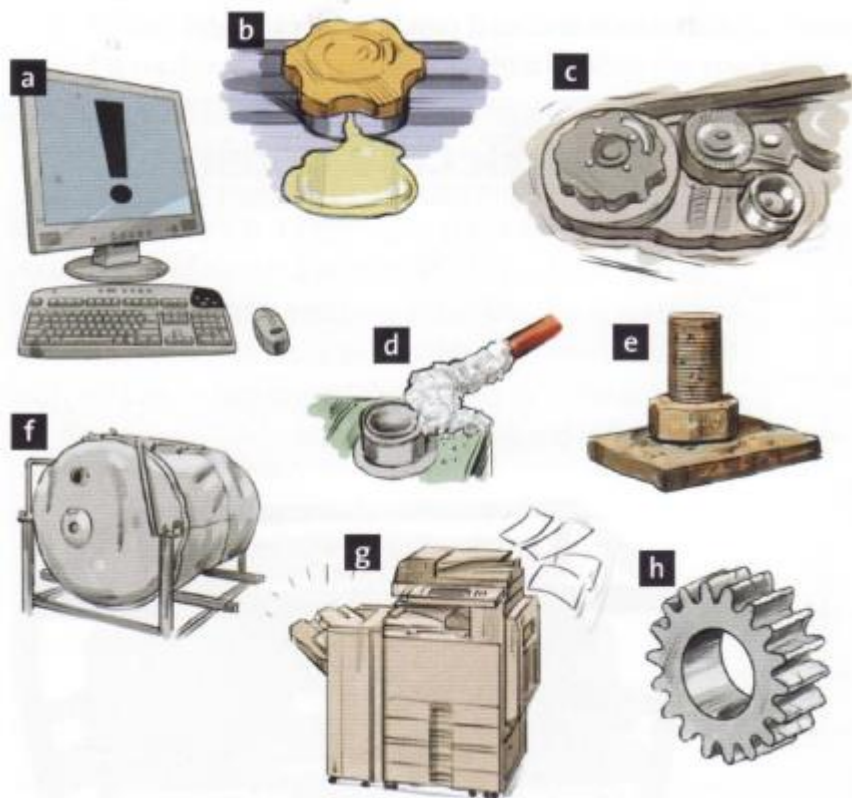
2. a bolt

5. a gear

8. a wire

3. a computer

6. a cap



5. Match the sentence halves to describe the pictures.

- | | |
|-----------------|--|
| 1. The wires | a. is worn. |
| 2. The tank | b. are corroded. |
| 3. The computer | c. is jammed. |
| 4. The copier | d. is leaking. |
| 5. The bolt | e. is loose. So it's noisy. |
| 6. The gear | f. is rusted. |
| 7. The belt | g. is frozen. The system is down. |
| 8. The cap | h. is damaged. There's a big dent in it. |

6. 🎧 Listen and check your answers.

7. 🎧 Listen again. Which problem does each solution match?

- a. I'll check it.
- b. I'll clean them.
- c. I'll get the angle grinder.
- d. I'll get the manual,
- e. I'll re-start the system,
- f. I'll tighten it.
- g. I'll write a report,
- h. I'll replace it.

Language spot

will

- We use will when we decide what to do.

A. *It's leaking*

B. *I'll check it*

- We use will when we talk about the future.

A. *When **will** you finish?*

B. *We **won't** finish before midnight*

» Go to **Grammar reference**

1. Complete the short conversations. Use the words in the list in each conversation.

will 'll won't

A. The belt is broken.

B. I _____¹ replace it.

A. _____² you finish the job today?

B. No. I _____³.

A. _____⁴ Khalid be here tomorrow?

B. No, he _____⁵. He _____⁶ be here on Tuesday.

A. The gasket's damaged .

B. We _____⁷ replace it.

A. _____⁸ we have time tomorrow?

B. No, we _____⁹.

2. Say what you will do in each situation. Use will.

Example

"The belt's worn out" → I'll replace it.

1. "I need the angle grinder".
2. "I can't lift this box".
3. "I can't find my goggles".
4. "I don't have time to write the repair report".
5. "The batteries need to be replaced".

3. Work in pairs Talk about your things that need repair and maintenance.

Examples

Tomorrow, I'll change the oil in my car.

Next year, I'll paint my bedroom.

Useful language

Tomorrow .. Next week... Next month...

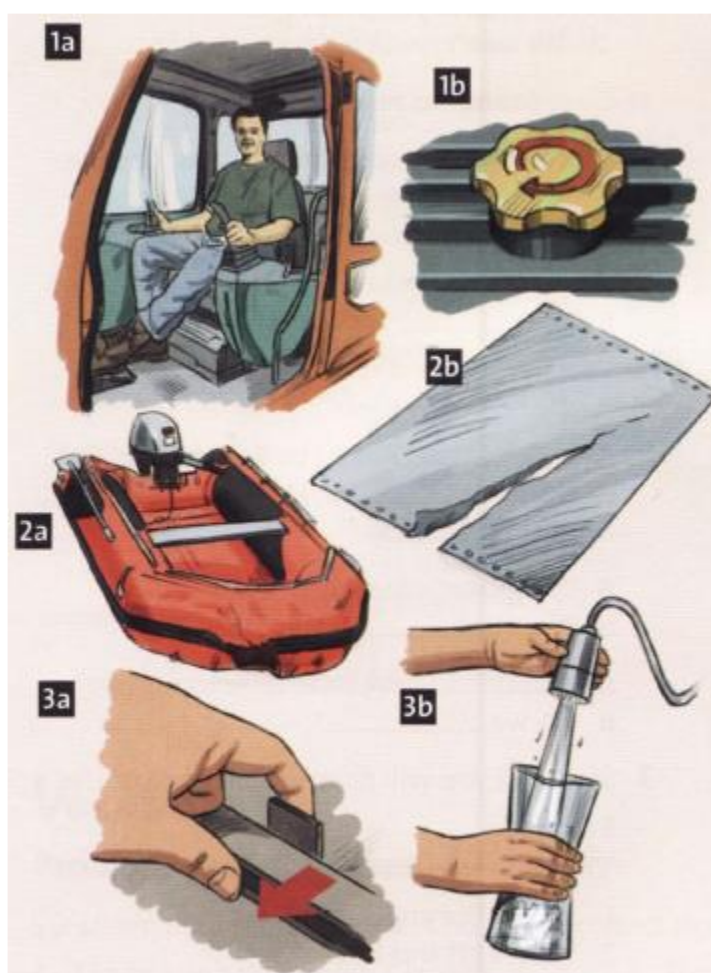
Next year... in two years...

portable electric generator (n) a petrol- powered machine that makes electricity, used to power lights and tools on sites with no other electrical supply

Pronunciation

1. 🎧 Listen. Which sentence do you hear?

- | | |
|-----------------------|--------------------|
| 1. a. Turn the cab. | b. Turn the cap. |
| 2. a. Repair the RIB. | b. Repair the rip. |
| 3. a. Pull the tab. | b. Pull the tap. |



2. 🎧 Compare answers with a partner. Then listen again and check your answers.

3. Complete these words from Vocabulary. Write *p* or *b*.

- | | |
|-----------|-------------|
| 1. ___elt | 5. ca___ |
| 2. ___olt | 6. ___roken |

3. com__uter

7. re__air

4. co__ier

8. __roblem

4. 🎧 Listen and repeat. Check your answers.

5. Work in pairs. Practise saying the sentences in 1. Can your partner tell which sentence you're saying?

Reading

Routine maintenance

1. Do you own a machine that needs routine maintenance? What is the machine?
What maintenance does it need? Tell a partner.

Portable Electric Generator

Routine maintenance is important for the generator's safe operation and long life. Routine maintenance is especially important in hot and dusty environments. The schedule at the right shows the procedures and frequency for basic maintenance. The generator's hour meter shows the number of hours that the generator has run.



2. Read the paragraph above. For each word or phrase below, write T (time) or A (action).

1. routine maintenance _____

2. long life _____

3. procedure _____

4. number of hours _____

3. Tick (✓) the ideas that the text mentions about maintenance.

1. It can reduce accidents and injuries. ☐

2. It can save time and money. ☐

3. It can help a machine work well for many years. ☐

4. Heat and dust can damage a machine. ☐

4. Look at the maintenance schedule below. Which statement isn't correct?

1. A month has passed. The hour meter says 15 hours have passed. I'll clean and check the battery.

2. Six months have passed. The hour meter says that 200 hours have passed. I'll replace the air filter.

3. Eleven months have passed. The hour meter says 250 hours have passed. I'll wait one more month and then change the spark plug.

MAINTENANCE PROCEDURE	MAINTENANCE FREQUENCY			
	Every day or 8 hours	1 month or 20 hours	9 months or 200 hours	12 months or 300 hours
General inspection	X			
Check engine oil level	X			
Clean and check battery		X		
Change engine oil			X	
Replace air filter			X	
Replace spark plug				X
Replace fuel filter				X

5. Look at the maintenance record below. Answer the questions.

1. Has this generator been well maintained?

2. Say what they haven't done.

Example

They haven't inspected the generator every day.

DATE	HOUR METER READING	MAINTENANCE OR SERVICE PERFORMED
20/1/20-	20	general inspection, checked engine oil level - OK
25/3/20-	85	general inspection, cleaned and checked battery
15/5/20-	89	changed air filter
19/7/20-	265	general inspection, changed engine oil, cleaned and checked battery
20/7/20-	1	2
21/7/20-	281	3
22/7/20-	285	4
23/7/20-	289	5

6. Now look at the maintenance schedule. Fill in the gaps showing correct routine maintenance



give (someone) a hand (v) help (someone)

Listening

Planning the day's work

- Which job would a mechanic probably do? Write M. Which job would an electrician probably do? Write E.
 - check a photocopier
 - check the petrol engine of a portable generator
- 🔊 Listen to Frank planning the day's work with his team. Write the jobs.

Name	Jobs
Frank Workshop manager	morning _____ 1
	afternoon _____ 2
Eric Office manager	morning _____ 3
	afternoon _____ 4
Carl Electrician	morning _____ 5
	afternoon _____ 6
Bill Mechanic	morning _____ 7
	afternoon _____ 8

3.  Listen again. Answer the questions.

1. How did the front office report their problem to Eric?
2. Carl may ask for help with the photocopier. Who will he ask?
3. Who has a problem with the generator?
4. When did Bill finish the repairs on the pump?
5. When did the new lights for the loading area arrive?

4. Listen again and check your answers to 2 and 3.

Writing

Recording repairs

1. Read the repair record. Put the notes in the correct place.

Checked belt tension

Checked oil level

Compressor making strange noise

Loose belt

Tightened belt

REPAIR RECORD	Date: 9 April 20—
Item to repair: Portable air compressor	
Problem: _____	1
Troubleshooting notes	
_____	2
_____	3
Cause: _____	4
Repair: _____	5

2. Look at the pictures. Complete the repair record.



REPAIR RECORD	Date: 9 April 20—
Item to repair: Portable generator	
Problem: _____	1
Troubleshooting notes	
_____	2
_____	3
Cause: _____	4
Repair: _____	5

3. Compare answers with a partner.

Key words

Nouns

belt

bolt

gear

maintenance

troubleshooting

Verbs

install

reinstall

remove

Adjectives

bent

corroded

damaged

frozen

jammed

rusted

split

worn

Look back through this unit. Find five more words or expressions that you think are useful.

Lesson 15. EMERGENCIES

1. Look at the pictures. Have you had an experience like this? What happened?



2. Match situations a-e above with descriptions 1-5.

1. He's having problems breathing. I think he breathed in some fumes.
2. He's cut his arm. He's bleeding.
3. He's broken his leg.
4. He's got a bad burn.
5. He's had an electric shock.

3. Match each piece of advice with a description (1-5) in 2.

a Pour cold water on it and call emergency services. Keep it very clean!

Stop his leg from moving. Call emergency services.

Clean it. Then put a bandage on it.

Make sure the electricity is off before you touch him.

Gently move him to some fresh air. If you've got some oxygen, give it to him.



Reading

Dealing with accidents and emergencies

1. If you see a situation like those in *Kick off*, what should you do?
2. Read and check your answers.

When there's an accident...

1. Assess the situation.

- Try to understand what has happened. Do this quickly and calmly.
- Check for danger. If something has injured somebody, will it also injure you?
- Never do something that will injure you. If you do, then there may be two injured people.

2. Make the area safe.

- Protect the injured person from danger.
- Be careful!

3. Assess the injured people and give emergency first aid.

- Assess each person.
- Help the people with the worst injuries first.
- Only treat an injured person if you are competent to do so.

4. Get help.

- Call emergency services or make sure that someone has called them.

3. Find words in the text for these definitions.

1. _____ (v) to judge and have an opinion about something.
2. _____ (adv) in a quiet way, not excited or angry.
3. _____ (v) to keep someone or something safe.

4. Match each action with a section (1-4) of the text.

- a. I could see that he was burned, so I poured cold water on the burn.
- b. I saw him lying on the floor. Then I saw that there was a broken power cable.
- c. I used my mobile and phoned emergency services.
- d. I switched off the electricity so I wouldn't get shocked.

5. Complete the text. Use the words in the list.

Activate Call Ensure Remove Try



6. Look at the first letter of each sentence. What word do they make?

_____ (v) to do something when something happens

Language spot

if/ when / in case

- We use *if* and *when* to talk about expected situations.

When someone is sick or injured, I take care of them.

If someone is badly injured or very sick, I arrange evacuation.

- We use *in case* to talk about plans and preparations for possible emergencies.

We also have an evacuation plan in case we need to get everyone off the rig quickly.

» Go to **Grammar reference**

1. Choose the correct words.

1. *When / In case* new employees start work, I train them.
2. We have a first aid kit *when / in case* someone gets hurt.
3. *If / In case* there's an accident, we need to complete a report.
4. *When / in case* the fire alarm rings, we stop work immediately and evacuate the building.
5. We always have a fire extinguisher nearby *if / in case* there's a fire and we need to use it quickly.

6. *If/In case* there's a problem. I try to deal with it quickly.

2. Complete the sentences using your own ideas.

1. When I'm sick or injured, I...

2. If I have an English test, I...

3. If the fire alarm rings, we ...

4. I try to save a little extra money in case ...

5. When the weather is very hot, I...

6. I always carry my mobile phone in case ...

3. Make sentences to describe these signs. Use if, when, or in case

Example

When there's an electrical fire, don't use this fire extinguisher.



Vocabulary

Emergency vehicles and equipment

1. Can you name these things?



2. Match each name below with an item in 1.

- | | |
|----------------------|-------------------------|
| 1. fire extinguisher | 6. medical oxygen |
| 2. first aid kit | 7. emergency shower |
| 3. ambulance | 8. defibrillator |
| 4. fire engine | 9. SCBA (self-contained |
| 5. stretcher | breathing apparatus) |

3. Can you think of a situation where each item would be used?

conscious (adj) awake, alert, able to speak

unconscious (adj) not awake, usually because of an injury or illness

a minor injury (n) an injury that is not very serious

a serious injury (n) a bad or dangerous injury

4. For each situation 1-5, answer the questions. For ideas, look again at Reading on p.95.

- What will you do?
- Which emergency equipment will you use?

Example

I'll check the area for danger. Then I'll try to help him.

I'll use the first aid kit. I'll call emergency services.

1. A rigger has fallen from a high place. His leg is badly broken. The injury is serious. He is conscious but he is in a lot of pain.
2. A technician has cut his arm. It's a minor injury.
3. An electrician has had an electric shock. He's unconscious.
4. A welder has burned his arm.
5. There's a fire in the workshop. The workshop manager has just come out. He's having trouble breathing.



Listening

Understanding what's wrong

1. 🎧 Listen to people talking in three emergencies. Write T (true) or F (false).

Situation 1

1. The man has broken his hand.
2. The injury is very serious.
3. The area is now safe.

Situation 2

4. The man has a serious head injury.
5. He's unconscious.
6. They telephone an ambulance.

Situation 3

7. The man was burned by a fire.
8. He used the emergency shower.
9. The injury is serious.

2. 🎧 Listen again. Answer the questions.

Situation 1

1. Where was the incident?
2. What were the men doing?
3. What will they do now?

Situation 2

4. What fell on the man's head?
5. Can the injured man talk?
6. Where did the incident happen?

Situation 3

7. What part of the man's body was injured?
8. Where did the incident happen?
9. What do they need to do next?

3. 🎧 Listen again. Check your answers.

Language spot

Past Continuous

We use the Past Continuous to talk about continuing actions in the past. It is often used with the Past Simple.

Positive

*We **were welding** when the fire started.*

*I **was working** on the ladder this morning.*

Negative

*I **wasn't wearing** my goggles when I hurt my eye.*

*We **weren't using** the safety guard on the saw.*

Questions

***Were you welding** when the fire started?*

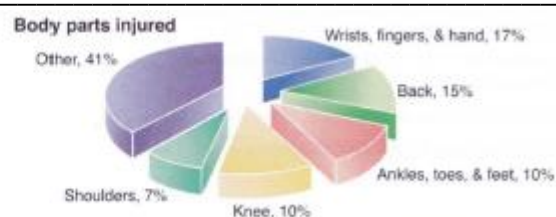
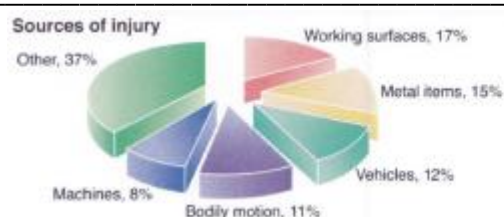
***Was he working** on the ladder this morning?*

1. Use the cues. Write sentences.

1. I (work) in Dubai last year.
2. We (not weld) yesterday when the fire started.
3. they (go) to the airport when the car broke down?
4. He (clean) the spark plugs.
5. You (not use) the hand guard.
6. she (use) her mobile phone when she was driving?
7. It (make) a strange noise so we turned it off.
8. I (not drive) the truck.

2. Answer the questions about yourself.

1. What were you doing last Monday morning?
2. What were you wearing yesterday?
3. Who were you talking to before English class?
4. What were you using the computer for last month?
5. When were you studying?
6. Where were you sitting in English class last time?



Pronunciation

1. Complete the words with *v* or *w*.

- | | |
|-----------------|--------------|
| 1. s___itch off | 6. ___elding |
| 2. ad___ice | 7. ___ater |
| 3. e___acuate | 8. ___ery |
| 4. acti___ate | 9. ___orst |
| 5. ___ehicle | |

2. 🎧 Listen and check your answers.

3. 🎧 Listen. Circle the word that you hear.

- Do you know where it vents / went?
- Did you get the veal / wheel?
- We had a problem with a wiper / viper.

4. Work in pairs. Take turns reading the sentences above, saying either the first word or the second. Can your partner tell which word you're saying?



Speaking

Explaining an accident

1. Match the halves of the questions.

- | | |
|--------------|-------------------|
| 1. Where was | a. the injuries? |
| 2. What | b. did it happen? |
| 3. Who | c. happened? |
| 4. What are | d. was there? |

5. When e. the accident?

2. Read the report. Answer the questions in 1.

Injury type: Broken leg
Work activity: Air conditioning repair
Location: Roof of admin block
Date and time of incident: 10.00 a.m. 8 July 20—
Description of incident:
John Green, Bill Becks, and Rolf Jordan were repairing the air conditioning in the admin block. Jordan was carrying a large piece of wood. He didn't see that a roof panel had been removed. He fell into the roof space and broke his leg.

3. Look at the pictures. Role-play this situation.

Student A, you saw the incident. Phone Student B, a medic, to report it.

Begin with *I need to report an accident.*

Student B, you are the medic. Answer Student A's phone call. Ask for details about the accident. Give advice.



Writing

An accident report

1. Complete an accident report.

1. Read the report in Speaking 2.
2. Look again at the accident you explained in Speaking 4.

3. Write a report about that accident.

Injury type:	_____
Work activity:	_____
Location:	_____
Date and time of incident:	_____
Description of incident:	_____

2. Compare your answers with other students who wrote about the same accident.

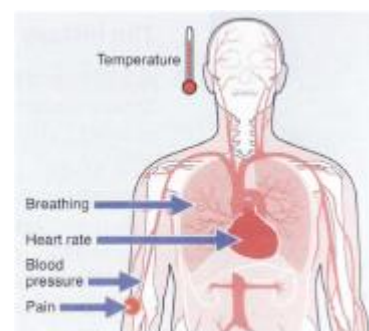
Number talk

Vital signs

Vital signs are numbers that help medics understand a sick or injured person.

1. Look at the picture. Complete the text.

- A fever is a _____¹ above 38.5°C.
- A normal resting _____² rate is 60-100 beats per minute.
- A normal resting _____³ rate is 12-20 breaths per minute.
- 85/55 Is a low _____⁴ pressure.
150/100 is high
- _____⁵ is measured on a scale of 1-10. 1 is very mild and 10 is the worst possible



2. 🎧 Listen and check your answers.

Checklist

Assess your progress in this unit. Tick (✓) the statements which are true.

I can deal with accidents and emergencies

I can understand what's wrong

I can explain an accident

I can write an accident report

I can understand vital signs

Key words

Nouns

ambulance

defibrillator

emergency shower

fire engine

fire extinguisher

first aid kit

medical oxygen

SCBA (self-contained breathing apparatus)

stretcher

Verbs

activate

assess

deal with

ensure

evacuate

react

Lesson 16. PETROCHEMICALS IN OUR LIFE.

Crude oil is a central part of modern life and the world's most important energy resource. We rely on it in many ways for the food we eat, the clothes we wear and the electronics we use at home and in the workplace. Without oil, we would not be able to continue to enjoy the same standard of living.

1. Look at the pictures. Can you name these products?



2. Match the words with the pictures.

- | | | |
|---------------|--------------|----------------|
| 1. adhesives | 4. plastics | 7. rubber |
| 2. fertilizer | 5. carpeting | 8. medications |
| 3. paints | 6. cosmetics | 9. clothes |

3. Petrochemicals are chemicals made from petroleum and petroleum gas. They are used to make all of the products in the pictures. Can you say what other materials can be used for some of the products? Think about plants, animals, and minerals (things from the ground, for example iron, sand, etc.).



Reading

The history of petrochemicals

1. Read the text From *carbon black* to *PVC*. Choose the correct definition for each word.
- carbon black
 - a fuel
 - a colouring
 - in prehistoric times
 - a very long time ago
 - recently
 - plentiful
 - dangerous
 - easy to find
 - inexpensive
 - cheap
 - hard to get
 - crayon
 - a type of tyre
 - a drawing tool
 - by-product
 - an extra, unneeded product
 - a flammable product
 - hydrocarbon molecule
 - petrochemicals
 - tiny pieces of hydrogen and carbon
 - familiar
 - known by many people
 - useful
 - synthetic
 - man-made
 - natural
2. Read the text again. Answer the questions.
- What natural clothing materials does the text talk about?
 - What did the first big petrochemical plant make?

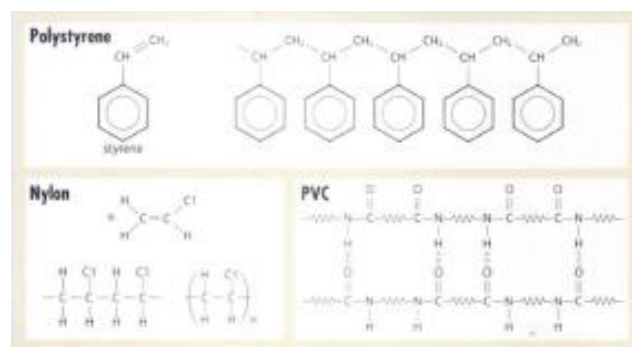
3. Why did the petrochemical business grow?
 4. When were a lot of synthetic materials developed?
 5. What synthetic cloth does the text mention?
 6. Why are plastics sometimes a problem?
3. Name three things that you use every day that are made from petrochemical products.
4. Read the text about polymers. Write T (true) or F (false).
1. *Polymer* is another name for a single molecule.
 2. Bakelite is a natural product.
 3. Natural rubber is a polymer.
5. What products can you name that are made of the three polymers in the text?

Polymers

Nylon, polystyrene, and PVC are polymers. Poly means many, and mer means part. A polymer is many single molecules (called monomers) formed into a chain.

The first synthetic polymer - Bakelite - was first sold in 1909. It was used to make casings for radios and telephones, and also for kitchenware, jewellery, and toys.

Not all polymers are synthetic. Many natural products, for example rubber, are polymers.



From carbon black to PVC

Before oil and gas were freely available, people made everyday things from natural materials. Clothes were made from cotton, wool, and leather. Containers, for example bottles and cups, were made from metal, glass, and clay (soft earth that becomes hard when cooked). Paints and cosmetics were made from plants and minerals.

One example of a natural product is carbon black. It's a colouring used in ink for writing and drawing and for paint. It is made by burning wood, oil, or other

natural materials. It was discovered in prehistoric times, and it's commonly used today.

The first petrochemical factory was built in 1872, and it made carbon black from natural gas. Carbon black wasn't a new product, but using a factory was a new way of making it. It became possible to make large amounts of it cheaply because natural gas was plentiful and inexpensive. At that time, carbon black was used to make ink, paint, and crayons. It is now used mostly to make car tyres.

In the early 1900s, the petrochemical business began to grow. There were a lot of oil refineries, and they created chemical by-products. Oil companies wanted to find ways to use these chemicals.

Soon scientists and engineers learned to change the hydrocarbon molecules in coal, petroleum, and refinery by-products. From the 1920s to the 1940s, familiar man-made products like nylon, polystyrene, and polyvinyl chloride (PVC) were developed. Synthetic dyes, paints, and medicines were invented.

Today, petrochemical products are everywhere. They are very useful, but they also have some problems. People throw away a lot of plastic products because they are inexpensive. One problem with plastics is that generally they do not rot or break up like natural materials.

Plastic bags are already polluting oceans and killing wildlife. They cannot easily be remelted and reused.

Scientists and petrochemical manufacturers continue their work to develop safe and useful products.

Language spot

and, but, because

- We use *and* to join two sentences. It shows that we are giving additional information.

It was discovered in prehistoric times.

It's commonly used today.

It was discovered in prehistoric times, and it's commonly used today.

The first petrochemical factory was built in 1872.

It made carbon black from natural gas.

The first petrochemical factory was built in 1872, and it made carbon black from natural gas.

- We use because to join two sentences. It shows why something happens or is true.

It became possible to make large amounts of it cheaply. Natural gas was plentiful and inexpensive. It became possible to make large amounts of it cheaply because natural gas was plentiful and inexpensive.

People throw away a lot of plastic products.

They are inexpensive.

People throw away a lot of plastic products because they are inexpensive.

- We use but to join two sentences. It shows that the additional information may be unexpected.

They are very useful.

They also have some problems.

They are very useful, but they also have some problems.

Carbon black wasn't a new product.

Using a big factory was a new way of making it. Carbon black wasn't a new product, but using a factory was a new way of making it.

1. Complete the sentences. Use and, but, or because.

1. I was late this morning _____ I had a problem with my car.
2. We repaired the compressor yesterday, _____ it stopped working again this morning.
3. We started work at 9.00, _____ we finished at 4.00.
4. I want to go to the meeting, _____ I really don't have time.
5. We'll tidy up the workshop today _____ start work on the pump repair tomorrow.
6. I can't replace the lamp today _____ I haven't got a new one.

2. Write three sentences for each set of sentences. Use *and*, *but*, or *because*. There is more than one correct answer in some cases.

Example

I took an umbrella.

It wasn't raining.

I didn't take an umbrella.

I wore my raincoat.

(and) *I took an umbrella, and I wore my raincoat,*

(but) *I took an umbrella, but it wasn't raining,*

(because) *I didn't take an umbrella because it wasn't raining.*

1. We called the medic.

Juan injured his hand.

I cut my finger.

It wasn't serious.

a. (and) _____

b. (but) _____

c. (because) _____

2. We replaced the gasket.

We cleaned the spark plug.

It's running much better.

It's making a funny noise.

a. (and) _____

b. (but) _____

c. (because) _____

3. We aren't using this tank.

It's damaged.

We're using this tank.

It isn't damaged.

a. (and) _____

b. (but) _____

c. (because) _____

» Go to **Grammar reference**

composite fibre (n) a thin, strong thread or string made from two or more other materials, for example polypropylene and polyethylene. Composite fibres are often made into fabric.

carbon fibre (n) a very thin, strong thread or string, usually 0.005-0.010 mm in diameter, made mostly from carbon molecules. Carbon fibres are made into very strong, light products.



Spunbond is a fabric made from composite fibre.



Listening

Factory and product description

1. Use the words to complete the text.

polyethylene	near Tokyo	Gol Factory
polypropylene	Chisso Petrochemical	Corporation

Company:	_____	1
Plant:	_____	2
Location:	_____	3
Main products:	_____ and _____	4

2. 🎧 Listen and check your answer



3. 🎧 Listen again. Tick (✓) the words you hear.

Polyethylene

1. 18 million tonnes per year
2. 80 million tonnes per year
3. packaging material
4. packing material

Polypropylene

5. ropes
6. car parts
7. shopping bags
8. fabrics
9. containers
10. bottles

11.50 million tonnes per year

12.15 million tonnes per year

4. 🎧 Listen again Check your answers.

5. 🎧 Listen. Complete the words

Chisso's Moriyama Plant m_____ ¹ composite

fibres it u_____ ² the polypropylene and

polyethylene p_____ ³ at the Goi Plant. It

s_____ ⁴ in the production of spunbond fabric.

Spunbond composite i_____ u_____ ⁵

to make floor carpets for cars, medical packaging, diapers, very strong envelopes, and many other products.

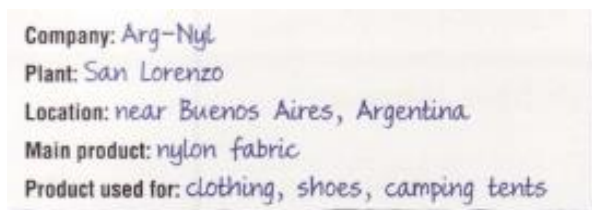
6. 🎧 Listen again. Check your answers.



Speaking

Describing a petrochemical product

1. Tell Student A about this company.



2. Listen to Student A Complete the description.

Company: _____

Plant: _____

Location: _____

Main product: _____

Product used for: _____

Useful language

Chisso's Moriyama Plant is...

It manufactures...

...is used to make...

toxic chemical (adj) a gas, liquid, or powder that can hurt people
domestic appliance (n) a machine used in the home, for example a dishwasher, toaster, or oven
resin (n) a very thick, sticky liquid often made from polymers

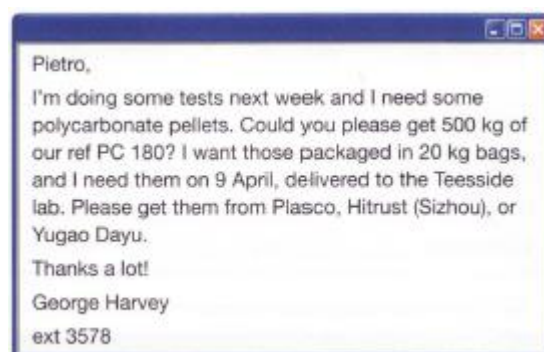


Writing

Materials requisition

1. Read the email. Answer the questions on p. 105.

1. What material does George Harvey want?
2. How much (what quantity) does he need?
3. What type of packaging does he mention?
4. He names three suppliers. What are they?



2. Read the email again. Complete the form.

- A materials requisition form is used to ask your company's buyer to buy something that you need for your work.

MATERIALS REQUISITION	
Material: _____	1
Reference number: _____	2
Quantity: _____	3
Packaging: _____	4
Delivery date: _____	5
Delivery location: _____	6
Preferred suppliers: _____	7
Requested by: _____	8
Telephone extension: _____	9

Project

Every day, you use products that contain petrochemicals. Make a list of these things. Be specific. Include

- clothing
- food preparation and storage
- transport
- electronics
- decorations in your home
- any other ideas you have.

Key words

Nouns

carbon black
molecule
monomer
plastics
polyethylene
polymer
requisition
supplier

Adjectives

inexpensive
man-made
plentiful
prehistoric
synthetic

Verbs

package
specialize (in)

Look back through this unit. Find five more words or expressions that you think are useful

IRREGULAR VERBS

<i>Infinitive</i>	<i>Past Simple</i>	<i>Past Participle</i>
be	was / were	been
become	became	become
begin	began	begun
break	broke	broken
bring	brought	brought
build	built	built
burn	burnt /burned	burnt / burned
buy	bought	bought
choose	chose	chosen
come	came	come
cost	cost	cost
cut	cut	cut
deal	dealt	dealt
dig	dug	dug
do	did	done
drink	drank	drunk
drive	drove	driven
fall	fell	fallen
feel	felt	felt
mm	found	found
fly	flew	flown
freeze	froze	frozen
get	got	got / gotten
give	gave	given
go	went	gone / been
grow	grew	grown

have	had	had
hear	heard	heard
hide	hid	hidden
hit	hit	hit
hurt	hurt	hurt
keep	kept	kept
know	knew	known
leave	left	left
lose	lost	lost
make	made	made
meet	met	met
put	put	put
quit	quit	quit
read	fead	read
ride	rode	ridden
run	ran	run
say	said	said
see	Sinv	seen
sell	sold	sold
send	sent	sent
shake	shook	shaken
show	showed	shown
shut	shut	shut
sleep	slept	slept
smell	smelt	smelt
speak	spoke	spown
spend	spent	spent
stand	stood	stood
swim	swam	swum
take	took	taken

teach	taught	taught
tell	told	told
think	thought	thought
throw	threw	thrown
understand	understood	understood
wear	wore	worn
write	wrote	written

ABBREVIATIONS

°	degree	LNG	liquefied natural gas
%	per cent	LON	longitude
π	pi	LPG	liquefied petroleum gas
±	plus or minus	m	metre
2D	two-dimensional	m ³	cubic metre
3D	three-dimensional	mm	millimetre
A	amps	μm	micron
a.m.	ante meridian (in the morning)	mPa	megapascal
bbbl	barrel	N	north
bpd	barrels per day	N	nitrogen
C	Carbon	no.	number
C	Celsius	NOC	national oil company
co.	company	Ω	ohms
CO ₂	carbon dioxide	p.m.	post meridian (in the afternoon / evening / at night)
dd/mm/yyyy	day/month/year	PPE	personal protection equipment
E	east	PTT	press to talk
g	gram	PVC	polyvinyl chloride
GPS	global positioning system	r	radius
H	hydrogen	R	resistance
HR	Human Resources	S	south
IOC	international oil company	t	tonne
k	kilogram	UAE	United Arab Emirates
kPa	kilopascal	UK	United Kingdom
kph	kilometres per hour	USA	United States of America
I	current	V	voltage / volts
l	litre	W	west
LAT	latitude		

GRAMMAR REFERENCE

1. *a / an / the*, the verb *be*

a / an

We use a and an to talk about something in general.

We use $a +$ singular noun that begins with a consonant.

a pipeline, a team, a department

We use *an* + singular noun that begins with a vowel.

an oil rig. *an* effect, *an* idea

However, we use *a* before nouns that begin with a “y” sound, e.g. *a* university.

the

We use *the* before singular and plural nouns to talk about:

- a specific example of something

Muktar is a manager. (= one of several)

*Muhtar is **the** manager of this department* (= there Is only one manager)

- something that is known to everyone present

*He works at **the** university* (= everyone understands which university it is)

- something that has been mentioned earlier

*A new plant has just opened. We will visit **the** plant next week.*

- some countries, regions, rivers, seas, and oceans

the UAE, the US, the UK, the Middle East, the Danube, the North Sea,

the Pacific Ocean

The verb be

Positive

I am ('m) late.

He/She/It **is ('s)** late.

We/You/They **are ('re)** late.

= subject + **am/is/are**

Negative

I **am not ('m not)** late.

He/She/It **is not (isn't)** late.

We/You/They **are not (aren't)** late.

= subject + **am/is/are + not ('m not / isn't/ aren't)**

Questions

Short answers

Am I late?

Yes, **I am**. No. **I'm not**.

Is he /she /it late?

Are we / you / they late?

= **Am /Is/ Are** + subject

We can use question words such as What or How if we want more specific information than a yes / no answer will give.

What is your job? ~ I'm a radio operator.

We can use the verb *be* for:

- nationalities and places of origin

The team manager is from Dublin. (= subject + *am/ is / are* + *from* + place)

Mr. Beyrand and Ms. Gougelot are French. (= subject + *am / is / are* + adjective)

Gazprom is a Russian company. (subject + *am / is / are* + *a /an* + adjective + noun)

- introductions and occupations

My name's Don Bradman.

This is Ranjit Chatterjee. He's your new manager.

- personal information

Your employee number is 2173. What is your address ?

there is, there are

We use *there is*, *there are* to say that something exists. We often use this phrase when describing the contents of an item or a building's facilities.

We use *there is* + *a / an*, and *there are* + *some or a number*.

There is a glossary at the back of this book.

There are three restaurants on this site.

Note that there is no contracted form for *there are*.

not ~~*There 're three restaurants...*~~

In questions, we change the order to *is there...? / Are there...?*

Is there a glossary at the back of the book?

Are there two or three restaurants on this level?

We can also use a question word before *Is there / Are there*.

How many restaurants are there? ~ There are three.

2. *do* and *does*, and *Wh-* questions

We use *do* and *does* to form the negative and questions in the Present Simple.

Negative

I / You / We / You / They **do not (don't)** work here.

He / She / It **does not (doesn't)** work here.

= subject + ***do / does*** + ***not (don't / doesn't)*** + infinitive

Questions

Short answers

Do I / you / we / you / they

work here?

Yes, I **do**.

Does he / she / it work here? No, he **doesn't**

= auxiliary ***do / does*** + subject + infinitive

We use a question beginning with *do* or *does* to ask a question that requires a yes / no answer

If we want to find out specific information, we can put a question word before *do* or *does*.

Question words include *who*, *what*, *which*, *when*, *where*, *how*.

Where do you work?

What does a well test operator do?

3. Present Continuous

Positive

I **am talking.**

He /She /It **is ('s) talking.**

We/You/They **are ('re) talking**

= subject + **am / is / are** + **-ing** form

Negative

I **am not ('m not) talking.**

He/She/It **is not (isn't) talking**

We/You/They **are not (aren't) talking**

= subject + **am / is / are** + **not ('m not / isn't / aren't)** + **-ing** form

Questions

Short answers

Am I talking?

Yes, I am. No. I'm not.

Is he /she/ it talking?

Are we / you / they talking?

= **Am / Is/ Are** + subject + **-ing** form

We use the Present Continuous to talk about what we are doing at the moment. We do not use this tense to talk about routines, jobs, or to give facts about ourselves.

For those functions we use the Present Simple.

*We're **having** trouble with one of the control panels.*

*This machine **isn't working** properly.*

*Why is the warning light **flashing**?*

We often use time expressions such as (*right*) now, *at the moment*, *currently*.

*George is giving a talk **right now**.*

*The team is having a meeting **at the moment**.*

-ing form

The rules for forming the *-ing* form are as follows:

- verb + *-ing*
talk → *talking* *work* → *working*
- verbs ending in *-e*:
live → *living* *take* → *taking*
not liveing, takeing
- short verbs ending in consonant + vowel + consonant:
get → *getting* *stop* → *stopping*

4. Modal verbs can and must

Modal verbs never change their form and are always followed by the infinitive.

can

We use *can* to talk about ability

Positive

I / You / He / She / It / We / You / They ***can lift*** this.

= subject + ***can*** + infinitive

Negative

I / You / He / She / It / We / You / They ***cannot***

(can't) lift this.

= subject + ***cannot (can't)*** + infinitive

Questions

Can I / you / he / she / it /

we / you / they lift this?

= ***Can*** + subject + infinitive

Short answers

Yes. I **can**. No, he **can't**.

Can /can't often refer to something that is (not) possible in the circumstances.

*One of the hazards is that the load **can** fall on you.*

*I wear a safety harness, so I **can't** fall very far*

We also use the question form of *can* to ask for permission and to make a request or ask for help.

Permission *Can we accompany you on the tour?* →

Yes, of course. /No, I'm afraid not.

Help *Can you explain the process to me?*

Can I ask a question?

Can you help me prepare this load?

must

We use *must* to talk about obligation, instructions, and rules.

Positive

I / You / He / She / It / We / You /They ***must listen*** carefully.

= subject + ***must*** + infinitive

Negative

I / You / He / She / It / We / You /They ***mustn't*** come

into this area without shoes.

= subject + ***must*** + ***not (mustn't)*** + infinitive

We often use *must* and *mustn't* when giving spoken instructions.

*One man **must** always have radio contact with the crane operator.*

*We **mustn't** go beyond this line.*

5. Words in sentences

There are three kinds of sentences: statements, questions, and imperatives.

In statements, the word order is as follows:

subject + verb

In questions, the word order is usually:

verb + subject

In imperatives, there is no subject.

Take this to the drilling platform.

Don't do anything yet.

There are other words that we can use in a sentence, such as nouns, pronouns, adjectives, and adverbs.

Nouns and pronouns

Nouns are the names of things, e.g. *drill, platforms*. Pronouns are words such as *he, it, they* which can be used instead of nouns. We do not use both together.

not ~~*The GPS it tells you exact position*~~

Nouns and pronouns can be either the subject or the object of the sentence.

*The **job** is hard work. I haven't got a **job**.*

***It** is on the chair. You re sitting on **it**.*

*We work with **them**.*

***He** is in the same team as **me**.*

but

***It's** a CPS receiver. You use **it** to find your exact position on the Earth.*

Adjectives

These are words that describe nouns. They go before nouns or after the verb be.

*This a **heavy** piece of equipment.*

*The equipment is **heavy**.*

Adverbs

These are words that describe a verb. The position of adverbs varies within the sentence. Adverbs of frequency (*usually, never, sometimes, etc.*) go before most verbs but after be and modal verbs. Other adverbs, such as *carefully, well*, often go after the object. Adverbs never go between the verb and the object.

***It usually** takes a few seconds to do this.*

*You read the data from the GPS unit **carefully** to get the position right.*

Sentences often include phrases using prepositions such as *in, on, at*, to say when or where something happened or to talk about conditions.

*It's hard work because you're carrying things in **hot weather**.*

*I prefer working **at night**.*

6. Adjective forms

We can change adjective forms to modify the meaning of the adjective.

too, not... enough

We use *too* + adjective and *not* + *adjective* + *enough* to talk about qualities in a different way.

*The liquid is **too thick**.* (= it needs to be less thick)

*The liquid is **not thick enough**.* (= it needs to be thicker)

We can use these expressions with adjectives that have opposite meanings to make them mean the same thing.

too thin = not thick enough

too dark = not light enough

-er, -est and more, most

We can add *-er* to the end of an adjective or put *more* in front of the adjective to make a comparison between two things or people. We add *-est* or put *the* *most* in front of the adjective to make a comparison between more than two things or people. The rules are as follows:

		<i>Adjective</i>	<i>Comparative</i>	<i>Superlative</i>
Short adjective	+ -er/-est	tall	taller	the tallest
Adjective ending in <i>-e</i>	+ -r/-st	large	larger	the largest
Short adjective ending in consonant + vowel + consonant	double the consonant + -er/-est	big	bigger	the biggest
Adjective of two or more syllables	more/the most + adjective	modern important	more modern more important	the most modern the most important
Adjective ending in consonant + <i>-y</i>	change -y to -i + -er/-est	heavy	heavier	the heaviest

*Let's make the mud **thicker**.*

*The problem with the pump is getting **more serious**.*

7. Countable and uncountable nouns

Nouns can be countable or uncountable Both types can be used with the.

Countable nouns

These can be singular or plural In the singular, they are used with *a /an* or one. In the plural, they can be used with numbers 01 other expressions such as some or *many*.

a pipe three instruments

an inspector several fittings

one litre

The verb agrees with the countable noun.

*The **pipe** carries the oil.*

*Some **sparks are coming** out of the machinery.*

Uncountable nouns

These have no plural form. They are used with expressions such as some or *much*, but not *a/an* or numbers Examples include *safety*, *smoke*, and *petrol*.

not ~~*a smoke, two petrols*~~

Uncountable nouns always have a singular verb form.

*There **is** smoke inside.*

***Is** there much smoke?*

8. Comparative sentences

There are several ways of making comparisons.

- comparative form of the adjective + *than*

*Helicopters are **faster than** boats.*

*Offshore work is **more hazardous than** onshore work.*

Note that some adjectives have irregular comparative and superlative forms.

<i>good</i>	<i>better</i>	<i>the best</i>
<i>bad</i>	<i>worse</i>	<i>the worst</i>
<i>far</i>	<i>further</i>	<i>the furthest</i>

*I think offshore work is **better** than onshore work.*

*The platform was **further** from land than I realized.*

Note that the comparative form of the adjective is followed by *than*, not *that*.

not ~~*bigger that*~~

- as + adjective + as

We use *as ... as* to talk about two things or people that are equal in some way.

*The platform is **as big as** a football field.*

*The rooms are great. They're **as comfortable as** they are at home.*

- not as + adjective + as

We use *not as ... as* to say that one thing or person has less of a particular quality than another.

*The food **isn't as good as** it is at home.*

*Onshore work is **not as hazardous as** offshore work.*

9. Past Simple *be*

We use the Past Simple of *be* to talk about states and conditions in the past.

Positive

I/He/She/It **was** late.

You/We/You/They **were** late.

= subject + **was/were**

Negative

I/He/She/It **was not (wasn't)** late.

You/We/You/They **were not (weren't)** late.

= subject + **am/is/are + not ('m not / isn't / aren't)**

Questions

Was I / he/ she / it late?

Were you / we / you /
they late?

= **Am / Is / Are** + subject

Short answers

Yes, I **was**. No, I **wasn't**.

Yes, we **were**.

No. we **weren't**.

We can use question words such as *What* or *How* if we want more specific information than a yes / no answer will give.

What was the meeting about? ~ It was about the Introduction of a new computer system.

We often use the Past Simple of *be* with past time expressions such as *yesterday* and *last...*

*I wasn't at the meeting **yesterday**.*

*We were at the refinery **last month**.*

10. Past Simple

We use the Past Simple to talk about completed actions in the past.

Positive

I/You/He/She/It/We/You/They **cleaned** the spill right away.

= subject + Past Simple

Negative

I/You/He/She/It/We/You/They **didn't clean** the spill right away.

= subject + **did** + **not (didn't)** + infinitive

Questions

Did I/you/he/she/it/

we / you / they **clean** the

spill right away?

= **Did** + subject + infinitive

Short answers

Yes, they **did**.

No. they **didn't**.

To form the Past Simple in the positive, we add *-d* or *-ed* to the infinitive.

live → *lived* *want* → *wanted*

*I **waited** all day for the delivery.*

*He **closed** the main valve to make it safe.*

Some common verbs, such as *do*, *go*, or *have*, are irregular.

do → *did* *have* → *had*

go → *went* *make* → *made*

Note the use of the infinitive in the negative.

*It **didn't arrive** on time.*

not *It ~~**didn't arrived**~~ on time.*

We often use time expressions with the Past Simple. These can go at the beginning or end of a sentence.

*They completed the refinery **in 1995**.*

*The whole team went to the meeting **on Thursday**.*

***Last week** I worked on a risk assessment with the operations team.*

11. Present Perfect

Positive

I/You/We/You/They **have ('ve) checked** the pressure.

He/She/It **has ('s) checked** the pressure.

= subject + **have / has** + past participle

Negative

I/You/We/You/They **have not (haven't) checked** the pressure.

He/She/It **has not (hasn't) checked** the pressure.

= subject + **have / has** + **not (haven't / hasn't)** + past participle

Questions

Have I/you/we/you/they

checked the pressure?

Has he/she/it

Short answers

Yes, I **have**.

No, I **haven't**.

Yes, I **has**.

checked the pressure? No, I **hasn't**.

= **Have / Has** + subject + past participle

Many past participle forms are irregular and need to be learned individually. For example, *be*, *go*, and *take*.

Verb	Past Simple	Past participle
be	was, were	been
go	went	been, gone
take	took	taken

We use the Present Perfect to talk about:

- recent actions

*We've **taken** out the old switch and put a new one in.*

*They **haven't repaired** the faulty lights.*

Have you done the maintenance check ?

- our lives up to now, often with ever in the question form:

***Have you ever worked** in Kuwait? ~ Yes, I have.*

*I worked there last year. /No, I **haven't**.*

We don't use the Present Perfect to talk about a completed action. With the Present Perfect, there is always a link with the present.

12. *will*

Positive

I/You/He/She/It/We/You/They **will ('ll)** **check** the reports.

= subject + **will ('ll)** + infinitive

Negative

I/You/He/She/It/We/You/They **will not (won't)** **check** the reports.

= subject + **will** + **not (won't)** + infinitive

Questions

Will I/you/he/she/it/we/

you /they **check** the reports?

Short answers

Yes, they **will**.

No, they **won't**

= **Will** + subject + infinitive

We use will when we.

- decide what to do, often in response to a particular situation:

This belt is noisy. ~ OK. I'll tighten it.

*The mechanic's coming to look at that part. ~ I **won't** touch it until he gets here, then.*

- talk about the future in general:

*The new bearing **will** arrive tomorrow.*

***Will** you be here for the meeting?*

We often use *will* with future time expressions, such as *later, tomorrow, next...*

*I'll check the part again **later**.*

*We'll reinstall the pump **tomorrow afternoon**.*

13. The Passive

We use the Passive to explain actions or processes. It generally isn't important who does the action. It is the action that is the most important element.

Passive

The crude oil **is stored** in these tanks. (= this is the process; it doesn't matter who stores them)

The refinery and pipes **are hidden** from the village by trees.

= subject + present simple of *be* + past participle

Active

We use the Active when we know who or what does an action, and we feel that it is relevant or important to give this information.

The crude oil **travels** along these pipes into the tanks. The refinery **uses** river water for cooling the machinery.

= subject + verb

When describing a process, we can sometimes choose to use either the Active or the Passive. In this case, we often use *by* with the Pass *we* to say who does the action.

Active

*A bridge **connects** the refinery to the main road.*

*Tankers **bring** crude oil to the refinery.*

Passive

The refinery **is connected** to the main road **by** a bridge.

Crude oil **is brought** to the refinery **by** tankers.

14. *if/ when / in case*, Past Continuous

if, when

We use *if* and *when* to talk about situations that we expect to happen. Of the two, *when* indicates greater probability.

***When** someone is sick or injured. I take care of them.* (= this is a situation that is quite common)

***If** there's a fire, we follow a fire-fighting plan.* (=this situation doesn't happen on a regular basis)

in case

We use *in case* when making plans for situations that happen more infrequently, such as an emergency.

*We have an evacuation plan **in case** we need to get everyone off the rig quickly.*

Past Continuous

Positive

I/He/She/It

was working.

You/We/You/ They

were working.

= subject + *was/were* + *-ing* form

Negative

I/He/She/It **was not (wasn't) working.**

You/We/You/They **were not (weren't) working.**

= subject + **was / were** + **not (wasn't / weren't)** + **-ing** form

Questions **Short answers**

Was I/he/she/it working? Yes, **I was.** No, **I wasn't.**

Were you/we/you/ Yes, we **were.**

they working? No, we **weren't**

= **Was / Were** + subject + **-ing** form

We use the Past Continuous to describe something that was happening over a period of time in the past.

*The fire **was burning** fiercely.*

*I'm sorry. I **wasn't listening**.*

***Were you training** to be a medic at the time of your accident?*

We often use the Past Continuous with the Past Simple to describe something that was happening when another action interrupted it.

*He **was working** on a ladder **when** he **fell** off.*

*Fortunately, I **wasn't walking** near the ladder **when** he **dropped** the toolbox.*

***Were they working** at the refinery **when** the explosion **happened**?*

15. *and, but, because*

We can use *and*, *but*, and *because* to join two sentences. The linkers *and*, *but*, and *because* have different meaning*.

and

We use *and* to give additional information.

Compare:

Polyethylene is the most commonly used polymer in the world. It is used as a packaging material.

and:

*Polyethylene is the most commonly used polymer in the world **and** it is used as a packaging material.*

but

We use but to contrast two ideas or to show that the second idea is unexpected.

Compare:

Polypropylene is also used in packaging. It is used in many other products too.

and:

*Polypropylene is also used in packaging, **but** (it) is used in many other products too*

because

We use because to explain why something happened or why something is true.

Compare:

Polyethylene is important. It is the most commonly used polymer in the world.

and:

*Polyethylene is important **because** it is the most commonly used polymer in the world.*

GLOSSARY

Vowels

	sea
	refinery
	drill
	belt
	gas
	plant
	rock
	cause

	look
	room
	regulator
	pump
	earth
	tanker
	maintain
	flow

	pipe
	ground
	oil
	area
	repair
	pure

Consonants

	petrol
	bit
	tank
	field
	crane
	gear
	bench
	geologist

	fuel
	valve
	thin
	breathe
	service
	design
	offshore
	precision

	hole
	team
	engine
	string
	well
	rig
	yes
	wave

above-ground / on the surface of the earth rather than under it

activate / *v* to make a device start working

adjust / *v* to change something slightly to make it better or more suitable

ambulance / *n* a vehicle with special equipment, used for taking sick people to hospital

ammonia / *n* (symb NH₃) a gas with a strong smell, used to make fertilizers and cleaning substances

area / *n* part of a place, used for a particular purpose

asphalt / *n* a thick black substance, used for making the surface of roads

assess / *v* to examine and judge a situation, person, etc.

barrel / *n* **1.** a large round container with flat ends and curved sides, used for storing **liquids** such as oil; **2.** (*abbr. bbl*) a unit for measuring oil that equals 42 US gallons (= about 159 litres)

bearing / *n* the direction in which you must travel in order to reach a particular place. **Bearings** are measured in degrees in a clockwise direction from north.

belt / *n* a band in a machine that turns round in order to turn something else

bent / *adj* not straight

block / *v* to prevent oil or gas from flowing through a pipe

boil / *v* (of liquid) to reach the temperature at which it forms bubbles and becomes **gas**

bolt / *n* a strong metal pin like a screw that attaches to a circle of metal (= a nut) to fasten things together

broken / *adj* damaged or no longer working correctly

budget / *n* the money that is available to someone and a plan of how it will be spent

bulk tanker / *n* a ship or truck that carries oil, gas, or petrol in very large quantities

carbon black / *n* a fine carbon powder, used to make black paint or ink and some kinds of rubber

carefully / *adv* with care and attention

cause / *v* to make something happen, especially something bad

chemical / *n* a particular compound or substance, especially one which has been artificially prepared

circuit / *n* the complete path that an electric current flows along

circumference / *n* the distance around a circle or round shape such as a pipe

clean up / *v* to remove rubbish, dirt, etc. from somewhere, such as oil that has spilt because of an accident

cluttered / *adj* (of a place) covered with or full of many things, in an untidy way

connect / *v* to join together two or more things

consume / *v* to use something, especially **fuel** or energy

containment / *n* a structure that an oil tank stands in. The containment holds any oil that leaks from the tank and prevents it from spreading to other areas

contractor / *n* a person or company that does work or provides goods for another company

control room / *n* a room that contains equipment for operating the machines in a factory, refinery, etc.

convert / *v* to change something from one form, system, etc. to another, for example to change sound waves into an electrical signal

coordinates / *n* two numbers that are used to describe the position of something on a map

corroded / *adj* (of a metal or hard substance) destroyed slowly by chemical action

crane / *n* a tall machine with a long arm, used to lift and move heavy objects

crane operator / *n* a person who controls a crane (= a machine for lifting and moving heavy things)

cubic metre / *n* (*abbr.* m³) a unit of volume that equals 1,000 litres

cuboid / *adj* shaped like a cube (= a shape with six square sides like a box)

cylindrical / *adj* shaped like a cylinder (= an object like a pipe with long straight sides and two round ends)

damage / *v* to harm or spoil something

damaged / *adj* harmed or spoiled

danger / *n* the possibility of harm to someone or something

dangerous / *adj* likely to cause harm

deal with / *v* to take action to solve a problem

defibrillator / *n* medical equipment that is used to give the heart an electric shock so that it beats normally

degrees Celsius / *n* (*abbr.* °C) a scale of temperature in which water freezes at 0° and boils at 100°

department / *n* a section of a company or other large organization

deposit / *n* a substance that is left somewhere by the flow of water, oil, etc., such as dirt left at the bottom of a pipe

derrick / *n* a tall structure over an oil well for holding the drill

derrickman / *n* the person who moves the top part of a drill string

design / *v* to create and make plans for a new device, machine, etc.

development / *n* the process of preparing an oil well for production, for example by building a pipeline

diameter / *n* the width of a circle or any other round object such as a pipe

disconnect / *v* to separate two or more things

downstream / *adj* connected with the processing and selling of oil and gas

drill bit / *n* the cutting part of a drill

drill string / *n* a series of pipes that form the main part of a drill, connecting the *wellhead* to the *drill bit*

driller / *n* a person who controls a drill and manages the work of the drilling crew (= the people who work on a drill)

drilling company / *n* a company that drills holes for an oil or gas company

earth / *v* to connect equipment to the ground so that it is protected from the possible flow of electric current (Am E = ground)

eco-hazard / *n* something that can harm the environment

emergency / *n* a sudden dangerous situation which needs immediate action to deal with it

emergency shower / *n* a shower in a factory or laboratory that is used if there is an accident; also called a safety shower

enclosure / *n* an area that is surrounded by a wall and is used for a particular purpose

ensure / *v* to make certain that something happens

environmental / *adj* connected with the environment (= the natural world in which people, animals, and plants live)

evacuate / *v* to make people leave a dangerous building or area

exploration / *n* the process of finding a source of oil or gas that a company can possibly develop

explosion / *n* the sudden violent bursting of something like a bomb

fire engine / *n* a special vehicle that carries firefighters (= people who put out fires) and their equipment

fire extinguisher / *n* a device with water or chemicals inside that you use to stop a fire burning

first aid kit / *n* a box containing medicine and equipment that you use for emergency medical treatment

flow / *n* the steady movement of a liquid in one direction

foreign / *adj* in or from a country that is not your own

fractional distillation / *n* the process of separating the different substances within crude oil by heating it until it becomes a gas and then collecting the gas and liquids that form at different temperatures

frozen / *adj* **1.** (of a screw, etc.) stuck or rusted so that it no longer moves; **2.** (of a computer) not working or responding so that you cannot move anything on screen

fuel / *n* a material that you burn to produce heat or power

fuel oil / *n* a type of oil produced from crude oil and used as fuel for ships, trains, etc. as well as for heating buildings

fumes / *n* smoke or gas which is dangerous to breathe

furnace / *n* a container like an oven that is heated to very high temperatures so that you can melt iron, etc.

gas / *n* any substance that is neither a solid nor a liquid, for example hydrogen and oxygen

gauge / *n* a device for measuring the amount or level of something

gear / *n* a wheel with teeth (= pointed parts) around its edge that works with other gears to control the speed at which an engine turns something

geologist / *n* a scientist who studies the earth, especially by examining the rocks of a particular area to find out if oil or gas is under the ground

geophone / *n* a device that is used on land for recording seismic waves so that you can make a map of the land and rocks in that area

go ahead / *v* used to tell someone that they can begin to do something

guide / *v* to move something in a particular direction

hazard / *n* something that may be dangerous

heading / *n* the direction in which you are currently moving

heavy / *adj* weighing a lot

horizontal / *adj* going across and parallel to the ground rather than going up and down

Human Resources / *n* the department in a company that deals with employing and training people

hydrocarbons / *n* chemicals that are made of hydrogen and carbon, especially the main substances in oil, gas, and coal

incident / *n* a bad or unfortunate event such as an accident

increase / *v* to make something larger in amount

inexpensive / *adj* not costing a lot of money; cheap

injure / *v* to harm someone physically, especially in an accident

inspect / *v* to examine something closely to check that there are no problems or errors

inspection / *n* a close examination to check that there are no problems or errors

install / *v* to fix equipment into position so that it can be used

instrument / *n* a tool or device used for a particular task, especially for technical or scientific work

international / *adj* connected with or involving two or more countries

jammed / *adj* not able to move

kerosene / *n* a type of oil made from crude oil and used as fuel for planes and for heating in houses

layer / *n* a sheet or level of rock, soil, etc. that is above or below other sheets or surfaces

length / *n* the size of something from one end to the other

level / *n* the amount or height of something, for example the amount of liquid in a tank

light / *adj* not weighing very much

liquefied natural gas (LNG) / *n* natural gas such as methane that is changed into liquid so that it can be stored or transported more easily

liquefy / *v* to become liquid; to make something become liquid

liquid / *adj* in the form of a liquid; not a solid or a gas

liquid petroleum gas (LPG) / *n* gas that is obtained from crude oil and made into a liquid under pressure. LPG is usually a mixture of propane and butane and is used as fuel for some vehicles or for heating in houses,

load / *v* to put things on or in a vehicle, a container, etc.

maintain / *v* to keep a machine, a tool, etc. in good condition by checking or repairing it regularly

maintenance / *n* the act of keeping something in good condition by checking or repairing it regularly

manage / *v* **1.** to be responsible for organizing a business, a team, etc.; **2.** to decide how to use money in a sensible way

man-made / *adj* made by people; not natural

medical oxygen / *n* pure oxygen that is given to someone to breathe as part of medical treatment

melt / *v* (of a solid substance) to become liquid as a result of heating

messy / *adj* untidy

methane / *n* (*symb* **CH₄**) a gas without colour or smell, that burns easily and is used as fuel. Natural gas mainly contains methane.

micron / *n* (*symb* **μm**) one millionth of a metre (= 0.000 001m)

molecule / *n* the smallest unit of a chemical substance, consisting of a group of atoms

monomer / *n* a molecule that can join with other molecules to form a polymer

motor / *n* a machine that uses petrol / gasoline, electricity, etc. to produce movement and supply power to a vehicle or device

mud / *n* a mixture of water, earth, and other materials which cools and cleans the drill bit

noise / *n* sound, especially when it is loud or unpleasant

noisy / *adj* making a lot of noise

offshore / *adj* at sea, not far from the land

oilfield / *n* an area of land that has large amounts of oil under its surface

oil well / *n* a hole in the ground that an oil company makes in order to get oil

onshore / *adj* on the land rather than at sea

operate / *v* **1.** to use or control a machine; **2.** to manage an organization or process

operating company / *n* a company that controls production of an oil well

organize / *v* to plan work in an efficient way

package / *v* to put something into a box, bag, etc. so that you can transport or sell it

petrochemical / *n* any chemical substance that you obtain from crude oil or natural gas

petrodiesel / *n* a type of fuel made from crude oil (= petroleum) and used in diesel engines

pipeline / *n* a series of pipes that carries oil and gas over long distances

plant / *n* a large factory that processes oil and gas, produces power, etc.

plastics / *n* artificial materials that are made from polymers. Plastics can be shaped when heated and are used for making many things

platform / *n* a large structure standing above water in the sea which provides a base for drilling for oil or gas

plentiful / *adj* available in large amounts

polyethylene / *n* a common type of plastic that is used for making bags or packaging

polymer / *n* a substance that is made from a number of the same molecules (= monomers) that are joined together. Polymers are used to make plastics.

position / *n* the place where a person or thing is located

precision / *n* very accurate: a precision instrument

prehistoric / *adj* relating to the ancient past before people kept written records

pressure / *n* the amount of force that a gas or liquid produces in a pipe or container

processing plant / *n* a factory that separates the different substances within oil and natural gas

product / *n* a thing that is made, usually for sale

production / *n* the process of removing oil or gas from the ground and transporting it

protect / *v* to make sure that a person or thing is not harmed or damaged

pump / *n* a machine that is used to force liquid, gas, or air into or out of something

radius / *n* the distance between the centre of a circle and its outer edge

react / *v* to respond to something by behaving in a particular way

record / *v* **1.** to keep an account of facts, measurements, etc. by writing them down or storing them in a computer; **2.** (of a measuring device) to show a particular measurement or amount

reduce / *v* to make something less or smaller in size

refine / *v* to make crude oil into petrol, plastic, etc. by separating it into different substances

refinery / *n* a place where crude oil is separated into different substances and processed in order to produce petrol / gasoline, plastic, etc.

reflect / *v* to throw back light, sound, etc. from a surface

regulator / *n* a device on a machine that automatically controls something such as speed, pressure, etc.

reinstall / *v* to install something again

remove / *v* to take something away from a place

repair / *v* to fix something that is broken or damaged

replace / *v* to change something that is old or broken for a similar thing that is newer or better

requisition / *n* a formal written request for something

responsibility / *n* something that it is your duty to deal with because it is part of your job

rigger / *n* a person who prepares or uses equipment for lifting heavy objects

risk assessment / *n* an examination of the possible dangers in a particular situation before it happens

rock / *n* the hard solid material on the surface of the earth; a piece of this material

roughneck / *n* a skilled person who works on a drill, for example by connecting or separating the pipes in a drill string

roustabout / *n* a man with no special skills who does basic work on an oil or gas rig

rule / *n* a regulation or principle that tells you what to do in particular situations

rusted / *adj* covered with rust (= a reddish-brown substance that forms on iron when it is in contact with water and air)

safely / *adv* in a way that is not dangerous

safety / *n* **1.** the state of being safe; **2.** something that prevents injury or harm: a safety helmet

SCBA (self-contained breathing apparatus) / *n* special breathing equipment consisting of a container of air which you carry on your back and a tube and mask through which you breathe the air

schedule / *n* a plan or list of all the work that you must do and when you must do each task

seismic / *adj* relating to earthquakes or other movements of the earth

separate / *v* to divide things into different parts or groups

service company / *n* a company that supplies equipment and technical services to other companies

shift / *n* a period of time worked by workers in a factory, refinery, etc. where some people work at night and other people work during the day

shock / *n* you get an electric shock if electricity suddenly passes through your body

sign / *n* a notice with a picture or writing on it that gives instructions, a warning, etc.

signal / *n* **1.** a movement or sound that you make to give instructions, a warning, etc. **2.** a series of electrical waves that carry sounds, pictures, or messages

slippery / *adj* (of an object or a surface) difficult to hold or stand on because it is smooth and wet

solid / *adj* hard or firm; not in the form of a liquid or gas

specialize (in) / *v* to concentrate on a particular area of business; to become an expert in something

spherical / *adj* shaped like a sphere (= a figure that is completely round like a ball)

split / *adj* with a tear or crack in the surface

stand by / *v* used to ask someone to prepare or get ready to do something

stretcher / *n* a long piece of cloth with a pole on each side, used for carrying a sick or injured person

supplier / *n* a person or company that supplies goods

supply / *v* to provide somebody with something that they need

synthetic / *adj* artificial; made by combining chemical substances rather than made naturally by plants or animals

team / *n* a group of people who work together

Technical Support / *n* a department in a company that deals with problems relating to computers or technical equipment

technician / *n* a person whose job involves looking after technical equipment

thick / *adj* (of a liquid) not flowing very easily

thickness / *n* the distance between opposite surfaces or sides of a solid object

thin / *adj* (of a liquid) containing more water than usual so that it flows very easily

tidy / *adj* arranged neatly and with everything in order

tighten / *v* to make something become tight or tighter

toolpusher / *n* the most senior person in a drilling crew who is responsible for managing the staff and the supply of equipment; also known as a rig manager

training / *n* the process of learning the skills that you need to do a job

troubleshooting / *n* helping to solve problems in a company or an organization

truck / *n* a large vehicle for carrying heavy loads by road

underground / *adj* under the surface of the ground

unload / *v* to remove things from a vehicle or ship

upstream / *adj* connected with finding and drilling for oil and gas

valve / *n* a device that opens and closes and which is used for controlling the flow of a liquid or gas through a pipe

vaporize / *v* to become gas; to make something become gas

vapour / *n* a gas such as steam that is created by the heating of a liquid or solid substance

variable / *n* a number or quantity that can change

vertical / *adj* going straight up or down

vibration / *n* a continuous shaking movement

volume / *n* the amount of space in a container, for example the amount of liquid that a pipe can hold

warn / *v* to tell someone about a possible danger so that they can avoid it

wave / *n* the form that energy such as sound and light takes as it moves

waypoint / *n* a place where you may stop during a flight or journey

well head / *n* a structure over the top of a well with equipment for controlling the flow of oil or gas

wire / *n* a thin piece of metal that can carry an electric current

workbench / *n* a long table used when working with tools

worn / *adj* made thinner, smoother, or weaker because of being used or rubbed a lot

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