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22A Westlands Road
Quarry Bay Hong Kong

© Martin Webber 1983

First published by Thomas Nelson and Sons Ltd 1983

Illustrations, Parkway Illustrated Press

ISBN 0-17-555352-1
NPN 9

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Printed in Hong Kong



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(circular, rectangular, square . . .)

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Structures: Application and Examples

Description of simple objects

What is this?

It is a television.

Description of components

A television has a screen.

A saw has a handle and a blade.

Description of components and quantity

A car has four wheels.

A bicycle has two wheels, two pedals and two
handlebars.

Qualified description of objects and components

This is a small car.

It has a large engine.

It has two large rotors.

Description of multiple objects and components

These/they are pencils.

Pens have nibs.

Expressing dimension

It is 5 cm long.

They are 6 cm long and 1.5 m high.

Expressing dimension

The height of the aerial is 15 m.

The radius is 2.4 cm.

Describing function

An internal caliper is used for measuring internal
dimensions.

The adjusting screws are used for adjusting the
legs.

(Revision and consolidation)

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This is not a television.

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engine
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1. The external parts of a car.
The controls of a car.
2. The external parts of an aeroplane.
3. The external parts of a ship.
4. Basic tools.

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Sequential description

This circular saw holds blades 25 cm in diameter. It cuts wood from . . .

Universal statements (present simple of new verbs)

Hacksaws cut metal.
Handsaws do not cut metal.

Positive and negative instructions

Unscrew the wheel nuts.
Do not replace a 32 mm fuse with a 20 mm fuse.

Comparative descriptions

Some calculators have 32 keys.
This calculator has 24 keys.

Describing the construction of machines

The spark plug is connected to a plug lead.
The plug lead is connected to a magneto.

Describing mechanical operations

The fuel and air are ignited by the spark plug. The exhaust valve is opened by the rocker-arm.

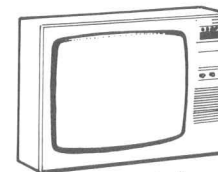
Explaining mechanical operations

The spring expands to close the valve.
The fuel and air are burned to produce power.

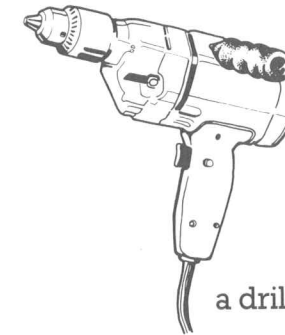
Unit 1

Technical Objects

Study Section 1.1



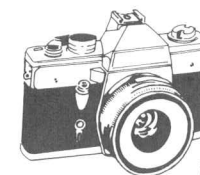
a television



a drill



a telephone



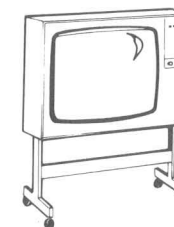
a camera



a calculator

Practice 1

Look at this example:



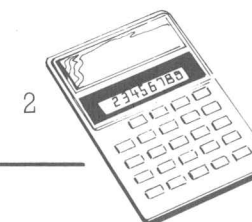
a television



Now name these objects in the same way:

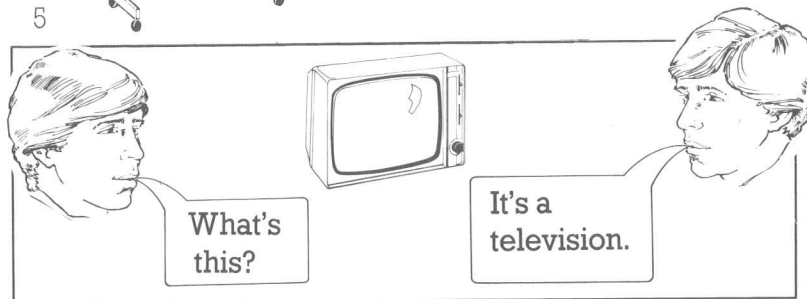
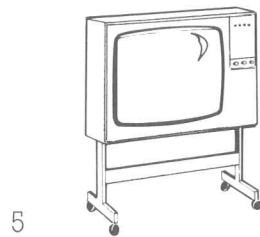
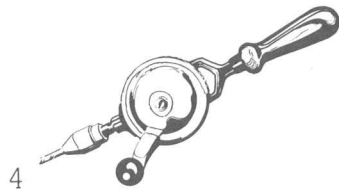


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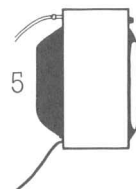
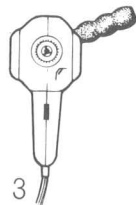
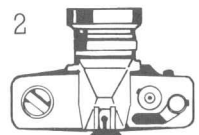
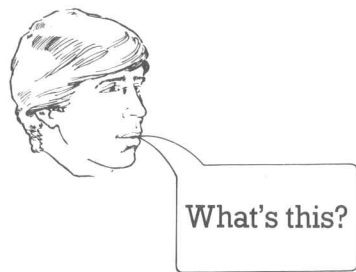


.....

Study Section 1.2

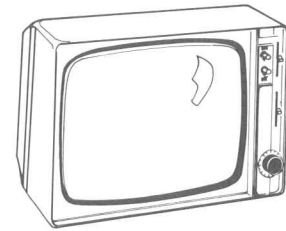


Practice 2



Study Section 1.3

What is this?



It is a television.

Practice 3

Look at this example:

What is this?



It is a telephone.

Now answer these questions:

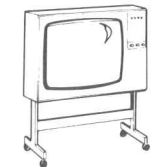
1 What is this?



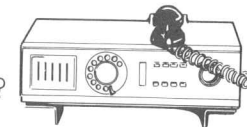
2 What is this?



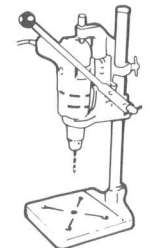
3 What is this?



4 What is this?



5 What is this?



Language Point

What is this?
It is a television.



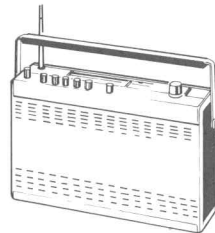
What's this?
It's a television.



Practice 4

Look at this example:

a radio



What is this?

It is a radio



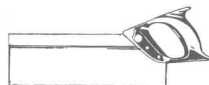
Now answer these questions:

1 What is this?



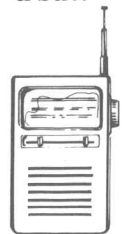
a car

2 What is this?



a saw

3 What is this?



4 What is this?

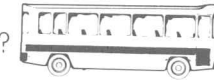


5 What is this?



a bicycle

6 What is this?



a bus

7 What is this?

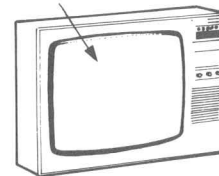


8 What is this?



Study Section 1.4

screen



A television has a screen.

display



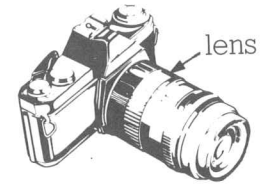
A calculator has a display.

dial



A telephone has a dial.

lens



A camera has a lens.

Practice 5

Look at this example:

display



A calculator has a display

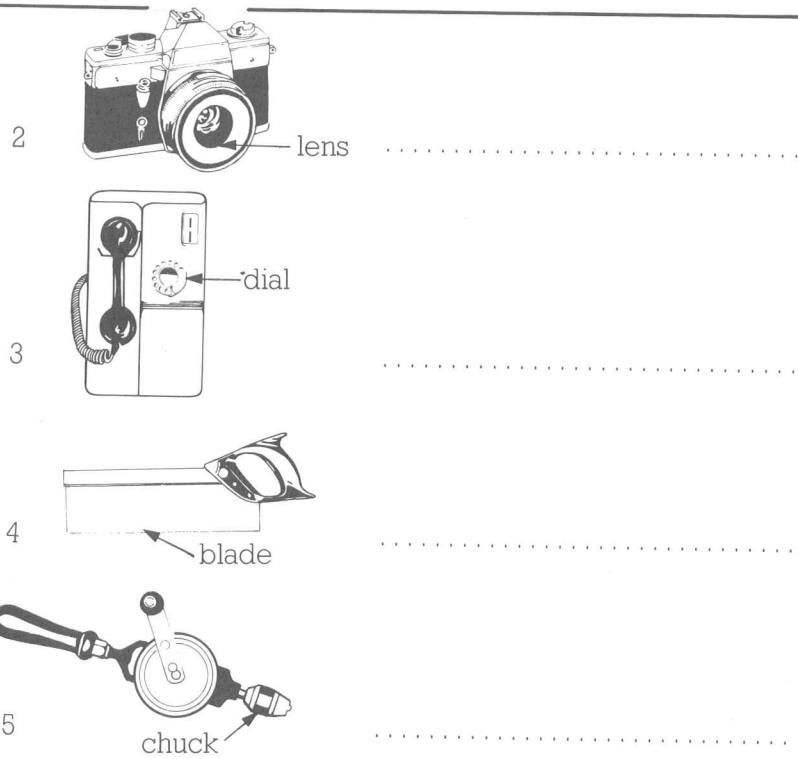


Now describe these objects in the same way:

screen



1

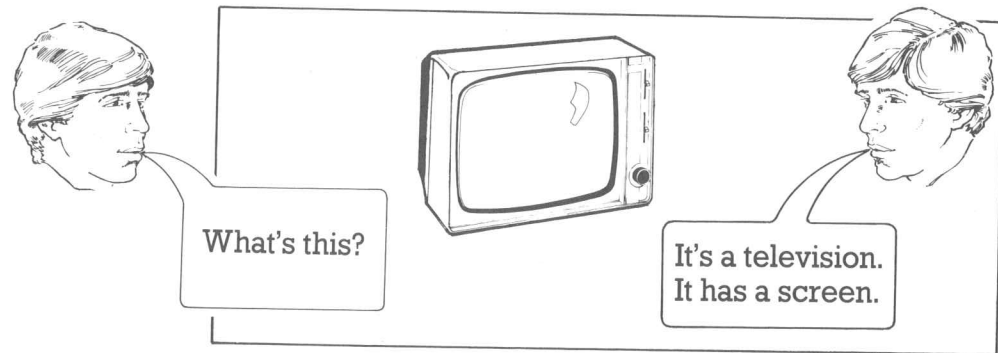


Practice 6

Make sentences from this table:

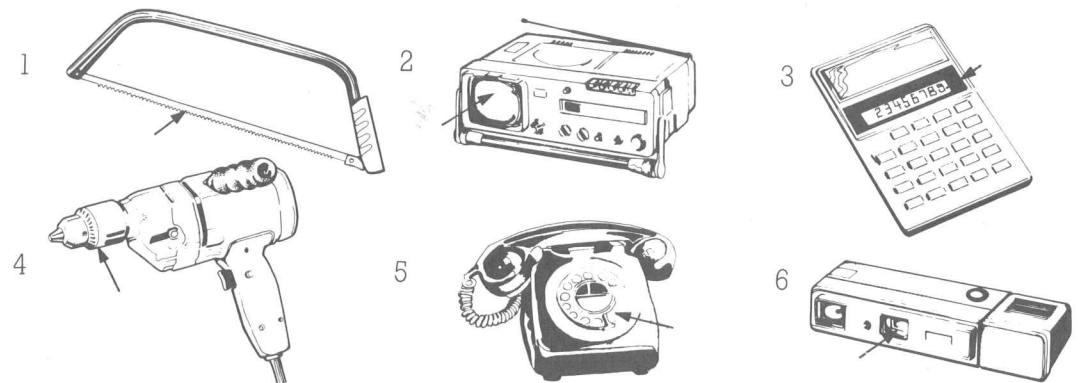
A	television calculator telephone camera saw drill	has a	blade. chuck. dial. lens. screen. display.
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Study Section 1.5

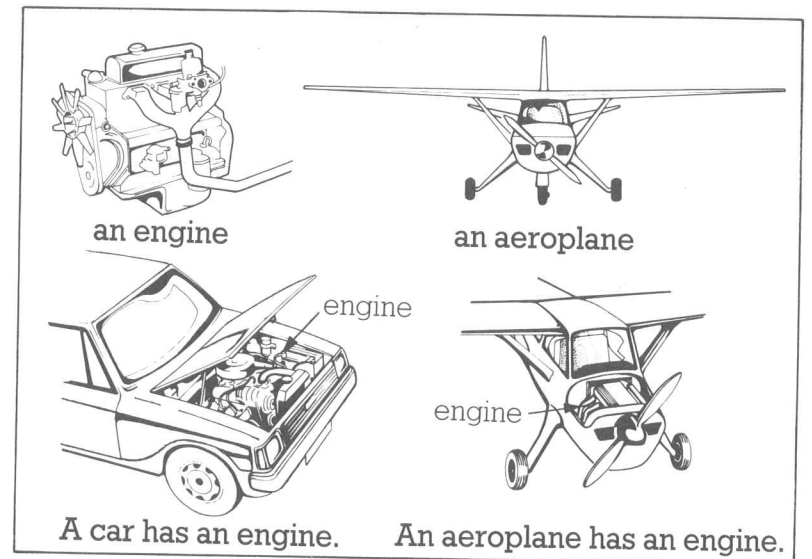


Practice 7

Now describe these objects in the same way:



Study Section 1.6



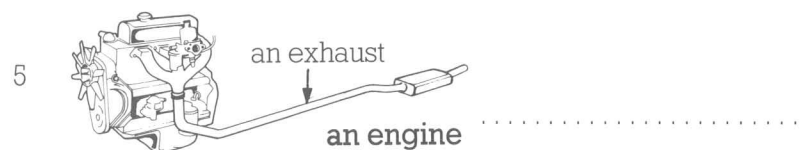
Practice 8

Look at this example:



Now describe these pictures in the same way:





Practice 9

Look at this example:

A saw has *a handle*

Complete these sentences:

- 1 A television has
- 2 A calculator
- 3 a dial.
- 4 a lens.
- 5 A drill
- 6 a blade.
- 7 A car

Study Section 1.7

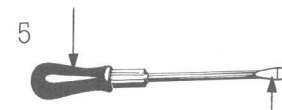
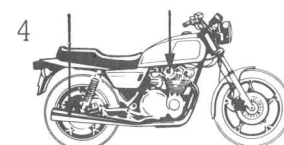
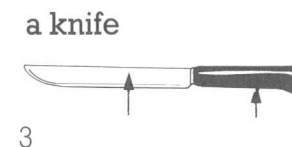
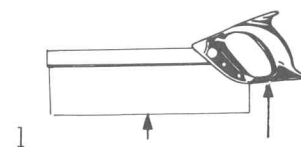
- 8 An aeroplane
- 9 an exhaust.
- 10 A bus

A drill has a chuck and a handle.

A camera has a body and a lens.

Practice 10

Describe these objects:



a motorcycle

a screwdriver

Practice 11

Make sentences from this table:

A	motorcycle								
	camera								
	saw	has	a	body		a	blade.		
An	car		an	engine	and	an	exhaust.		
	knife			handle			lens.		
	aeroplane								
	screwdriver								

Word List

an aeroplane
a bicycle
a blade
a body
a bus
a calculator
a camera
a car
a chuck
a dial
a display
a drill
an engine
an exhaust
a handle
a knife

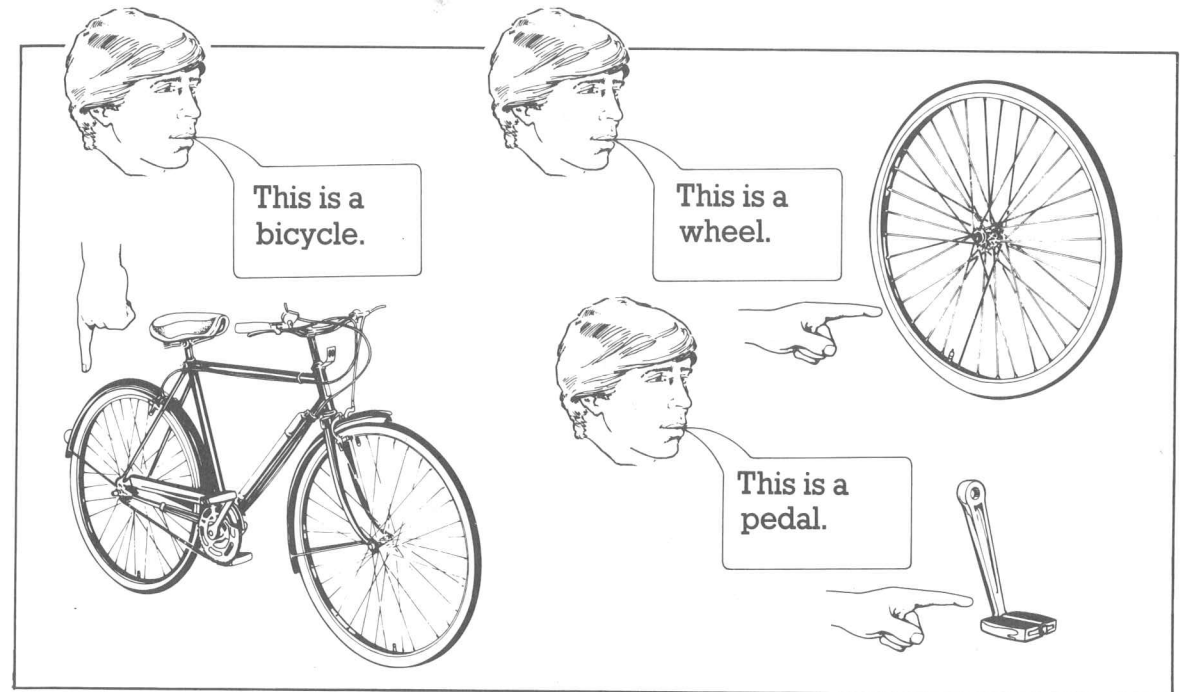
a lens
a motorcycle
a radio
a saw
a screen
a screwdriver
a telephone
a television

is
has
What is this?
It is
It has
and

Unit 2

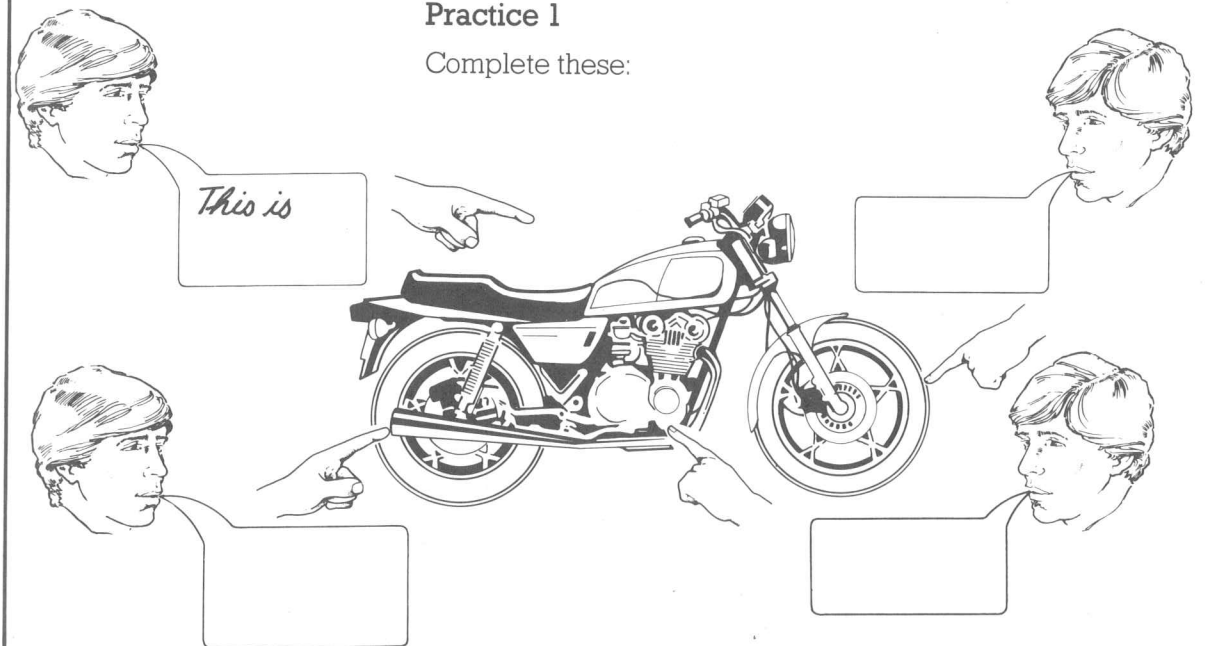
Transport

Study Section 2.1



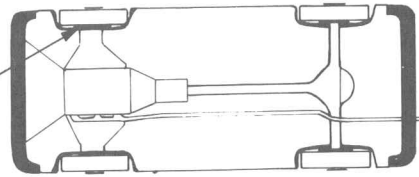
Practice 1

Complete these:



Study Section 2.2

This is a wheel.



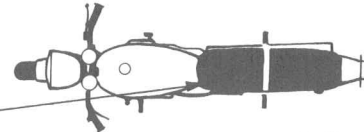
A car has four wheels.

This is a pedal.



A bicycle has two pedals.

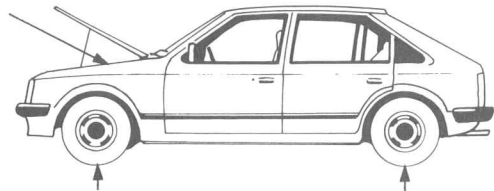
This is a saddle.



A motorcycle has a saddle.

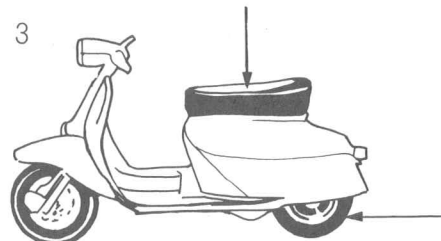
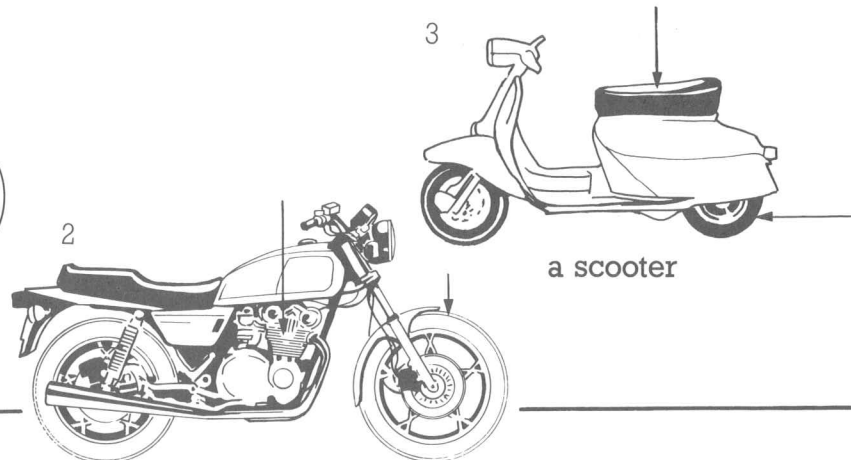
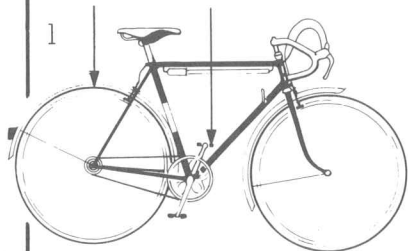
Practice 2

Look at this example:

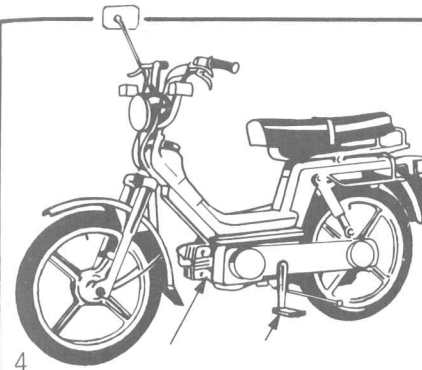


A car has an engine and four wheels.

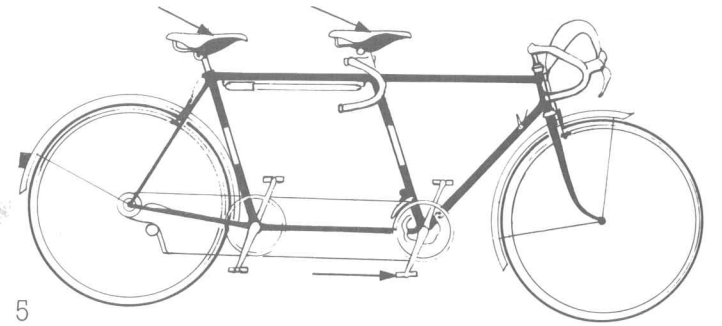
Now describe these in the same way:



a scooter



a moped



a tandem

Language Point

1 = one
2 = two
3 = three
4 = four

Practice 3

Are these statements true or false?

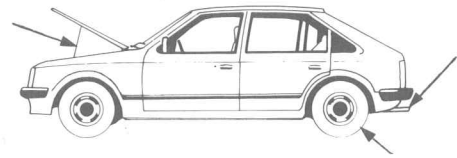
- 1 A bicycle has four wheels.
- 2 A bicycle has two pedals.
- 3 A car has two wheels.
- 4 A motorcycle has two engines.
- 5 A scooter has a saddle.
- 6 A moped has an engine.
- 7 A moped has two pedals.
- 8 A tandem has two pedals.

Practice 4

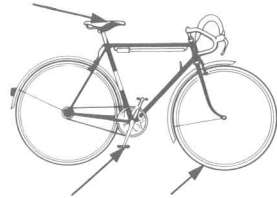
Make ten sentences from this table:

A car	has	a an two four	wheels.
A bicycle			pedals.
A motorcycle			saddle.
A scooter			engine.
A moped			saddles.
A tandem			

Study Section 2.3



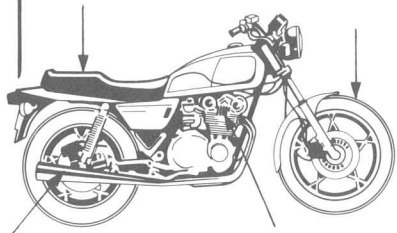
A car has four wheels, an engine and an exhaust.



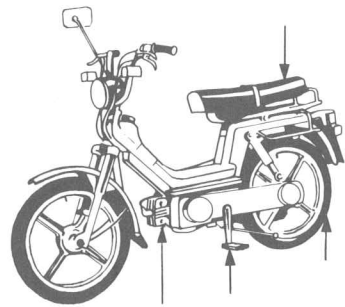
A bicycle has two wheels, two pedals and a saddle.

Practice 5

Complete these sentences:



A motorcycle has wheels, a engine and an



A moped

Practice 6

Make ten sentences from this table:

A	car bicycle moped scooter motorcycle tandem	has	a an two four	engine wheels pedals	and	a an two four	exhaust. saddle. wheels.
---	------------------------------------------------------------	-----	------------------------	----------------------------	-----	------------------------	--------------------------------

Study Section 2.4



This is a bicycle. It has two wheels.



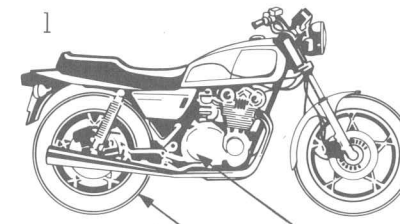
This is a moped. It has two wheels and an engine.



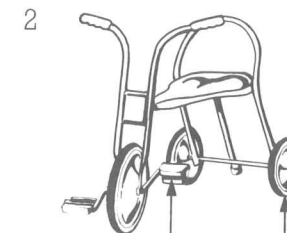
This is a car. It has four wheels and an engine.

Practice 7

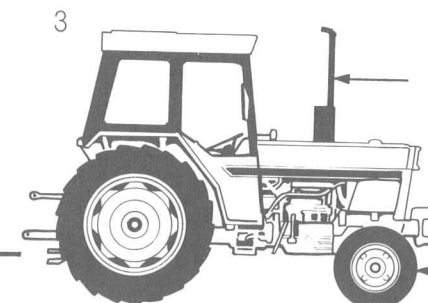
Complete these sentences:



This is
It has
..... and

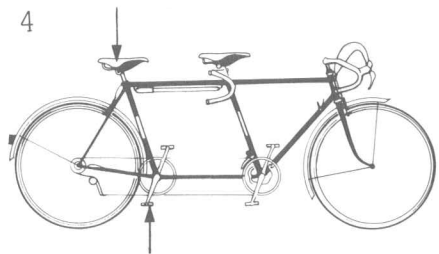


..... a tricycle.....
.....
.....



..... tractor.....
.....
.....

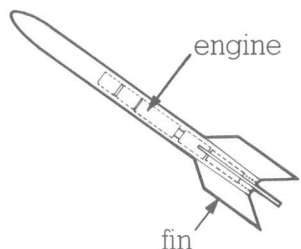
4



.....
.....
.....

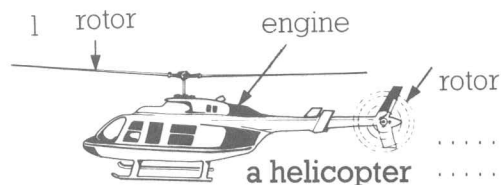
Practice 8

Look at this example:



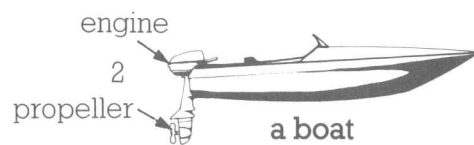
This is a rocket. It has four fins and an engine.

Now describe these objects in the same way:



a helicopter

.....
.....



a boat

.....
.....



a van

.....
.....

Practice 9

Are these statements true or false?

- 1 A tricycle has four wheels and an engine.
- 2 A scooter has a saddle and two wheels.
- 3 A rocket has four wheels and an engine.
- 4 A helicopter has two rotors and an engine.
- 5 A boat has two wheels and two pedals.
- 6 A tractor has four wheels and an engine.
- 7 A moped has four wheels and an engine.
- 8 A tandem has four pedals and four saddles.

Study Section 2.5



This is a small car.



This is a large car.



This is a large boat.



This is a small boat.

Practice 10

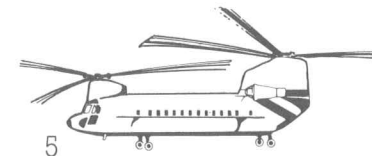
Now describe these objects in the same way:



1



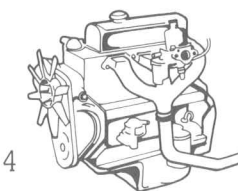
3



5



2



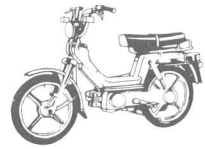
4



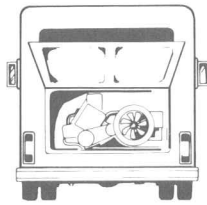
6



Study Section 2.6



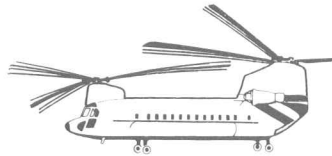
This is a moped.
It has a small engine.



This is a bus.
It has a large engine.



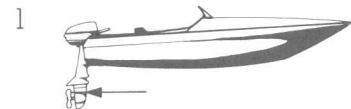
This is a small helicopter.
It has a large rotor and a small rotor.



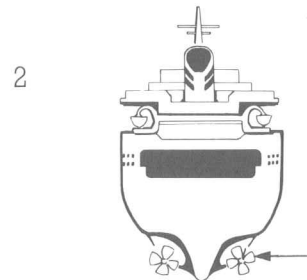
This is a large helicopter.
It has two large rotors.

Practice 11

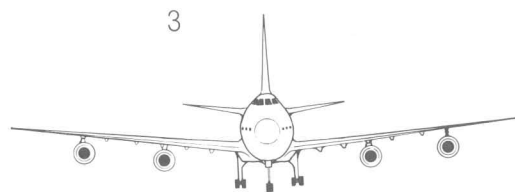
Complete these sentences:



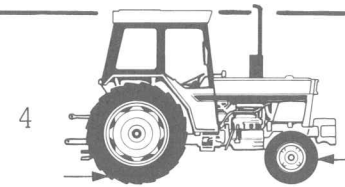
This is a small
It has a small



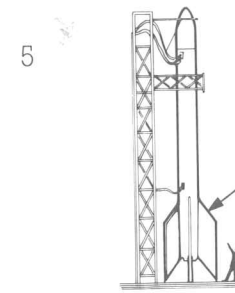
This is a large
It has



This
engines.



tractor two



..... and two

.....
.....
.....

Revision Exercises

Revision Practice 1

Look at this example:



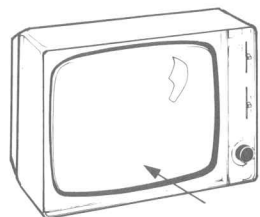
This is a drill.

Now describe these objects:

1 A small television set.	2 A camera with a lens.	3 A handheld calculator.	4 A digital display showing the number 145832.
5 A rotary telephone dial.	6 A simple knife.	7 A three-pronged electrical plug.	8 A tire with a tread pattern.

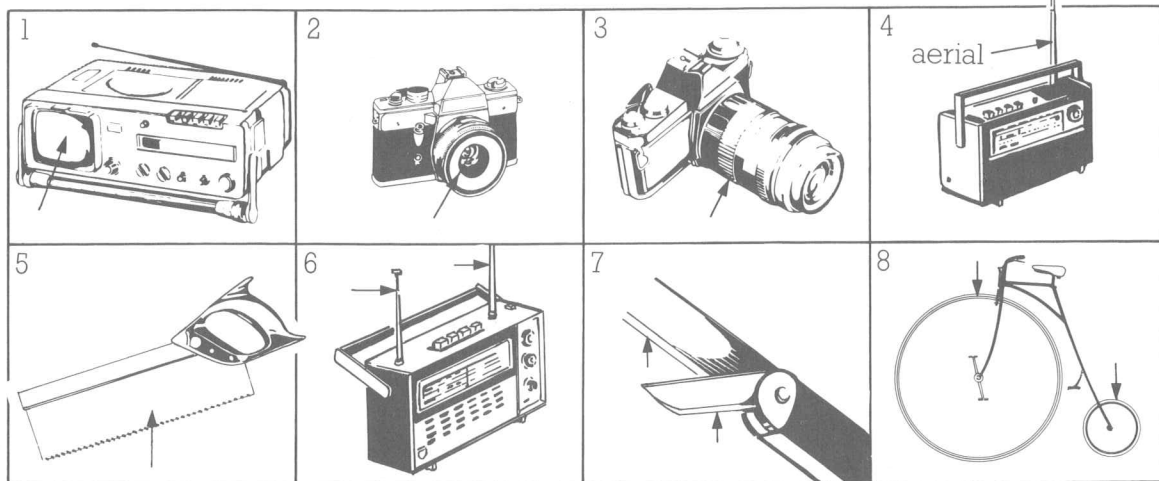
Revision Practice 2

Look at this example:



This is a television.
It has a large screen.

Now describe these objects:



Word List

an aerial
a boat
a fin
a helicopter
a lorry
a moped
a pedal
a propeller
a rocket
a rotor
a saddle
a scooter

a tandem
a tractor
a tricycle
a wheel

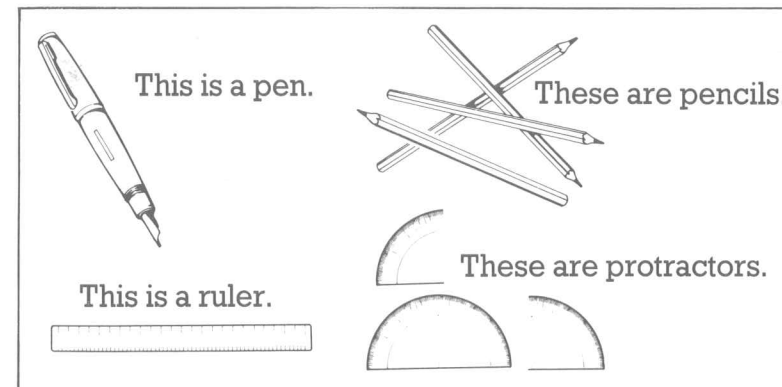
one
two
three
four

large
small
This is ...

Unit 3

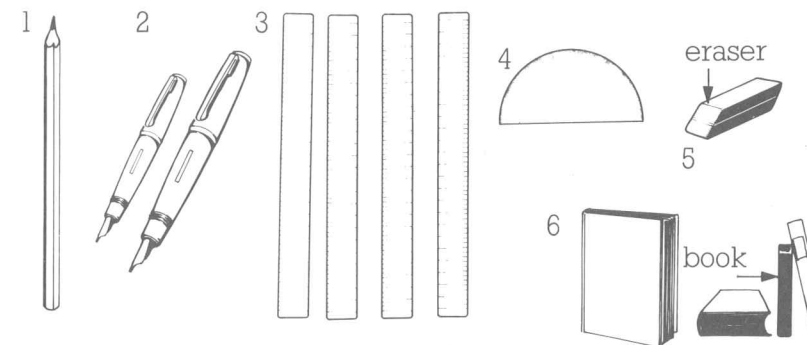
Technical Drawing

Study Section 3.1



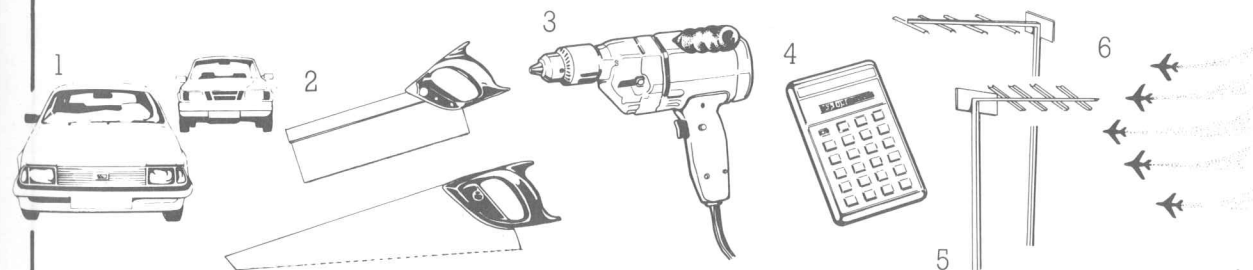
Practice 1

What is this?/What are these?

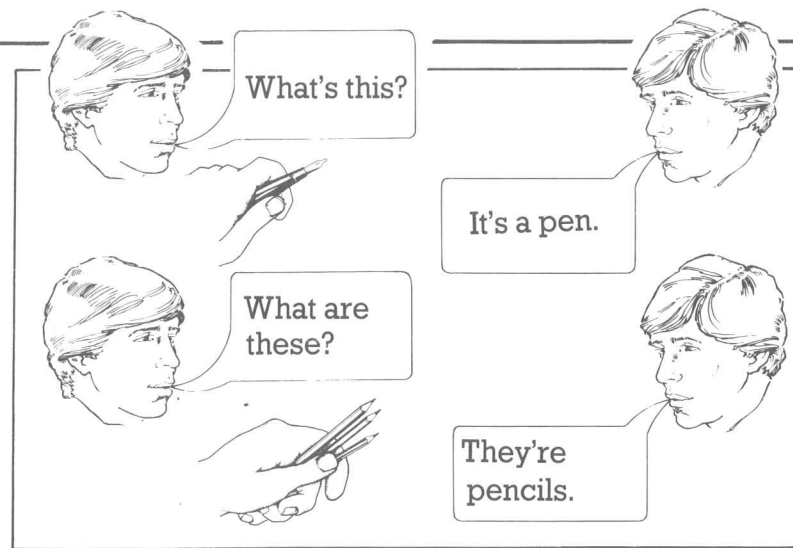


Practice 2

What is this?/What are these?



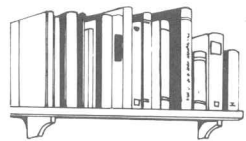
Study Section 3.2



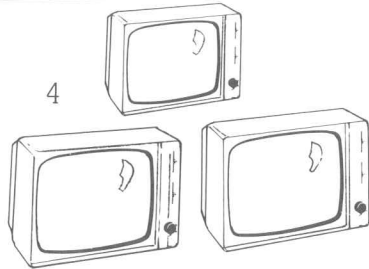
Practice 3



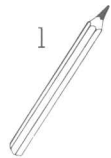
What's this?
What are these?



3



4



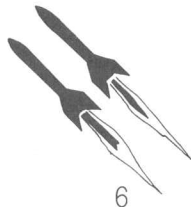
1



2



5



6

Practice 4

Make sentences from this table:

<p>It is a They are</p>	<p>wheel. boats. tractors. mopeds. television. radios. drills. cars. dials. screens. saws. camera.</p>
-----------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------

Language Point

It is a pen.
They are pencils.



It's a pen
They're pencils.



Study Section 3.3

a thin line _____

a dotted line

a thick line _____

a broken line -.-.-.-.-

Practice 5

Look at these examples:

What is this? It is a thick line.

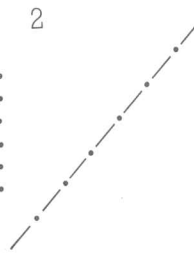
What are these? They are thin lines.

Now describe these lines:

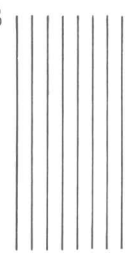
1



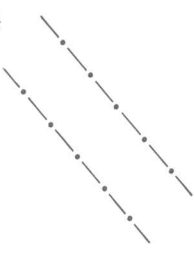
2



3



4



5



6



Practice 6

What is it?/What are they?

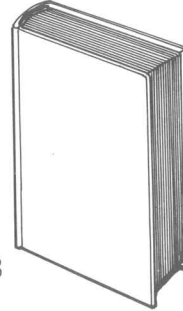
1



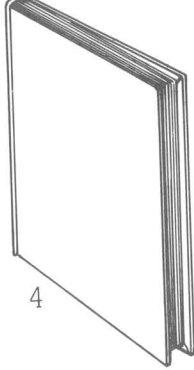
2



3



4



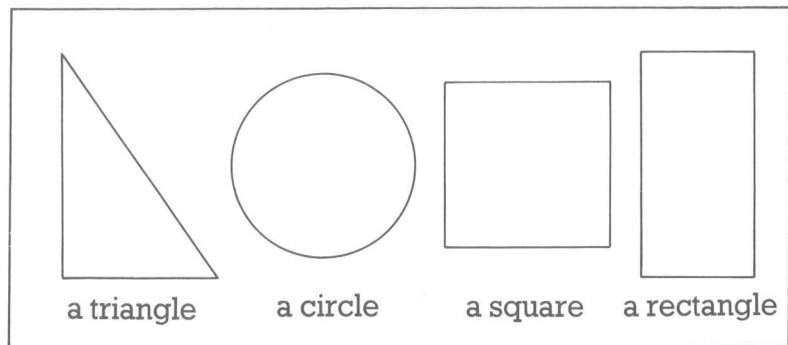
5



6

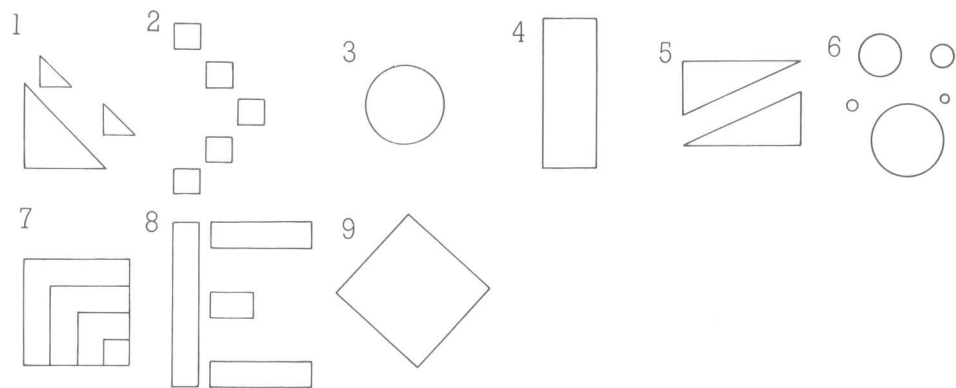


Study Section 3.4

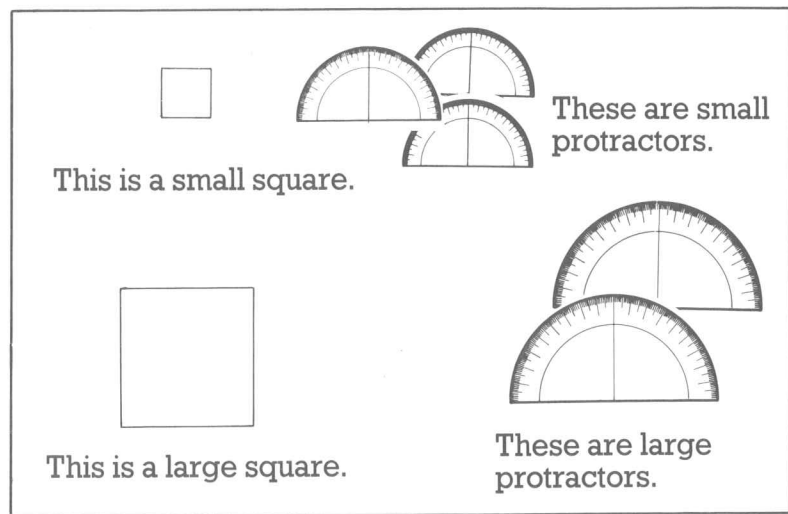


Practice 7

What is it?/What are they?



Study Section 3.5



This is a small square.

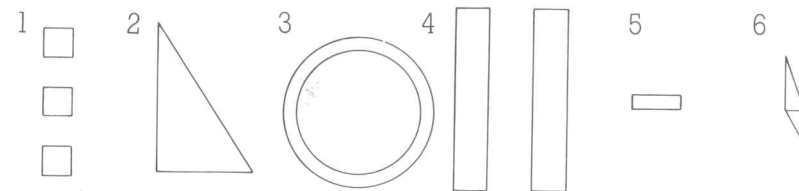
These are small protractors.

This is a large square.

These are large protractors.

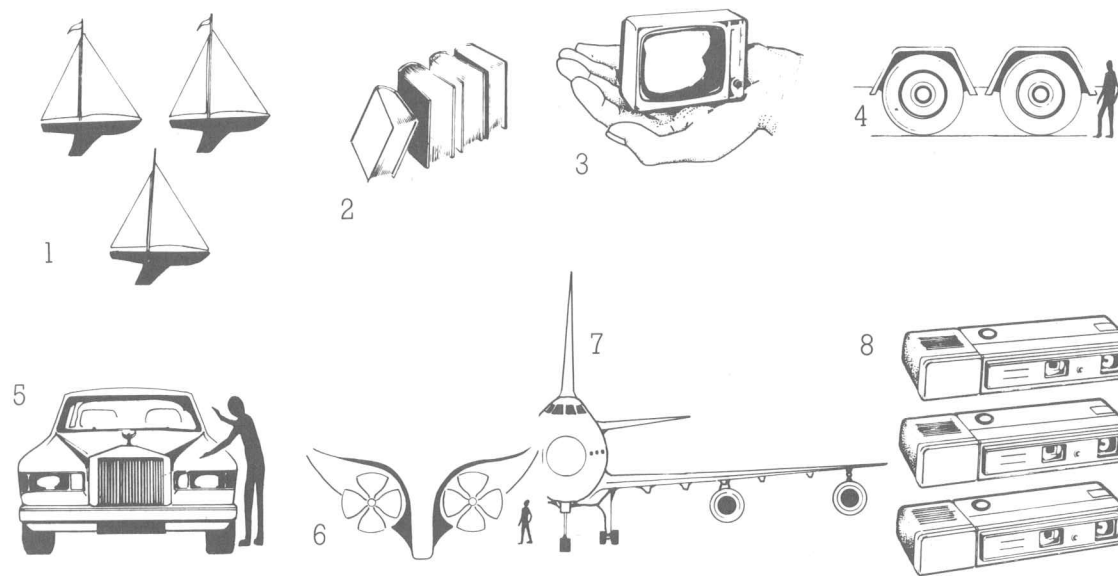
Practice 8

What is this?/What are these?

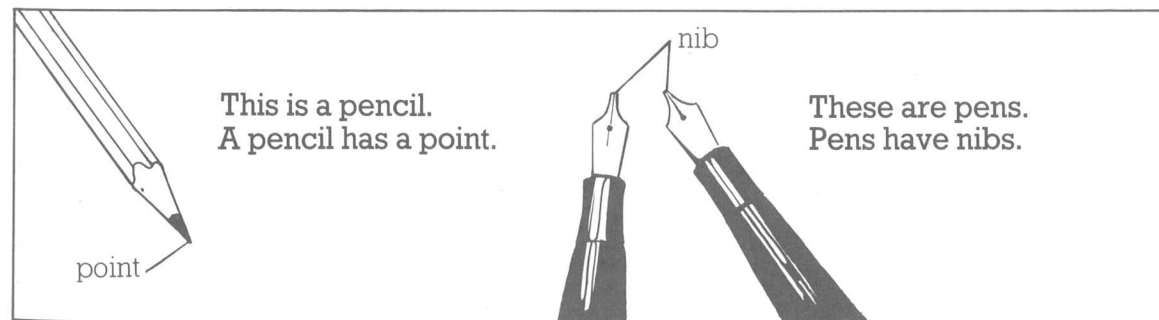


Practice 9

What is it?/What are they?



Study Section 3.6



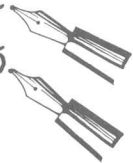
This is a pencil.
A pencil has a point.

These are pens.
Pens have nibs.

Practice 10

Look at these examples:

pencil *A pencil has a point*
 pencils *Pencils have points*



Now make sentences with these words:

- | | |
|---------------|---------------|
| 1 pen | 5 drill |
| 2 pens | 6 telephones |
| 3 televisions | 7 calculators |
| 4 camera | 8 aeroplane |

Practice 11

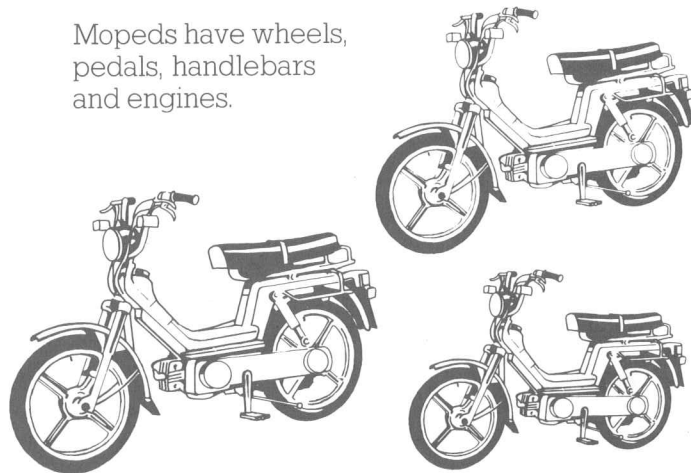
Look at these examples:

A bicycle has wheels, pedals and handlebars.

handlebars



Mopeds have wheels, pedals, handlebars and engines.



Now describe these objects in the same way:

- | | |
|------------|----------------|
| 1 bicycles | 4 screwdrivers |
| 2 a moped | 5 saws |
| 3 a camera | 6 tractors |

Language Point

A bicycle has wheels, pedals and handlebars.

Study Section 3.7



One, two, three, four, five, six, seven, eight, nine, ten, twenty, thirty, forty, fifty.

1 2 3 4 5 6 7 8 9 10
 20 30 40 50

Practice 12

Read out these numbers:

5 9 6 3 7 20 8 40 50 5 2 1 10 30

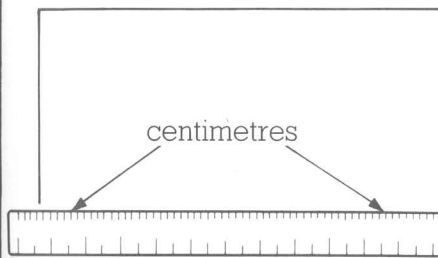
Practice 13

Write down these numbers:



Seven, six, nine, three, thirty, eight, fifty, five, four, twenty.

Study Section 3.8



One centimetre. Six centimetres. Thirty centimetres.

1 cm 6 cm
 30 cm


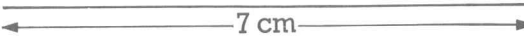


Practice 14

Read out these:

1 4cm 2 8cm 3 20cm 4 1cm 5 10cm 6 2cm 7 3cm
 8 50cm 9 1cm 10 7cm 11 30cm



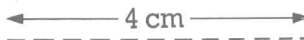





Study Section 3.9

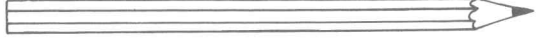

	This is a thick line. It is 5 cm long.
	This is a thin line. It is 7 cm long.
	These are dotted lines. They are 6 cm long.
	These are broken lines. They are 8 cm long.

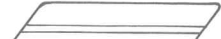



Practice 15

Describe these lines:

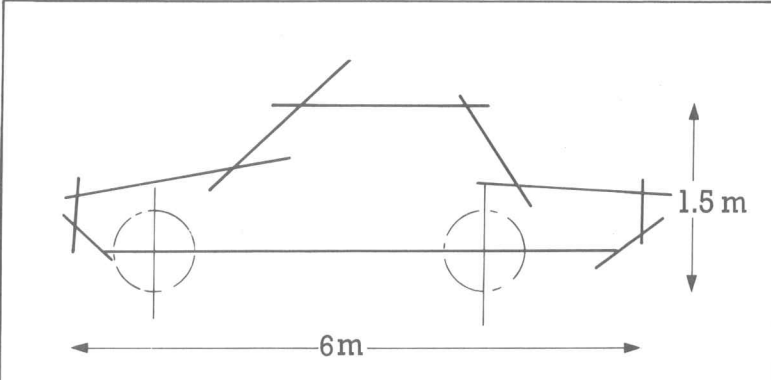
- 1 
- 2 
- 3 
- 4 
- 5 
- 6 

Now describe these objects:

- 7 
- 8 

- 9 
- 10 
- 11 
- 12 

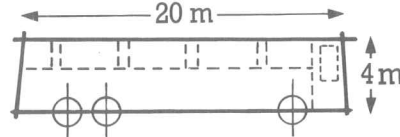
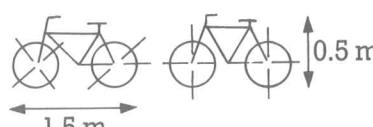
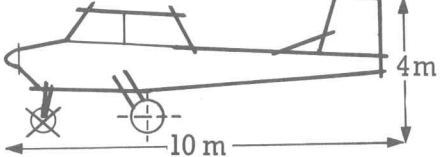

Study Section 3.10



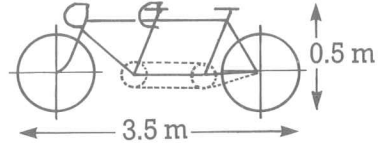
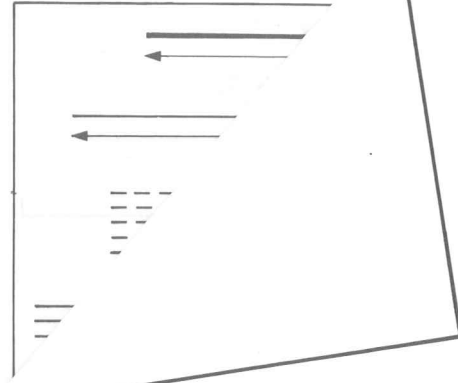
This is a car. It is 6 m long and 1.5 m high.

Practice 16

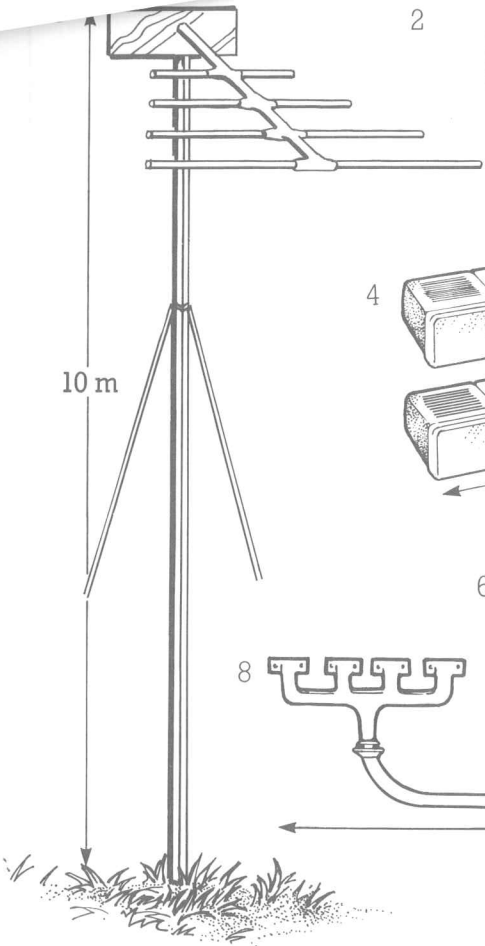
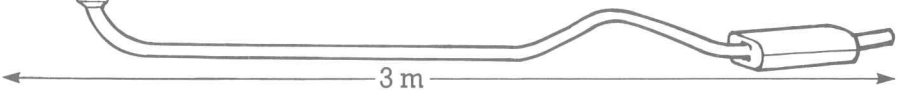
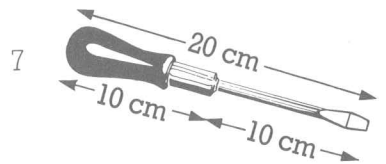
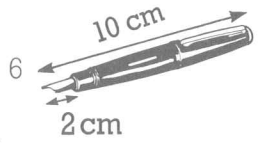
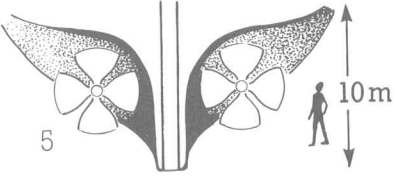
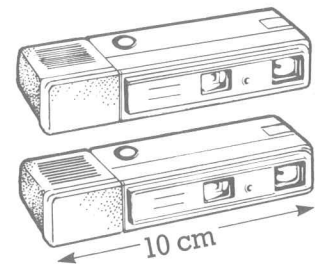
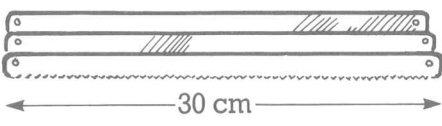
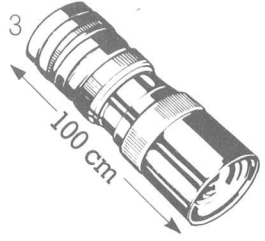
Describe these objects:

- 1 
- 2 
- 3 
- 4 

Study Section 3.9



These objects:



Word List

- a book
- a centimetre (cm)
- a circle
- an eraser
- a handlebar
- a line
- a metre (m)
- a nib
- a pen
- a pencil
- a point
- a projector
- a rectangle
- a ruler
- a square
- a triangle
- five
- six
- seven

- eight
- nine
- ten
- zero
- broken
- dotted
- thick
- thin
- (5 cm) high
- (0.5 m) long
- have
- It is ...
- They are ...
- These are ...
- What are these?
- What is it?
- What are they?

Unit 4

Technical Measurement

Study Section 4.1

11 = eleven	18 = eighteen	43 = forty-three	200 = two hundred
12 = twelve	19 = nineteen	50 = fifty	300 = three hundred
13 = thirteen	20 = twenty	60 = sixty	1.5 = one point five
14 = fourteen	21 = twenty-one	70 = seventy	1.6 = one point six
15 = fifteen	30 = thirty	80 = eighty	1.7 = one point seven
16 = sixteen	32 = thirty-two	90 = ninety	6.1 = six point one
17 = seventeen	40 = forty	100 = one hundred	7.2 = seven point two

Language Point

Seven / 7 is a number.
 Seven is a word.
 7 is a figure.
 1.7 is a decimal.

Practice 1

Write these figures in words:

- | | | | |
|---|------|----|-----|
| 1 | 15 | 6 | 92 |
| 2 | 16 | 7 | 500 |
| 3 | 16.5 | 8 | 9.3 |
| 4 | 44 | 9 | 1.8 |
| 5 | 87 | 10 | 8.4 |

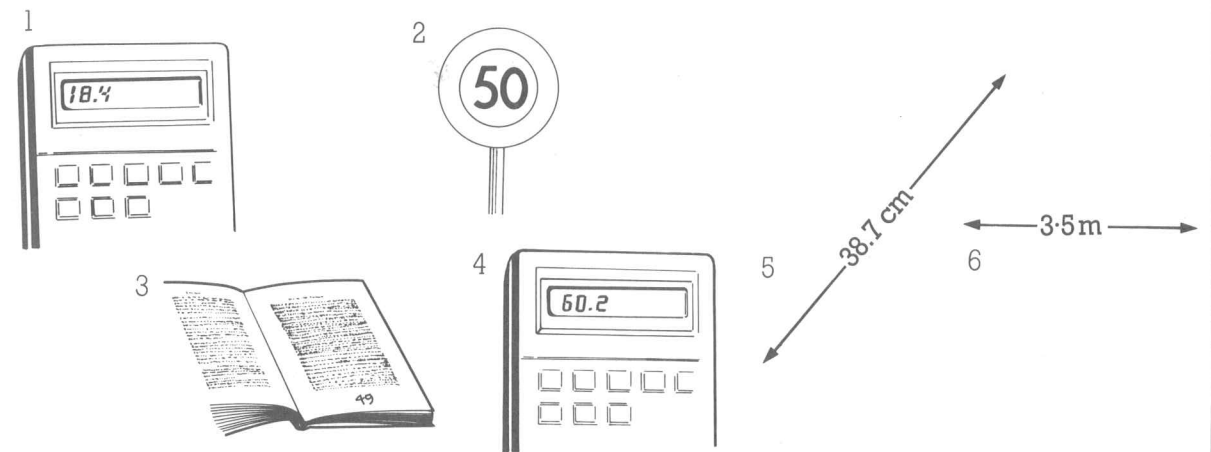
Practice 2

Now write these words in figures:

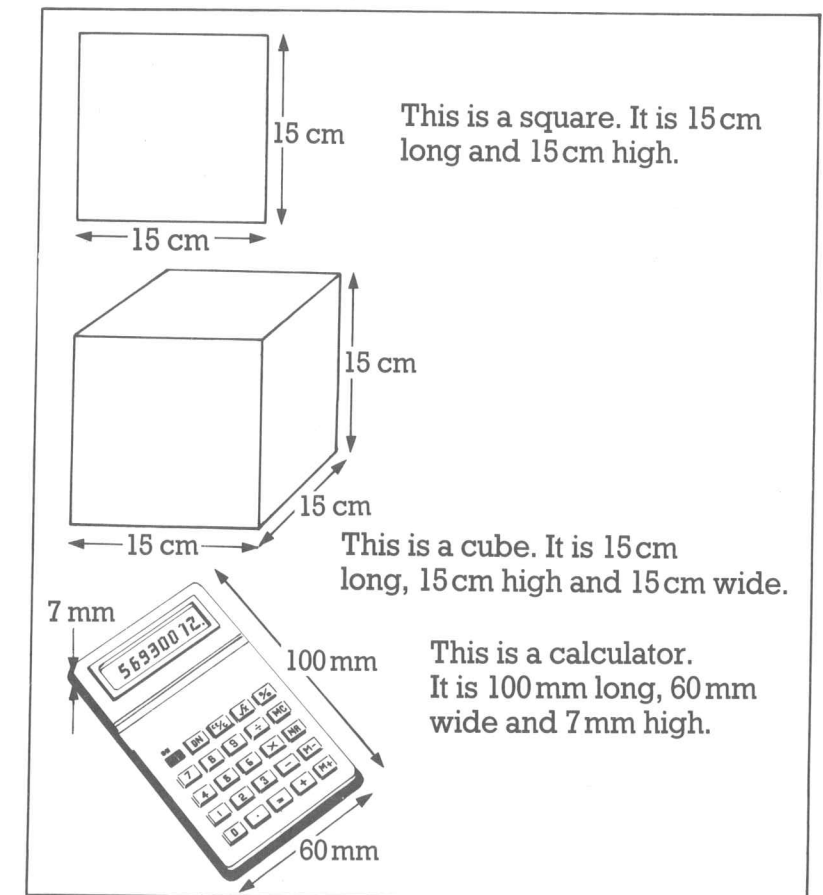
- seventeen
- sixty-three
- seventy-nine
- eight point seven
- one point one
- twelve point three
- forty-five point six
- ninety-nine point nine
- seven hundred
- one hundred and one

Practice 3

Write these figures in words:

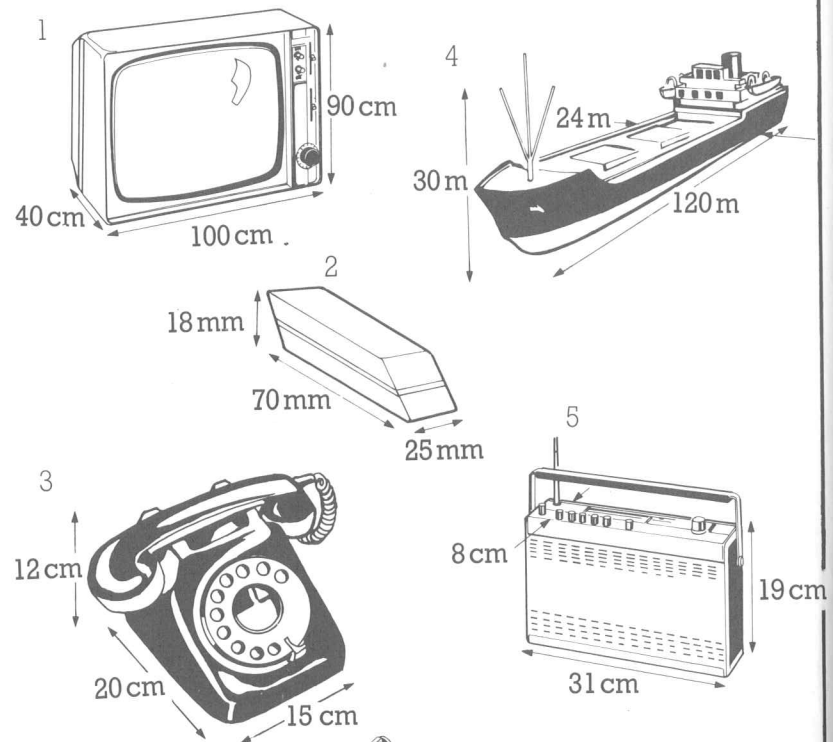


Study Section 4.2

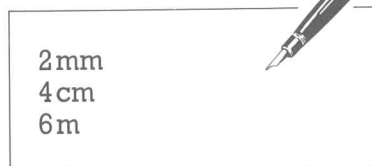


Practice 4

Describe these objects in the same way:



Language Point

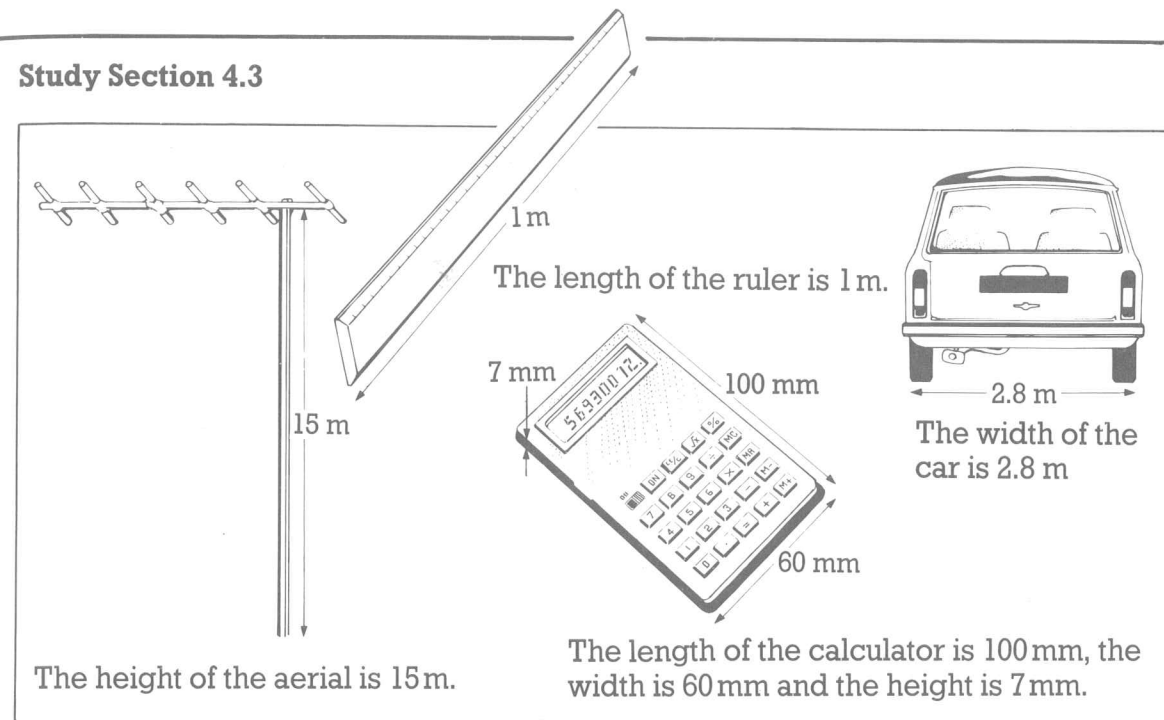


Two millimetres.
Four centimetres.
Six metres.

Practice 5

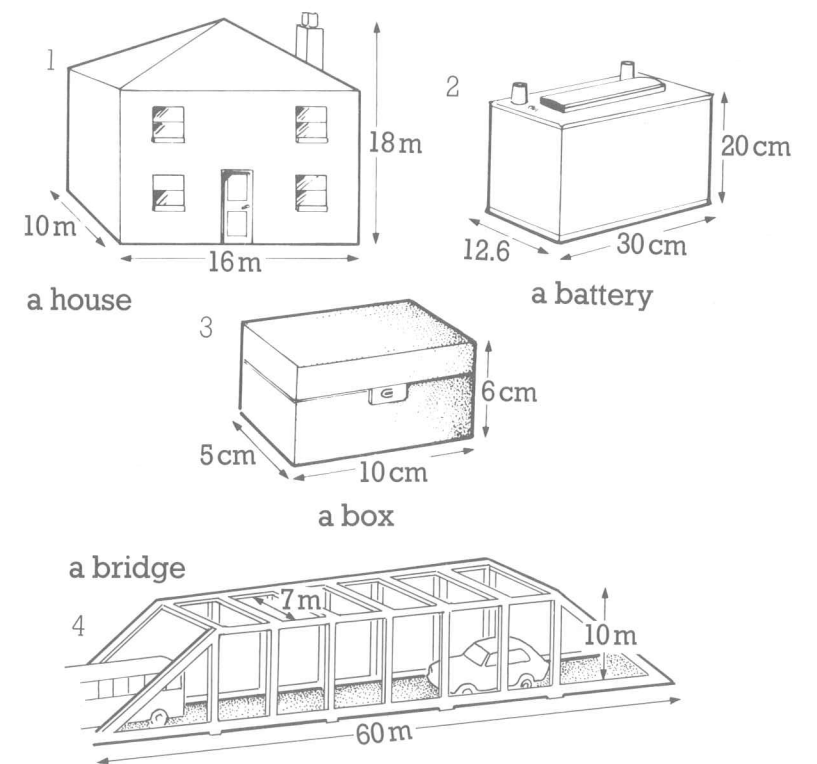
- 1 Draw a cube 5 cm long, 5 cm high and 5 cm wide.
- 2 Draw a television 50 cm long, 20 cm wide and 45 cm high.
- 3 Draw a car 4 m long, 2 m wide and 1.5 m high.
- 4 Draw a lorry 10 m long, 3.5 m wide and 4 m high.
- 5 Draw a dotted line 6.5 cm long and a broken line 7.8 cm long.

Study Section 4.3



Practice 6

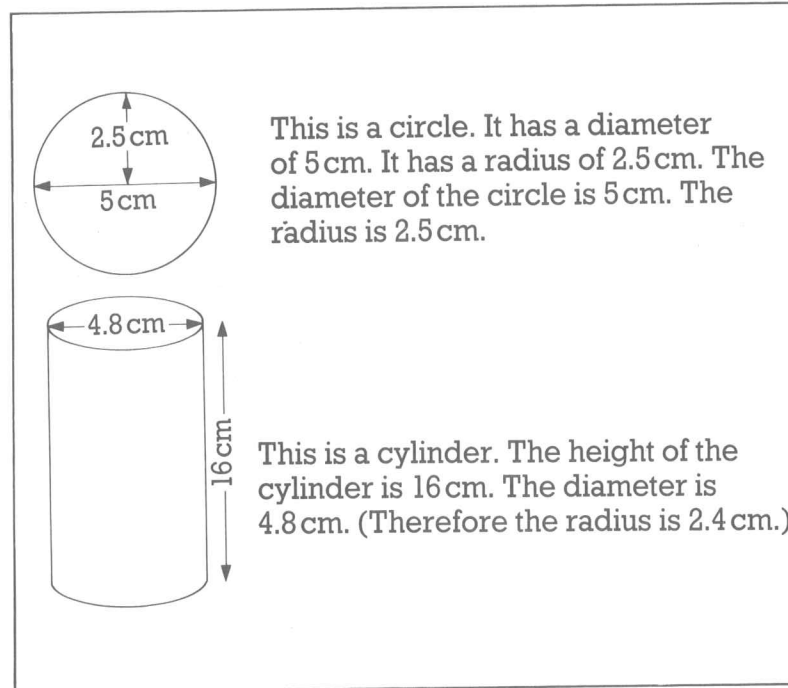
Describe these objects. Use the words length, width and height:



Study Section 4.4

Practice 7

Describe the objects in Practice 4 again.
Use length, width and height.

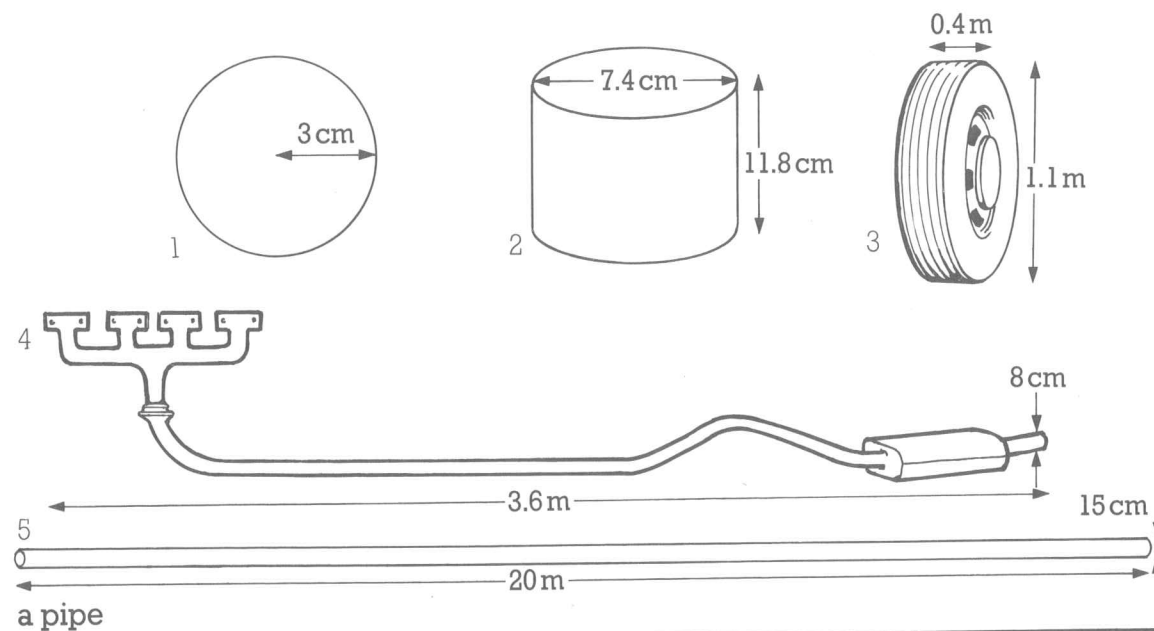


This is a circle. It has a diameter of 5 cm. It has a radius of 2.5 cm. The diameter of the circle is 5 cm. The radius is 2.5 cm.

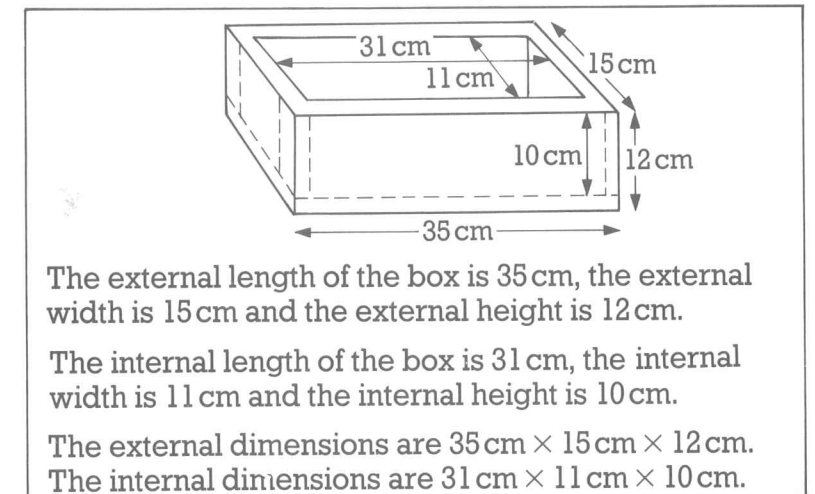
This is a cylinder. The height of the cylinder is 16 cm. The diameter is 4.8 cm. (Therefore the radius is 2.4 cm.)

Practice 8

Describe these objects in the same way:



Study Section 4.5



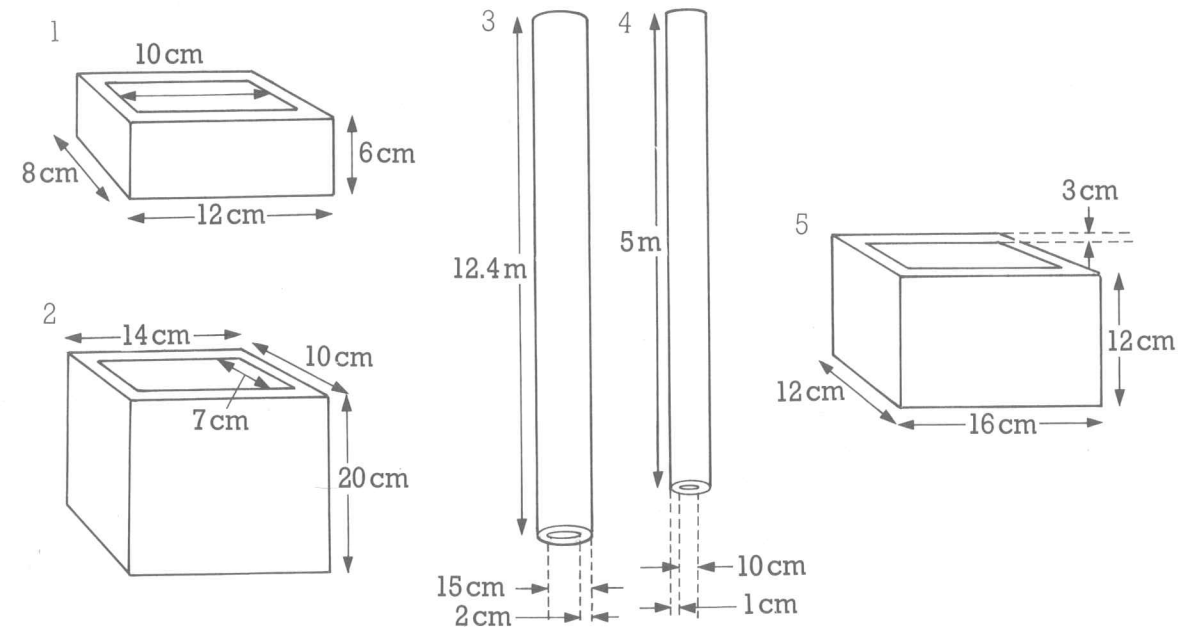
The external length of the box is 35 cm, the external width is 15 cm and the external height is 12 cm.

The internal length of the box is 31 cm, the internal width is 11 cm and the internal height is 10 cm.

The external dimensions are 35 cm × 15 cm × 12 cm. The internal dimensions are 31 cm × 11 cm × 10 cm.

Practice 9

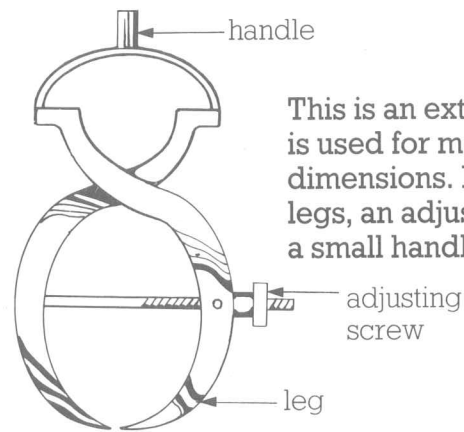
What are the dimensions of these objects?



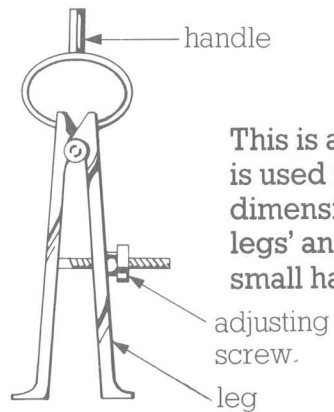
Practice 10

- 1 Draw a box with external dimensions of 24 cm × 18 cm × 18 cm and internal dimensions of 20 cm × 14 cm × 16 cm.
- 2 Draw a pipe 7.8 m long and with an external diameter of 10 cm and an internal diameter of 8 cm.
- 3 Draw a cylinder with a height of 17.2 cm, an internal radius of 8 cm and an external radius of 8.5 cm.

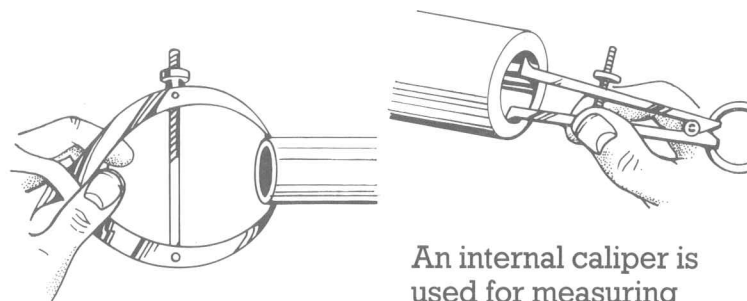
Study Section 4.6



This is an external caliper. It is used for measuring external dimensions. It has two legs, an adjusting screw and a small handle.



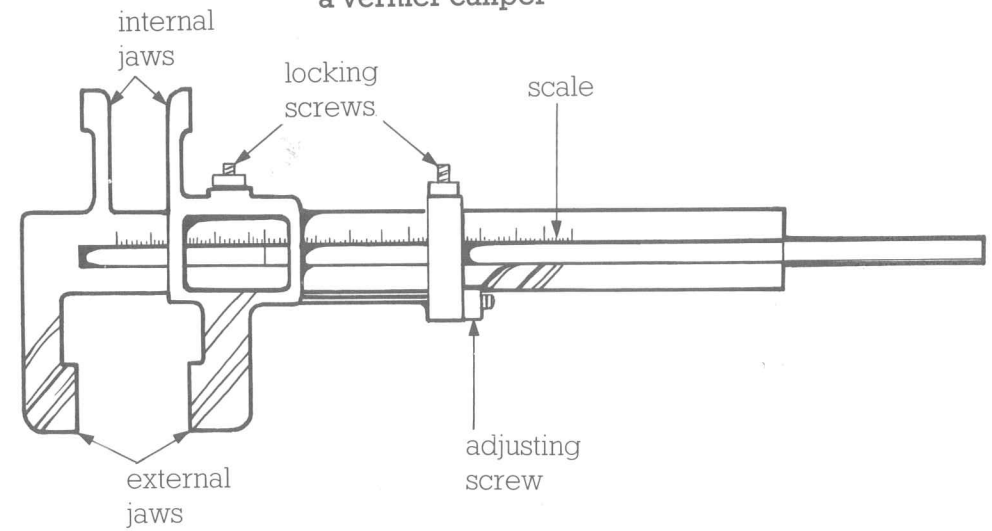
This is an internal caliper. It is used for measuring internal dimensions. It also has two legs, an adjusting screw and a small handle.



An internal caliper is used for measuring internal dimensions.

An external caliper is used for measuring external dimensions.

**Practice 11
a vernier caliper**



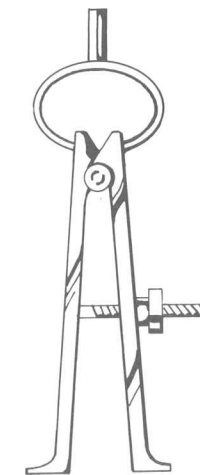
Complete this description of a vernier caliper:

This is a It is used for measuring internal and external It has a scale, two locking and an screw. It also has two jaws and external The external jaws are for measuring dimensions. The are used for internal The is used adjusting the jaws.

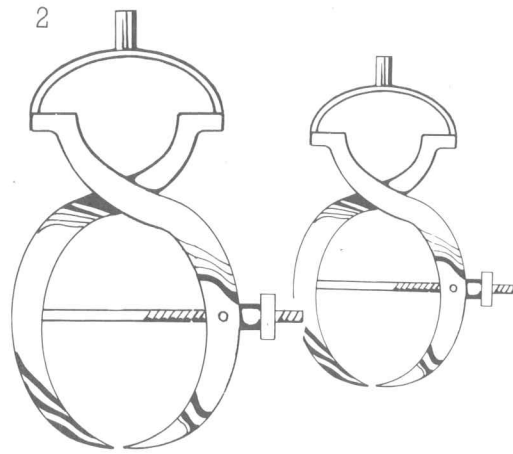
Practice 12

Answer these questions in complete sentences:

1



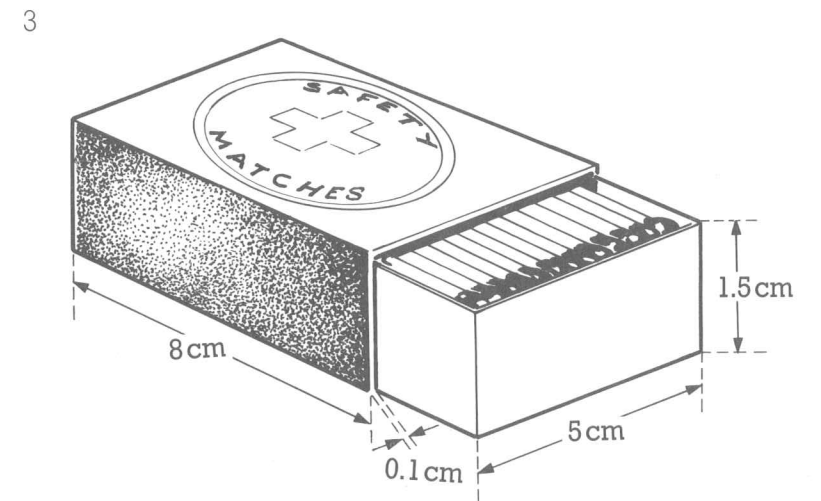
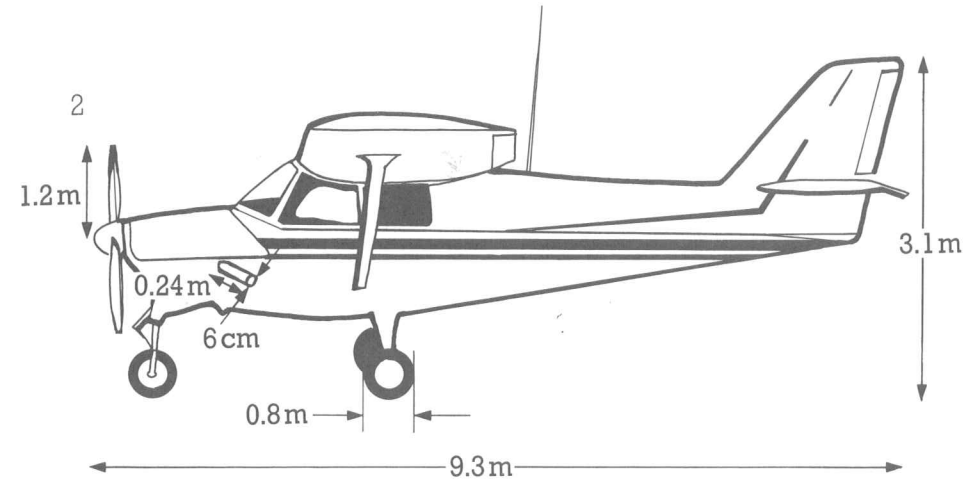
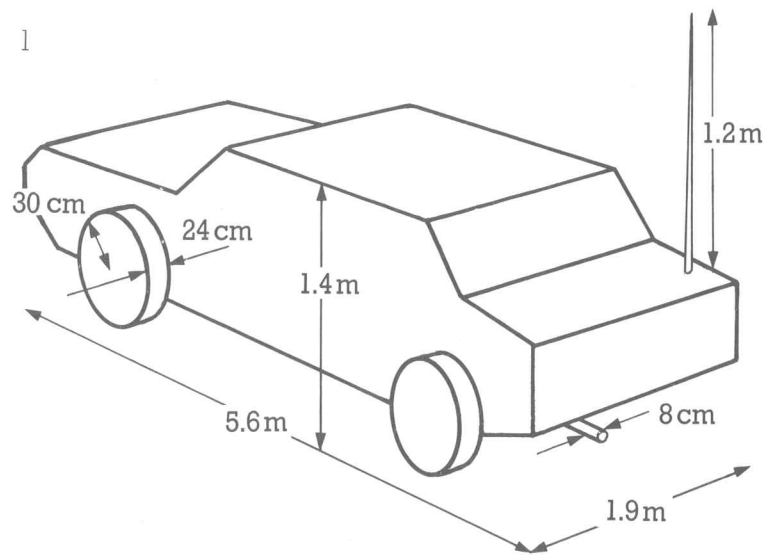
What is this?
What is it used for?
What is the adjusting screw used for?



What are these?
 What are they used for?
 What are the adjusting screws used for?

Revision Exercise

Describe these objects:



Word List

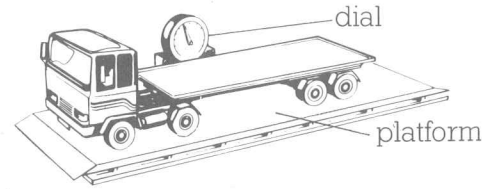
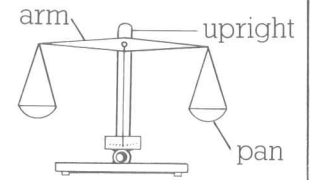
- | | |
|---------------------|---------------------------------|
| an adjusting screw | a vernier caliper |
| a battery (car) | a word |
| a box | height |
| a bridge | length |
| a caliper | width |
| a circle | numbers 11-100 |
| a cube | (ten) by (four) = 10×4 |
| a cylinder | (one) point (eight) = 1.8 |
| a decimal | external |
| a diameter | internal |
| a dimension | (10 cm) high |
| an external caliper | long |
| a figure | wide |
| a house | adjust |
| an internal caliper | measure |
| a jaw | It is |
| a leg | They are } used for ... |
| a locking screw | also |
| a millimetre (mm) | therefore |
| a number | |
| a pipe | |
| a radius | |
| a scale | |

Unit 5

Measuring Equipment

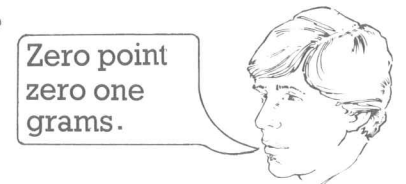
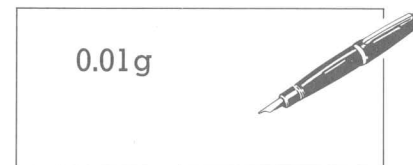
Study Section 5.1

This is a balance. It is used for weighing very small objects. It is used for weighing objects from about 0.01 g to about 10 g. It has an upright, an arm and two pans. The arm is approximately 50 cm long the upright is about 60 cm high. The pans have a diameter of about 10 cm.



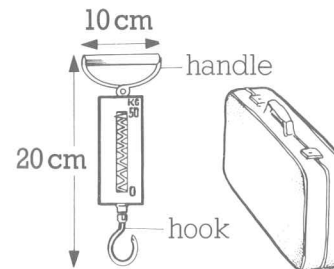
This is a weighbridge. It is used for weighing lorries. It is used for weighing lorries from about 1 tonne to about 75 tonnes. It has a rectangular platform (approx. 15 m x 3.5 m) and a large dial.

Language Point

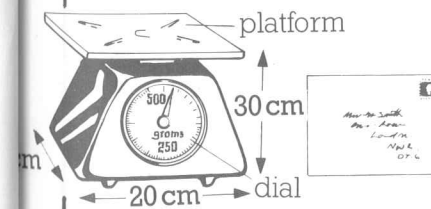


Practice 1

Describe these objects:

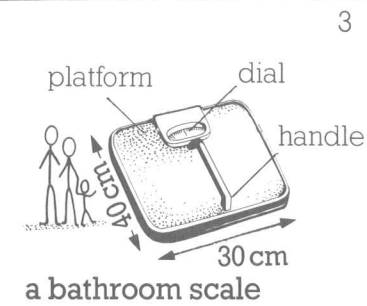


a spring balance

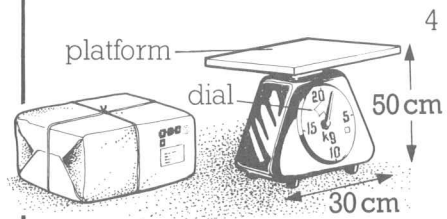


a letter scale

- 1 This is a balance. It is used for cases. It has a handle, a body and a It is high and It is used for cases from about kg to kg.
- 2 This is a It is used for It has a and a It is used for from about to It is long, wide and 30 cm



a bathroom scale



a parcel scale

3 This is
 It has and
 It is
 people. It is
 120 kg.
 It
 wide.

Language Point

1.12
 2.354
 12.12
 0.01



One point one two.
 Two point three five four.
 Twelve point one two.
 Zero point zero one.

Practice 2

Write these numbers in figures:

- | | |
|-------------------------------|---------------------------------|
| 1 three point two four | 6 eighteen point three five six |
| 2 seven point eight one | 7 one point zero five |
| 3 thirteen point four six | 8 two point zero zero five |
| 4 twenty-five point one three | 9 zero point six six |
| 5 nine point zero one | 10 zero point zero zero one |

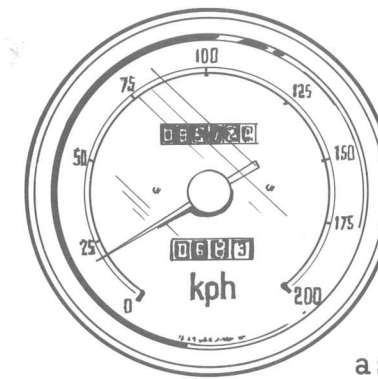
Practice 3

Read out these numbers:

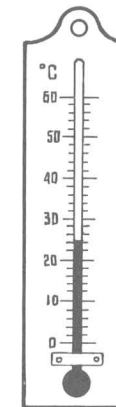
- | | |
|---------|-----------|
| 1 7.62 | 6 6.215 |
| 2 4.55 | 7 8.408 |
| 3 3.33 | 8 0.005 |
| 4 25.46 | 9 0.109 |
| 5 15.18 | 10 16.386 |

Study Section 5.2

This is a speedometer. It is used for measuring speed in kph (kilometres per hour) from 0 kph to 200 kph.



a speedometer

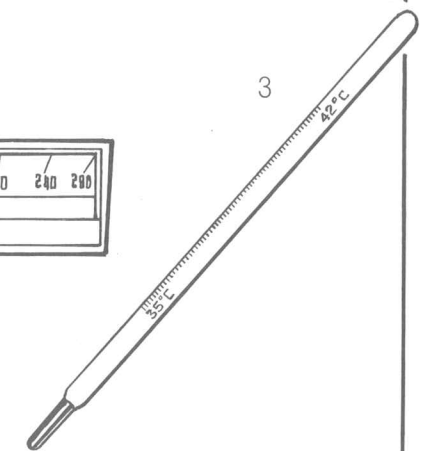
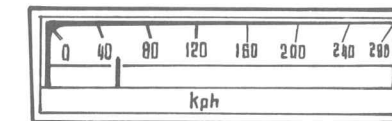
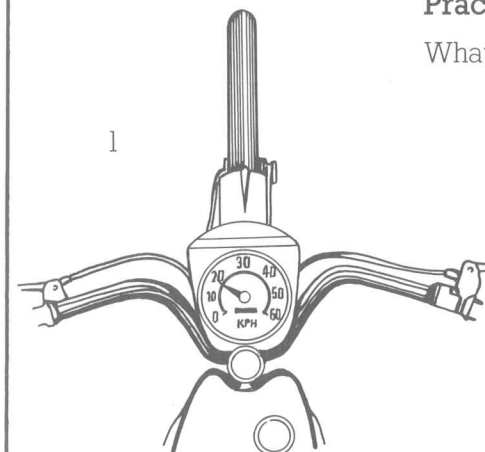


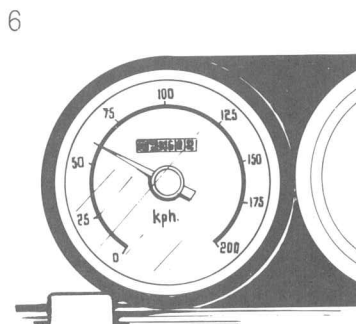
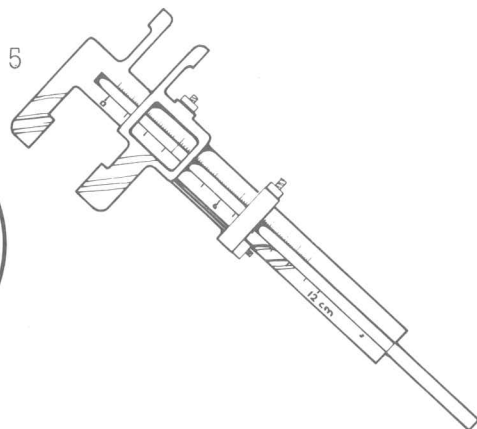
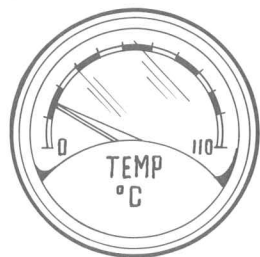
This is a thermometer. It is used for measuring temperature in °C (degrees Celsius) from 0°C to 60°C.

a thermometer

Practice 4

What is this? What is it used for?





Practice 5

Answer these questions:

- 1 What is a balance used for?
- 2 What is a weighbridge used for?
- 3 What is a spring balance used for?
- 4 What is a thermometer used for?
- 5 What is a speedometer used for?
- 6 What is an external caliper used for?
- 7 What is a vernier caliper used for?
- 8 What is a parcel scale used for?

Language Point

24°C
70 kph



Twenty-four degrees Celsius.
Seventy kilometres per hour.



Practice 6

Read out these measurements:

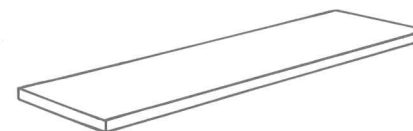
- | | |
|------------|-----------|
| 1 36 mm | 5 12 kph |
| 2 18.42 cm | 6 32.4°C |
| 3 19.08 g | 7 250 kph |
| 4 24.5 kg | 8 0.5°C |

Language Point

a rectangle ⇒ rectangular
a circle ⇒ circular
a triangle ⇒ triangular
a square ⇒ square

Practice 7

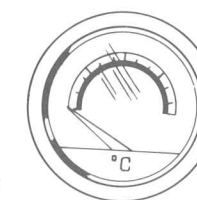
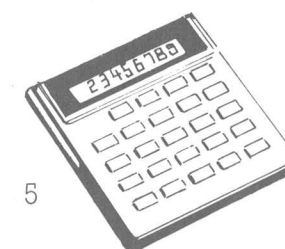
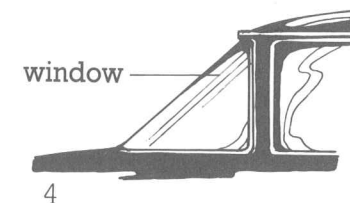
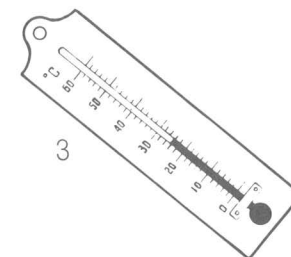
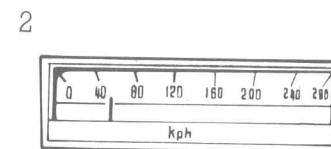
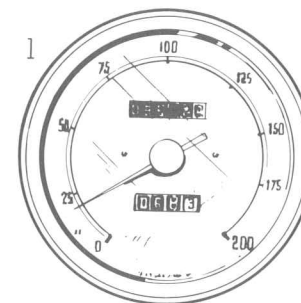
Look at this example:



This is a rectangular platform.



Now describe these objects in the same way:



Practice 8

Complete these paragraphs:

- Balances used for measuring small weights from 0.01 g to 10g. A balance an upright, arm two pans.
- weighbridge is for weighing lorries. It has a rectangular and a dial. It is for lorries about 1 tonne 75 tonnes.
- Spring are used for Bathroom scales for weighing people. Letter scales letters. Bathroom and letter scales have a and a A spring balance has and

Language Point

one lorry ⇒ two lorries
one bus ⇒ two buses

Study Section 5.3

a	This is a letter.
A	This is a capital letter.
abcdefghijkl	These are letters.
ABCDEFGHIJK	These are capital letters.
,	This is a comma.
.	This is a full stop.

Practice 9

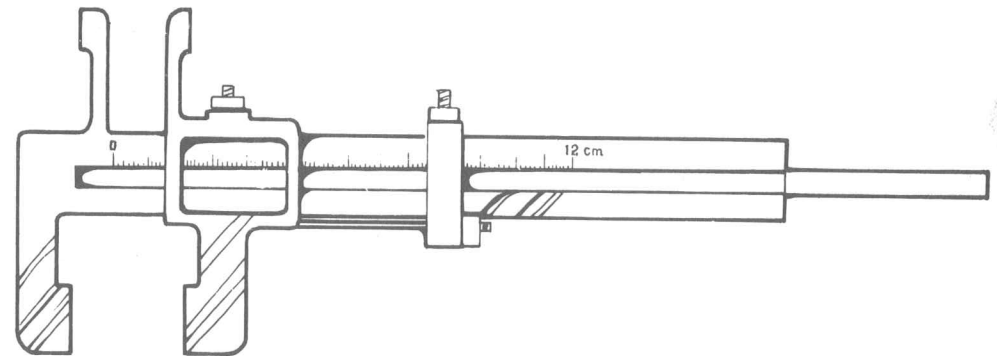
Put in the commas and the full stops:

- Speedometers are used for measuring speed
Thermometers are used for measuring temperature
Scales are used for measuring weight
Spring balances letter scales and parcel scales are also used for measuring weight

- A balance is used for measuring very small weights It has an upright an arm and two pans A bathroom scale has a platform a dial and a handle It is used for weighing people

Practice 10

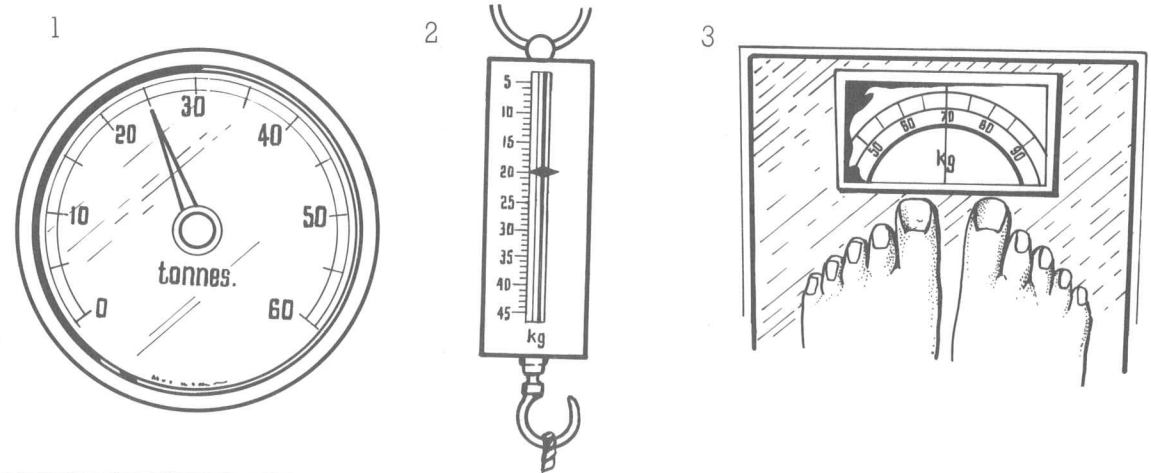
Put in the capital letters, commas and full stops:



- this vernier caliper is used for measuring internal and external dimensions from 0 cm to 12 cm it has two internal jaws two external jaws and two locking screws it also has a scale and an adjusting screw the adjusting screw is used for adjusting the jaws
- calipers are also used for measuring an internal caliper is used for measuring internal dimensions and an external caliper is used for measuring external dimensions calipers have two legs an adjusting screw and a small handle

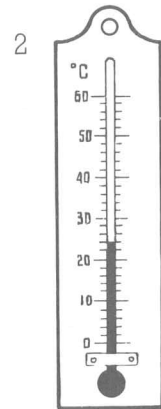
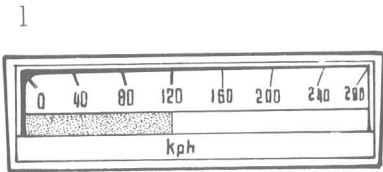
Practice 11

Write these weights in words:



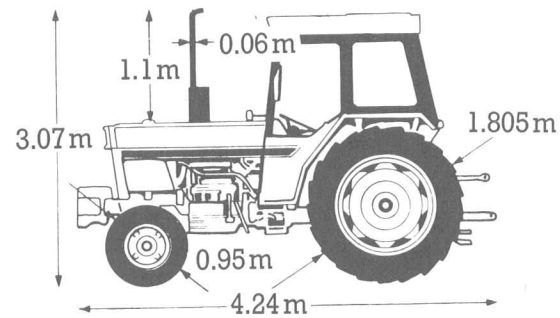
Practice 12

Write these measurements in words:



Revision Exercises

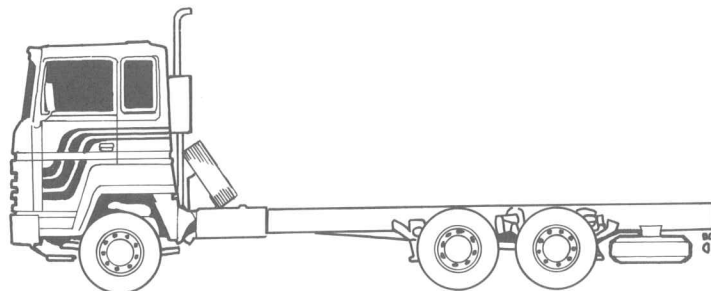
Revision Practice 1



Answer these questions:

- 1 What is the height of the tractor?
- 2 What is the length of the tractor?
- 3 What is the height of the exhaust?
- 4 What is the diameter of the exhaust?
- 5 What is the diameter of the small wheels?
- 6 What is the diameter of the large wheels?

Revision Practice 2

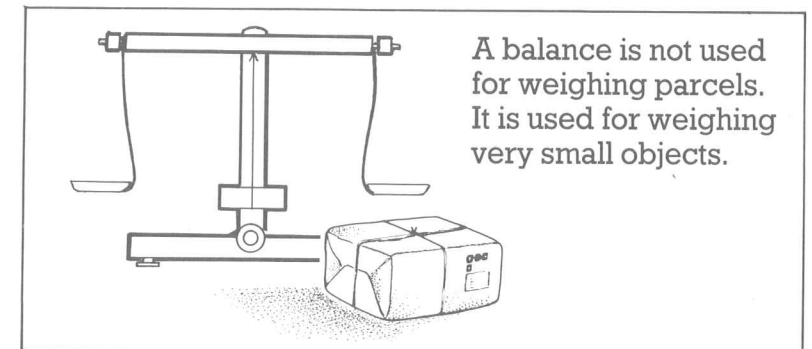


(In this diagram 1 cm = 1 m)

Measure the diagram and answer these questions:

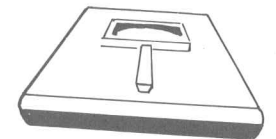
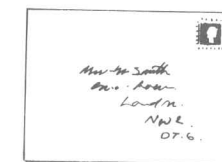
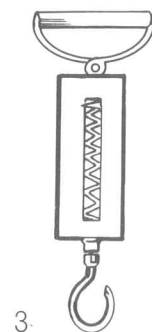
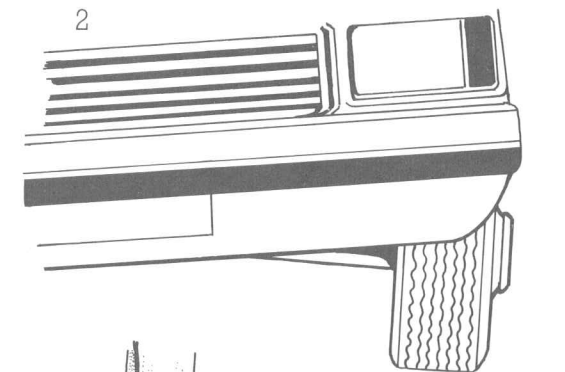
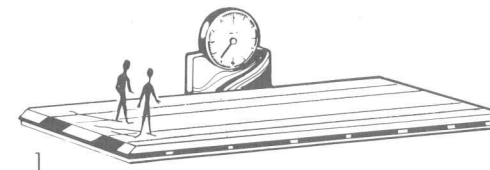
- 1 What is the length of the lorry?
- 2 What is the height of the lorry?
- 3 What is the height of the exhaust?
- 4 What is the diameter of the wheels?
- 5 What is the width of the wheels?

Study Section 5.4



Practice 13

Make two sentences about each of these pictures:



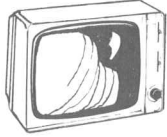
Language Point

A balance is not used for weighing parcels.

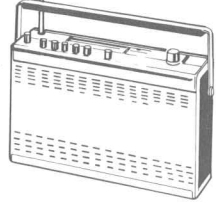
A balance isn't used for weighing parcels.

Study Section 5.5


This is a television.



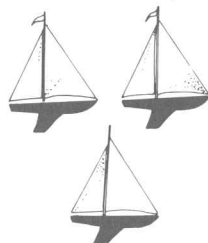
This is not a television. This is a radio.



These are aeroplanes.



These are not aeroplanes. These are boats.

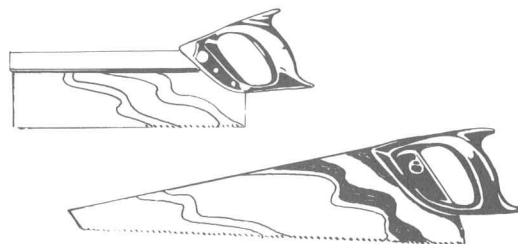
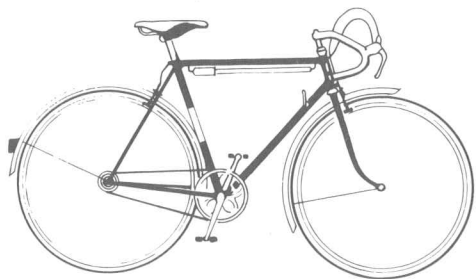


Practice 14

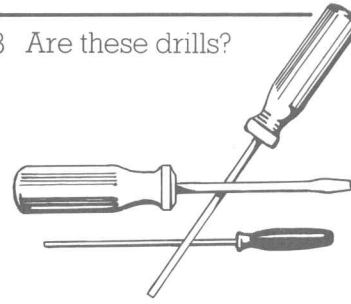
Answer these questions:

1 Is this a bicycle?

2 Are these screwdrivers?



3 Are these drills?



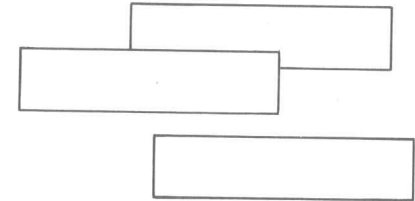
4 Is this a thick line?



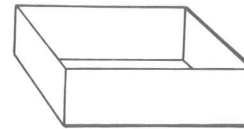
5 Is this a large boat?



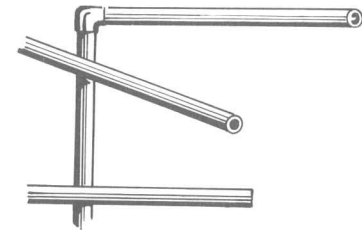
6 Are these rectangles?



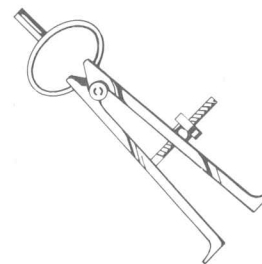
7 Is this a cylinder?



8 Are these pipes?



9 Is this an external caliper?



10 Is this three hundred and thirty?

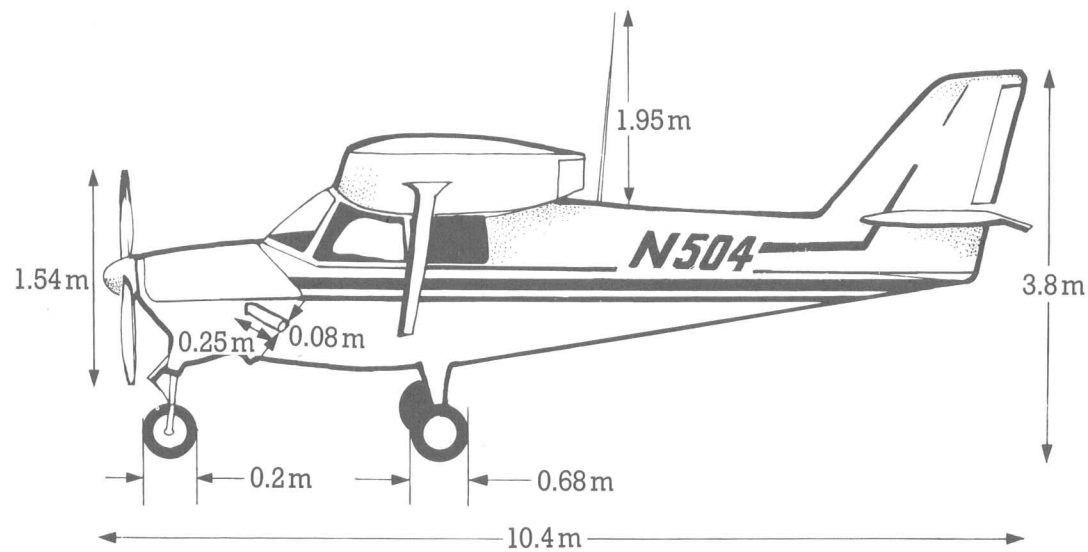


Language Point

This is not a television. These are not aeroplanes.

This isn't a television. These aren't aeroplanes.

Practice 15



Answer these questions:

- 1 Is the height of the aeroplane 10.4m?
- 2 Is the height of the aerial 1.95m?
- 3 Is the diameter of the propeller 15.4m?
- 4 Is the length of the exhaust 0.08m?
- 5 What is the diameter of the large wheels?
- 6 What is the diameter of the small wheel?
- 7 What is the length of the aeroplane?
- 8 Is the number of the aeroplane five hundred and forty?

Word List

an arm
 a balance
 a bathroom scale
 a capital letter
 a case
 a comma
 a degree Celsius (°C)
 a dial
 a full stop
 a gram (g)
 a hook
 a kilogram (kg)
 a kilometre (km)
 a letter
 a letter (of the alphabet)
 a pan
 a parcel
 a platform
 a scale
 a speedometer
 a spring balance
 a thermometer
 a tonne

an upright
 a weighbridge
 a weight
 a window

people

speed
 temperature
 weight

circular
 rectangular
 square
 triangular

about
 approximately
 very

from ... to ...

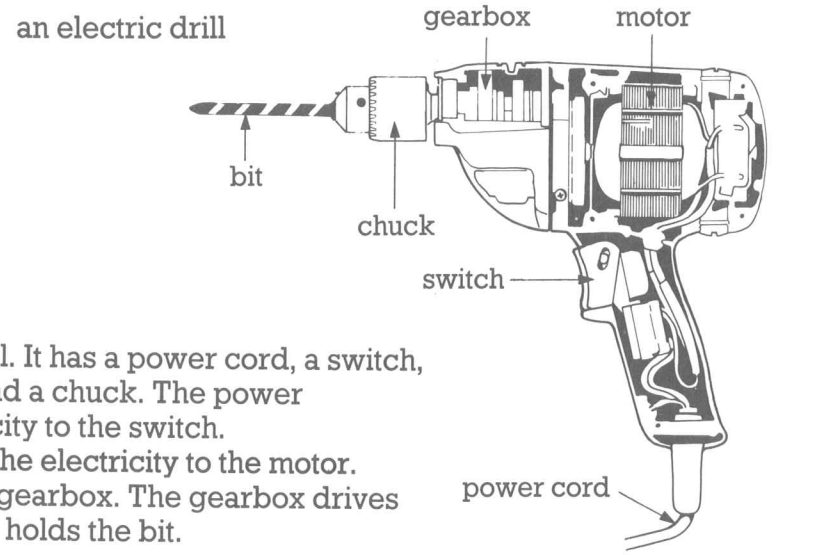
weigh

... is not used for ...
 This is not ...
 These are not ...

Unit 6

How Things Work

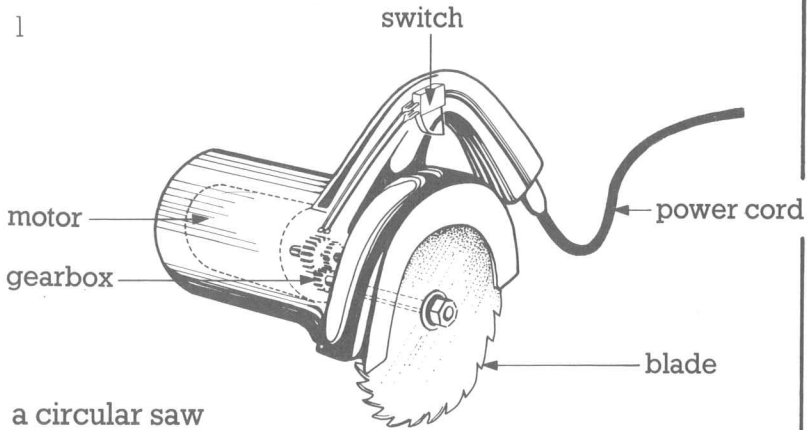
Study Section 6.1



This is an electric drill. It has a power cord, a switch, a motor, a gearbox and a chuck. The power cord supplies electricity to the switch. The switch connects the electricity to the motor. The motor drives the gearbox. The gearbox drives the chuck. The chuck holds the bit.

Practice 1

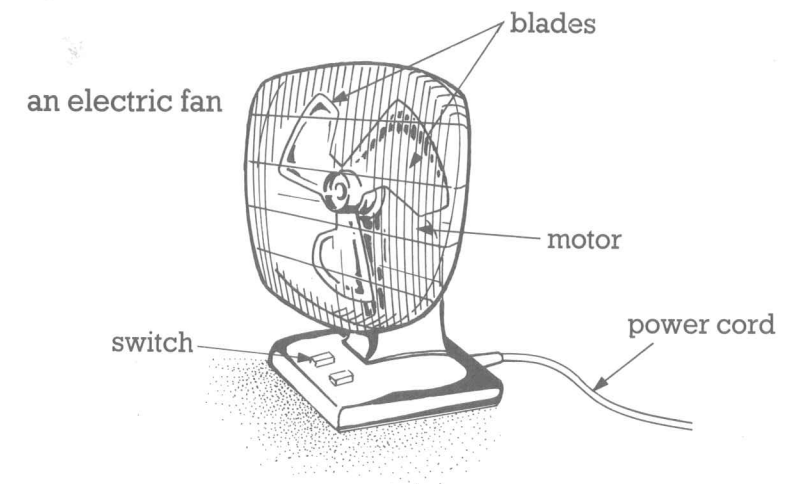
Describe how these things work:



This is a It has a power cord, a, a, a and a The power cord electricity to the switch. The switch

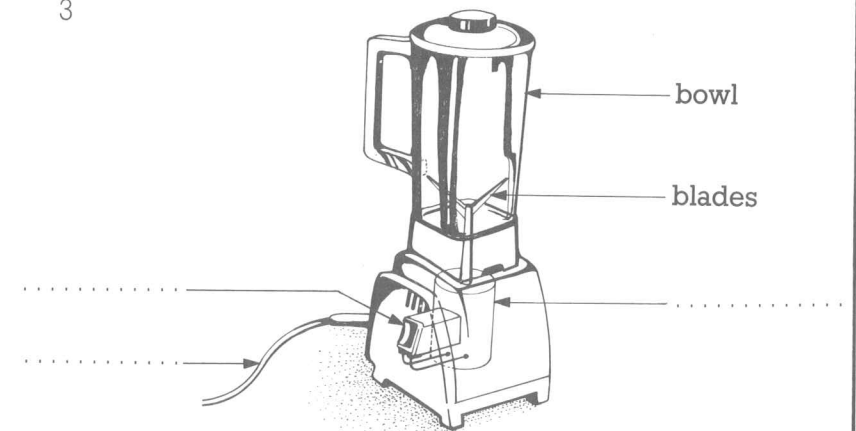
..... to the motor. The motor the gearbox. The gearbox the blade.

2



This is It has and three blades. The power cord The switch The motor

3



an electric blender

.....

Language Point

one switch ⇒ two switches
 one gearbox ⇒ two gearboxes

Practice 2

Make ten sentences from this table:

An electric drill Circular saws An electric fan Electric blenders Saws A screwdriver	has have	(a)	power cord(s). switch(es). motor(s). gearbox(es). chuck(s). blade(s). bowl(s).
-----------------------------------------------------------------------------------------------------	-------------	-----	--------------------------------------------------------------------------------------------------

Practice 3

Are these statements true or false? If they are false, write true statements.

- In an electric drill the motor drives the gearbox.
- The gearbox holds the bit.
- A circular saw has a gearbox.
- The gearbox drives the blade.
- The blade is rectangular.
- In a fan, the switch supplies electricity to the blades.
- The power cord drives the motor.
- In an electric blender, the motor drives the bowl.

Practice 4

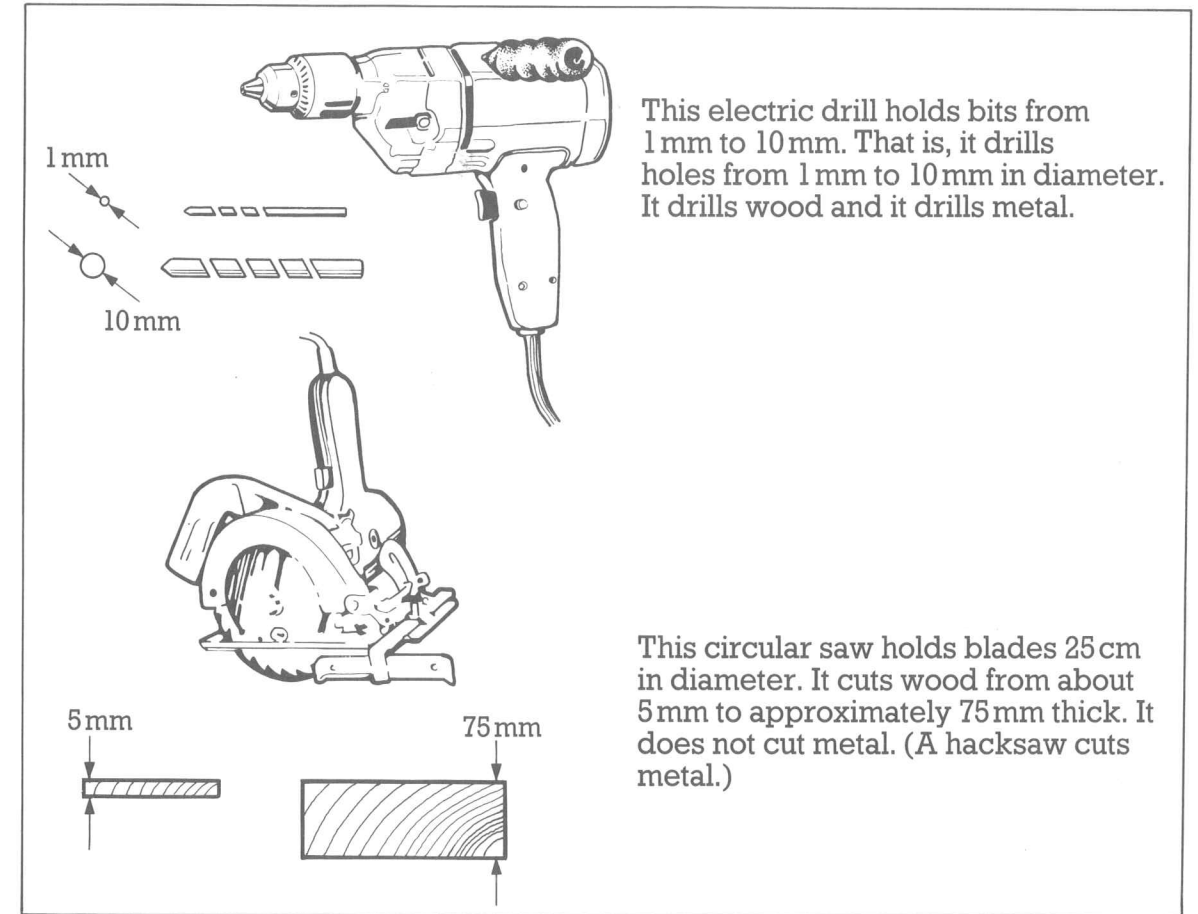
Look at this example:

In an electric fan, the motor drives the blades.

Now complete these sentences:

- In an electric blender, the motor
- In an aeroplane, the engine
- In a moped,
- In a boat,
- In a helicopter,
- In a scooter,

Study Section 6.2



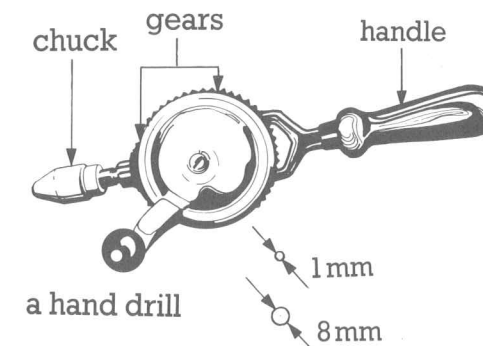
This electric drill holds bits from 1 mm to 10 mm. That is, it drills holes from 1 mm to 10 mm in diameter. It drills wood and it drills metal.

This circular saw holds blades 25 cm in diameter. It cuts wood from about 5 mm to approximately 75 mm thick. It does not cut metal. (A hacksaw cuts metal.)

Practice 5

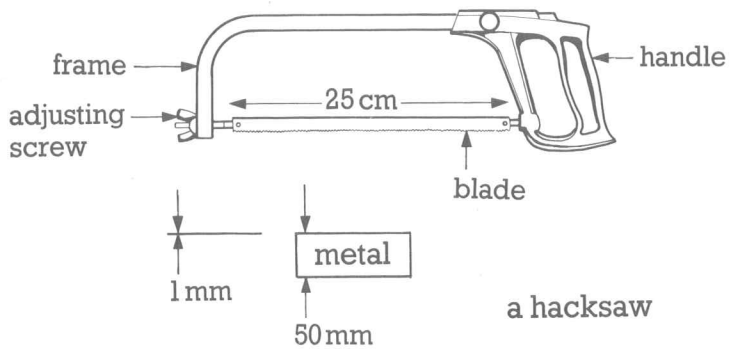
Describe these tools:

1



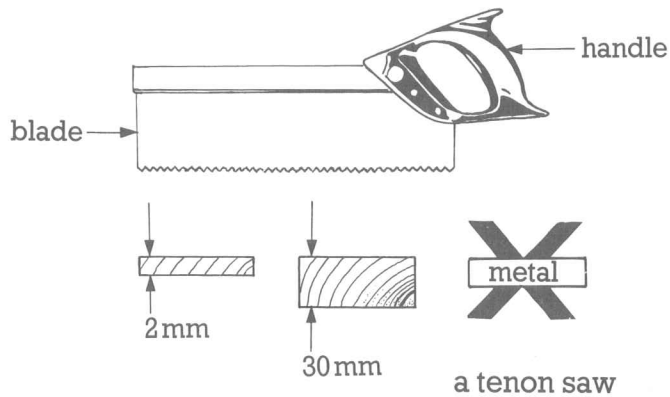
This is a It has two a and a The chuck bits from to That is, it holes from to in diameter. It wood and metal.

2



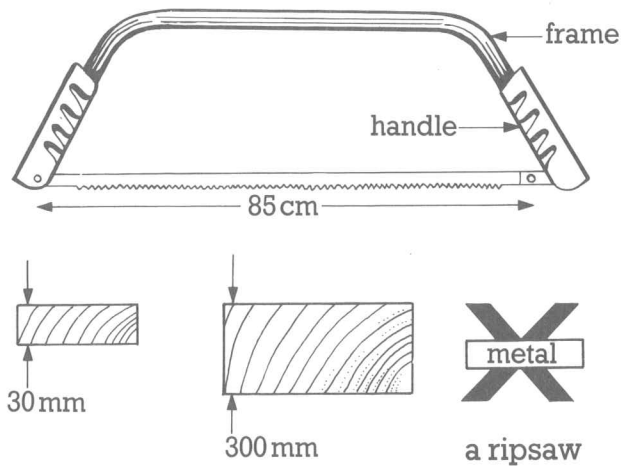
This is It has The frame blades 25 cm long. It metal from to thick.

3



This It It thick. It not metal.

4



.....

Language Point

A hacksaw cuts metal.
 A tenon saw does not cut metal.

Practice 6

Make ten sentences from this table:

A circular saw			wood
A tenon saw	(does not)	cut(s)	metal
A rip saw			
A hacksaw			
A knife			

Practice 7

Draw diagrams from these descriptions:

- 1 This is a small hacksaw. It has a handle, a frame and a blade. It does not have an adjusting screw. The frame holds blades 120 cm long. It cuts metal from 1 mm to 25 mm thick.
- 2 This is a screwdriver. It has a handle and a blade. The handle is 5 cm long. The blade is 10 cm long. The diameter of the blade is 2.5 mm. The diameter of the handle is 12 mm.
- 3 This is a hand drill. It is 20 cm long. The handle is 8 cm long. The diameter of the large gear is 12 cm. The diameter of the handle is 3.5 cm. The chuck holds bits from 1 mm to 8 mm. That is, it drills holes from 1 mm to 8 mm in diameter. It drills wood and metal.

Language Point

A tenon saw does not cut metal.

A tenon saw doesn't cut metal



Study Section 6.3

Hand Tools

Hand drills are used for drilling holes in wood and metal. They drill holes from 1 mm to about 8 mm in diameter. Hand drills do not have motors. They have gears. The gears drive the chuck.

Tenon saws cut wood from about 2 mm to 30 mm thick. Ripsaws cut wood up to about 300 mm thick. Tenon saws and ripsaws cut wood. They do not cut metal. Hacksaws cut metal.

Hacksaws cut metal.
Tenon saws do not cut metal.

Language Point

Practice 8

Answer these questions:

- 1 Do hand drills have motors?
- 2 Do electric drills have motors?
- 3 Do hacksaws have motors?
- 4 Does a hacksaw have a blade?
- 5 Does a hand drill have a blade?
- 6 Do screwdrivers have chucks?
- 7 Does a circular saw cut wood 10 mm thick?
- 8 Do tenon saws cut metal?
- 9 Do hand drills hold 15 mm bits?
- 10 Does an electric drill hold a 5 mm bit?

Practice 9

Make ten sentences from this table:

A circular saw	(do not)	cut(s)	wood.
Tenon saws			metal.
A ripsaw	(does not)	cut(s)	wood.
Hacksaws			metal.
Knives			

Practice 10

Answer these questions:

- 1 Does a car have two wheels?
- 2 Is a weighbridge used for weighing lorries?
- 3 Are bathroom scales used for weighing letters?
- 4 Do tricycles have four wheels?
- 5 Do tractors have four wheels?
- 6 Do buses have small engines?
- 7 Do pencils have nibs?
- 8 Do internal calipers measure external dimensions?
- 9 Do calculators have screens?
- 10 Do cars have handlebars?

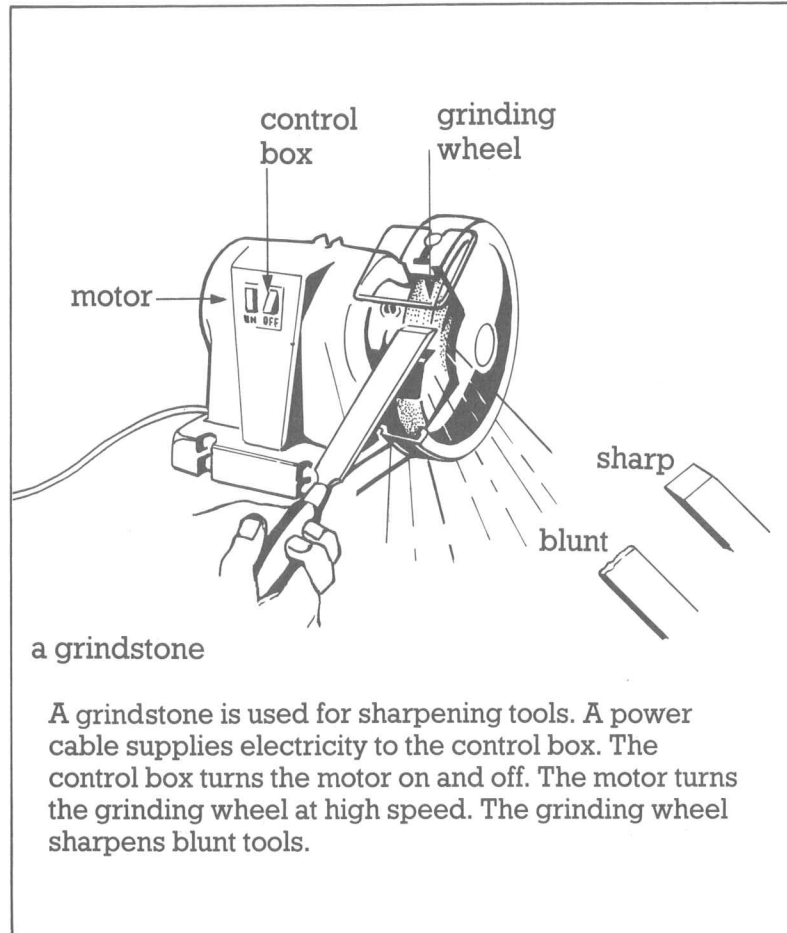
Language Point

Hand drills do not have motors.



Hand drills
don't have
motors.

Study Section 6.4



Practice 11

Look at these examples:

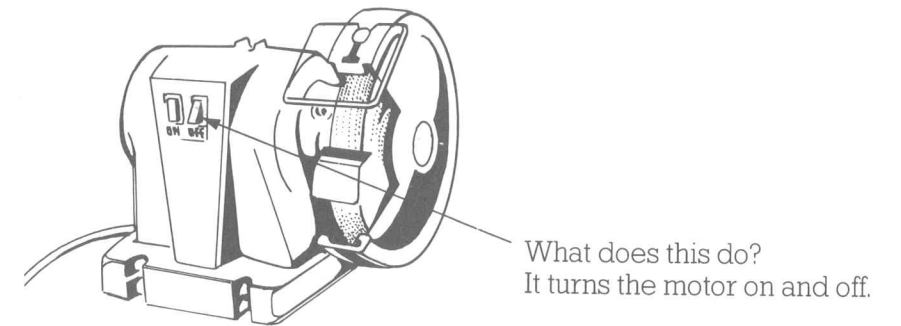
What is a grindstone used for?
 A grindstone is used for sharpening tools.
 What does a grindstone do?
 A grindstone sharpens tools.

Now answer these questions:

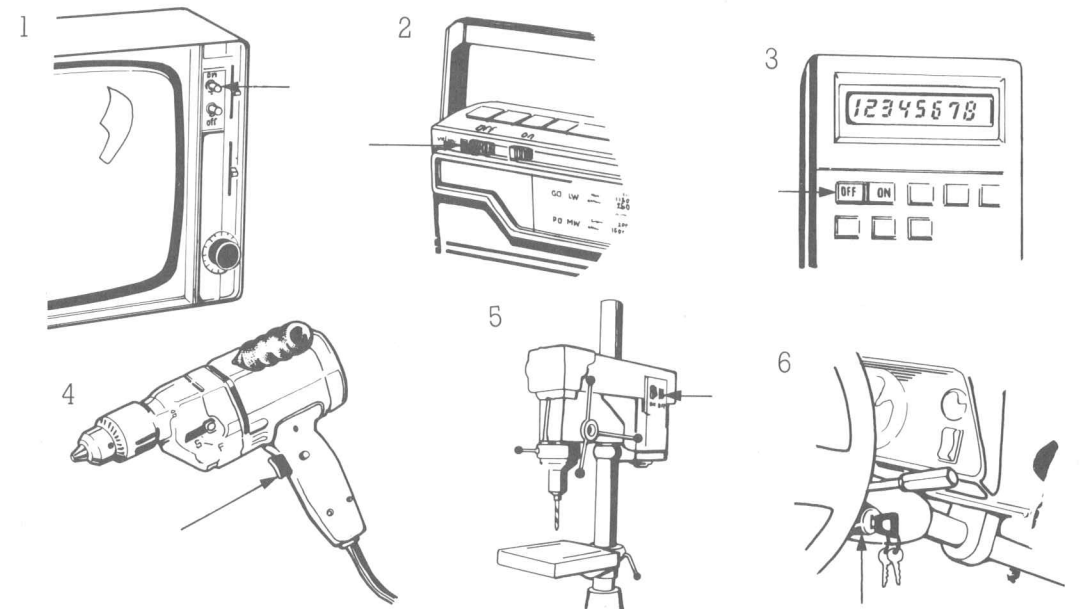
- 1 What is a hacksaw used for?
- 2 What does a tenon saw do?
- 3 What is a rip saw used for?
- 4 What is a spring balance used for?
- 5 What does a weighbridge do?
- 6 What does a hand drill do?
- 7 What is a pencil sharpener used for?
- 8 What does a knife sharpener do?

Practice 12

Look at this example:

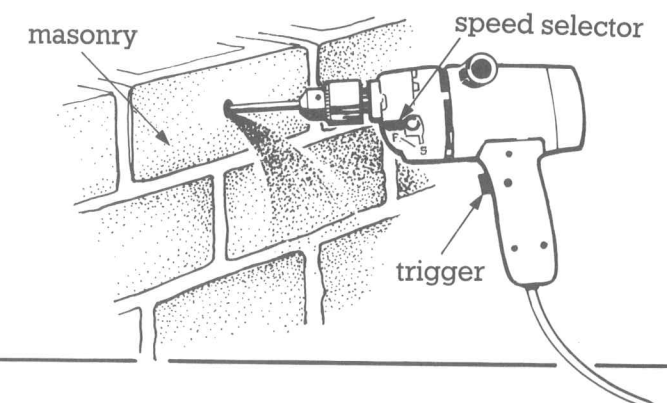


Now describe these things in the same way:



Practice 13

Look at this electric drill:



Now complete the paragraphs below using these words:

in	is	on
to	slow	trigger
drills	drilling	holds
holds	is	supplies
for	speed	

- This drill has two speeds. The turns the motor and off. The speed selector selects the The fast speed used for metal. The speed used drilling wood and masonry.
- A power cable electricity to the motor. The chuck the bits. The chuck bits from 1.5 mm to 15 mm. That is, the drill holes from 1.5 mm 15 mm diameter.

Revision Exercises

Revision Practice 1

Answer these questions:

- What is a balance used for?
- What are parcel scales used for?
- What are external calipers used for?
- What is a thermometer used for?
- What are hacksaws used for?
- What is a circular saw used for?
- What are tenon saws used for?
- What is an electric drill used for?

Revision Practice 2

Write these numbers in words:

- | | |
|---------|-----------|
| 1 11.22 | 5 25.25 |
| 2 5.001 | 6 0.909 |
| 3 104 | 7 3.333 |
| 4 0.75 | 8 19.0675 |

Revision Practice 3

Now read out these measurements:

- | | |
|-----------|------------|
| 1 12.5 cm | 5 2.25 gm |
| 2 0.65 mm | 6 32.5°C |
| 3 25 km | 7 16.29 kg |
| 4 35 kph | 8 35.035 m |

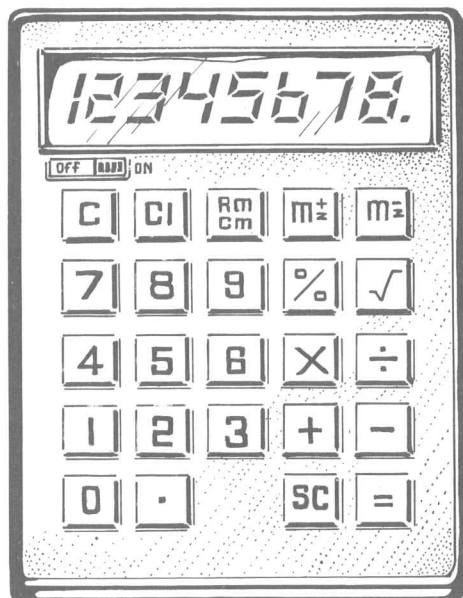
Word List

a bit	metal
a blender	wood
a bowl	blunt
a chainsaw	electric
a chuck	fast
a circular saw	high (speed)
a control box	rotary
an electric drill	sharp
a fan	slow
a frame	(75 mm) thick
a gear	in (an aeroplane)
a gearbox	in (diameter)
a grinding wheel	off
a grindstone	on
a hacksaw	bend
a hand drill	cut
a hand tool	drill
a hole	drive
a knife sharpener	hold
a motor	sharpen
a pencil sharpener	supply
a power cable	turn off
a power cord	turn on
a rip saw	... do not ...
a speed selector	... does not ...
a switch	Do ...?
a tenon saw	Does ...?
a tool	that is (i.e.)
a trigger	
electricity	
masonry	

Unit 7

Electrical and Electronic Devices

Study Section 7.1



This is an electronic calculator. It has a display, an on/off switch and twenty-four keys. Other calculators have thirty-two or thirty-eight keys.

This calculator has eight digits in the display. Other calculators have ten or twelve digits in the display.

The digits in this display are liquid crystal. A liquid crystal display (or LCD) is black. Other calculators do not have liquid crystal displays. They have light emitting diode (or LED) displays. LED displays are not black. They are red or green.

To add 2.62 and 3.91

- 1 First, switch the calculator on.
- 2 Next, press the keys ② ① ⑥ and ②.
- 3 Check the number in the display.
- 4 Press the addition (+) key.
- 5 Press the keys ③ ① ⑨ and ①.
- 6 Check this number in the display.
- 7 Press the equals (=) key.
- 8 Read the answer (6.53) in the display.
- 9 Switch the calculator off.

Practice 1

Are these instructions correct? If they are wrong, correct them.

To add 6.24 and 11.03:

- 1 Switch the calculator off.
- 2 Press the keys ⑥ ① ② and ④.
- 3 Check this number in the display.
- 4 Press the equals (=) key.
- 5 Press the keys ① ① ③.
- 6 Check this number in the display.
- 7 Press the addition (+) key.
- 8 Read the answer (17.72) in the display.
- 9 Switch the calculator off.

Study Section 7.2

\oplus	\ominus	\otimes	\div	$=$
addition	subtraction	multiplication	division	equals

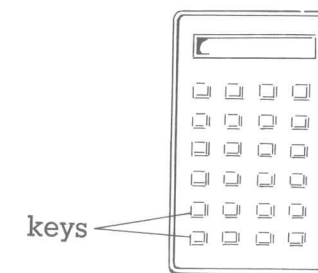
Practice 2

Write instructions for these calculations:

- 1 $9.68 + 7.41$
- 2 $3.24 - 1.304$
- 3 32×12.5
- 4 $27 \div 1.5$

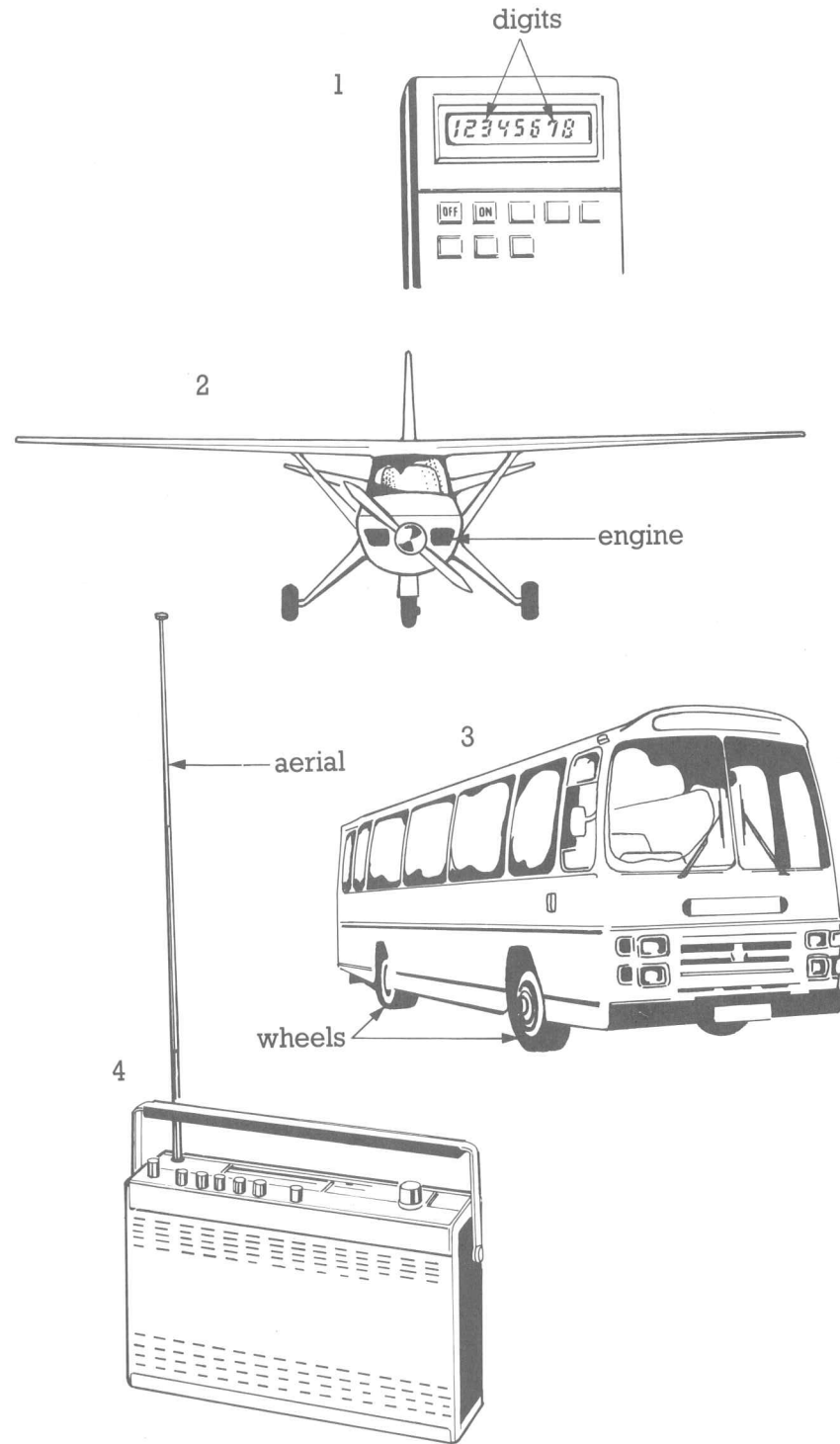
Practice 3

Look at this example:



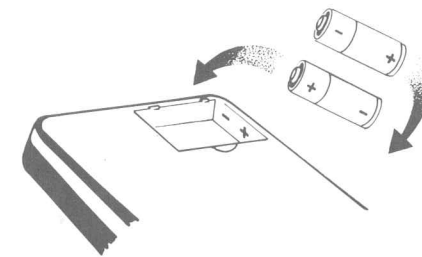
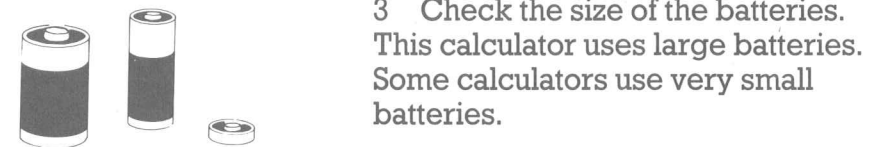
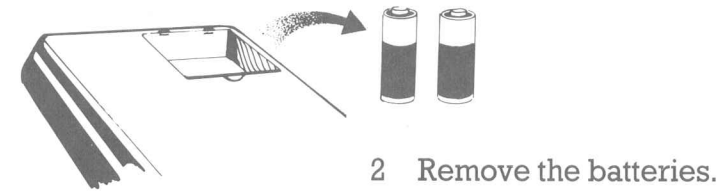
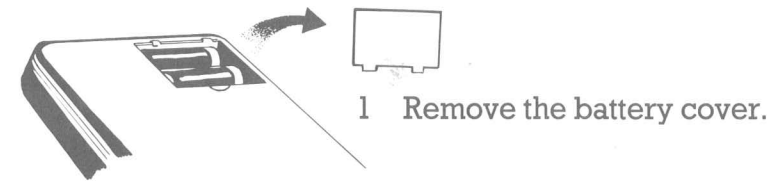
This calculator has twenty-four keys. Other calculators have thirty-two or thirty-eight keys.

Now write about these pictures in the same way:

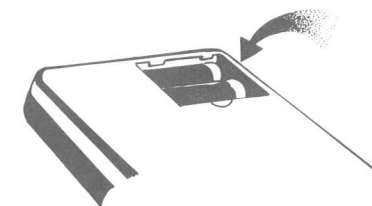


Study Section 7.3

To change the batteries in a calculator:



4 Check the polarity of the batteries.



5 Insert the new batteries.



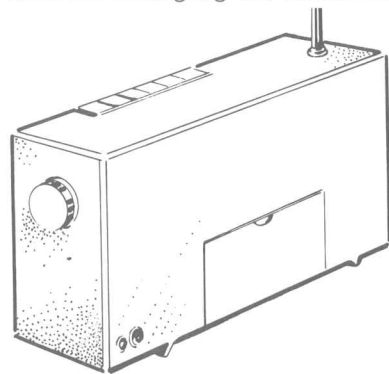
6 Replace the battery cover.



7 Test the calculator.

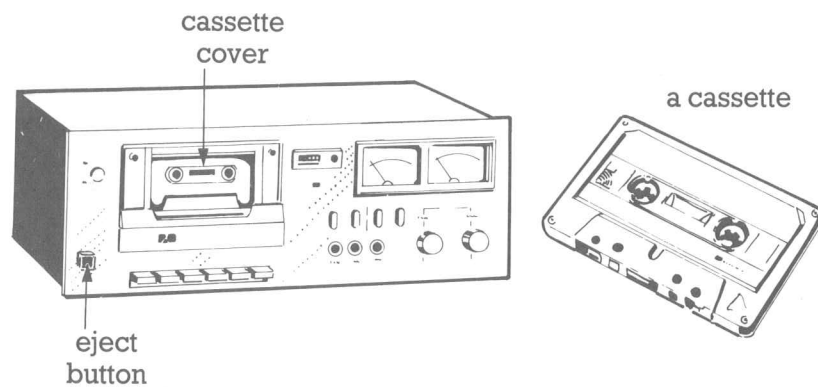
Practice 4

1 Write instructions for changing the batteries in this radio:

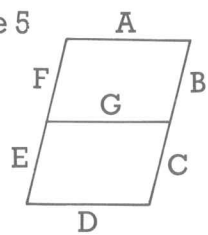


2 Now write instructions for changing the cassette in this (cassette) tape recorder:

a (cassette) tape recorder



Practice 5



This is a digit from an LED display in a calculator. It has seven segments. The segments are labelled A, B, C, D, E, F and G.

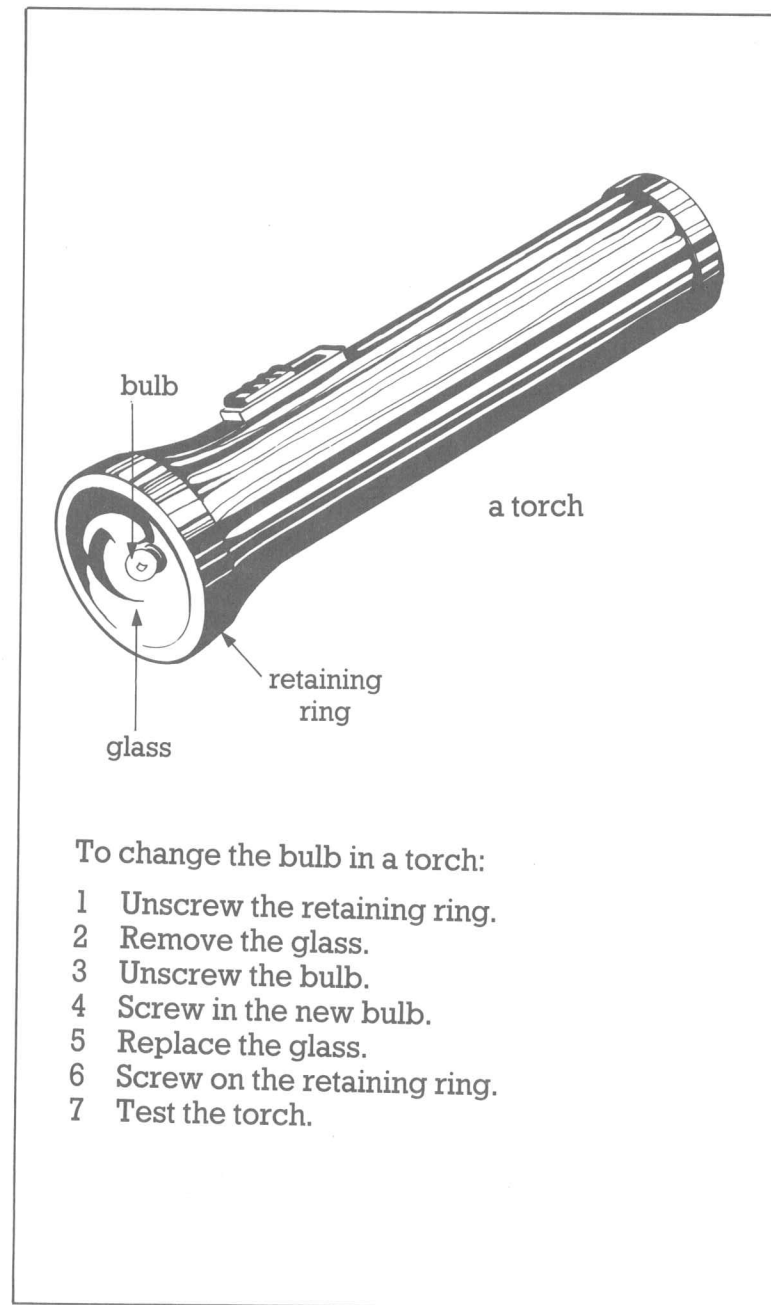
The number **8** uses seven segments. The number **3** uses five segments. It uses segments A, B, C, D and G.

Now answer these questions:

- 1 Which segments does the number **7** use?
- 2 Which segments does the number **9** use?
- 3 Which segments does the number **2** use?
- 4 Which segments does the number **5** use?
- 5 Which segments does the number **4** use?

- 6 Does the number **1** use segment A?
- 7 Does the number **6** use segment G?
- 8 Does the number **0** use segment G?
- 9 Does the number **3** use segment G?
- 10 Does the number **7** use segment F?

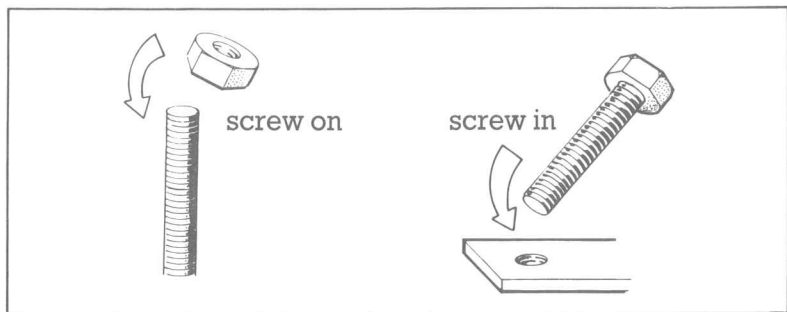
Study Section 7.4



To change the bulb in a torch:

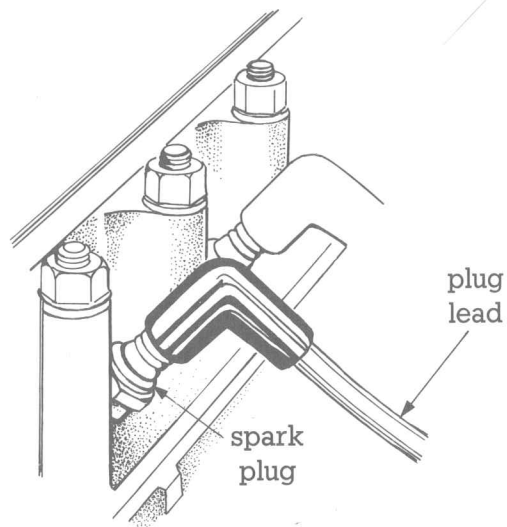
- 1 Unscrew the retaining ring.
- 2 Remove the glass.
- 3 Unscrew the bulb.
- 4 Screw in the new bulb.
- 5 Replace the glass.
- 6 Screw on the retaining ring.
- 7 Test the torch.

Language Point



Practice 6

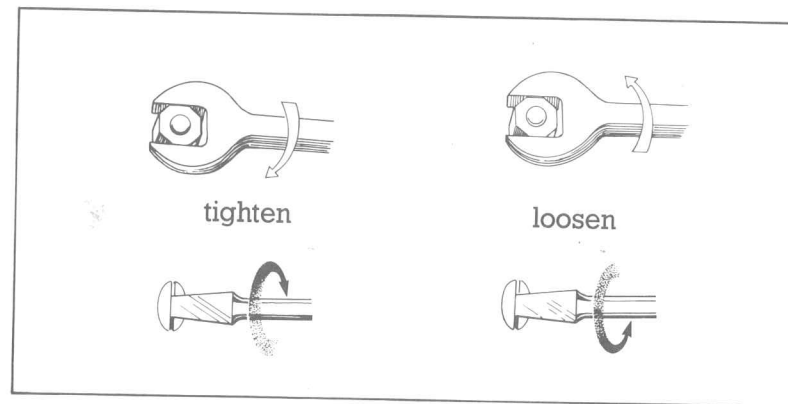
Complete these instructions:



To change a spark plug in an engine:

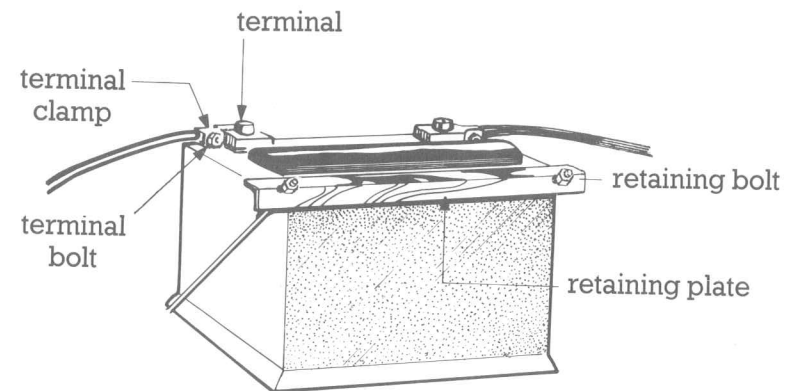
- 1 Remove the plug lead.
- 2 the spark plug.
- 3 the new
- 4 the plug lead.
- 5

Language Point



Practice 7

Now complete these instructions:



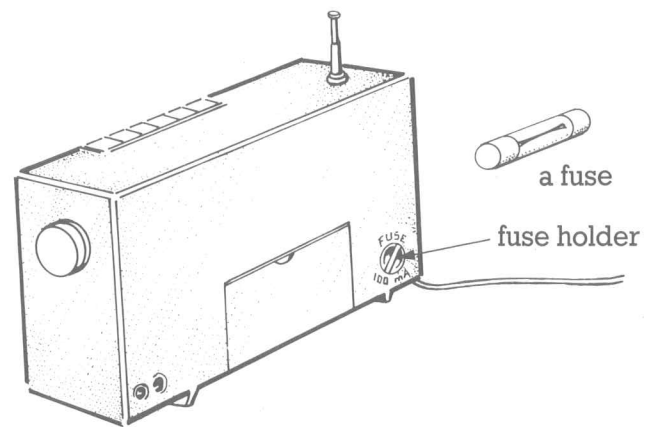
To change the battery in a car:

- 1 the retaining bolts.
- 2 the retaining plate.
- 3 the terminal bolts.
- 4 the terminal clamps.
- 5 the battery.
- 6 Put in
- 7 the polarity of the terminals.
- 8 Replace
- 9 Tighten
- 10 the retaining plate.
- 11

Practice 8

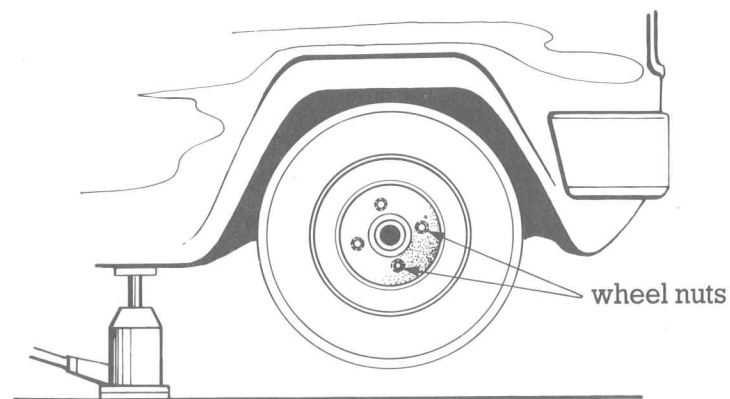
- 1 Write six instructions for changing the fuse in this radio. Use these words:

unscrew put in
remove screw in
remove test

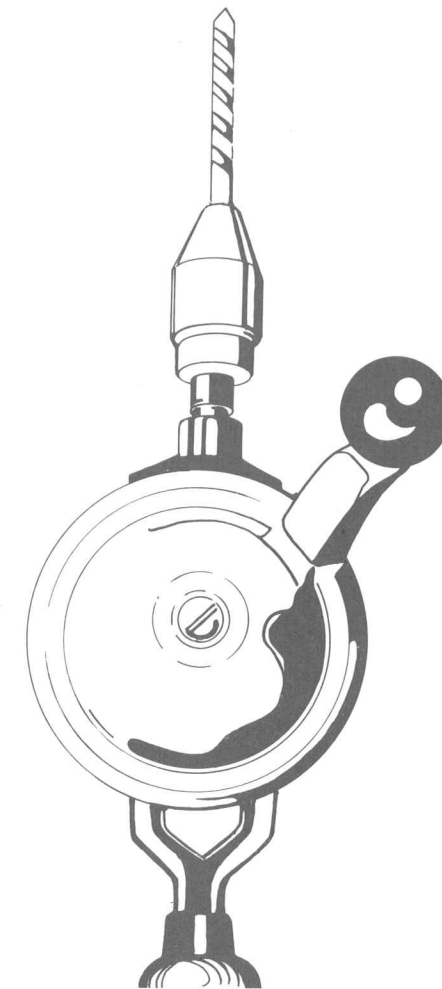


- 2 Now write instructions for changing the wheel on this car. Use these words:

unscrew replace
remove tighten
put on



- 3 Now write four instructions for changing the bit in this hand drill:



Practice 9

Follow these instructions:

- 1 Multiply seven by eleven.
- 2 Divide twelve by four.
- 3 Subtract nine from twenty-seven.
- 4 Add six, twelve and three.
- 5 Add two, nine and three and then divide by seven.
- 6 Multiply six by four and then subtract seventeen.
- 7 Divide forty-eight by six and then add ten.
- 8 Multiply six by five, add eight, divide by two, add one and then divide by ten.

Study Section 7.5

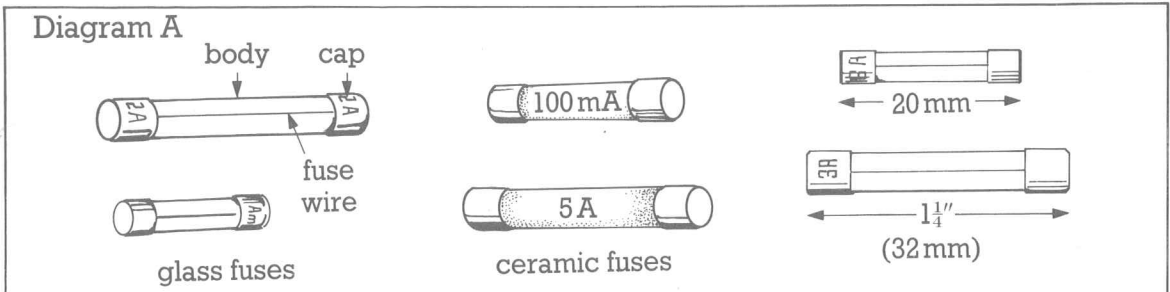


Diagram A shows some fuses. They are cartridge fuses. Some cartridge fuses are glass and some are ceramic.

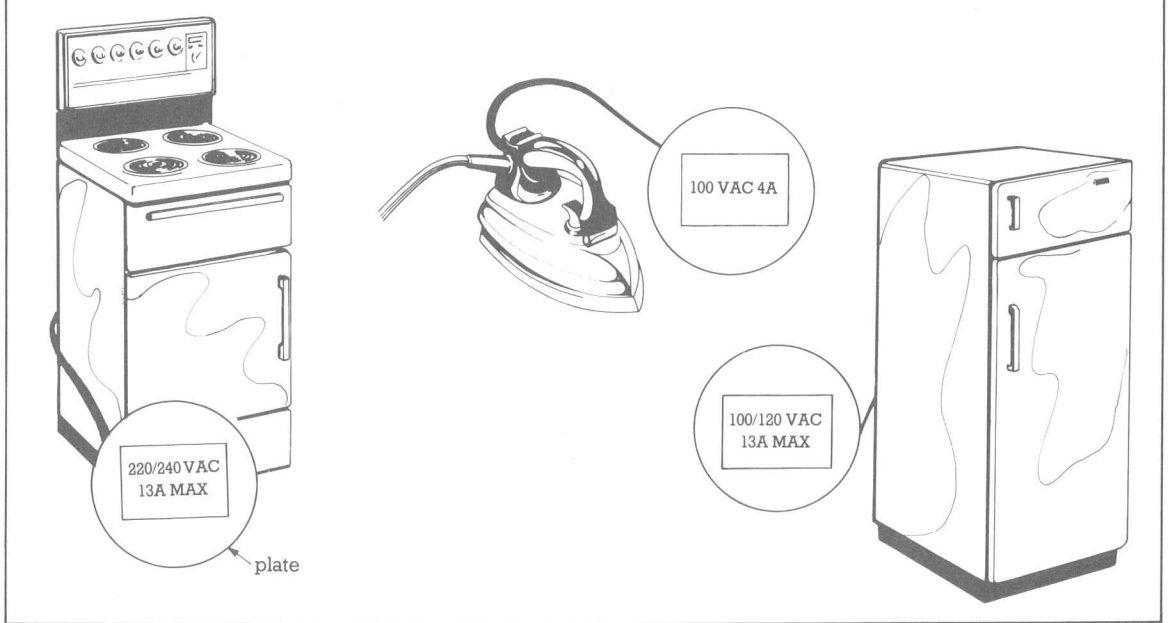
Some cartridge fuses are 20 mm long and some are 1 1/4 inches (about 32 mm) long.

Fuses have different ratings (that is, they have different fuse wire in them). Glass fuses usually have the rating on the cap (for example, 1 A, 5 A, 100 mA). Ceramic fuses have the rating on the body.

Electrical devices usually have a plate on the back or on the bottom. This plate shows the rating of the device.

To change a fuse on an electrical device, first check the rating of the device. Always use the correct fuse. Do not use a different fuse. Always replace a 20 mm fuse with a 20 mm fuse. Do not replace a 32 mm fuse with a 20 mm fuse.

Diagram B



Practice 10

Are these statements and instructions correct? If they are wrong, correct them.

- 1 Cartridge fuses are always made of glass.
- 2 Glass fuses have the rating on the body.
- 3 Ceramic fuses have the rating on a plate.
- 4 Some cartridge fuses are 1 1/4 mm long.
- 5 Some electrical devices have a plate on the bottom.
- 6 To change the fuse on an electrical device, first check the rating of the device.
- 7 Always replace a 20 mm fuse with a 20 mm fuse.
- 8 Do not replace a 1 A fuse with a 5 A fuse.

Practice 11

Look at this sentence:

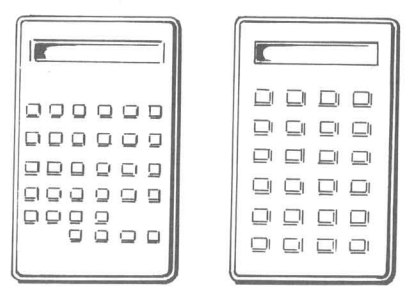
To change the fuse on an electrical device, first check the rating of the device.

Now complete these sentences:

- 1 To change the batteries in a calculator, first
- 2 first press the eject button.
- 3 unscrew the retaining ring.
- 4 the retaining bolts.
- 5 To change the wheel on a car,
- 6 To change the bit in a hand drill,
- 7 the plug lead.

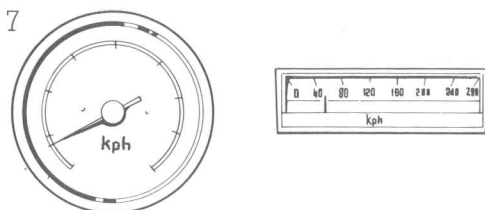
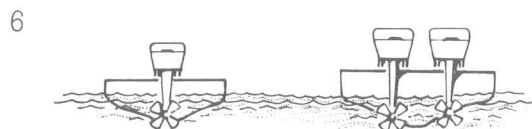
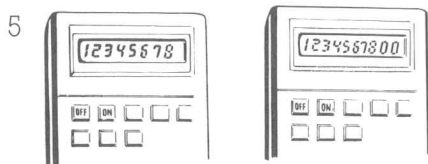
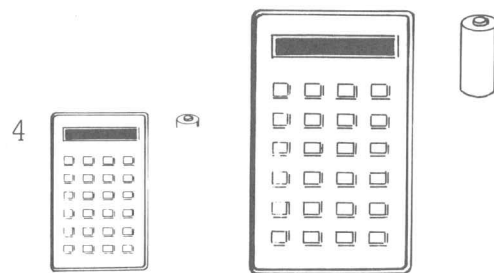
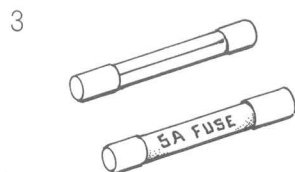
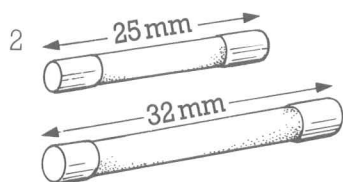
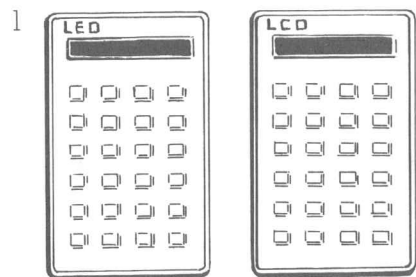
Practice 12

Look at this example:



Some calculators have twenty-four keys. Other calculators have thirty-two keys.

Now write about these pictures in the same way:



Use these tables for Practices 13, 14 and 15.

Table A shows the ratings of cartridge fuses.
Table B shows the approximate ratings of some electrical devices.

100mA	250mA	500mA	1A	1.5A	2A	3A	5A	10A	15A
-------	-------	-------	----	------	----	----	----	-----	-----

iron	4 A
toaster	3.8 A
refrigerator	2.6 A
electric drill	1.3 A
television	2.2 A
radio	60 mA
cooker	12 A

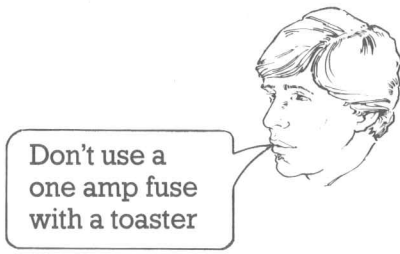
Practice 13

Are these instructions correct? If they are wrong, correct them.

- Use a 5 A fuse with an iron.
- Use a 5 A fuse with a television.
- Do not use a 1 A fuse with a toaster.
- Do not use a 3 A fuse with a refrigerator.
- Use a 1 A fuse with a radio.
- Do not use a 2 A fuse with an electric drill.
- Do not use a 3 A fuse with a television.
- Use a 15 A fuse with a cooker.

Language Point

Do not use a 1 A fuse with a toaster.



Practice 14

Look at these two examples:

- Drill – 2 A fuse** Use a 2 A with a drill.
Cooker – 2 A fuse Do not use a 2 A use with a cooker.
 Use a 15 A fuse with a cooker.

Now make more instructions in the same way:

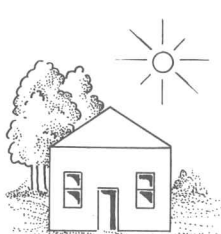
- 1 Iron – 5 A fuse
- 2 Toaster – 5 A fuse
- 3 Radio – 5 A fuse
- 4 Television – 2 A fuse
- 5 Refrigerator – 10 A fuse
- 6 Drill – 3 A fuse
- 7 Cooker – 15 A fuse
- 8 Iron – 15 A fuse

Practice 15

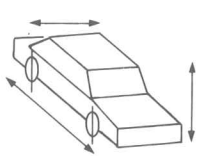
Make twelve sentences from this table:

(Do not)	use a	100mA	fuse with a(n)	cooker.
		1.5 A		iron.
		3 A		radio.
		5 A		toaster.
		10 A		television.
		15 A		refrigerator.
				electric drill.

Language Point



a drawing



a diagram

electrical devices
toaster 3.8 A
drill 1.3 A
cooker 12 A
television 2.2 A
radio 60 mA

a table

Revision Exercises

Revision Practice 1

Answer these questions:

- 1 What are weighbridges used for?
- 2 What do hand drills do?
- 3 What is a rip saw used for?
- 4 What does a tenon saw do?
- 5 What are pencil sharpeners used for?
- 6 What is a grindstone used for?
- 7 What do circular saws do?
- 8 What is a speedometer used for?
- 9 What do thermometers do?
- 10 What are vernier calipers used for?

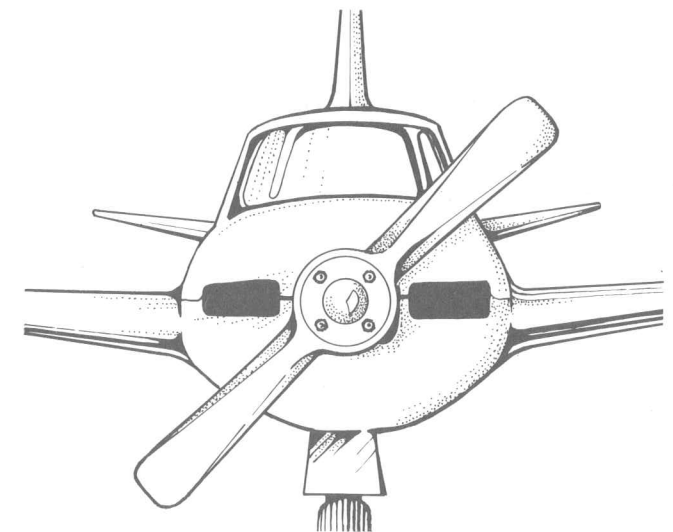
Revision Practice 2

Put in the capital letters, commas and full stops:

to change a fuse on an electrical device first check the rating of the device cookers for example use 15 A fuses but televisions use 3 A fuses always use the correct fuse do not use a different fuse do not replace a 5 A fuse with a 15 A fuse or a 100 mA fuse with a 1 A fuse always check the rating of a fuse glass fuses usually have the rating on the cap ceramic fuses have the rating on the body

Revision Practice 3

Write instructions for changing the propeller on this aeroplane:



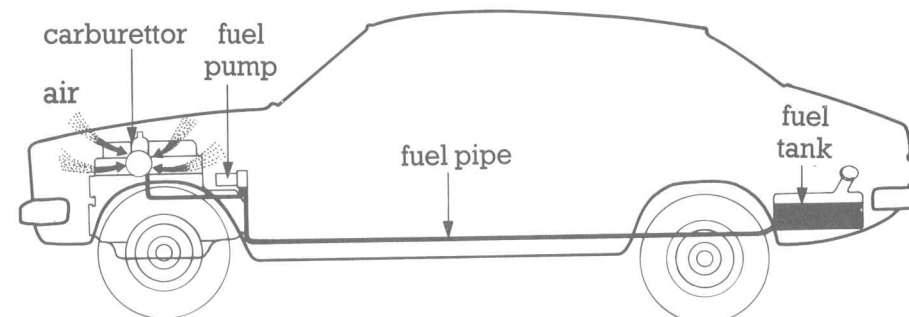
Word List

an amp(ere) (A)	a size	on the bottom
an answer	a spark plug	add (. . . and . . .)
a battery (electric)	a table	change
a bolt	a tape recorder	check
a bulb	a terminal	divide (. . . by . . .)
a button	a toaster	eject
a cap	a torch	equal (. . . equals =)
a cartridge fuse	glass	insert
a cassette	polarity	label
a clamp	wire	loosen
a cooker	calculation	multiply (. . . by . . .)
a cover	addition	press
a device	subtraction	put in
a diagram	multiplication	put on
a digit	division	read
a drawing	approximate	remove
an eject button	black	replace (. . . with . . .)
a fuse	ceramic	screw in
a fuse holder	correct	screw on
an inch (1 in. or 1")	different	show
an iron	electrical	subtract (. . . from . . .)
a key	electronic	switch off
a light emitting diode display (LED)	equal	switch on
a liquid crystal display (LCD)	green	test
a milliampere (mA)	more	tighten
a nut	new	unscrew
an on/off switch	old	use
a plate	other	Do not . . .
a plug lead	red	. . . is/are made of . . .
a rating	some	first
a refrigerator	always	for example (e.g.)
a retaining bolt	usually	next
a retaining plate	next	and then
a retaining ring	on the back	but
a segment		or

Unit 8

Engines

Study Section 8.1



An engine produces power by burning air and fuel. The fuel is stored in a fuel tank. (This is usually at the back of the car.) The fuel tank is connected to a fuel pipe. The fuel pipe carries the fuel to a fuel pump. The fuel pump is connected to the carburettor. The fuel pump pumps the fuel into the carburettor. In the carburettor the fuel is mixed with air. The fuel and air are drawn into the engine. In the engine the fuel and air are burned to produce power.

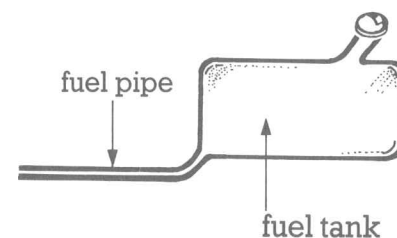
Practice 1

Are these statements true or false?

- 1 An engine produces fuel by burning air and power.
- 2 The fuel tank is usually at the back of a car.
- 3 Fuel is stored in a fuel tank.
- 4 The fuel pump pumps fuel to the fuel tank.
- 5 The carburettor is connected to the fuel pump.
- 6 The carburettor mixes fuel and air.

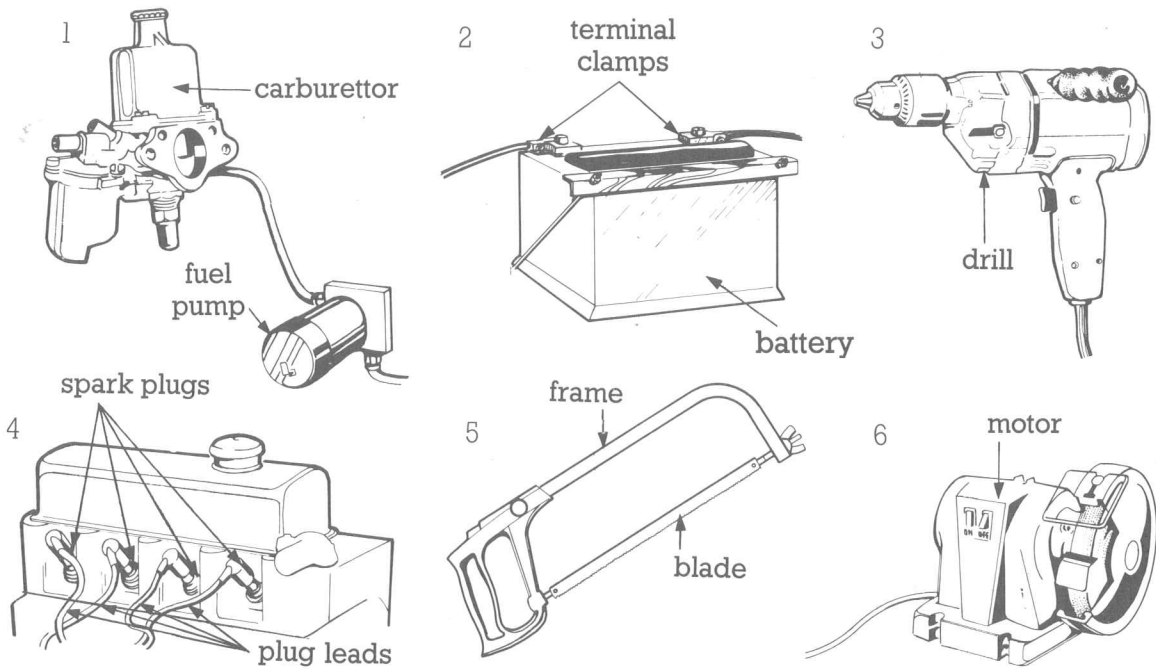
Practice 2

Look at this example:



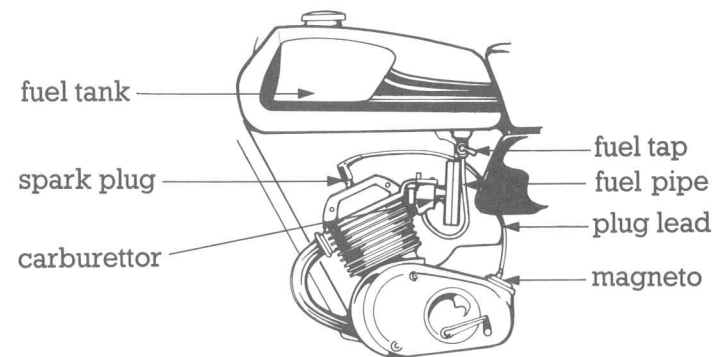
The fuel tank is connected to a fuel pipe.

Now describe these pictures in the same way:



Practice 3

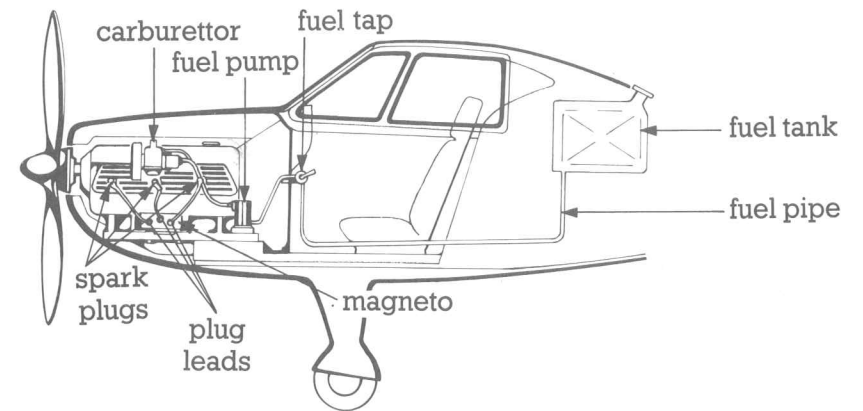
1 Look at this diagram of a motorcycle engine:



Now complete this description:

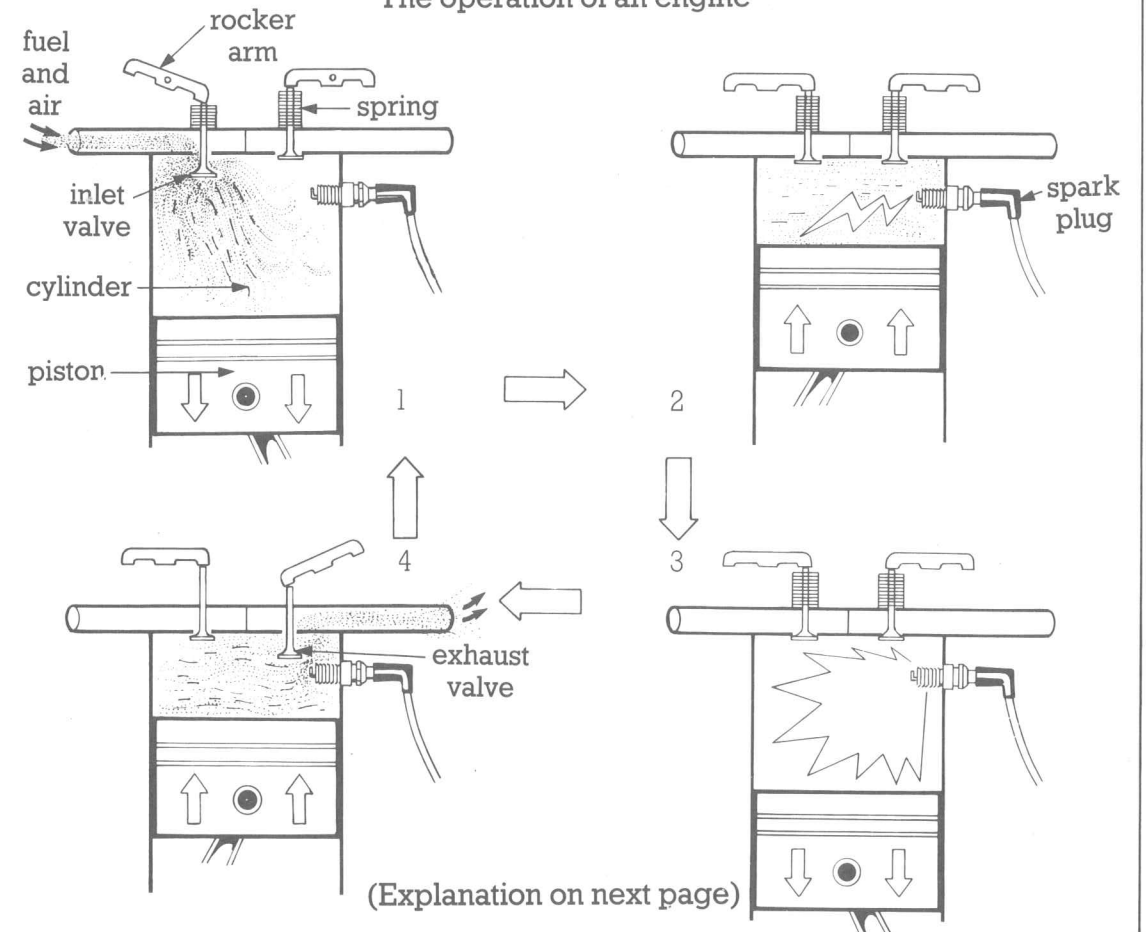
The above shows a motorcycle engine. Fuel is in the fuel tank. A fuel pipe is to the fuel tank. The fuel pipe the fuel to the fuel tap. The fuel tap turns the fuel on off. The fuel tap is to the carburettor. In the carburettor, the fuel is with The fuel and air drawn into the engine. In the engine they to produce power. There is a spark plug in the engine. The spark plug to a plug lead. The plug lead to the magneto.

2 Describe this aeroplane engine in the same way:



Study Section 8.2

The operation of an engine



(Study Section 8.2 continued)


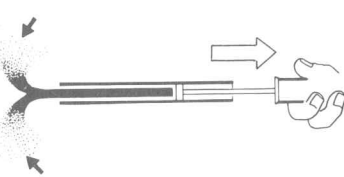


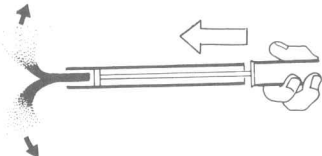
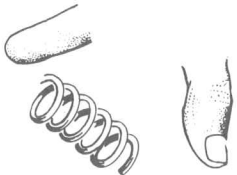
An engine produces power by burning fuel and air. The fuel and air are mixed in the carburettor. The inlet valve is opened by a rocker arm. The fuel and air are drawn into the cylinder by the piston (Diagram 1). Then they are compressed by the piston. The inlet valve is closed by a spring. The fuel and air are then ignited by the spark plug (Diagram 2). They burn and expand very quickly and push the piston down (Diagram 3). The exhaust valve is now opened by a rocker arm. The burned fuel and air are expelled from the cylinder by the piston (Diagram 4).

Practice 4

Make seven sentences from this table:

The	piston fuel and air exhaust valve inlet valve	is are	pushed down ignited closed opened compressed	by	the piston. a rocker arm. a spring. the spark plug. the fuel and air.
-----	--------------------------------------------------------	-----------	----------------------------------------------------------	----	-----------------------------------------------------------------------------------

Language Point

OPEN 	DRAW IN 	COMPRESS 
CLOSE 	EXPEL 	EXPAND 

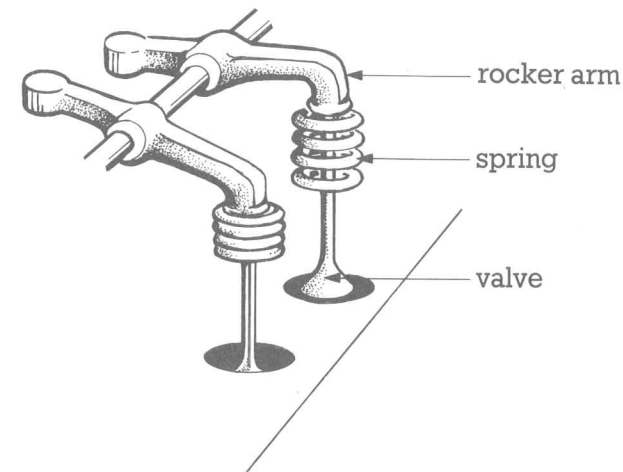
Practice 5

Are these statements true or false? If they are false, make true statements.

- 1 Fuel and air are drawn into the piston by the cylinder.
- 2 The inlet valve is opened by a spring.
- 3 The fuel and air are compressed by the piston.
- 4 The spark plug ignites the fuel and air.
- 5 The cylinder burns and expands very quickly.
- 6 The rocker arm is opened by an exhaust valve.
- 7 The piston expels the burned fuel and air from the cylinder.
- 8 An engine produces power by burning pistons.

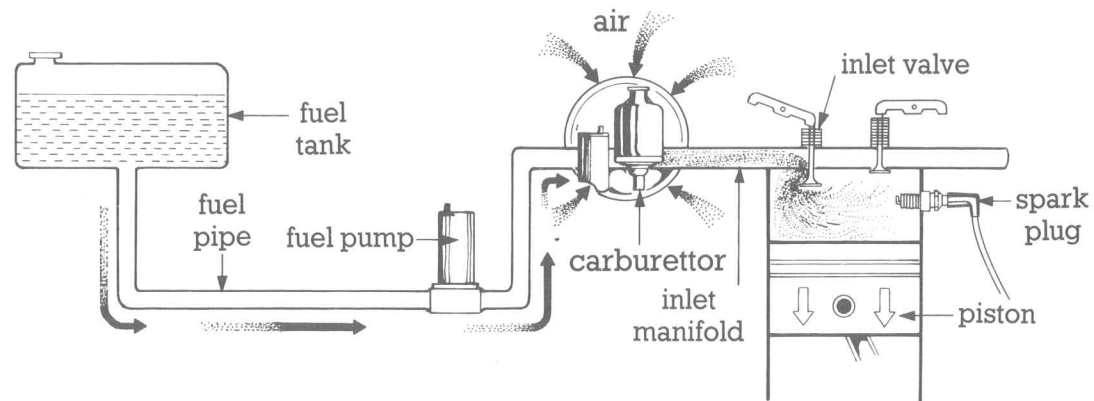
Practice 6

- 1 Look at this diagram of a valve and rocker arm and then complete the paragraph below:



The diagram above shows a valve a rocker arm. The valve is opened by the rocker arm and it is by a To open the valve, the rocker arm the valve down and compresses the The spring to close the valve. In an engine there are usually valves in a cylinder – the inlet valve and the exhaust valve. An engine with four cylinders usually has valves.

2 Now look at this diagram of an engine and complete the paragraph below it:



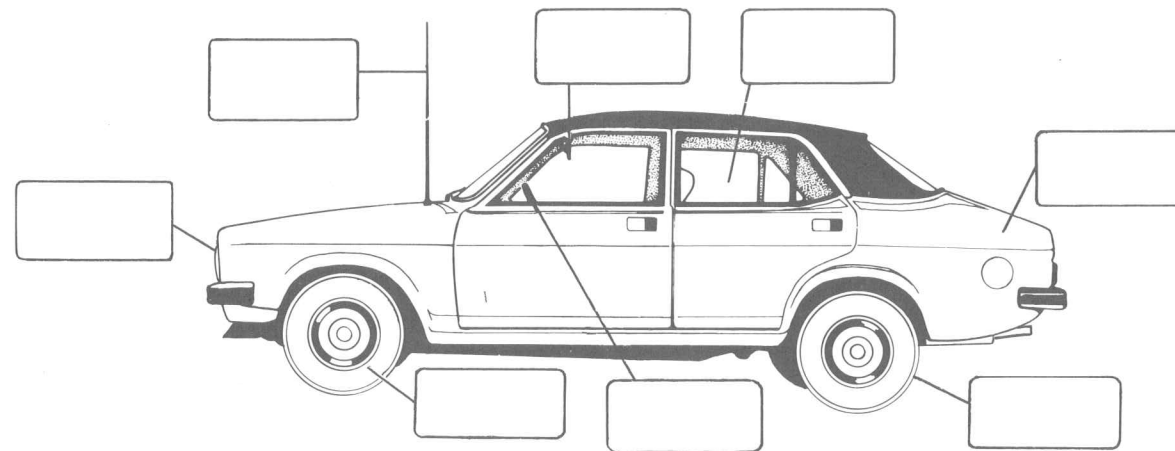
The fuel in the fuel tank. A fuel pipe the fuel to the fuel pump. The fuel pump is the carburettor. It the fuel into the carburettor. In the carburettor the fuel with air. The inlet manifold carries the fuel and air to the inlet valve. The fuel and air into the cylinder by the piston. The inlet valve by a rocker arm and it by a spring. The fuel and air are compressed Then they by the spark plug. They very quickly and the piston down.

is painted. The steering wheel is made of plastic. The mirrors are made of plastic and glass. This car has two mirrors. The rear-view mirror is fixed to the roof. The wing mirror is fixed to the door.

The engine is made of different metals. The pistons are made of aluminium and the valves are made of steel. The springs are also made of steel.

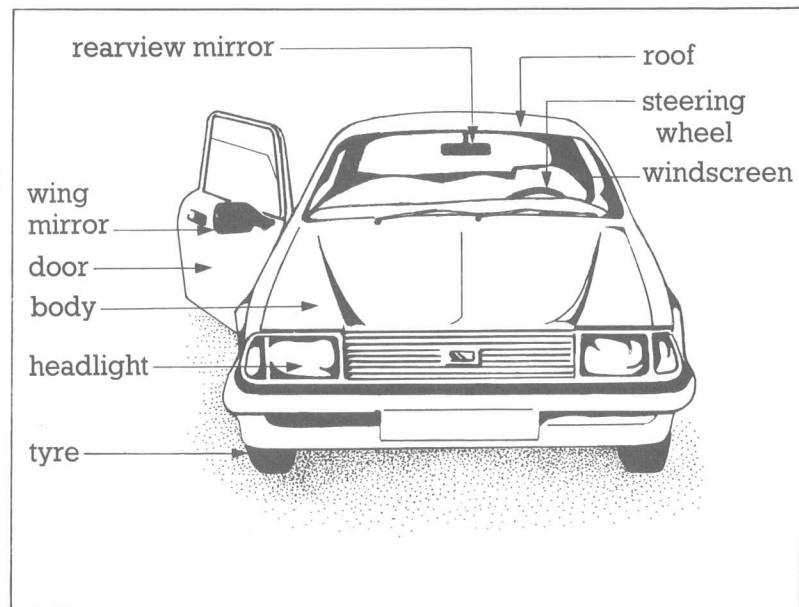
Practice 7

What is a car made of? Write the names of the materials in this picture:

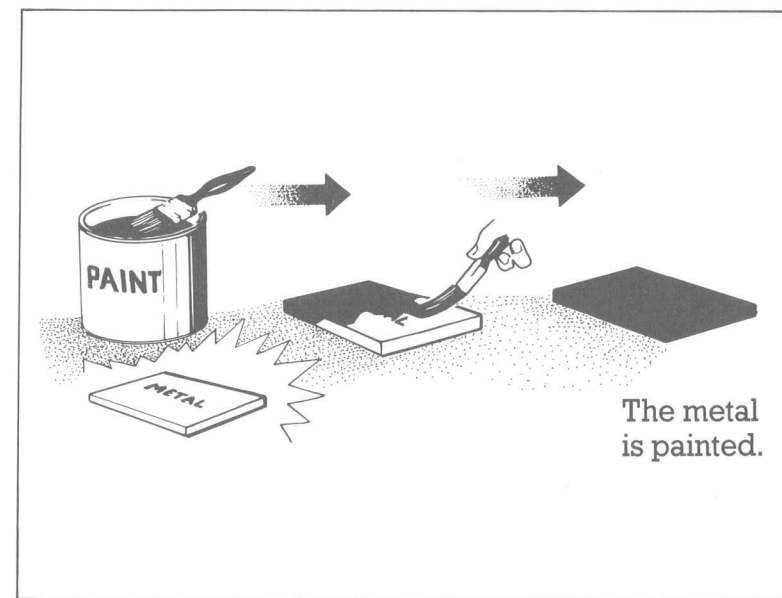


Study Section 8.3

A car is made of different materials. The windscreen, for example, is made of glass. The headlights are also made of glass. The tyres are made of rubber. They are filled with air. The air in the tyres is compressed (to approximately 1.5 gm/cm³). The body is made of metal. The metal

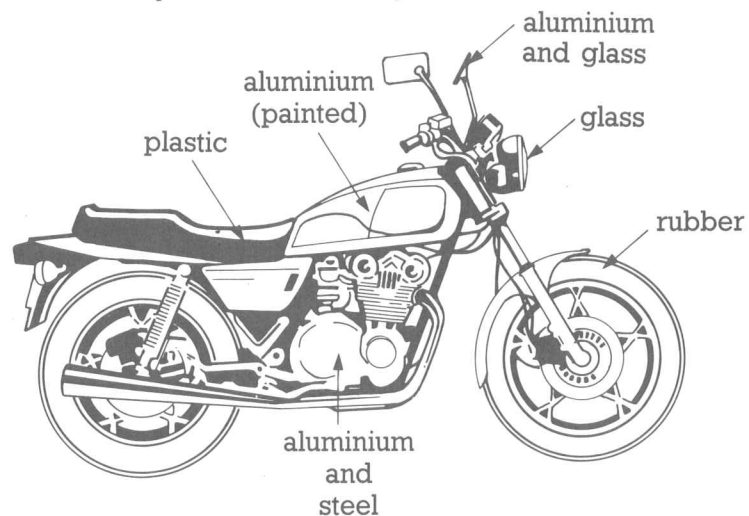


Language Point



Practice 8

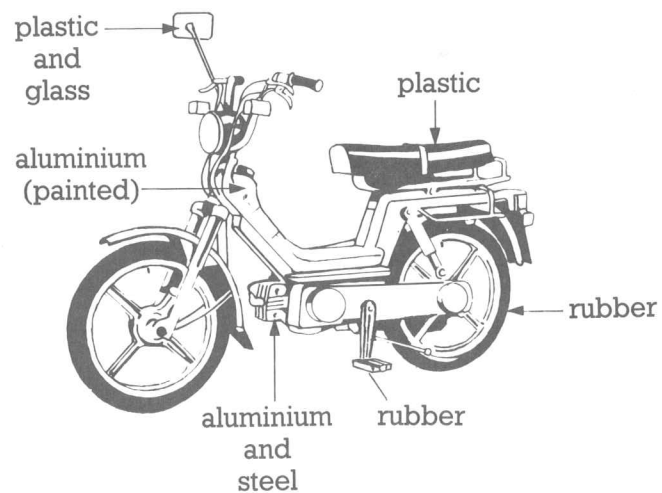
1 Look at this picture of a motorcycle:



Now complete this paragraph:

A motorcycle is made of different The headlight, for example,
 The tyres They air. The fuel tank The metal
 The saddle The engine
 steel.
 aluminium and glass. It is to the handlebars.

2 Now describe this moped in the same way:



Practice 9

Make eight sentences from this table:

A chuck	is are	made of	metal. plastic. glass. rubber.
A protractor			
Hacksaws			
A lens			
Erasers			
Tyres			
Calipers			
Windscreens			

Now make six sentences from this table:

Screwdrivers	is are	made of	metal plastic glass wood rubber	and	metal. plastic. glass. wood. rubber.
Pens					
A hand drill					
Electric drills					
A telephone					
Hammers					

Language Point

1.5g/cm³



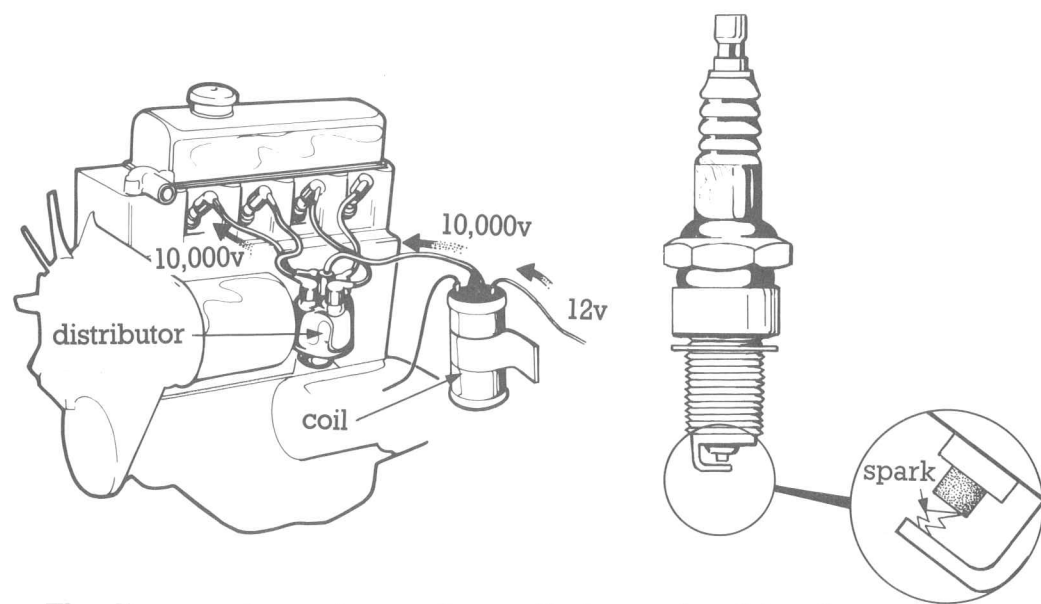
One point five grams per cubic centimetre.

Practice 10

Write these measurements in words:

- | | |
|----------|-------------------------|
| 1 6.5g | 7 4cm ² |
| 2 15.6kg | 8 3.6cm ³ |
| 3 2.6V | 9 5.05g/cm ³ |
| 4 13A | 10 1.8m ² |
| 5 25.5°C | 11 0.3kg/m ³ |
| 6 100m | 12 55kph |

Study Section 8.4



The diagram above shows a four-cylinder engine. It has four spark plugs. The spark plugs ignite the fuel and air in the cylinders. They ignite the fuel and air by making a spark inside the cylinder.

The spark plugs are connected to four plug leads. The plug leads are connected to the distributor. In the distributor, electricity is passed to the plug leads.

The lights and electrical devices in a car use a voltage of 12V. This voltage is not used for the spark plugs. A voltage of about 10,000V is used for the spark plugs. The voltage is increased from 12V to 10,000V by the coil.

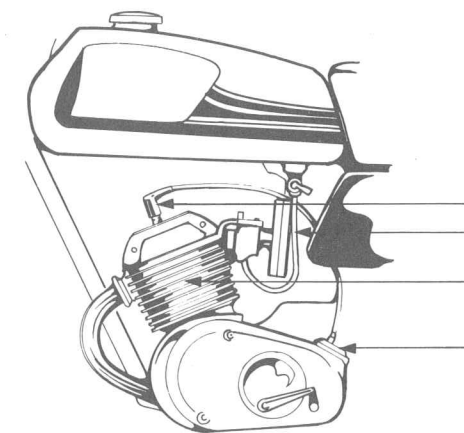
Practice 11

Are these statements true or false? If they are false then write true statements.

- 1 The spark plugs are ignited by the fuel and air in the cylinders.
- 2 A four-cylinder engine has four spark plugs.
- 3 Spark plugs make a spark.
- 4 A spark plug is connected to four plug leads.
- 5 The distributor is connected to the coil.
- 6 In the distributor, the voltage is increased from 10,000V to 12V.
- 7 Car headlights use a voltage of 12V.
- 8 A spark plug uses a voltage of 10,000V.

Practice 12

Look at this diagram of a motorcycle engine:

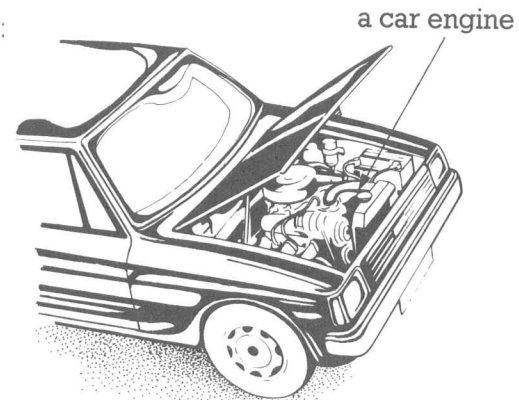
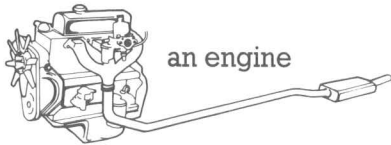
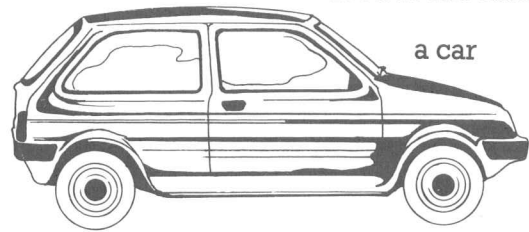


Now complete this description and label the diagram:

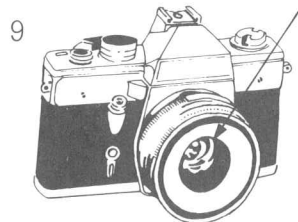
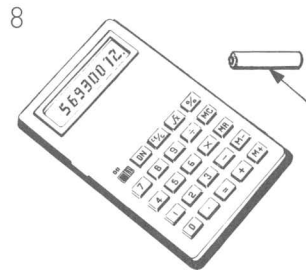
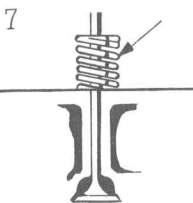
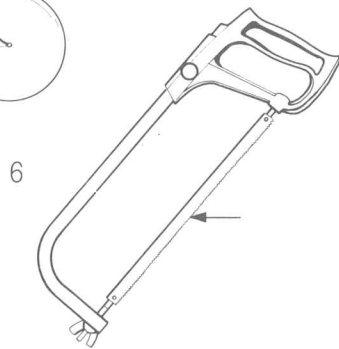
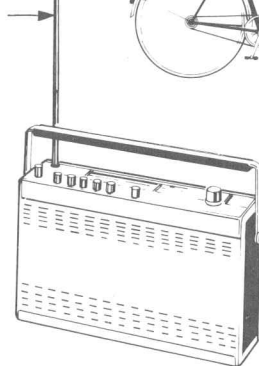
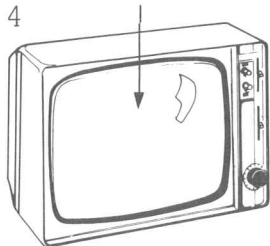
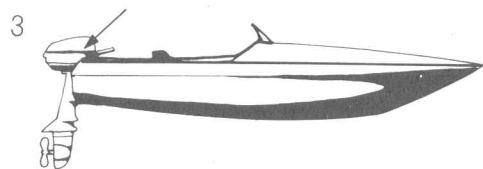
This motorcycle engine does have four cylinders. It one cylinder. It
 four spark plugs. one spark plug. The spark plug a plug lead. The plug lead to a distributor. It to a magneto.
 The lights in a motorcycle do not use a of 12V. They use a voltage of 6V. The spark plug
 a voltage of 6V. It
 8,000V. The voltage 6V to 8,000V by the magneto.

Practice 13

Look at this example:



Now name these objects:



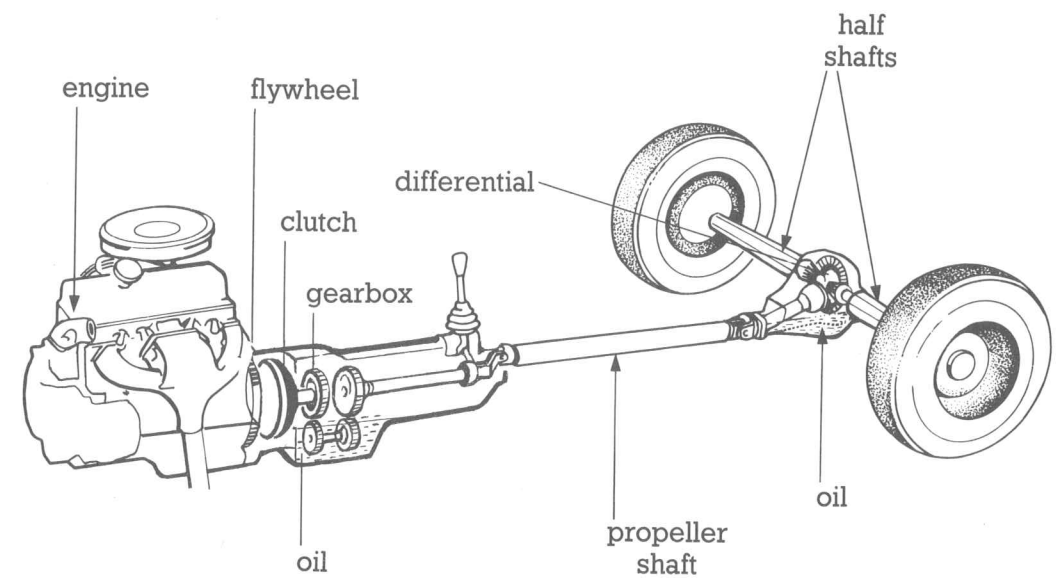
Practice 14

Make as many objects as possible from this table:

A	car	seat
	boat	wheel
	tractor	engine
	television	switch
	screwdriver	aerial
	hacksaw	screen
	aeroplane	blade
	radio	handle
	helicopter	propeller
	knife	

Practice 15

Look at this diagram of the mechanical parts of a car:



1 Complete this description of the mechanical parts of a car.

Use these words:

- turn
- turn
- turns
- turns
- filled
- filled
- connected
- decrease
- propeller shaft
- gears
- oil

The power from the engine turns the flywheel. The flywheel then the clutch. The clutch is to the gearbox. The clutch the gears in the gearbox. The gearbox is with oil. The gears the speed of the engine.

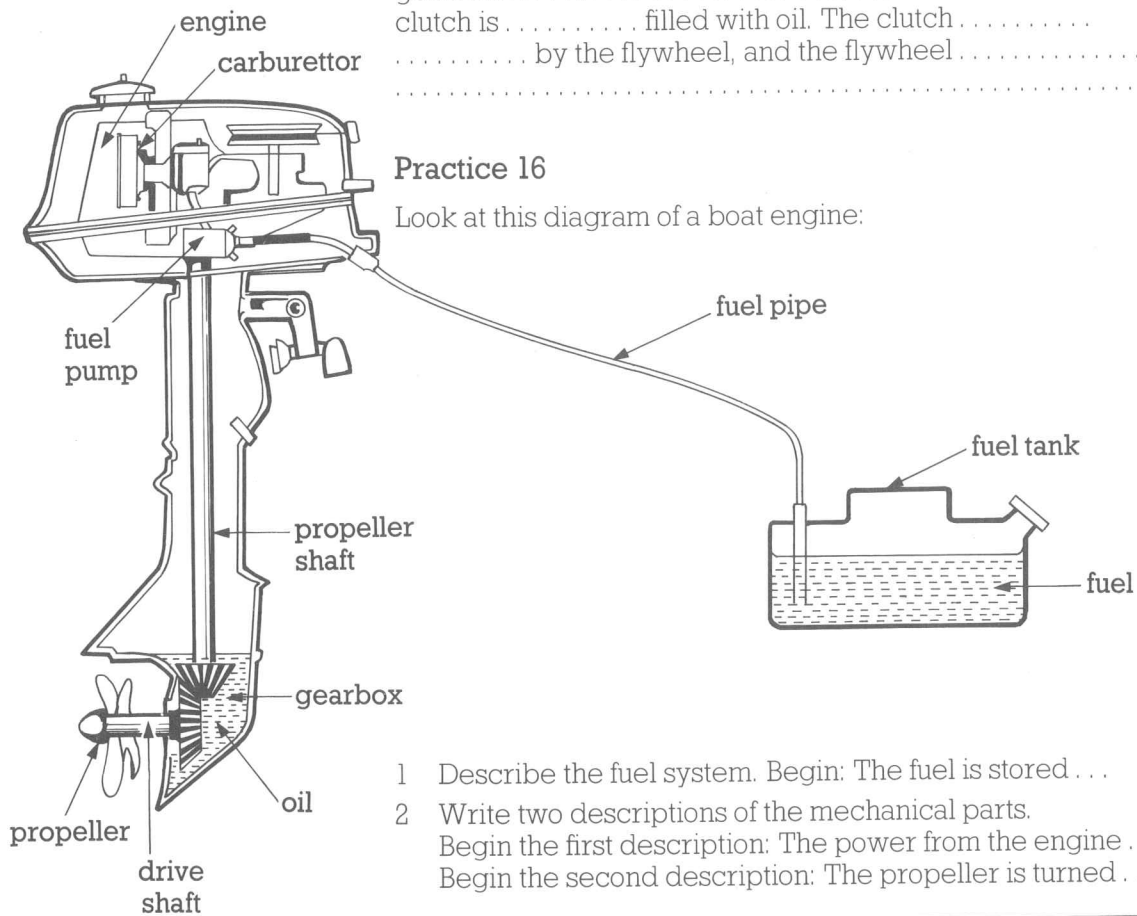
The gears turn the The propeller shaft then turns the in the differential. The differential is also with The gears in the differential the halfshafts and the halfshafts the wheels.

2 Now write a different description of the mechanical parts of a car:

The wheels are driven by the half shafts. The halfshafts the gears in the differential. The differential oil. The gears the differential are driven by The propeller shaft is in the gearbox. The gearbox is filled with The gears in the gearbox the clutch. The clutch is filled with oil. The clutch by the flywheel, and the flywheel

Practice 16

Look at this diagram of a boat engine:



- 1 Describe the fuel system. Begin: The fuel is stored . . .
- 2 Write two descriptions of the mechanical parts. Begin the first description: The power from the engine . . . Begin the second description: The propeller is turned . . .

Revision Exercises

Revision Practice 1

Make twenty sentences from this table:

A car Lorries A bicycle Tandems Tricycles A moped A scooter Motorcycles	does not do not	have	a(n) two three four	wheel(s). engine(s). pedal(s). exhaust(s). handlebar(s).
----------------------------------------------------------------------------------------------	--------------------	------	------------------------------	----------------------------------------------------------------------

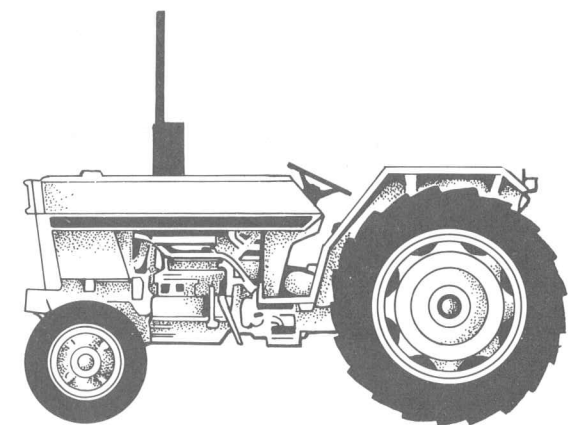
Revision Practice 2

Read out these numbers and measurements:

- | | |
|---------|-----------|
| 1 49 | 7 12.5cm |
| 2 16.4 | 8 35.8gm |
| 3 7.896 | 9 750mA |
| 4 1.045 | 10 350kph |
| 5 0.505 | 11 32.6°C |
| 6 105 | 12 0.5mm |

Revision Practise 3

In this diagram 1.5 cm = 1 m. Measure the diagram and then describe the tractor:



Word List

a carburettor
a clutch
a coil
a cylinder
a differential
a distributor
a door
a drive shaft
an exhaust valve
a flywheel
a half shaft
a headlight
an inlet manifold
an inlet valve
a light
a magneto
a material
a mirror
a piston
a propeller shaft
a pump
a rocker arm
a roof
a seat
a spark
a spring
a steering wheel
a tank
a tap
a tyre
a valve
a volt (V)
a voltage
a windscreen
a wing mirror

air
aluminium
fuel
oil
paint

plastic
power
rubber
steel

burned
cubic (m^3 , cm^3)
mechanical
painted
square (m^2 , cm^2)

above
down
quickly

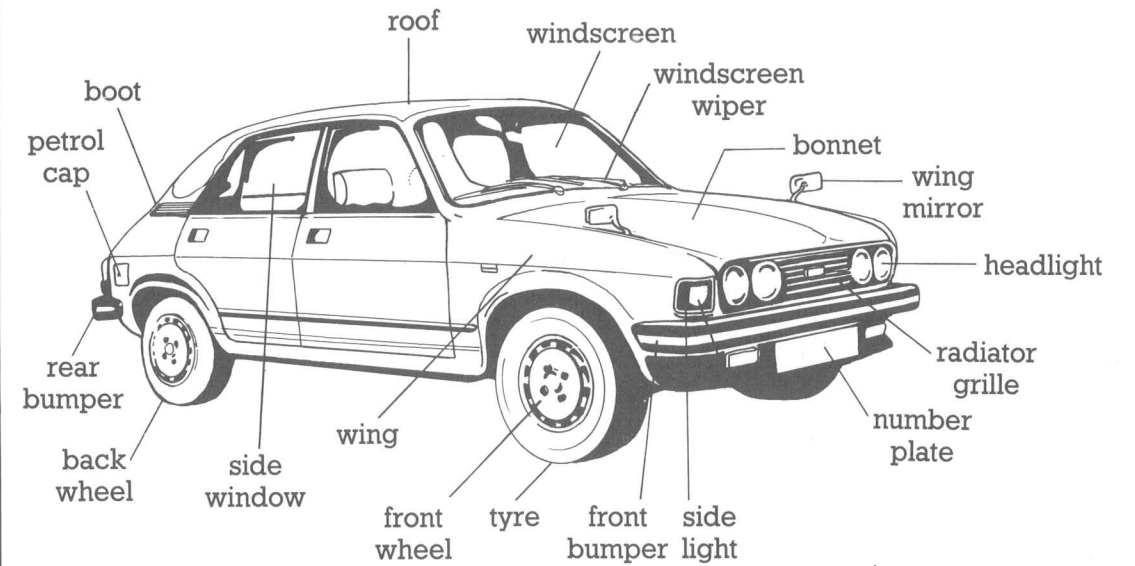
at the back

burn
carry
close
compress
connect (to)
decrease
draw in
expand
expel
fill (with)
fix
ignite
increase
make
mix (with)
open
paint
pass
produce
pump
push
store
turn
use

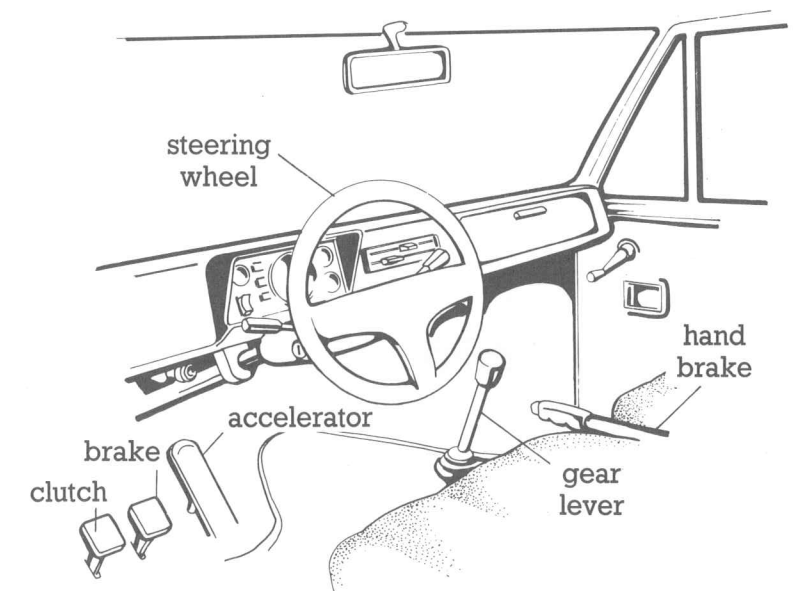
Appendices

Appendix 1

The External Parts of a Car

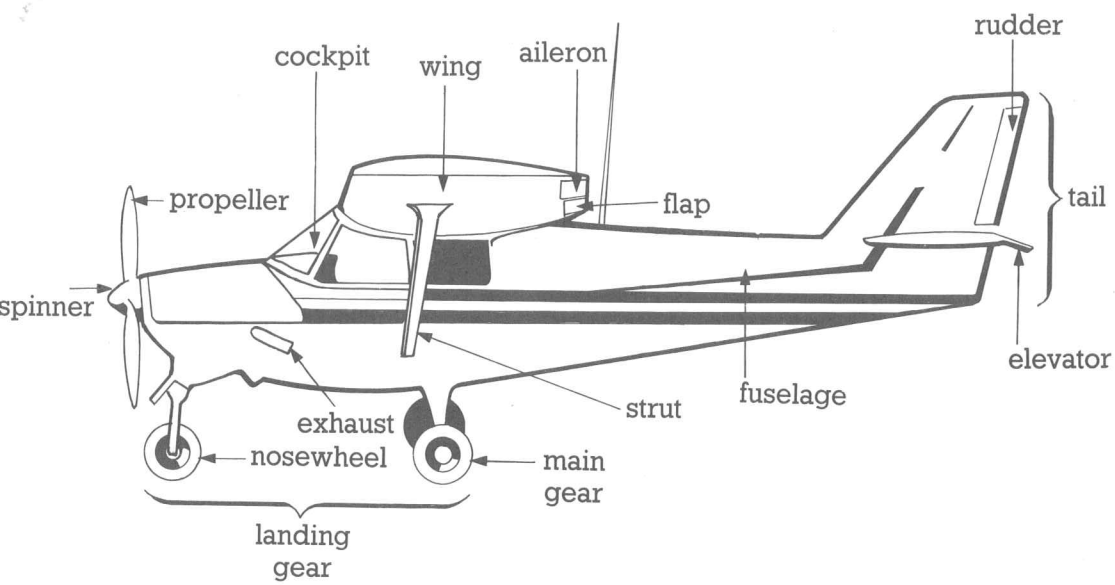


The Controls of a Car



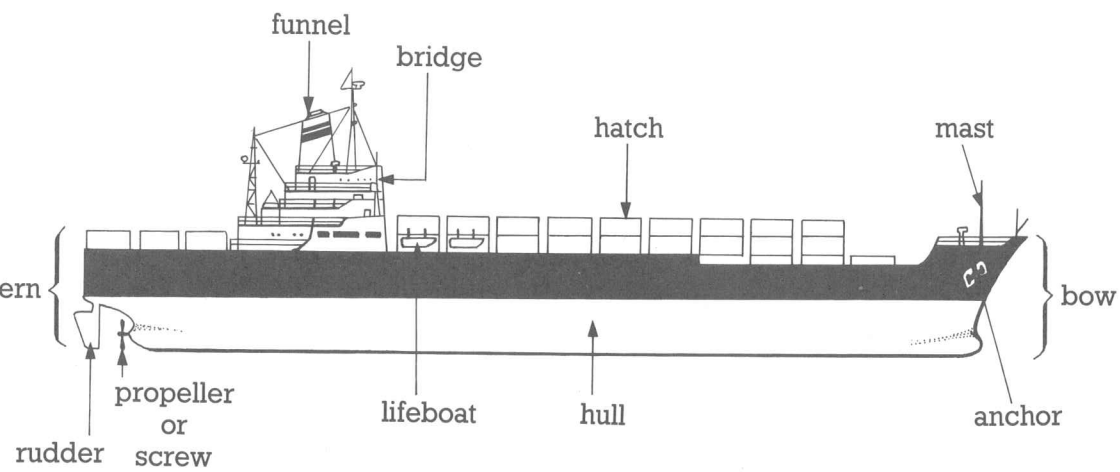
Appendix 2

The External Parts of an Aeroplane



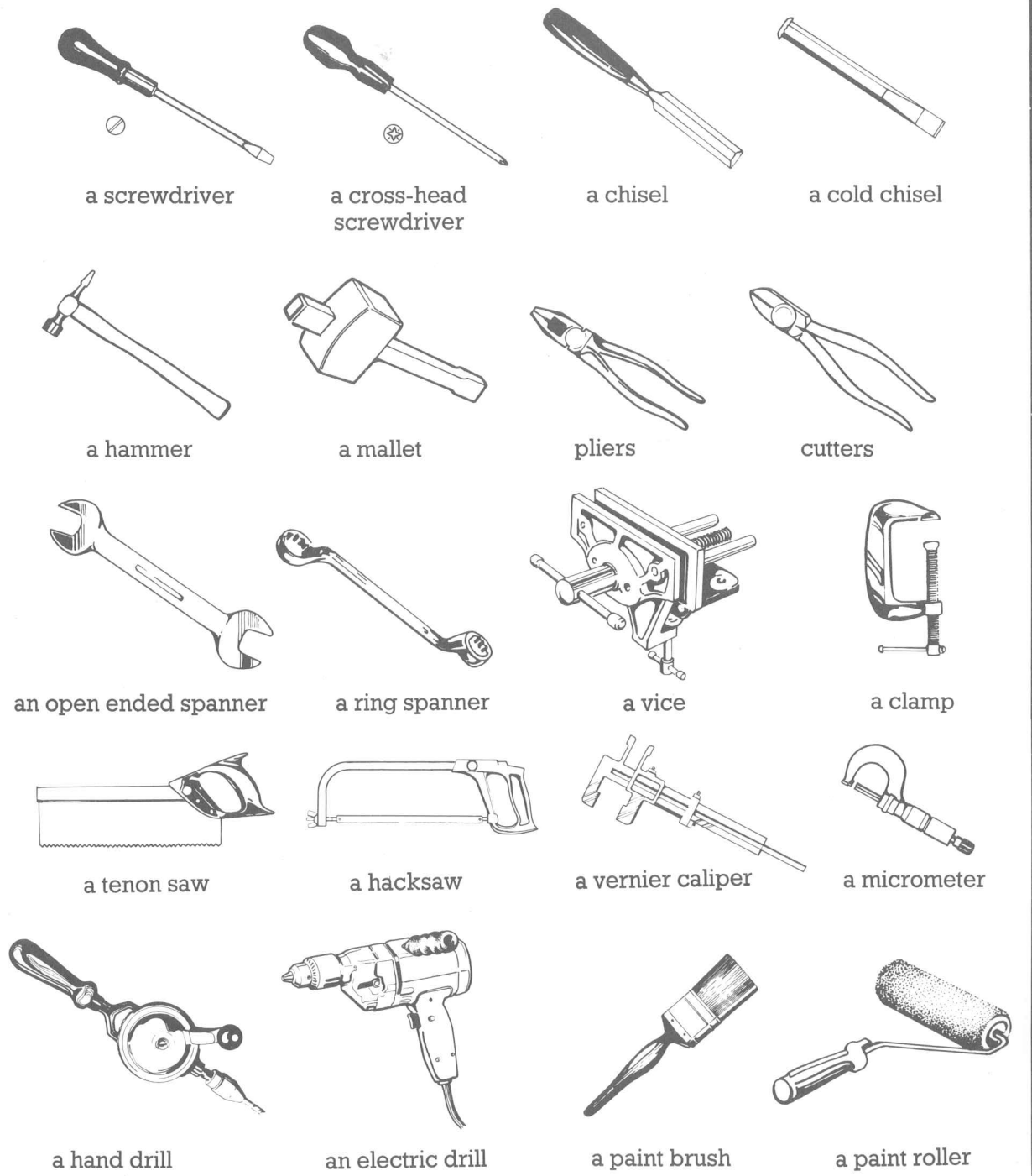
Appendix 3

The External Parts of a Ship



Appendix 4

Basic Tools



Word List

Elementary Technical English 1

The number after each word indicates the Unit where the word is first used. For Example:

aeroplane (nc) 1

– means that the word **aeroplane** is first used in Unit 1. If a word is first used in an Appendix then the letters App. are used. For example:

accelerator (nc) App. 1

– means that the word **accelerator** is first used in Appendix 1.

The letters in brackets () indicate if the word is:

- a verb (v)
- an adjective (adj)
- an adverb (adv)
- a preposition (prep)
- a countable noun (nc)
- an uncountable noun (nφ)

A countable noun is a noun which we can count. For example:

an aeroplane (nc) one aeroplane, two aeroplanes, six aeroplanes

An uncountable noun is a noun which we cannot count. For example:

air (nφ) air, some air

Therefore:

aeroplane (nc) 1 – is a countable noun and it is first used in Unit 1

aluminium (nφ) 8 – is an uncountable noun and it is first used in Unit 8

add (v) 7 – is a verb and it is first used in Unit 7.

The Present Simple and the Passive forms of **irregular** verbs are given after the verb.

about (adv) 5
above (prep) 8
accelerator (nc) App. 1
add (v) 7
addition (nφ) 7
adjusting (adj) 4
aerial (nc) 2
aeroplane (nc) 1
aileron (nc) App. 2
air (nφ) 8
also (adv) 4
aluminium (nφ) 8
always (adv) 7
amp (ere) (nc) 7
anchor (nc) App. 3
answer (nc) 7
approximately (adv) 5
arm (nc) 5

back (nc) 7
balance (nc) 5
bathroom scale (nc) 5
battery (nc) 7
bend (v) 6
(it bends/it is bent)
bicycle (nc) 1
bit (nc) 6
black (adj) 7
blade (nc) 1
blender (nc) 6
blunt (adj) 6
boat (nc) 2
body (nc) 1
bolt (nc) 7
bonnet (nc) App. 1
book (nc) 3
boot (nc) App. 1
bottom (nc) 7
bow (nc) App. 3
bowl (nc) 6
box (nc) 4
brake (nc) App. 1
bridge (nc) 4
bridge (ship) (nc) App. 3
broken (adj) 3
bulb (nc) 7
bumper (nc) App. 1
burn (v) 8
burned (adj) 8
bus (nc) 1
button (nc) 7

calculation (nc) 7
calculator (nc) 1
caliper (nc) 4
camera (nc) 1
cap (nc) 7
capital (adj) 5
car (nc) 1
carburettor (nc) 8

carry (v) 8
(it carries/it is carried)
cartridge (nc) 7
case (nc) 5
cassette (nc) 7
Celsius 5
centimetre (nc) 3
ceramic (nφ) 7
chainsaw (nc) 6
change (v) 7
check (v) 7
chisel (nc) 6
chuck (nc) 1
circle (nc) 3
circular (adj) 5
circular saw (nc) 6
clamp (nc) 7
close (v) 8
clutch (nc) 8
cockpit (nc) App. 2
coil (nc) 8
comma (nc) 5
compress (v) 8
connect (v) 8
control box (nc) 6
cooker (nc) 7
correct (adj) 7
cover (nc) 7
cube (nc) 4
cubic (adj) 8
cut (v) 6
cutters (nφ) App. 4
cylinder (nc) 4

decimal (nc) 4
decrease (v) 8
degree (nc) 5
device (nc) 7
diagram (nc) 7
dial (nc) 1
diameter (nc) 4
different (adj) 7
differential (nc) 8
digit (nc) 7
dimension (nc) 4
display (nc) 1
distributor (nc) 8
divide (v) 7
division (nc & nφ) 7
door (nc) 8
dotted (adj) 3
down (prep) 8
draw in (v) 8
(it draws in/it is drawn in)
drawing (nc) 7
drill (nc) 1 (v) 6
drive (v) 6
(it drives/it is driven)
drive shaft (nc) 8

eject (v) 7
electric (adj) 6
electrical (adj) 7
electricity (nφ) 6
electronic (adj) 7
elevator (nc) App. 2
engine (nc) 1
equal (v & adj) 7
eraser (nc) 3
exhaust (nc) 1
expand (v) 8
expel (v) 8
external (adj) 4

fan (nc) 6
fast (adj) 6
figure (nc) 4
fill (v) 8
fin (nc) 2
first (adv) 7
fix (v) 8
flap (nc) App. 2
flywheel (nc) 8
frame (nc) 6
fuel (nφ) 8
full stop (nc) 5
funnel (nc) App. 3
fuse (nc) 7
fuselage (nc) App. 2

gear (nc) 6
gearbox (nc) 6
gear lever (nc) App. 1
glass (nφ) 7
gram (nc) 5
green (adj) 7
grille (nc) App. 1
grinding wheel (nc) 6
grindstone (nc) 6

hacksaw (nc) 6
half shaft (nc) 8
hammer (nc) App. 4
hand brake (nc) App. 1
hand drill (nc) 6
handle (nc) 1
handlebar (nc) 3
hatch (nc) App. 3
headlight (nc) 8
height (nc) 4
helicopter (nc) 2
high (adj) 3
hold (v) 6
(it holds/it is held)
hole (nc) 6
hook (nc) 5
house (nc) 4
hull (nc) App. 3
ignite (v) 8
inch (nc) 7

base (v) 8
ator (nc) App. 1
(nc) 8
nal (adj) 4
t (v) 7
(nc) 7
(nc) 4
(nc) 7
(nc) 5
metre (nc) 5
e (nc) 1
sharpener (nc) 6
(v) 7
ing gear (nc) App. 2
e (adj) 2
(nc) 4
(nc) 1
th (nc) 4
r (nc) 5
r (nc) App. 1
oat (nc) App. 3
(nc) 8
emitting diode (nc) 7
(nc) 3
d crystal (nc) 7
ing (adj) 4
(adj) 3
en (v) 7
(nc) 2
neto (nc) 8
l (adj) 6
e (v) 8
akes/it is made)
et (nc) App. 4
ifold (nc) 8
onry (nφ) 6
(nc) App. 3
rial (nc) 8
sure (v) 4
hanical (adj) 8
l (nφ) 6
e (nc) 3
ometer (nc) App. 4
ampere (nc) 7
metre (nc) 4
or (nc) 8
(v) 8
ed (nc) 2
or (nc) 6
orcycle (nc) 1
iply (v) 7
ultiplies/it is multiplied)
iplication (nφ) 7
(adj) 7
(adj & adv) 7
(nc) 3

nosewheel (nc) App. 2
number (nc) 4
number plate (nc) App. 1
nut (nc) 7
off (prep) 6
oil (nφ) 8
old (adj) 7
on (prep) 6
open (v) 8
page (nc) 4
paint (v and nc) 8
paintbrush (nc) App. 4
painted (adj) 8
paint roller (nc) App. 4
pan (nc) 5
parcel (nc) 5
pass (v) 8
pedal (nc) 2
pen (nc) 3
pencil (nc) 3
pencil sharpener (nc) 6
people (nc) 5
petrol (nφ) App. 1
pipe (nc) 4
piston (nc) 8
plastic (nφ) 8
plate (nc) 7
platform (nc) 5
pliers (nφ) App. 4
plug lead (nc) 7
point (nc) 3
polarity (nc) 7
power (nφ) 8
power cable (nc) 6
power cord (nc) 6
press (v) 7
produce (v) 8
propeller (nc) 2
propeller shaft (nc) 8
protractor (nc) 3
pump (v & nc) 8
push (v) 8
put in (v) 7
(it puts in/it is put in)
put on (v) 7
(it puts on/it is put on)
quickly (adv) 8
radiator grille (nc) App. 1
radio (nc) 1
radius (nc) 4
rating (nc) 7
read (v) 7
rectangle (nc) 3
rectangular (adj) 5
red (adj) 7
refrigerator (nc) 7

remove (v) 7
replace (v) 7
retaining (adj) 7
ring (nc) 7
rip saw (nc) 6
rocker (nc) 8
rocket (nc) 2
roof (nc) 8
rotary (adj) 6
rotor (nc) 2
rubber (nφ) 8
rudder (nc) App. 2
ruler (nc) 3
saddle (nc) 2
saw (nc) 1
scale (nc) 4
scooter (nc) 2
screen (nc) 1
screw (nc) 4
screw in (v) 7
screw on (v) 7
screwdriver (nc) 1
seat (nc) 8
segment (nc) 7
selector (nc) 6
sharp (adj) 6
sharpen (v) 6
show (v) 7
(it shows/it is shown)
size (nc) 7
slow (adj) 6
small (adj) 2
spanner (nc) App. 4
spark (nc) 8
spark plug (nc) 7
speed (nc) 5
speedometer (nc) 5
spinner (nc) App. 2
spring (nc) 8
spring (adj) 5
square (nc & adj) 3
steel (nφ) 8
steering wheel (nc) 8
stern (nc) App. 3
store (v) 8
strut (nc) App. 2
subtract (v) 7
subtraction (nφ) 7
supply (v) 6
(it supplies/it is supplied)
switch (nc) 6
table (nc) 7
tail (nc) App. 2
tandem (nc) 2
tank (nc) 8
tap (nc) 6
tape recorder (nc) 7
telephone (nc) 1

television (nc) 1
temperature (nc) 5
tenon saw (nc) 6
terminal (nc) 7
test (v) 7
therefore 4
thermometer (nc) 5
thick (adj) 3
thin (adj) 3
tighten (v) 7
toaster (nc) 7
tonne (nc) 5
tool (nc) 6
torch (nc) 7
tractor (nc) 2
triangle (nc) 3

triangular (adj) 5
tricycle (nc) 2
trigger (nc) 6
turn off/on (v) 7
tyre (nc) 8
unscrew (v) 7
upright (nc) 5
use (v) 4
usually (adv) 7
valve (nc) 8
vernier (adj) 4
very (adv) 5
vice (nc) App. 4
volt (nc) 8
voltage (nc) 8

wheel (nc) 2
weigh (v) 5
weighbridge (nc) 5
weight (nc & nφ) 5
wheel (nc) 2
wide (adj) 4
width (nc) 4
windscreen (nc) 8
windscreen wiper (nc) App. 1
wing (nc) App. 1 & App. 2
wing mirror (nc) 8
wire (nc & nφ) 4
wood (nφ) 6
word (nc) 4

