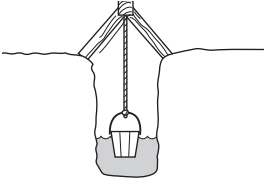
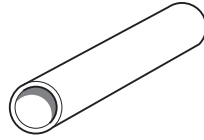


### 1 Label these pictures with words from the box.

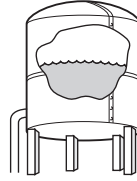
hole / well / drill / bit / pipe / tank / field / string / barrel / collar



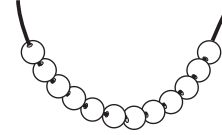
① \_\_\_\_\_



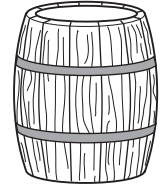
② \_\_\_\_\_



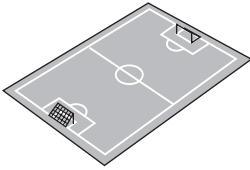
③ \_\_\_\_\_



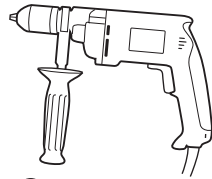
④ \_\_\_\_\_



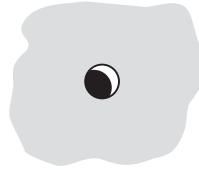
⑤ \_\_\_\_\_



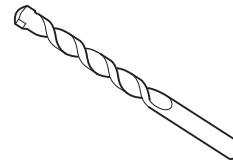
⑥ \_\_\_\_\_



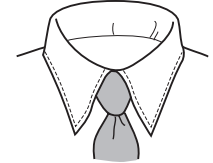
⑦ \_\_\_\_\_



⑧ \_\_\_\_\_



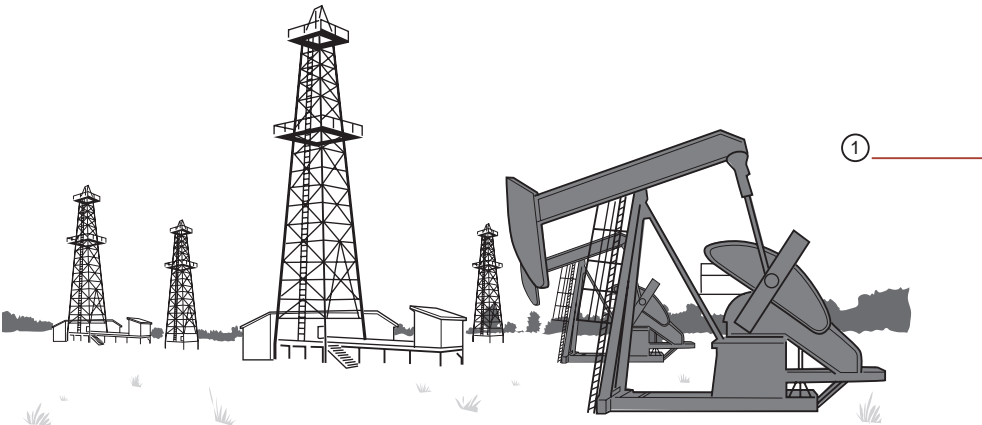
⑨ \_\_\_\_\_



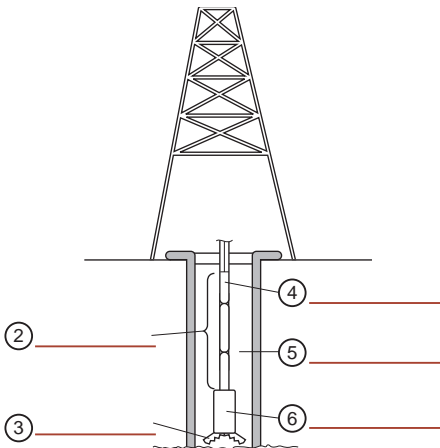
⑩ \_\_\_\_\_

### 2 Label these diagrams with words from the box.

well hole / drill pipe / oil field / drill string / drill collar / drill bit



① \_\_\_\_\_



② \_\_\_\_\_

④ \_\_\_\_\_

⑤ \_\_\_\_\_

③ \_\_\_\_\_

⑥ \_\_\_\_\_

### 3 Match the words with their meanings.

#### Some oil terms and their meanings

- |              |                |
|--------------|----------------|
| 1 drill bit  | 5 tank         |
| 2 drill pipe | 6 collar       |
| 3 barrel     | 7 drill string |
| 4 well hole  | 8 oil field    |

a) it sits on the drill bit

b) about 159 litres of oil

c) it cuts the rock

d) many drill pipes

e) area with oil under the ground

f) you drill this

g) it holds water or fuel

h) it turns the bit

### 4 Write out these numbers and units.

- 90 rpm ninety revolutions per minute
- 417 mm \_\_\_\_\_
- 159 L \_\_\_\_\_
- 14 km \_\_\_\_\_
- 518 m \_\_\_\_\_
- 880 b/d \_\_\_\_\_ barrels per \_\_\_\_\_

### 5 Write the numbers and units from 4 in the spaces.

- The drill bit turns at a speed of 90 rpm.
- The oil well produces \_\_\_\_\_.
- The diameter of the well hole is \_\_\_\_\_.
- The depth of the well hole is \_\_\_\_\_.
- The length of the pipeline is \_\_\_\_\_.
- An oil barrel contains about \_\_\_\_\_ of oil.

### 6 Complete these pairs of instructions. Write the opposite of the underlined word(s) in the second sentence of each pair.

right / stop / lower / down / pick up

- Please start the engine. OK, now please \_\_\_\_\_ the engine again.
- Pull the drill bit up. Now push it \_\_\_\_\_ again.
- Please raise the drill pipe. Now \_\_\_\_\_ it into the well.
- Turn the drill collar to the left. Now turn it to the \_\_\_\_\_.
- Please put down that pipe. Now please \_\_\_\_\_ this pipe.

### 7 Complete this conversation.

What's / Pleased / I'm / do / What's / name's / I'm / work

- A: Hello. My (1) \_\_\_\_\_ Tom. I work on an oil rig in the desert. (2) \_\_\_\_\_ your name?
- B: (3) \_\_\_\_\_ Ali. I (4) \_\_\_\_\_ on an offshore oil platform.
- A: (5) \_\_\_\_\_ to meet you, Ali. What do you (6) \_\_\_\_\_ on the oil rig?
- B: I operate the drills. (7) \_\_\_\_\_ your job?
- A: (8) \_\_\_\_\_ a crane operator.

### Word list

**8** Write the meanings of these words and phrases in your own language.

#### NOUNS

barrel \_\_\_\_\_

diameter \_\_\_\_\_

driller \_\_\_\_\_

oil \_\_\_\_\_

tank \_\_\_\_\_

#### NOUN PHRASES

crane operator \_\_\_\_\_

drill bit \_\_\_\_\_

drill collar \_\_\_\_\_

drill pipe \_\_\_\_\_

drill string \_\_\_\_\_

offshore oil platform \_\_\_\_\_

oil field \_\_\_\_\_

oil rig \_\_\_\_\_

well hole \_\_\_\_\_

#### VERBS

contain \_\_\_\_\_

operate \_\_\_\_\_

produce \_\_\_\_\_

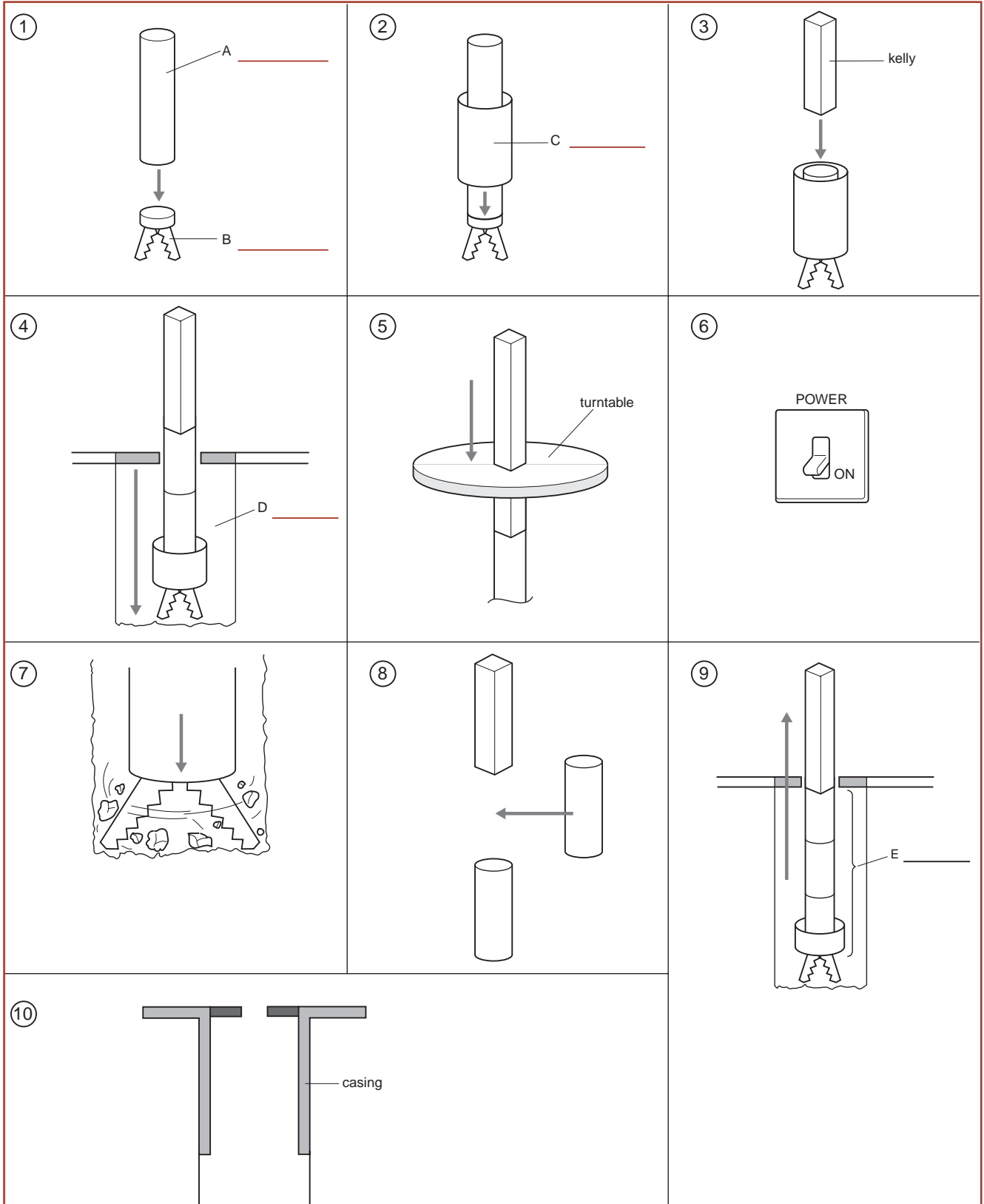
#### UNIT OF MEASUREMENT

barrels per day (bpd) \_\_\_\_\_

**1 Label these pictures with words from the box.**

well hole / drill string / drill bit / drill pipe / drill collar

### How to drill a well



**2** Put these instructions in the correct order. Write a number (1 – 10) next to each one.

### Instructions: How to drill for oil

- |   |   |
|---|---|
| _____ Trip the drill string into the well hole.   | _____ Attach another drill pipe to the string.        |
| _____ Slide the kelly into the turntable.         | _____ Install the casing in the well hole.            |
| _____ Put the collar on the drill bit.            | _____ 1 _____ Attach the drill pipe to the drill bit. |
| _____ Trip the drill string out of the well hole. | _____ Drill the hole                                  |
| _____ Fix the kelly to the drill pipe.            | _____ Switch on the power.                            |

*trip in the drill string = lower the drill string into the well*

*trip out the drill string = raise the string out of the well*

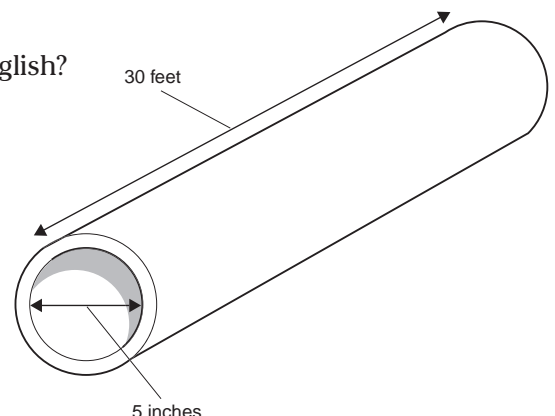
**3** Write the opposite of these instructions. Use the words in brackets.

- Lower the drill bit into the well hole. (Raise / out of)  
\_\_\_\_\_
- Put the collar on the drill pipe. (Take / off)  
\_\_\_\_\_
- Pull the drill string out of the well hole. (Push / into)  
\_\_\_\_\_
- Loosen the drill bit and take it off the drill pipe. (Put / on / tighten)  
\_\_\_\_\_

**4** Complete this dialogue between the Driller (A) and the Supplies Manager (B) on the oil rig. Use words from the box.

called / what / what's / They're / do / It's / some / how / need / what

- A:** I need (1) \_\_\_\_\_ drill pipes, please.  
**B:** OK, but (2) \_\_\_\_\_ diameter do you need?  
**A:** Five inches inside diameter, please.  
**B:** OK, what length do you need?  
**A:** 30 feet, please.  
**B:** And (3) \_\_\_\_\_ many do you need?  
**A:** I (4) \_\_\_\_\_ 24.  
**B:** OK. I'll send them to you.  
**A:** Thanks. Excuse me, (5) \_\_\_\_\_ this called in English?  
**B:** It's (6) \_\_\_\_\_ a kelly.  
**A:** And (7) \_\_\_\_\_ are those called?  
**B:** (8) \_\_\_\_\_ called drill collars.  
**A:** OK, thanks. How (9) \_\_\_\_\_ you spell *kelly*?  
**B:** (10) \_\_\_\_\_ K - E - L - L - Y.  
**A:** I see. Thanks.



### Word list

**6** Write the meanings of these words and phrases in your own language.

#### NOUNS

casing \_\_\_\_\_

dimension \_\_\_\_\_

foot (*pl* feet) \_\_\_\_\_

inch (*pl* inches) \_\_\_\_\_

kelly \_\_\_\_\_

length \_\_\_\_\_

pump \_\_\_\_\_

turntable \_\_\_\_\_

#### NOUN PHRASES

inside diameter \_\_\_\_\_

outside diameter \_\_\_\_\_

#### VERBS

attach \_\_\_\_\_

fix \_\_\_\_\_

install \_\_\_\_\_

loosen \_\_\_\_\_

screw \_\_\_\_\_

tighten \_\_\_\_\_

trip in \_\_\_\_\_

trip out \_\_\_\_\_

#### ADVERB

approximately \_\_\_\_\_

5 inches = 127 mm  
(approximately)

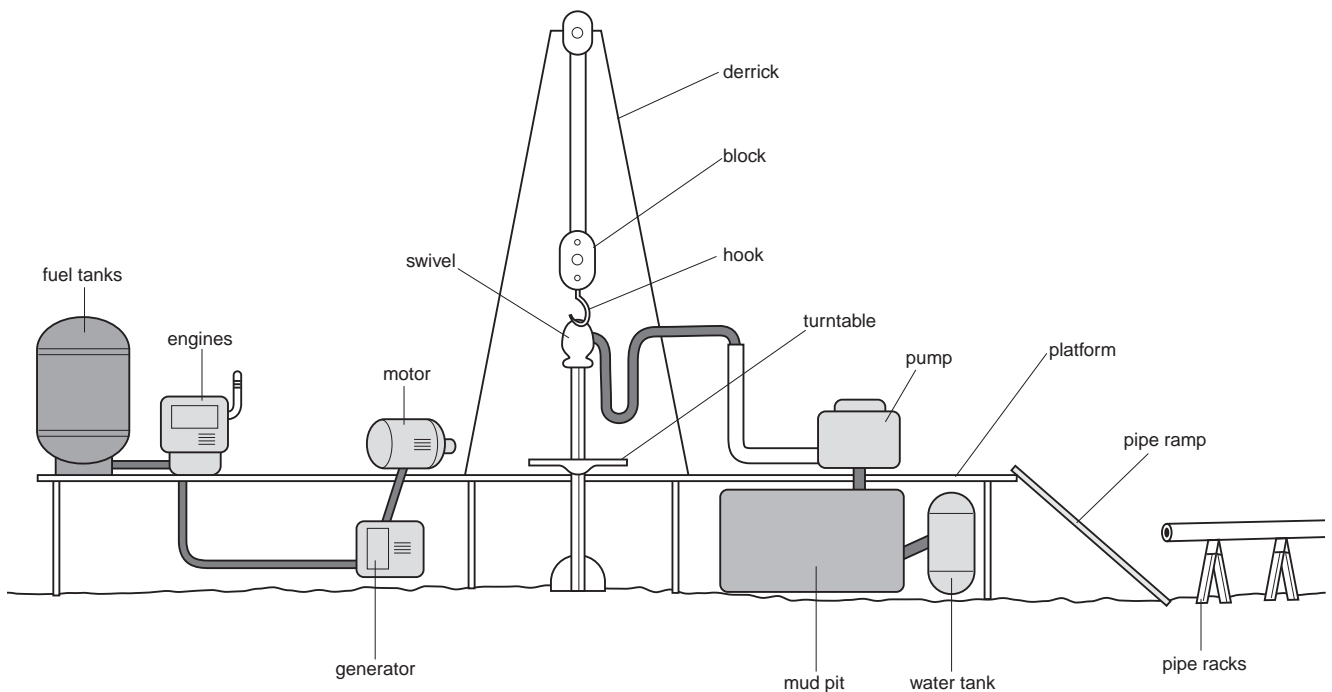
1 foot = 305 mm  
(approximately)

30 feet = 9.1 m  
(approximately)

**1 Circle T (true) or F (false) next to each statement about the diagram below.**

- 1 The turntable is on the platform at the bottom of the derrick. (T / F)
- 2 The block and the hook are at the top of the derrick. (T / F)
- 3 The engines are below the platform. (T / F)
- 4 The pipe racks are to the left of the platform. (T / F)
- 5 The motor is above the generator. (T / F)
- 6 The water tank is to the right of the mud pit below the platform. (T / F)

### An oil rig



**2 Underline all the mistakes in these statements. Write the correct word(s) on the line.**

- 1 The motor is below the platform, to the left of the engines. on / to the right of
- 2 The fuel tanks are above the platform, to the right of the engines. \_\_\_\_\_
- 3 The ramp is to the left of the platform and to the right of the racks. \_\_\_\_\_
- 4 The mud pit is to the right of the pump and above the water tank. \_\_\_\_\_
- 5 The pump is below the platform, to the left of the derrick. \_\_\_\_\_

**3 Write three sentences in your notebook. Describe the location of the *water tank*, the *generator* and the *engines*.**

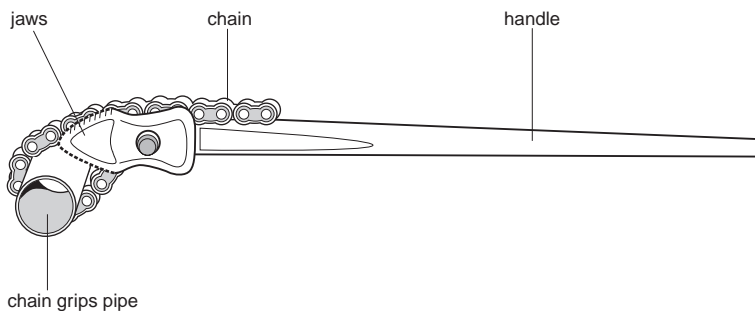
**4 Match the first, middle and final parts of each sentence. Underline the correct form of the verbs.**

Part	Function	
1 The derrick	<input type="checkbox"/> drive/ drives	<input type="checkbox"/> the drill pipes.
2 The engines	<u>1</u> support/ <u>supports</u>	<input type="checkbox"/> fuel for the engine.
3 The fuel tanks	<input type="checkbox"/> turn/ turns	<input type="checkbox"/> the motor.
4 The generator	<input type="checkbox"/> hold/ holds	<input type="checkbox"/> the generator.
5 The pipe racks	<input type="checkbox"/> store/ stores	<u>1</u> the block and the kelly.
6 The motor	<input type="checkbox"/> drive/ drives	<input type="checkbox"/> the turntable.

**5 Complete these questions about the table in 4.**

- Does the generator drive the motor ? Yes, it does .
- What do the pipe racks \_\_\_\_\_ ? They \_\_\_\_\_ .
- Do the engines \_\_\_\_\_ ? Yes, they \_\_\_\_\_ .
- What \_\_\_\_\_ the motor \_\_\_\_\_ ? It \_\_\_\_\_ .
- \_\_\_\_\_ the generator store fuel for the engine? No, it \_\_\_\_\_ .
- \_\_\_\_\_ the pumps hold the drill pipes? No, they \_\_\_\_\_ .

**6 Complete this dialogue about the pipe tong.**



- A:** What (1) is (is / has) that tool?
- B:** (2) \_\_\_\_\_ (It's / Is) a pipe tong. Drillers (3) \_\_\_\_\_ (use / uses) it.
- A:** What (4) \_\_\_\_\_ (does / has) it do?
- B:** It (5) \_\_\_\_\_ (grip / grips) pipes.
- A:** What (6) \_\_\_\_\_ (have / are) the main parts?
- B:** It (7) \_\_\_\_\_ (is / has) a handle and a chain.
- A:** Does it (8) \_\_\_\_\_ (has / have) jaws?
- B:** Yes, it (9) \_\_\_\_\_ (does / do). The jaws (10) \_\_\_\_\_ (holds / hold) the chain.
- A:** How does it (11) \_\_\_\_\_ (do / work)?
- B:** The chain (12) \_\_\_\_\_ (go / goes) round the pipe and through the jaws. Then you (13) \_\_\_\_\_ (pull / pulls) the handle, and the chain (14) \_\_\_\_\_ (grip / grips) the pipe.

### Word list

**7** Write the meanings of these words and phrases in your own language.

#### NOUNS

block \_\_\_\_\_

chain \_\_\_\_\_

derrick \_\_\_\_\_

engine \_\_\_\_\_

fuel \_\_\_\_\_

generator \_\_\_\_\_

hook \_\_\_\_\_

jaws \_\_\_\_\_

motor \_\_\_\_\_

mud \_\_\_\_\_

pit \_\_\_\_\_

platform \_\_\_\_\_

rack \_\_\_\_\_

ramp \_\_\_\_\_

#### NOUN PHRASES

fuel tank \_\_\_\_\_

mud pit \_\_\_\_\_

pipe rack \_\_\_\_\_

pipe ramp \_\_\_\_\_

pipe tong \_\_\_\_\_

water tank \_\_\_\_\_

#### VERBS

carry \_\_\_\_\_

drive \_\_\_\_\_

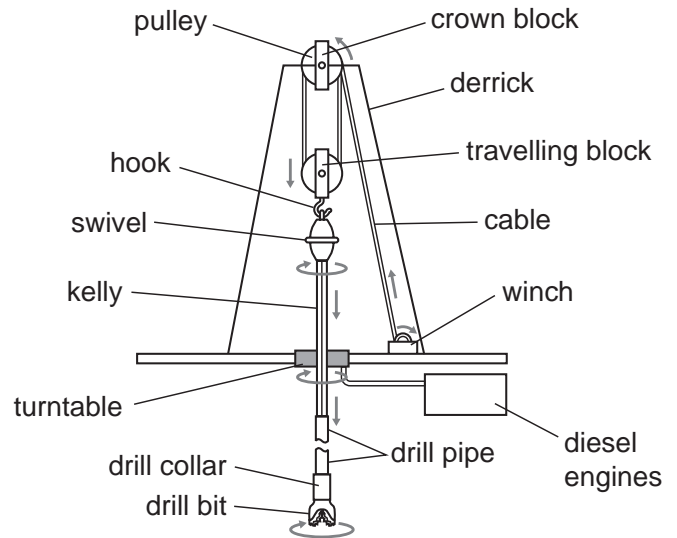
grip \_\_\_\_\_

store \_\_\_\_\_

support \_\_\_\_\_

**1 Study this diagram of the lifting and rotary systems of an oil rig. Circle T (true) or F (false) next to each statement.**

- 1 The crown block is in the centre of the derrick. (T / F)
- 2 The travelling block is below the crown block. (T / F)
- 3 The swivel is between the kelly and the turntable. (T / F)
- 4 The cable moves diagonally downwards from the winch. (T / F)
- 5 The hook on the travelling block does not rotate. (T / F)
- 6 The turntable moves vertically downwards. (T / F)

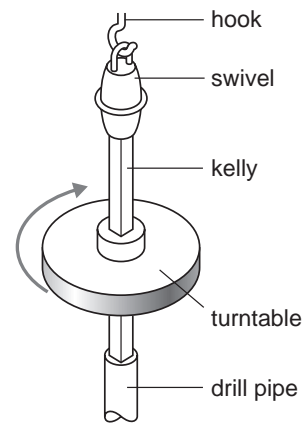


**2 Read this description of the rotary system of an oil rig and match parts with functions in the table below.**

### The lifting and rotary systems of an oil rig

**Lifting system.** When the winch rotates, it pulls the cable. The two blocks have lots of pulleys. The cable passes round the pulleys in the two blocks. The crown block does not move up or down. It is fixed to the top of the derrick. The travelling block moves vertically. When the winch turns, it raises the travelling block up towards the crown block.

**Rotary system.** The swivel hangs from a hook on the travelling block. The kelly (a long square pipe) is fixed to the swivel at one end. The lower end of the kelly is attached to the drill pipe. It goes through the turntable. The square shape of the kelly slides exactly into the square hole of the turntable. When the engines are on, the turntable rotates. The turntable turns the kelly and the kelly turns the drill pipe. When the drill pipe rotates, the drill bit rotates and cuts the rock.



Part	Function
1 The winch <input type="checkbox"/>	a) turns the kelly.
2 The kelly <input type="checkbox"/>	b) raises and lowers the rotary equipment.
3 The turntable <input type="checkbox"/>	c) supports the swivel and the kelly.
4 The engines <input type="checkbox"/>	d) pulls the cable.
5 The hook <input type="checkbox"/>	e) turns the drill pipe.
6 The cable <input type="checkbox"/>	f) drive the turntable.

### 3 Complete these statements with *can* or *can't*, according to the text in 2 and the diagram.

- 1 The top half of the swivel \_\_\_\_\_ rotate, but the bottom half \_\_\_\_\_.
- 2 The hook \_\_\_\_\_ move up and down, but it \_\_\_\_\_ rotate.
- 3 The crown block \_\_\_\_\_ move up and down, but the travelling block \_\_\_\_\_.
- 4 The turntable \_\_\_\_\_ rotate, but it \_\_\_\_\_ move up and down.

### 4 Join up parts of the table to make six meaningful instructions. Then write out the full instructions in your notebook.

1 Slide	the handle	from the hook.
2 Lower	the drill pipe	out of the well hole.
3 Turn	the kelly	into the well hole.
4 Attach	the drill pipe	of the winch.
5 Raise	the swivel	to the kelly.
6 Hang	the drill pipe	into the turntable.

### 5 Match the first part of each sentence with the second part. Underline the correct verb forms. Then write out the full sentences in your notebook.

- 1 You (switches on/ switch on) the winch, and D
- 2 When the driller (switches on/ switch on) the turntable, \_\_\_\_\_
- 3 (Turns off/ Turn off) the winch, and \_\_\_\_\_
- 4 When the drillers (turns off/ turn off) the turntable, \_\_\_\_\_
  - A the cable (doesn't/ don't) move.
  - B the kelly (rotates/ rotate).
  - C the turntable and the kelly (doesn't/ don't) rotate.
  - D the cable (move/ moves) up and down.

### 6 Complete this description of the lifting and rotary systems. Choose the correct verb and use the correct verb form.

#### The swivel

The swivel is an important piece of equipment. It connects the lifting system to the rotary system. The swivel (1) \_\_\_\_\_ (have / not have) two parts. The top part is fixed. It can't (2) \_\_\_\_\_ (move down / rotate), but the bottom half can rotate freely. When the turntable and the kelly rotate, the bottom half of the swivel turns, but the top half (3) \_\_\_\_\_ (do / do not) rotate. This protects the travelling block and the cable.

#### How to lower the drill pipe into the well

The winch turns and (4) \_\_\_\_\_ (pull / release) the cable. The cable (5) \_\_\_\_\_ (rotate / move) diagonally upwards towards the crown block. Then the cable goes round the pulleys of the crown block and the travelling block.

The travelling block moves vertically downwards and (6) \_\_\_\_\_ (raise / lower) the kelly into the hole in the turntable. When the diesel engines (7) \_\_\_\_\_ (start / stop), the turntable and the kelly (8) \_\_\_\_\_ (move up / rotate) together.

### Word list

**7** Write the meanings of these words and phrases in your own language.

#### NOUNS

- block \_\_\_\_\_
- cable \_\_\_\_\_
- derrick \_\_\_\_\_
- engine \_\_\_\_\_
- equipment \_\_\_\_\_
- hook \_\_\_\_\_
- kelly \_\_\_\_\_
- pulley \_\_\_\_\_
- swivel \_\_\_\_\_
- system \_\_\_\_\_
- turntable \_\_\_\_\_
- winch \_\_\_\_\_

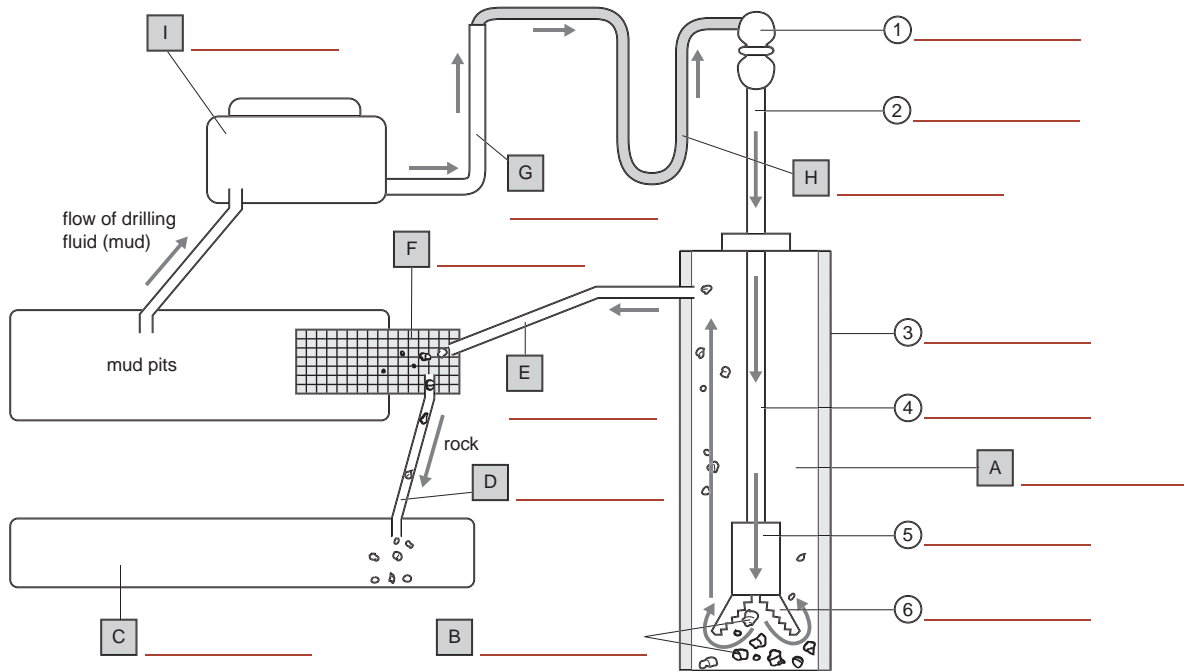
#### NOUN PHRASES

- crown block \_\_\_\_\_
- diesel engine \_\_\_\_\_
- drill bit \_\_\_\_\_
- drill collar \_\_\_\_\_
- drill pipe \_\_\_\_\_
- lifting system \_\_\_\_\_
- rotary system \_\_\_\_\_
- travelling block \_\_\_\_\_

1 Label items 1 – 6 on the diagram with words from the box.

kelly / swivel / drill string / drill collar / drill bit / casing

### The circulation system in an oil rig



2 Read this text and label items A – I on the diagram in 1. Use some of the words in *italics* in the text.

### The circulation system

The circulation system cleans out the well. It pumps a special liquid (called *drilling fluid* or *drilling mud*) down the drill string into the well hole. This liquid picks up pieces of rock (*rock cuttings*) and carries them up the well hole and out of the well.

This is how the system works. The *mud pump* sucks the drilling fluid from large open tanks (called *mud pits*) and pumps it through the *stand pipe* and *the rotary hose*. The fluid then enters the kelly through a hole in the swivel. The fluid then moves through the kelly and the drill string to the drill bit. Then the mud flows out of the drill bit and around the bottom of the well. It collects the rock cuttings and carries them up through the *annulus* (the space between the drill string and the casing). At the top of the annulus, the mud and cuttings leave the well through the *mud return line* (or pipe).

Now the mud flows into the *shaker*. This moves quickly from side to side. The fluid flows through the small holes in the shaker, but the large rock cuttings stay on the shaker. The fluid then flows back into the mud pits, and the large cuttings slide down the *shale slide* into the *reserve pit*.

3 Complete these statements. Underline the correct words.

- 1 The mud enters the swivel through an \_\_\_\_\_ (inlet / outlet) in the swivel.
- 2 The mud leaves the drill bit through an \_\_\_\_\_ (inlet / outlet) in the bit.
- 3 The rotary hose connects the \_\_\_\_\_ (pump / drill bit) to the rotary equipment.
- 4 The mud flows \_\_\_\_\_ (into / out of) the well through the drill string.

### 4 Put these stages in the circulation system in the correct order. Number each one.

#### Stages in the circulation system

- \_\_\_\_\_ It then flows down through the drill string.
- \_\_\_\_\_ From the rotary hose it enters the swivel and the kelly.
- 1** \_\_\_\_\_ The pumps suck the drilling mud out of the mud pits.
- \_\_\_\_\_ It then leaves the drill bit and flows around the annulus.
- \_\_\_\_\_ The fluid picks up pieces of rock and sand.
- \_\_\_\_\_ The fluid then goes into the mud pits again, and the cuttings enter the reserve pit.
- \_\_\_\_\_ The shaker takes the cuttings out of the fluid.
- \_\_\_\_\_ At the top of the well, the fluid flows through the mud return line into the shaker.
- \_\_\_\_\_ Then the mud rises up the well hole between the drill pipe and the casing.
- \_\_\_\_\_ They then pump the fluid through a hose to the rotary equipment.

### 5 Choose the correct word and complete this text about the circulation system.

down / up / into / out of / around / through / up / from

This is how the drilling mud flows (1) \_\_\_\_\_ the whole circulation system. The pump sucks the mud (2) \_\_\_\_\_ the mud pits. The pump then pushes the mud (3) \_\_\_\_\_ the stand pipe and (4) \_\_\_\_\_ the rotary hose (5) \_\_\_\_\_ the swivel. Next, it flows (6) \_\_\_\_\_ the kelly and the drill string. Then the mud comes (7) \_\_\_\_\_ the drill bit and enters the well hole. Finally, the fluid collects the cuttings and flows back (8) \_\_\_\_\_ the well hole.

### 6 Complete these statements. Choose the correct verb and use the correct verb form.

- 1 The pumps \_\_\_\_\_ (push / pull) drilling mud out of the mud pits and \_\_\_\_\_ (push / pull) it through the rotary hose.
- 2 The rotary hose \_\_\_\_\_ (carry / flow) the drilling mud into the swivel.
- 3 The mud \_\_\_\_\_ (pass / leave) into the drill string through a hole in the swivel and then \_\_\_\_\_ (flow / contain) through the kelly.
- 4 The drilling mud \_\_\_\_\_ (enter / leave) the well hole through the mud return line.
- 5 In the shaker, the mud \_\_\_\_\_ (rise / sink) through the holes, but the rock cuttings \_\_\_\_\_ (stay / flow) on the shaker.

### 7 Answer the questions. Use *if* and the present simple.

- 1 What happens if the pump is off? Does the drilling mud flow to the drill string?  
\_\_\_\_\_
- 2 What happens if the drilling mud doesn't flow? Do the rock cuttings rise to the top of the well?  
*If the pump is off, the drilling mud doesn't flow to the drill string.*  
\_\_\_\_\_
- 3 What happens if the engines are off? Do the kelly and the drill string rotate?  
\_\_\_\_\_
- 4 What happens if the drill string doesn't rotate? Does the drill bit cut the rock?  
\_\_\_\_\_

### Word list

**8** Write the meanings of these words and phrases in your own language.

#### NOUNS

annulus \_\_\_\_\_

circulation \_\_\_\_\_

fluid \_\_\_\_\_

liquid \_\_\_\_\_

shaker \_\_\_\_\_

stage \_\_\_\_\_

system \_\_\_\_\_

#### NOUN PHRASES

circulation system \_\_\_\_\_

drilling fluid \_\_\_\_\_

drilling mud \_\_\_\_\_

mud return line \_\_\_\_\_

reserve pit \_\_\_\_\_

rock cutting \_\_\_\_\_

rotary equipment \_\_\_\_\_

rotary hose \_\_\_\_\_

shale slide \_\_\_\_\_

stand pipe \_\_\_\_\_

#### VERBS

carry \_\_\_\_\_

collect \_\_\_\_\_

connect \_\_\_\_\_

pump \_\_\_\_\_

shake \_\_\_\_\_

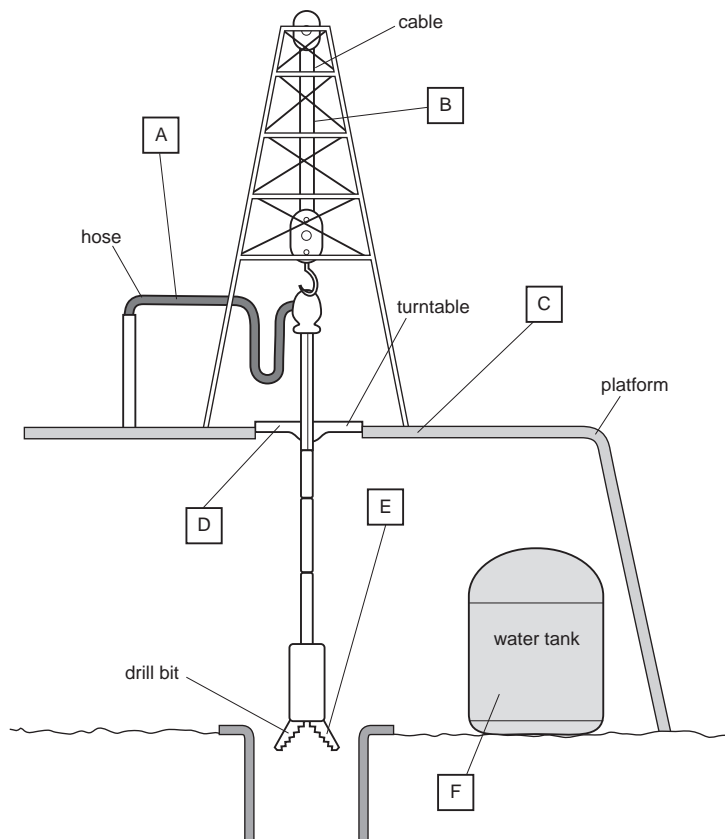
slide \_\_\_\_\_

stay \_\_\_\_\_

suck \_\_\_\_\_

**1 Match the statements with the letters on the diagram.**

- 1 If you pull this material, it doesn't stretch or break. \_\_\_\_\_
- 2 If you compress or press down on this material, it doesn't bend or break. \_\_\_\_\_
- 3 This material can cut things, but you can't cut or scratch the material. \_\_\_\_\_
- 4 This material doesn't corrode when it holds water or chemicals. \_\_\_\_\_
- 5 This material is strong, but it can bend easily. \_\_\_\_\_
- 6 When this material rotates it becomes hot, but it doesn't burn or melt. \_\_\_\_\_



**2 Complete the statements (1–6) about this table. Use the correct verb forms. Use some verbs twice.**

make / bend / heat / melt / cut / break / crack / corrode / pull / stretch / push

Part	Material	Property
hose	plastic	flexible, tough
bit	diamond	hard, heat-resistant
casing	concrete	strong in compression
derrick	steel	rigid
drilling pipe	steel	tough; corrosion-resistant
cable	high-carbon steel	strong in tension

- 1 The rotary hose is \_\_\_\_\_ of plastic. It \_\_\_\_\_ easily, but it doesn't \_\_\_\_\_.
- 2 You can \_\_\_\_\_ diamond up to high temperatures and it doesn't \_\_\_\_\_. It \_\_\_\_\_ hard rock easily.
- 3 The casing is made of concrete. This material doesn't \_\_\_\_\_ when heavy equipment \_\_\_\_\_ down on it.
- 4 The steel in the derrick does not \_\_\_\_\_ when the heavy rotary equipment \_\_\_\_\_ down on it.
- 5 The drilling pipe is \_\_\_\_\_ of a tough steel. When you twist or rotate the pipe, it doesn't \_\_\_\_\_. And drilling mud can't \_\_\_\_\_ it.
- 6 The cable is made of a strong steel. When you \_\_\_\_\_ it with a heavy weight, you can't \_\_\_\_\_ it.

### 3 Read this text about petroleum products and match the items in the table below.

#### Petroleum products

**Petrol** (also called gasoline). This is a liquid fuel for vehicles on land and sea. It ignites easily in engines. It remains liquid at normal temperatures.

**Jet fuel.** This is a liquid fuel for aircraft and rockets. It can remain liquid at very low temperatures. It is suitable for use at high altitudes.

**Plastics** (also called **polymers**). These are generally light, durable and corrosion-resistant. You can shape them. There are two types: thermosets and thermoplastics.

- **Thermoplastics.** When you heat them, they melt and you can shape them. Then you can re-heat them and melt them again and again. This means that you can recycle them. But they are not heat-resistant. Water bottles are made of thermoplastics.
- **Thermosets.** You can mould them into shape. But you cannot re-melt them. They are heat-resistant. Plastic parts in or near engines are made of thermosets.

**Synthetic fibres.** These are made from plastics. Many textiles and ropes are made from synthetic fibres such as nylon. These are often water-resistant and don't stretch or break when you pull them.

**Synthetic rubber.** This is a heat-resistant and corrosion-resistant material. Oil and petrol can't corrode it. For this reason, fuel hoses are often made of synthetic rubber.

Material	Properties	Example of use
1 Petrol	a) light-weight; you can melt it many times	A climbing ropes
2 Jet fuel	b) chemical-resistant	B plastic bottles
3 Thermoplastic	c) can burn	C hoses in petrol stations
4 Thermoset	d) you can hang heavy weights from it	D fuel for aeroplanes
5 Synthetic fibre	e) doesn't freeze	E plastic parts on heaters
6 Synthetic rubber	f) light-weight; heat-resistant	F fuel for cars and boats

### 4 In your notebook, rewrite these statements to give the same or a similar meaning. Use the words in the brackets to replace the words in *italics*. Add any other words.

- 1 The plastic in the engine *is heat-resistant*. (not / melt / when / heat)
- 2 This pipe is made of synthetic rubber because it *doesn't corrode*. (corrosion / resistant)
- 3 The rope is made of nylon because *it doesn't stretch* if you pull it. (you / cannot)
- 4 If you pull this synthetic fibre, *you can't stretch it or break it*. (does / not)

### 5 A trainer is showing a DVD of the drilling operation and talking about it. Complete the description. Use the present continuous.

Right. Here they (1) are raising (raise) the kelly. The winch (2) \_\_\_\_\_ (turn), and the travelling block (3) \_\_\_\_\_ (move) upwards. The block (4) \_\_\_\_\_ (pull) the kelly upwards. Now they (5) \_\_\_\_\_ (attach) the drill pipe to the kelly. What (6) \_\_\_\_\_ (happen) now? That's right, the men (7) \_\_\_\_\_ (lower) the kelly and the drill pipe through the turntable and into the well hole. Now the turntable (8) \_\_\_\_\_ (rotate). The drilling mud is (9) \_\_\_\_\_ (flow) through the kelly and the drill pipe. Now you can see the drill string and the drill bit. What (10) \_\_\_\_\_ (they/ do)? They (11) \_\_\_\_\_ (rotate), and the bit (12) \_\_\_\_\_ (cut) the rock at the bottom of the well.

### Word list

**6** Write the meanings of these words and phrases in your own language.

#### NOUNS

chemical \_\_\_\_\_

compression \_\_\_\_\_

diamond \_\_\_\_\_

fibre \_\_\_\_\_

fuel \_\_\_\_\_

gasoline \_\_\_\_\_

jet \_\_\_\_\_

petrol \_\_\_\_\_

plastic \_\_\_\_\_

polymer \_\_\_\_\_

rubber \_\_\_\_\_

tension \_\_\_\_\_

thermoplastic \_\_\_\_\_

thermoset \_\_\_\_\_

#### NOUN PHRASE

high-carbon steel \_\_\_\_\_

#### ADJECTIVES

synthetic \_\_\_\_\_

water-resistant \_\_\_\_\_

#### VERBS

compress \_\_\_\_\_

corrode \_\_\_\_\_

ignite \_\_\_\_\_

melt \_\_\_\_\_

recycle \_\_\_\_\_

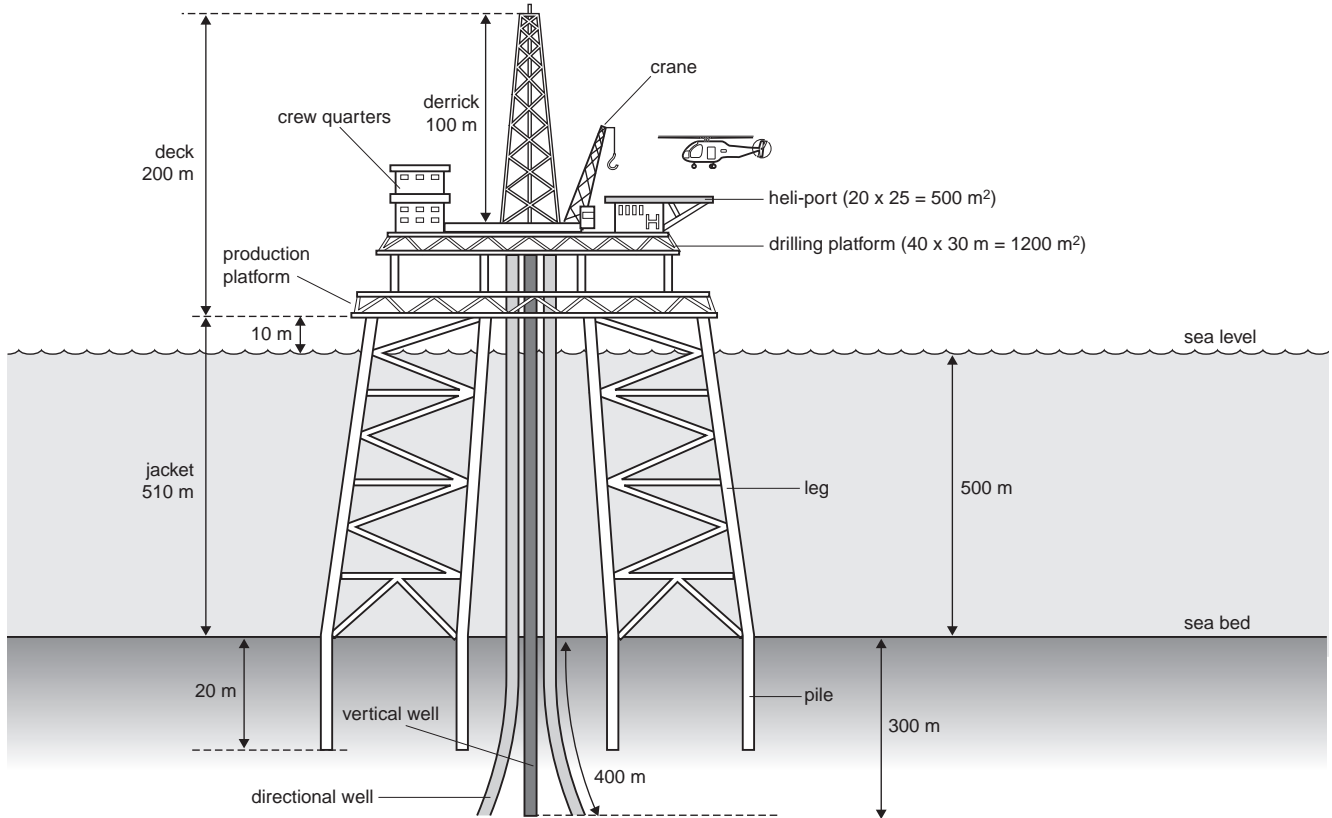
re-heat \_\_\_\_\_

re-melt \_\_\_\_\_

shape \_\_\_\_\_

1 Study this diagram of an offshore oil platform and complete the specification table below.

### The Scorpio offshore fixed platform



The Scorpio offshore fixed platform	
1 height of jacket above sea bed	
2 height of deck (including derrick) above jacket	
3 number of platforms	
4 height of derrick above drilling platform	
5 depth of piles below sea floor	
6 depth of vertical well below sea bed	
7 length of directional well below sea bed	
8 area of drilling platform	

2 Write the words in the correct order.

- 1 pipeline kilometres is long The five \_\_\_\_\_
- 2 five hundred is The deep sea metres \_\_\_\_\_
- 3 width in The metres is heli-port twenty \_\_\_\_\_
- 4 metres The drilling platform the forty length of is \_\_\_\_\_

### 3 Make statements about the dimensions in the table in 1.

- 1 vertical well / deep The vertical well is 300 m deep.
- 2 derrick / high \_\_\_\_\_
- 3 heli-port / long / and / wide \_\_\_\_\_
- 4 piles / deep/ \_\_\_\_\_
- 5 drilling platform / long \_\_\_\_\_

### 4 Write questions and answers about the platform in 1.

- 1 high/ derrick/ above sea level  
Q: How high is the derrick above sea level? ? A: It's 210 metres high.
- 2 area / heli-port  
Q: \_\_\_\_\_ ? A: \_\_\_\_\_.
- 3 deep / sea at the platform  
Q: \_\_\_\_\_ ? A: \_\_\_\_\_.
- 4 width / drilling platform  
Q: \_\_\_\_\_ ? A: \_\_\_\_\_.
- 5 total height / jacket / above sea bed  
Q: \_\_\_\_\_ ? A: \_\_\_\_\_.

### 5 Scorpio is planning a new offshore oil platform. Disagree with each statement about the future oil platform and make a new statement. Write in your notebook.

*Example. 1 The new platform won't be ready next year. It'll be ready two years from now.*

- 1 The new offshore oil platform will be ready next year. (two years from now).
- 2 The rig will have horizontal wells. (diagonal and vertical)
- 3 The piles will extend 40 metres below the sea bed. (only 35 metres)
- 4 The crew quarters will accommodate 500 workers. (only 400)
- 5 The platform will produce about 40,000 bpd. (more than 60,000)

### 6 Complete this dialogue using *much* and *many*.

- A:** Tell me about the Scorpio platform. How (1) \_\_\_\_\_ oil does it produce?  
**B:** It produces about 21,000 barrels per day.  
**A:** How (2) \_\_\_\_\_ tonnes is that per year?  
**B:** Let me see. That's over one million tonnes per year.  
**A:** How (3) \_\_\_\_\_ oil workers are on the platform?  
**B:** I think there are about 120.  
**A:** How (4) \_\_\_\_\_ money do the oil workers earn?  
**B:** They earn quite a lot because they have to work hard.

### Word list

**7** Write the meanings of these words and phrases in your own language.

#### NOUNS

crane \_\_\_\_\_

crew \_\_\_\_\_

deck \_\_\_\_\_

jacket \_\_\_\_\_

leg \_\_\_\_\_

pile \_\_\_\_\_

platform \_\_\_\_\_

tonne \_\_\_\_\_

worker \_\_\_\_\_

#### NOUN PHRASES

crew quarters \_\_\_\_\_

directional well \_\_\_\_\_

drilling platform \_\_\_\_\_

fixed platform \_\_\_\_\_

heli-port \_\_\_\_\_

offshore platform \_\_\_\_\_

production platform \_\_\_\_\_

sea bed \_\_\_\_\_

sea level \_\_\_\_\_

vertical well \_\_\_\_\_

#### VERBS

accommodate \_\_\_\_\_

extend \_\_\_\_\_

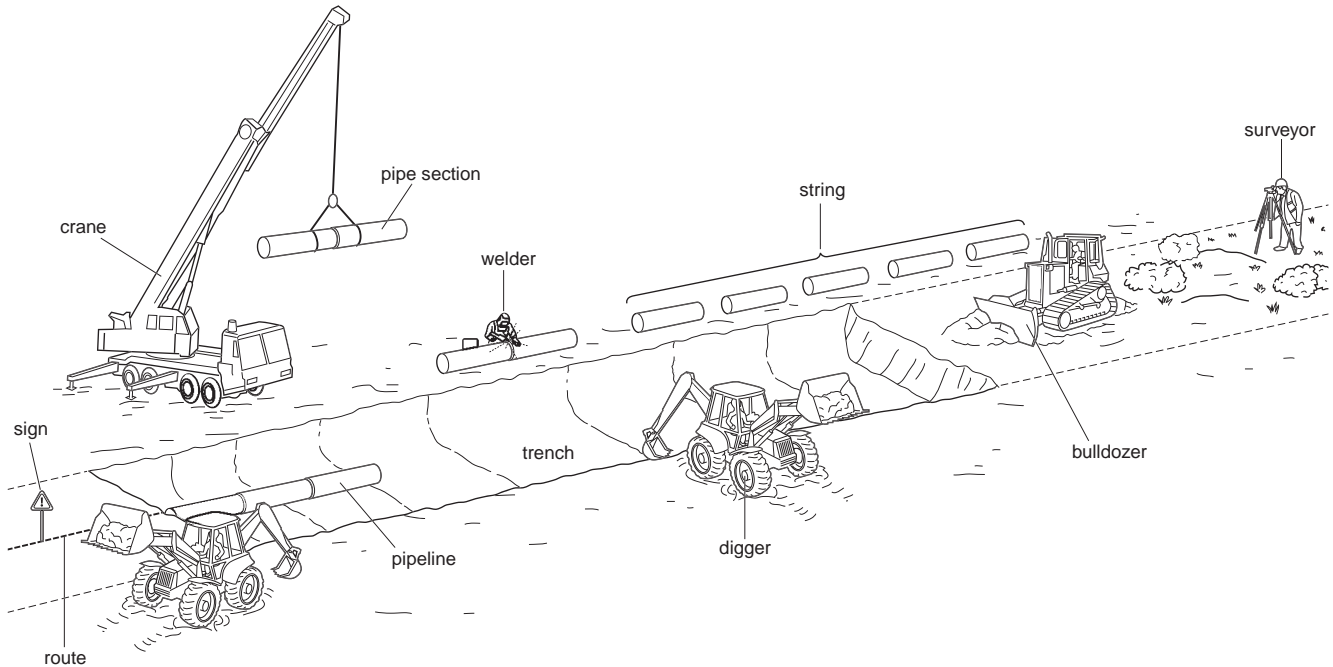
produce \_\_\_\_\_

#### ADJECTIVES

offshore \_\_\_\_\_

onshore \_\_\_\_\_

1 Look at this diagram, read the text and put the instructions below into the correct order.



### Laying a pipeline

Before work begins, two teams of surveyors travel along the route of the pipeline. One team drives along the route, and the other team flies over the route by helicopter or small plane. They survey the whole route and inspect it carefully. After the survey, the work begins. First, workers drive bulldozers along the route and clear it. They take out trees and bushes or other obstacles, and they level the ground. Next, they *string* (place in a line) pipes along the route. After this, the diggers excavate trenches next to the pipe string. The trenches are about two metres deep. Then they weld the pipes together into a pipe section. They also bend the pipe section into the shape of the route. Next, cranes lift up the pipe section and place it carefully into the trench. The welders weld the section to the rest of the pipeline. Then diggers push earth into the trench and cover the pipeline. Workers place signs above the pipeline to warn the public. Finally, engineers pump water at high pressure through the complete pipeline. This tests the strength of the pipeline. If there is a leak, they will detect it now.

- \_\_\_\_\_ Test the pipeline. Pump fluid through it and check for leaks.
- \_\_\_\_\_ Lower the welded pipe section into the trench and weld it to the pipeline.
- \_\_\_\_\_ Dig a 2-metre trench along the route next to the pipe string.
- \_\_\_\_\_ String pipes in a line along the route.
- \_\_\_\_\_ Clear the route and level it.
- \_\_\_\_\_ Weld the pipes into a long pipe section and bend it into shape.
- \_\_\_\_\_ Cover the pipeline with earth.
- \_\_\_\_\_ 1 Survey the land along the planned route.

### 2 Complete this dialogue between a company director (A) and a project manager (B) about the company's pipeline project.

- A:** How's your team's progress on the pipeline?
- B:** They've (1) \_\_\_\_\_ (plan) the route, and the surveyors have (2) \_\_\_\_\_ (survey) the area. The bulldozers have (3) \_\_\_\_\_ (clear) the path for the pipeline.
- A:** Good. Have they (4) \_\_\_\_\_ (do) the whole route?
- B:** Yes, they have.
- A:** That's good. Have they (5) \_\_\_\_\_ (lay) pipe sections along the route?
- B:** Yes, they've (6) \_\_\_\_\_ (string) the pipes along about 2 km of the route. They've also (7) \_\_\_\_\_ (dig) a trench about 1.5 km long.
- A:** That's great. When did they (8) \_\_\_\_\_ (finish) the trench?
- B:** They (9) \_\_\_\_\_ (complete) it yesterday morning.
- A:** Right. So they haven't (10) \_\_\_\_\_ (weld) all the pipe sections yet?
- B:** No, they haven't. They're (11) \_\_\_\_\_ (weld) some sections right now.
- A:** OK. When will they (12) \_\_\_\_\_ (finish) the welding, do you think?
- B:** Probably by the end of this week.

### 3 Underline the correct words in this report.

#### Safety inspector's report

My team has inspected the damage to the pipeline after the fire at km 5.3 marker. Here are our main findings:

- 1 Fifteen metres of pipeline are (*burn / burnt*).
- 2 There are three large (*cracks / cracked*) in the pipeline.
- 3 Two safety valves are (*missing / missed*).
- 4 There are two deep (*dents / dented*) in the pipeline.
- 5 Five metres of pipeline are (*blocking / blocked*). No fluid can pass through them.
- 6 One metre of pipeline is (*twist / twisted*).
- 7 Some oil is (*leaking / leaked*) from the pipe near the pump.
- 8 The welding between two pipe sections is (*break / broken*).

### 4 Complete the text. Use the past simple.

#### Some dates in the early history of oil drilling

In **AD 47**, the Chinese (1) \_\_\_\_\_ (dig) oil wells 250 m deep. They (2) \_\_\_\_\_ (use) drill bits attached to bamboo poles. In **1264**, Marco Polo (3) \_\_\_\_\_ (see) oil mines in Baku, Persia. In **the 1500s**, people in Poland (4) \_\_\_\_\_ (light) their street lamps with oil. The oil (5) \_\_\_\_\_ (come) from the surface of the ground. In **1594**, the Persians in Baku (6) \_\_\_\_\_ (make) oil wells 35 metres deep. In **1735**, French people (7) \_\_\_\_\_ (excavate) oil from sand. In **1848**, a Russian engineer (8) \_\_\_\_\_ (drill) the first modern oil well near Baku. In **1857**, Michael Dietz (9) \_\_\_\_\_ (invent) the kerosene lamp. In **1858**, Canadian engineers (10) \_\_\_\_\_ (complete) the first oil well in North America.

### Word list

**5** Write the meanings of these words and phrases in your own language.

#### NOUNS

bulldozer \_\_\_\_\_

crane \_\_\_\_\_

digger \_\_\_\_\_

earth \_\_\_\_\_

fluid \_\_\_\_\_

gas \_\_\_\_\_

kerosene \_\_\_\_\_

leak \_\_\_\_\_

pipeline \_\_\_\_\_

pressure \_\_\_\_\_

route \_\_\_\_\_

sign \_\_\_\_\_

team \_\_\_\_\_

trench \_\_\_\_\_

welder \_\_\_\_\_

#### NOUN PHRASE

pipe section \_\_\_\_\_

#### VERBS

clear \_\_\_\_\_

detect \_\_\_\_\_

drill \_\_\_\_\_

excavate \_\_\_\_\_

fill in \_\_\_\_\_

lay \_\_\_\_\_

plan \_\_\_\_\_

string \_\_\_\_\_

survey \_\_\_\_\_

test \_\_\_\_\_

weld \_\_\_\_\_

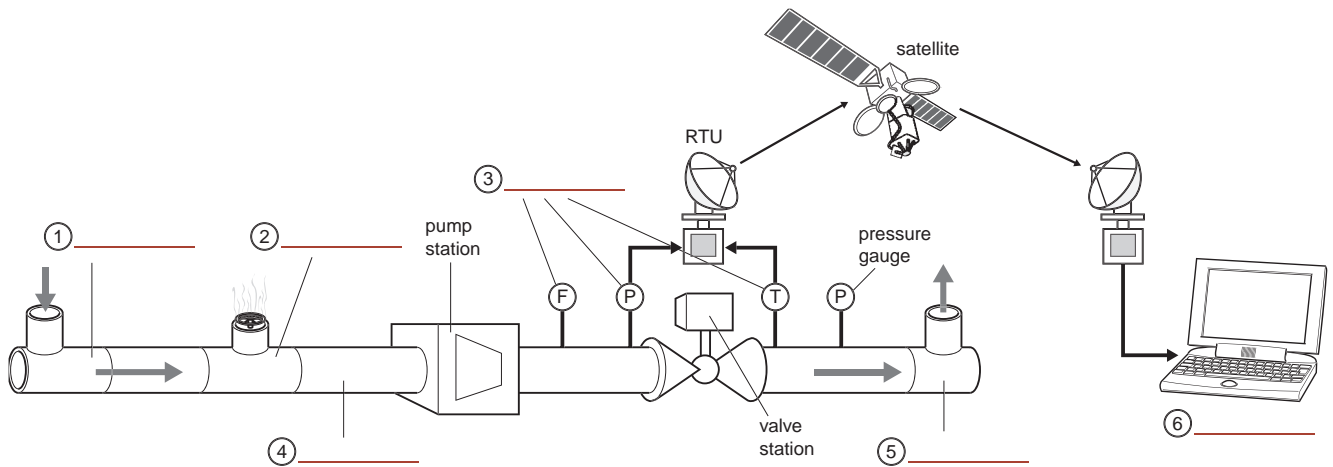
#### ADJECTIVES

blocked \_\_\_\_\_

welded \_\_\_\_\_

### 1 Read the text and complete the labels on this diagram.

supply station / terminal / regulator station / gauges / control station / pipeline



### Components of oil and gas pipelines

**Pipeline.** This is made of high-carbon steel and covered with a moisture-resistant material. It carries gas or oil from a supply station to a terminal.

**Supply station.** This injects the product (oil or gas) into the pipeline.

**Pump station** (for oil) or **compressor station** (for gas). These push the product along the pipeline.

**Valve station.** The operator can close two valve stations and isolate the pipeline between them. Then he can do maintenance work or isolate a break or leak in the pipe. Valve stations are usually located every 10 to 30 km along the line.

**Regulator station.** The operator can release pressure from the pipeline here.

**Terminal.** The product leaves the pipeline here.

There are three measuring instruments: **flow gauges** measure the speed of product along the pipeline, **pressure gauges** measure pressure, and **temperature gauges** measure temperature.

The **remote terminal unit** (RTU) receives the information from the three gauges and sends it to the control station by satellite or mobile phone link.

The **control station** contains computers. They receive all the data from the RTUs and check for leaks. The computer operator can open or close valves, and control compressors or pumps.

### 2 Match the pipeline components with their functions.

1 pipeline <input type="checkbox"/>	a) measure heat, pressure and flow along the pipeline
2 valve station <input type="checkbox"/>	b) is the outlet for the whole pipeline
3 supply station <input type="checkbox"/>	c) transports oil or gas from one place to another
4 regulator station <input type="checkbox"/>	d) lowers the pressure in the pipeline
5 terminal <input type="checkbox"/>	e) is the inlet for the whole pipeline
6 gauges <input type="checkbox"/>	f) can stop the flow of oil or gas

### 3 Complete these sentences. Choose the correct verb and use the correct verb form.

pump, measure, compress, receive, switch off, give, transmit, fall, send, check

- The purpose of the flow gauge is to \_\_\_\_\_ the speed of the oil along the pipeline.
- The compressor station \_\_\_\_\_ the gas and \_\_\_\_\_ it under pressure along the line.
- One function of the control station computers is to \_\_\_\_\_ valve stations and to \_\_\_\_\_ compressors if there is a leak.
- One function of the temperature gauge is to \_\_\_\_\_ a warning if the heat is rising.
- If there is a leak in the pipeline and the pressure \_\_\_\_\_, the pressure valve \_\_\_\_\_ this information through the RTU to the control station.
- The job of the RTU is to \_\_\_\_\_ information from the gauges and to \_\_\_\_\_ it to the control station.

### 4 Answer these questions. Use contractions where possible.

- 'Are the valve stations open?' 'Yes, \_\_\_\_\_.'
- 'Will the operators open the valves if there is leak?' 'No, \_\_\_\_\_.'
- 'Have they checked the temperature gauges yet?' 'No, \_\_\_\_\_.'
- 'Is the compressor switched off?' 'No, \_\_\_\_\_.'
- 'Did the pressure gauges indicate a rise in pressure?' 'No, \_\_\_\_\_.'
- 'Has the computer received all the data from the RTUs?' 'Yes, \_\_\_\_\_.'

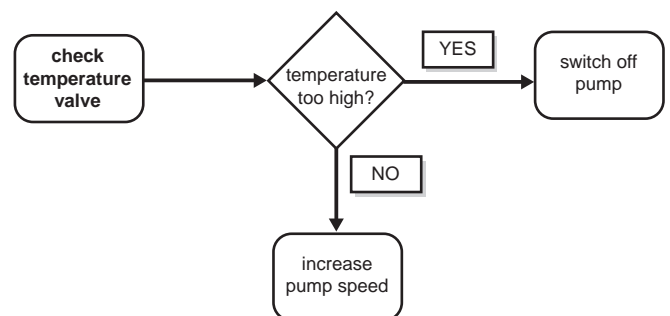
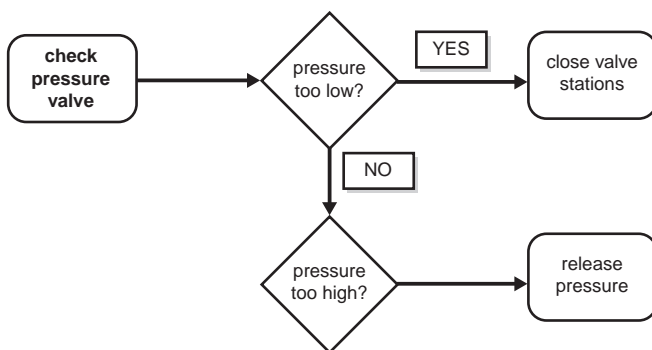
### 5 Complete these sentences.

mounted on, connected to, disconnected from, suspended from

- The kelly is \_\_\_\_\_ the hook on the travelling block.
- The derrick is \_\_\_\_\_ the drilling platform.
- If the hose is \_\_\_\_\_ the swivel, the drilling mud flows into the kelly.
- If the hose is \_\_\_\_\_ the swivel, the drilling mud can't flow into the kelly.

### 6 In your notebook, write part of a troubleshooting guide based on these flow charts.

Start like this: *Check the pressure valve. If the pressure is ...*



### Word list

**7** Write the meanings of these words and phrases in your own language.

#### NOUNS

- component \_\_\_\_\_
- control \_\_\_\_\_
- data \_\_\_\_\_
- flow \_\_\_\_\_
- gauge \_\_\_\_\_
- inspection \_\_\_\_\_
- pipeline \_\_\_\_\_
- pressure \_\_\_\_\_
- product \_\_\_\_\_
- pump \_\_\_\_\_
- regulator \_\_\_\_\_
- remote \_\_\_\_\_
- satellite \_\_\_\_\_
- station \_\_\_\_\_
- supply \_\_\_\_\_
- terminal \_\_\_\_\_
- unit \_\_\_\_\_
- valve \_\_\_\_\_

#### NOUN PHRASES

- compressor station \_\_\_\_\_
- control station \_\_\_\_\_
- flow gauge \_\_\_\_\_
- pressure gauge \_\_\_\_\_
- pump station \_\_\_\_\_
- remote terminal unit \_\_\_\_\_
- supply station \_\_\_\_\_
- temperature gauge \_\_\_\_\_
- valve station \_\_\_\_\_

#### VERBS

- compress \_\_\_\_\_
- inject \_\_\_\_\_
- measure \_\_\_\_\_
- transport \_\_\_\_\_

### 1 Match the hazards below with the illustrations.

<p>①</p>	<p>②</p>
<p>③</p>	<p>④</p>
<p>⑤</p>	<p>⑥</p>
<p>⑦</p>	<p>⑧</p>
<p>⑨</p>	<p>⑩</p>

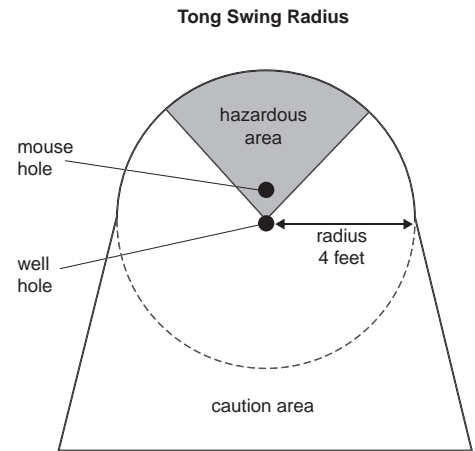
### Safety hazards on an oil rig

- 1 If there are obstructions in the walkway, you might trip or fall over them. \_\_\_\_\_
- 2 If you carry tools when you are climbing, you might drop them on someone. \_\_\_\_\_
- 3 If rungs are missing from a stairway or ladder, you could fall from a height. \_\_\_\_\_
- 4 The rotating kelly might catch your loose clothing. \_\_\_\_\_
- 5 A kelly or pipe could swing and strike your head. \_\_\_\_\_
- 6 If a guard rail is missing from a walkway, you could fall off. \_\_\_\_\_
- 7 If you step off a monkeyboard onto a fingerboard, you might fall off. \_\_\_\_\_
- 8 The moving pipes could trap your hand and crush it. \_\_\_\_\_
- 9 When the handle of the tong swings, it might strike you. \_\_\_\_\_
- 10 You could fall into an uncovered mouse hole. \_\_\_\_\_

### 2 Complete these safety instructions. The words can be used more than once.

must, mustn't, always, never, don't

- 1 When you are operating the tong, you must \_\_\_\_\_ stand in the hazardous area.
- 2 If you are working with the kelly, \_\_\_\_\_ wear your hard hat, safety gloves and safety boots. You \_\_\_\_\_ stand directly under the kelly.
- 3 When you are working on the monkeyboard, \_\_\_\_\_ attach your tools to a wire line. When you are climbing, \_\_\_\_\_ carry tools in your hands.
- 4 If a rung on a ladder is broken or missing, you \_\_\_\_\_ use it. You \_\_\_\_\_ report it to the safety officer immediately.



### 3 Write these notes as a report. Use the past tense.

guard rail on stairway missing - no guards on winch - 3 drillers with no hard hats - nuts & bolts missing from swivel - no cables for tools - walkway blocked with hoses

### 4 Complete this dialogue between the Safety Investigator and the Oil Rig Manager.

- A:** What has (1) \_\_\_\_\_ ?
- B:** There's been an accident on the rig.
- A:** When (2) \_\_\_\_\_ ?
- B:** At 6 am this morning.
- A:** Who (3) \_\_\_\_\_ the accident?
- B:** A derrickman called Peter Willis.
- A:** Where (4) \_\_\_\_\_ when the accident happened?
- B:** He was on the monkeyboard on the main derrick.
- A:** How (5) \_\_\_\_\_ up the derrick?
- B:** He was about 9 metres up.
- A:** Did (6) \_\_\_\_\_ from the monkeyboard?
- B:** Yes, he fell to the deck.
- A:** (7) \_\_\_\_\_ a safety line or a harness?
- B:** Yes, he wore a safety line, so he wasn't too badly hurt.
- A:** What injuries (8) \_\_\_\_\_ ?
- B:** He had a twisted ankle and some cuts on his leg.

### Safety report

I inspected the oil rig on 24<sup>th</sup> August, and I observed these safety hazards:

- 1 A guard rail on a stairway was missing.
- 2 There were no \_\_\_\_\_.
- 3 Three drillers did not \_\_\_\_\_.
- 4 \_\_\_\_\_.
- 5 \_\_\_\_\_.
- 6 \_\_\_\_\_.

### Word list

**5** Write the meanings of these words and phrases in your own language.

#### NOUNS

- bolts \_\_\_\_\_
- catwalk \_\_\_\_\_
- derrickman \_\_\_\_\_
- fingerboard \_\_\_\_\_
- guard \_\_\_\_\_
- hand rail \_\_\_\_\_
- hose \_\_\_\_\_
- ladder \_\_\_\_\_
- monkeyboard \_\_\_\_\_
- obstruction \_\_\_\_\_
- radius \_\_\_\_\_
- railings \_\_\_\_\_
- rung \_\_\_\_\_
- stairway \_\_\_\_\_
- tong \_\_\_\_\_
- walkway \_\_\_\_\_

#### NOUN PHRASES

- guard rail \_\_\_\_\_
- hazardous area \_\_\_\_\_
- mouse hole \_\_\_\_\_
- safety line \_\_\_\_\_
- safety officer \_\_\_\_\_
- tong swing radius \_\_\_\_\_
- wire line \_\_\_\_\_

#### VERBS

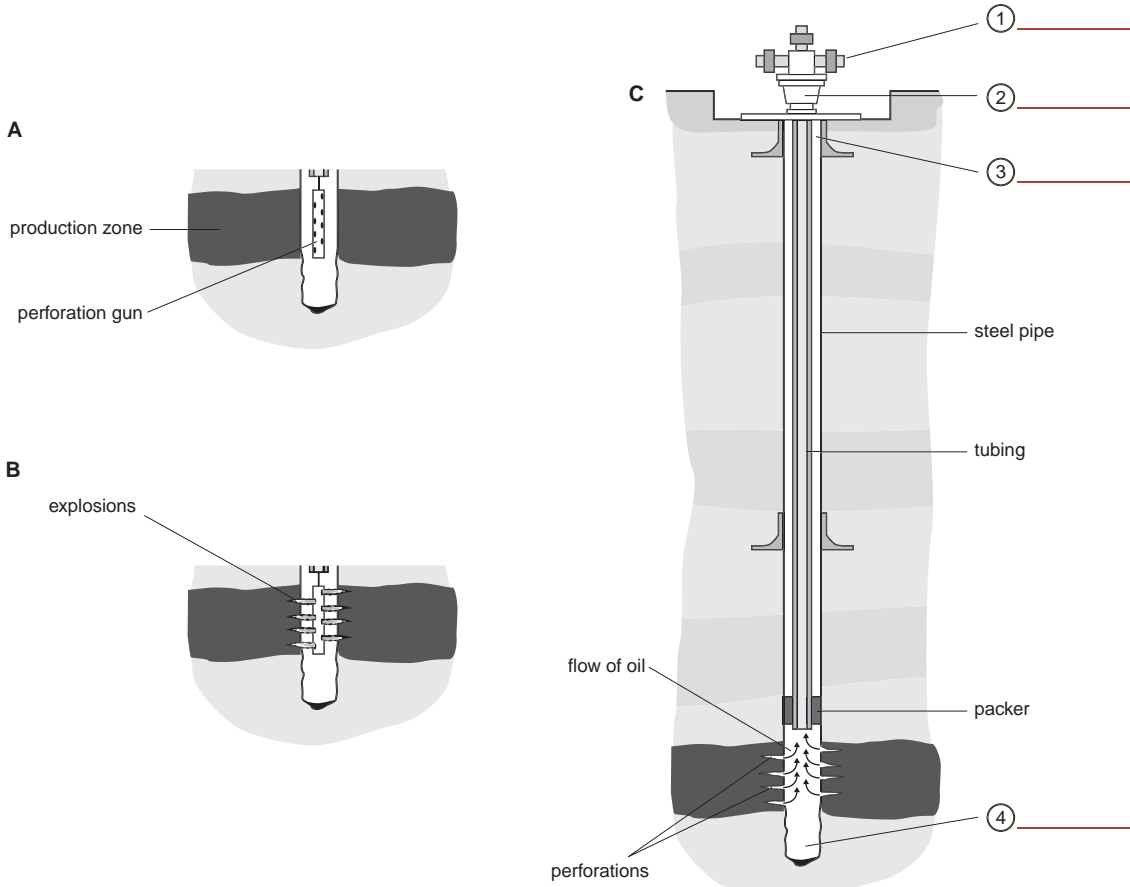
- catch \_\_\_\_\_
- swing \_\_\_\_\_

#### ADJECTIVE

- hazardous \_\_\_\_\_

### 1 Read the text and complete the labels on the diagram.

well head / casing / valve / well hole



### Completing a well

When the well is at the correct depth (the **production zone**), the crew completes the well.

First, they run a **steel pipe** all the way to the bottom of the hole. This stops oil, gas, and salt water from coming into the hole from levels above the production level.

They lower a **perforating gun** into the hole to the production zone. The gun contains explosives.

These explosives blast holes (**perforations**) in the steel casing and cement, up to several feet out into the rock. Then they run a small-diameter pipe (**tubing**) into the hole.

The perforations allow the oil and gas fluids to flow through the holes into the bottom of the well. The tubing allows the oil and gas to flow up the well to the surface.

Then the crew runs a device called a **packer** down the outside of the tubing. When it reaches the production zone, it expands and fills the space outside the tubing. This prevents oil and gas from flowing outside the tubing.

They attach a **well head** to the top of the tubing and fix it with cement. This has many valves. The **valves** allow them to control the flow of oil from the well.

If the production zone contains limestone rock, they pump acid down the well and into the perforations. The acid dissolves part of the rock. This allows the oil to flow easily into the well.

**2 Match the first, middle and final parts of each sentence. Underline the correct verb forms.**

Part	Function	
1 The steel pipe	a) cause/ causes	A oil from flowing between tubing and casing.
2 The perforating gun	b) allow/ allows	B limestone rock to dissolve and break up.
3 The perforations	c) prevent/ <u>prevents</u>	C oil from escaping from well.
4 The tubing	d) make/ makes	D <u>water from entering well hole.</u>
5 The packer	e) stop/ stops	E oil to enter bottom of well.
6 The well head	f) let/ lets	F oil rise up to well head.
7 Acid	g) prevent/ prevents	G holes form in side of casing.
8 Valves	h) permit/ permits	H crew to stop flow of oil through well head.

**3 Write full sentences from 2 in your exercise book.**

Example. 1 The steel pipe prevents water from entering the well hole.

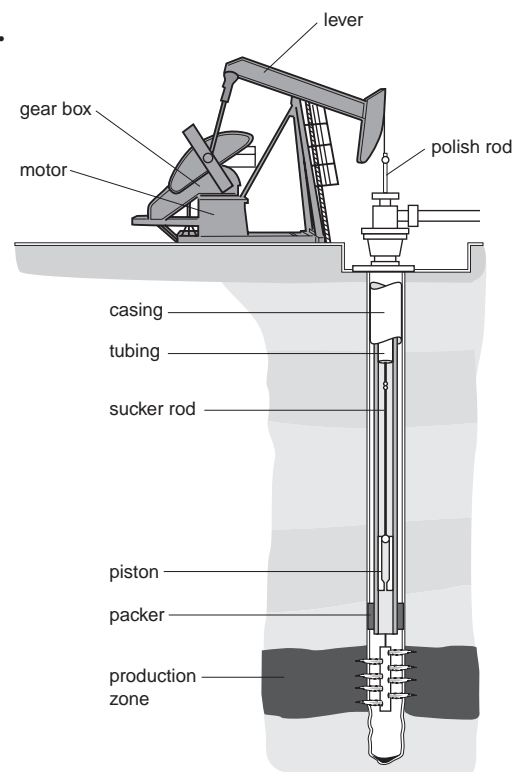
**4 Make sentences from these notes in your exercise book.**

Example: 1 The turntable makes the kelly rotate.

- 1 turntable kelly rotate (make)
- 2 heli-port helicopters land on oil platform (allow)
- 3 pumps mud and rock cuttings rise to top of well (cause)
- 4 shaker large cuttings enter mud pit (prevent)
- 5 hole in swivel drilling mud flow into kelly (let)
- 6 blowout preventer oil and gas explode out of well hole (stop)

**5 Put these sentences about the diagram into the correct order.**

- \_\_\_\_\_ This rod is connected to a piston.
- \_\_\_\_\_ The suction from the pump makes the oil flow up the tubing.
- \_\_\_\_\_ This makes a lever move up and down.
- \_\_\_\_\_ The lever causes a polish rod to go up and down.
- 1 \_\_\_\_\_ The electric motor makes the gear box operate.
- \_\_\_\_\_ This rod is attached to a sucker rod.
- \_\_\_\_\_ When the sucker rod moves up, it causes the pump to move up.



### Word list

**6** Write the meanings of these words and phrases in your own language.

#### NOUNS

beam \_\_\_\_\_

perforation \_\_\_\_\_

gun \_\_\_\_\_

tube \_\_\_\_\_

tubing \_\_\_\_\_

packer \_\_\_\_\_

acid \_\_\_\_\_

explosion \_\_\_\_\_

diameter \_\_\_\_\_

lever \_\_\_\_\_

#### NOUN PHRASES

polish rod \_\_\_\_\_

sucker rod \_\_\_\_\_

production zone \_\_\_\_\_

well head \_\_\_\_\_

steam injector \_\_\_\_\_

perforating gun \_\_\_\_\_

flow of oil \_\_\_\_\_

limestone rock \_\_\_\_\_

gear box \_\_\_\_\_

#### VERBS

complete (a well) \_\_\_\_\_

run (a pipe down a well) \_\_\_\_\_

dissolve \_\_\_\_\_

install \_\_\_\_\_

blast \_\_\_\_\_

#### ADJECTIVES

explosive \_\_\_\_\_

small-diameter \_\_\_\_\_

**1 It is the fourth week of February in an oil rig project. Answer these questions.**

- 1 Have they excavated the reserve pit yet?
- 2 When did they transport the equipment to the rig location?
- 3 What are they doing now?
- 4 When will they put the kelly into position?

### Preparing the site and the rig before drilling

Task	Week	January				February				March			
		1	2	3	4	1	2	3	4	1	2	3	4
Level the site (use bulldozers)		█											
Dig the mud and reserve pits			█										
Drill starter hole and mouse hole				█									
Transport equipment to rig location					█								
Install power system					█								
Assemble rig platform						█							
Raise the derrick on the platform							█						
Install the lifting and rotary system								█	█	█			
Set up mud tanks and mud pumps									█	█			
Connect the mud pipes and hoses									█	█			
String the electric cables											█		
Put kelly into position on the block												█	

**2 Complete this dialogue between the Project Manager (A) and the Project Supervisor (B). Use information from the chart in 1.**

**A:** (1) \_\_\_\_\_ the derrick on the platform yet?

**B:** Yes, we have.

**A:** When (2) \_\_\_\_\_ the rig platform?

**B:** We (3) \_\_\_\_\_ it in the first week of February.

**A:** (4) \_\_\_\_\_ the lifting and rotary system now?

**B:** Yes, we are.

**A:** What else are you doing now?

**B:** We're (5) \_\_\_\_\_ the tanks and pumps, and (6) \_\_\_\_\_ the pipes and hoses.

**A:** When (7) \_\_\_\_\_ the electrical cables?

**B:** We'll (8) \_\_\_\_\_ that in the second week of March.

### 3 Complete this progress report. Write one or two verbs in each space.

The team have levelled the site with bulldozers. They've (1) \_\_\_\_\_ the mud and reserve pits, and they (2) \_\_\_\_\_ the starter hole and the mouse hole. During the fourth week of January they (3) \_\_\_\_\_ the equipment to the rig location. They (4) \_\_\_\_\_ the power system at the end of January, but they didn't (5) \_\_\_\_\_ the rig platform then. They (6) \_\_\_\_\_ it in the first week of February. The crew have (7) \_\_\_\_\_ the derrick on the platform, but they haven't (8) \_\_\_\_\_ the lifting and rotary systems yet. They're still (9) \_\_\_\_\_ that. Another crew are (10) \_\_\_\_\_ the mud tanks and the mud pumps. And a third crew (11) \_\_\_\_\_ the mud pipes and hoses right now as we speak. They haven't (12) \_\_\_\_\_ the electric cables yet. According to the schedule, they'll (13) \_\_\_\_\_ the cables in the second week of March, but they (14) \_\_\_\_\_ the kelly into position then. They'll (15) \_\_\_\_\_ the kelly into position during the third week of March. I expect that they (16) \_\_\_\_\_ the pipe racks and drill pipes at the end of March.

### 4 The well is completed and you want to dismantle the rig. Choose the correct verb and write the opposite of these instructions.

dismantle, lower, detach, disconnect, uninstall, remove, fill in (a hole), take down

- |   |   |
|---|---|
| 1 Attach the kelly to the travelling block.<br><u>Detach the kelly from the travelling block.</u> | <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;">1</div> |
| 2 Dig out the mud and reserve pits.<br>_____  | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |
| 3 Connect the mud pipes and hoses to the equipment.<br>_____                                      | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |
| 4 Assemble the rig platform.<br>_____   | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |
| 5 Put up all the electric cables.<br>_____  | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |
| 6 Raise the derrick.<br>_____   | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |
| 7 Bring the equipment to the site.<br>_____   | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |
| 8 Install the power system and connect it to the cables.<br>_____                                 | <div style="border: 1px solid black; width: 30px; height: 30px;"></div>   |

### 5 Put your new instructions in 4 into the best order to dismantle the rig. Number your instructions 1 – 8 in the boxes in 4.

Example: *Detach the kelly from the travelling block. [ 1 ]*

### 6 Complete this report explaining how your team dismantled the rig.

First of all, my team detached the kelly from the travelling block. Next, we \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Word list

**7** Write the meanings of these words and phrases in your own language.

#### NOUNS

site \_\_\_\_\_

location \_\_\_\_\_

position \_\_\_\_\_

schedule \_\_\_\_\_

#### NOUN PHRASES

starter hole \_\_\_\_\_

power system \_\_\_\_\_

rig location \_\_\_\_\_

oil rig project \_\_\_\_\_

project manager \_\_\_\_\_

project supervisor \_\_\_\_\_

rig platform \_\_\_\_\_

mud tank \_\_\_\_\_

mud pump \_\_\_\_\_

electric cable \_\_\_\_\_

#### VERBS

set up \_\_\_\_\_

dig out \_\_\_\_\_

excavate \_\_\_\_\_

prepare \_\_\_\_\_

load \_\_\_\_\_

unload \_\_\_\_\_

drill \_\_\_\_\_

install \_\_\_\_\_

assemble \_\_\_\_\_

fill in \_\_\_\_\_

detach \_\_\_\_\_

uninstall \_\_\_\_\_

level \_\_\_\_\_