FOR OFFICIAL USE

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	KU	PS
Total Mark		

3700/27/01

NATIONAL QUALIFICATIONS 2013

WEDNESDAY, 1 MAY
9.00 AM – 10.00 AM

SCIENCE
STANDARD GRADE
Foundation Level

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth
Day Month Year

Scottish candidate number

Number of seat

1 Answer as many questions as you can.

2 Read the whole of each question carefully before you answer it.

3 Write your answers in the spaces provided. Showing working may help in some questions.

4 Before leaving the examination room you must give this book to the Invigilator. If you do not, you may lose all the marks for this paper.

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1. Part of the index of a book is shown below.

Acid rain	41	Floor insulation	33
Aero generator	12	Gas	26
Alaskan pipeline	17	Heating costs	31
Alternative energy	38	Hydrogen	39
Batteries	27	Kilowatt hour	30
Biogas	39	Nuclear energy	29
Cavity insulation	34	Oil – production	16
Coal – mine	25	– transportation	18
– production	22	Peat	45
Dams	39	Pollution	40
Double glazing	32	Radioactivity	28

(*a*) Which **two** pages should Gwen look up to find out about cavity insulation and heating costs?

Pages ..... and **1**

(*b*) Charles looked up pages 17 and 18.

What was he trying to find out about?

..... **1**

2. (*a*) Complete the list below to show the four main parts of a balanced diet.

1 milk and dairy products

2 bread or cereals

3 .....

4 ..... **2**

(*b*) A person with an eating disorder did not eat enough food to stay healthy.

What name is given to this eating disorder?

..... **1**

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3. (*a*) The names of some living things are shown in the box below.

beetle	grass	sparrow	pondweed

Use **all** of the names to complete the table below.

Producers	*Consumers*

1

(*b*) Where does the energy for all living things come from?

..... **1**

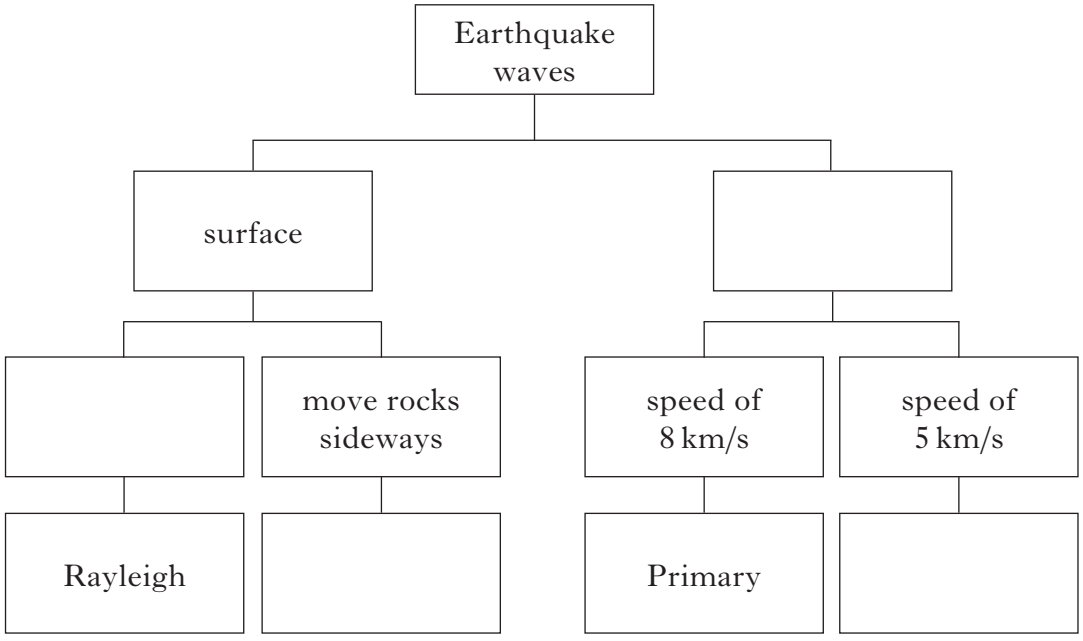
4. **Earthquake waves**

Earthquakes cause different types of waves in rocks. These are either surface waves or body waves.

There are two types of surface waves. Rayleigh waves move rocks upwards and Love waves move rocks sideways.

Body waves can be Primary or Secondary. Primary waves travel at a speed of 8 km/s but Secondary waves travel at a speed of 5 km/s.

Use this information to complete the following key.



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5. **Strength** is one aspect of fitness.

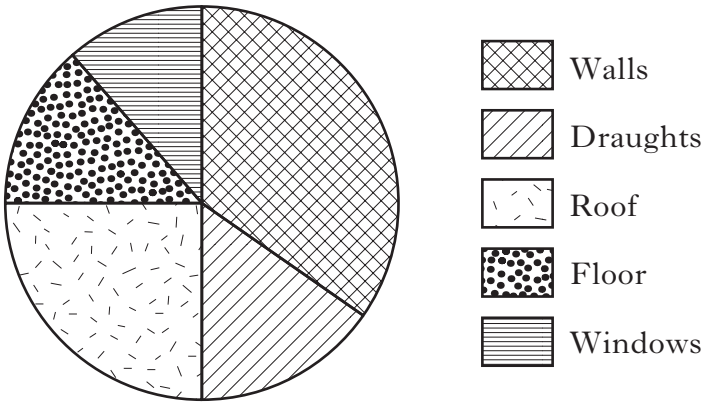
(*a*) Give **one other** aspect of fitness.

..... **1**

(*b*) How could a person improve their level of fitness?

..... **1**

6. The pie chart shows heat loss from a house.



(*a*) Which part of the house loses most heat?

..... **1**

(*b*) Which **two** parts of the house **together** make up 25% of the total heat loss?

..... and **1**

(*c*) The total heat loss from the house is 240 kWh.

Calculate the amount of heat energy lost through the **roof**.

Space for working

Answer .....kWh **1**

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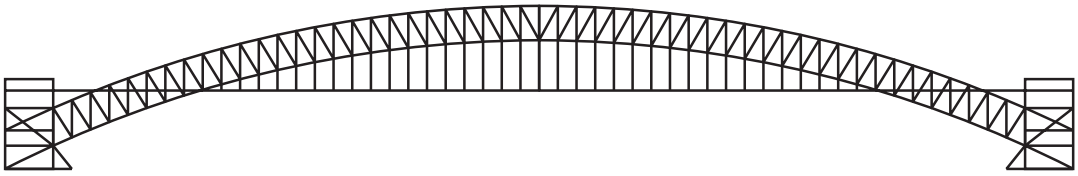
7. Some pupils tested the strength of model bridges.

The strongest model bridge is shown below.



Give **two** reasons why this model bridge is strong.

1 .....

2 ..... **2**

8. Coal is a source of energy used to heat homes.

(*a*) Give **one other** source of energy used for heating homes.

..... **1**

(*b*) Give **one other** use of energy in the home.

..... **1**

[Turn over

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9. Match the use of each material to its property.

One has been done for you.

Use of material	**Property**
concrete supports in a bridge	good electrical conductivity
stainless steel sink	good thermal conductivity
brass pins on an electric plug	good strength
copper pans	good resistance to corrosion

2

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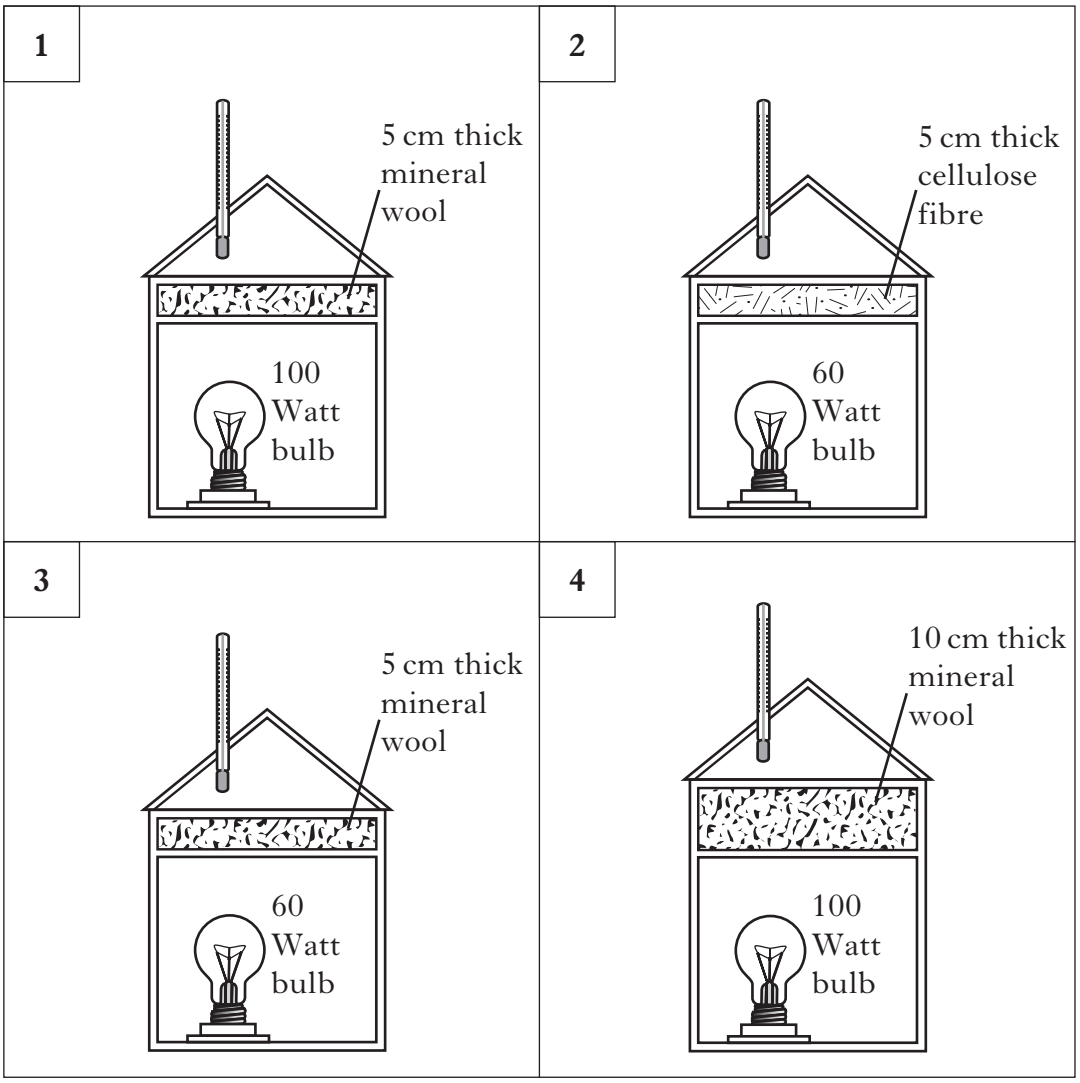
10. Alistair used model houses to investigate loft insulation materials.

For each experiment, he used a light bulb as a heat source and a thermometer to measure the temperature in the loft.



(*a*) Alistair wanted to find out if mineral wool or cellulose fibre is the better material for insulating a loft.

Which **two** boxes show the experiments he should compare for a fair test?

Box numbers ..... and **1**

(*b*) Alistair compared the experiments in boxes 1 and 4.

What was he trying to find out?

..... **1**

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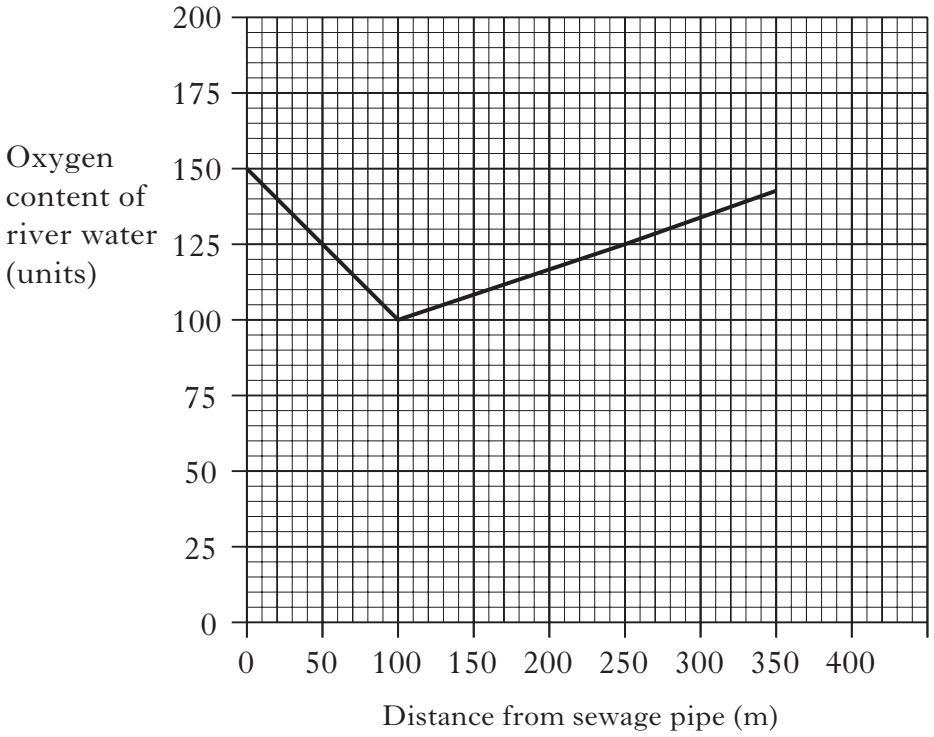
11. A sample of river water was collected beside a sewage pipe. More samples were taken further down the river.

The oxygen content of each sample was measured.

The results are shown in the graph.



(*a*) What is the oxygen content of the river water 250 m from the sewage pipe?

..... units **1**

(*b*) At what distance from the sewage pipe is the oxygen content **lowest**?

..... m **1**

(*c*) Trout need an oxygen content of at least 150 units to survive.

Predict the distance from the sewage pipe where the oxygen content of the river water will return to 150 units.

..... m **1**

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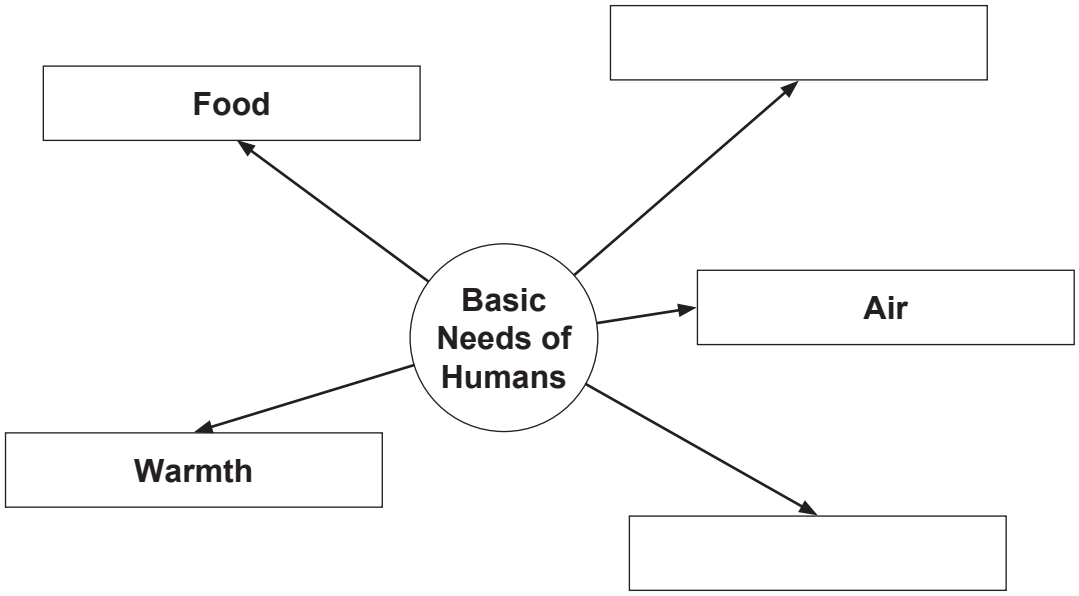
12. (*a*) Complete the diagram below to show the five basic needs of humans.



1

(*b*) Replanting areas of forest after the trees have been cut down for timber is an example of

A recycling

B energy saving

C conservation

D pollution

Underline the correct answer **1**

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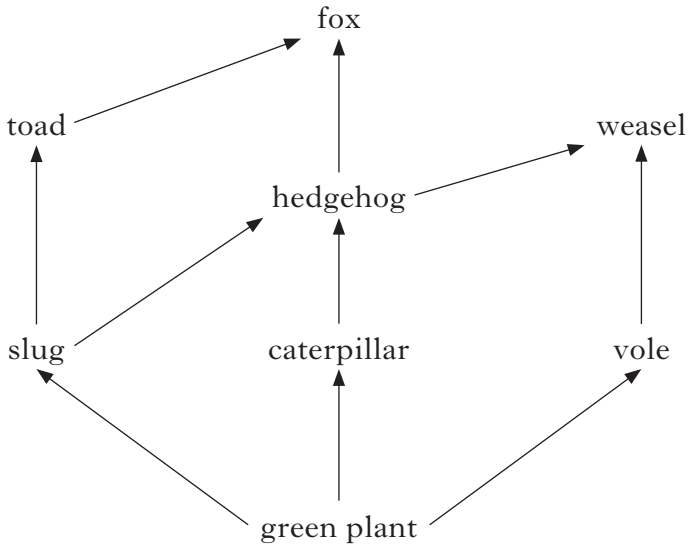
13. Which **three** of the diseases shown in the box below can be caused by smoking?

(Circle) the correct answers.

arthritis	common cold	lung cancer	heart disease
measles	bronchitis	obesity	chicken pox

2

14. A food web is shown below.



Use this food web to answer the questions.

(*a*) Name **two** predators of the hedgehog.

..... and **1**

(*b*) Name an animal that is both predator and prey.

..... **1**

(*c*) **From the food web**, complete this food chain.

..... → ..... → ..... → fox **1**

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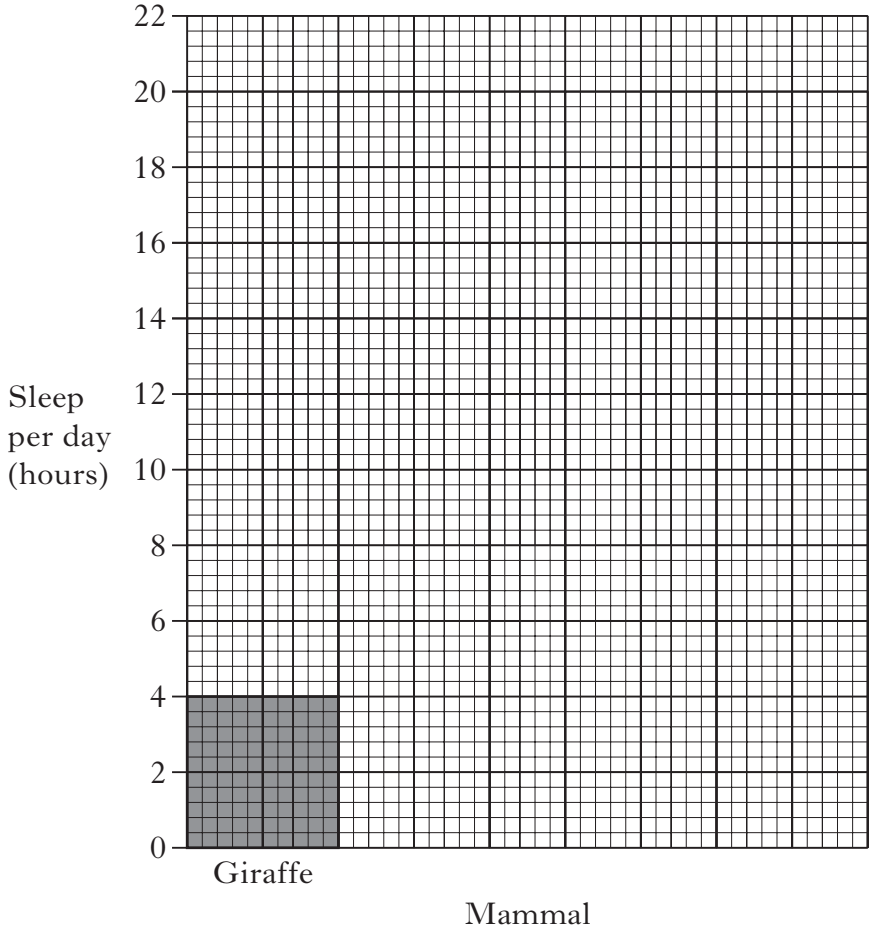
15. Different **mammals** need different amounts of **sleep per day**. A giraffe sleeps for only 4 hours per day. A sloth, however, spends 20 hours per day sleeping. Sleeping 14 hours per day, a hamster gets twice as much sleep as a guinea pig, which sleeps for 7 hours per day.

(*a*) Use this information to complete the table below.

Mammal	*Sleep per day* (hours)

2

(*b*) Use this information to complete the bar graph.
(Another copy of this graph, if required, can be found on *Page nineteen*)



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16. Fossil fuels are our main energy sources.

(*a*) Which gas in the air is used up when fossil fuels burn?

..... **1**

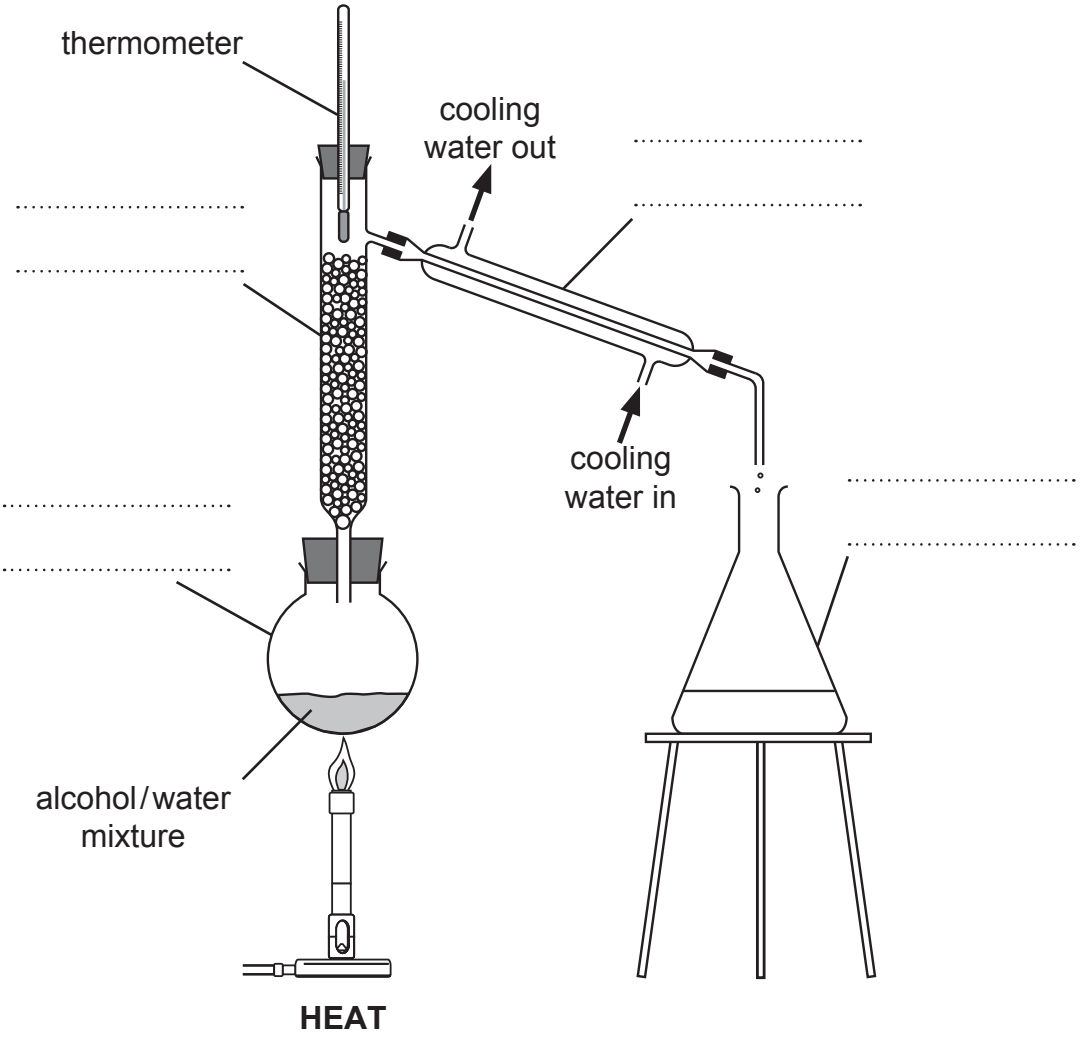
(*b*) Why is it important to conserve our supplies of fossil fuels?

..... **1**

17. Read the information below and use it to label the diagram.

Distillation can be used to separate alcohol from a mixture of alcohol and water.

The mixture is heated in a **distillation flask**. Alcohol vapour passes through a column filled with **glass beads**. A **Leibig condenser** uses cooling water to change the alcohol vapour into a liquid. The liquid drips into a **conical flask**.



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18. The boxes below show different substances which can pollute the environment.

1 CFCs sulphur dioxide smoke	2 oil mining waste smoke
3 pesticides litter mining waste	4 CFCs pesticides oil

(*a*) Which box shows three substances which can pollute the land?

Box number **1**

(*b*) Which box shows three substances which can pollute the air?

Box number **1**

[Turn over

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19. Read the passage and then answer the questions below.

When a volcano erupts, the material that rises to the surface is called magma.

There are two main types of magma—basic magma and silicic magma. Basic magma contains less than 55% silica and is very hot, reaching a temperature of about 1200 °C. Basic magma is fast flowing. Silicic magma contains between 55% and 70% silica. Silicic magma is slow moving and only reaches temperatures of about 700 °C.

When the magma reaches the surface, it can form lava and hot gases. If the volcano is underwater the lava cools quickly to form rock formations called pillow lava. If the volcano is on land the lava can flow and cool to form layers of volcanic rock.

(*a*) What temperature is reached by fast flowing basic magma?

..... **1**

(*b*) Which type of magma contains the higher percentage of silica?

..... **1**

(*c*) Where would you find volcanoes that form pillow lava?

..... **1**

(*d*) A magma has a silica content of 60%.

List **two** other pieces of information about this magma.

1 .....

2 ..... **1**

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20. Plastic is one type of waste that can be **recycled**.

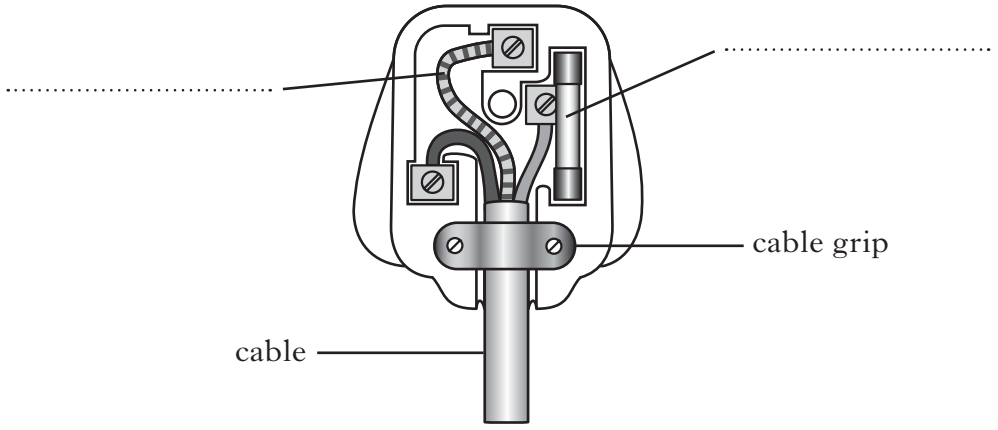
(*a*) What does **recycled** mean?

..... **1**

(*b*) Give **one** other **type** of waste that can be recycled.

..... **1**

21. Electrical plugs have safety features.
For example, the cable grip prevents the wires being pulled out of the pins.
Label the diagram to show two other safety features in the plug.



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22. Alison timed how long it took to boil water using kettles with different power ratings.

Power rating (kW)	*Volume of water* (l)	*Time to boil* (s)
1	0·5	225
1	1·0	460
1	1·5	580
2	0·5	110
2	1·0	225
2	1·5	285

(*a*) (i) Complete the sentence by (circling) the correct word in the box.

As the power rating increases, the time to boil the same volume of water

decreases
stays the same
increases

. **1**

(ii) Draw **one** other conclusion from the information.

..... **1**

(*b*) Predict the time to boil 0·75 litres of water using a kettle with a 1 kW power rating.

..... s **1**

23. The box shows the names of some substances.

cement	zinc	wood
iron	sand	glass

(*a*) Which substance is mixed with copper to make the alloy called brass?

..... **1**

(*b*) Which **two** substances are mixed with aggregate to make concrete?

..... and **1**

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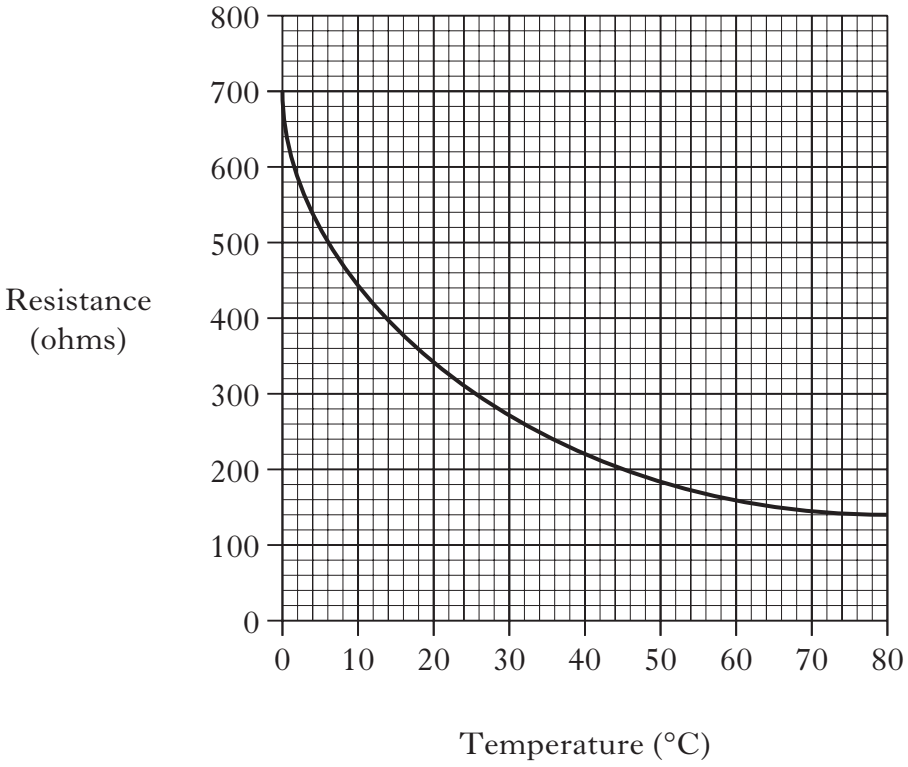
24. The graph shows how the resistance of a thermistor changes with temperature.



(*a*) Draw **one** conclusion from the information in the graph.

.....

..... **1**

(*b*) What is the resistance of the thermistor when the temperature is 40 °C?

..... ohms **1**

[Turn over

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25. The table shows the energy content of 100 g of different cheeses.

Cheese	*Energy content* (kJ/100 g)
Brie	1120
Cheddar	1680
Edam	1320
Parmesan	920
Ricotta	400

(*a*) Calculate the energy content of a 50 g portion of Brie.

Space for working

Answer .....kJ **1**

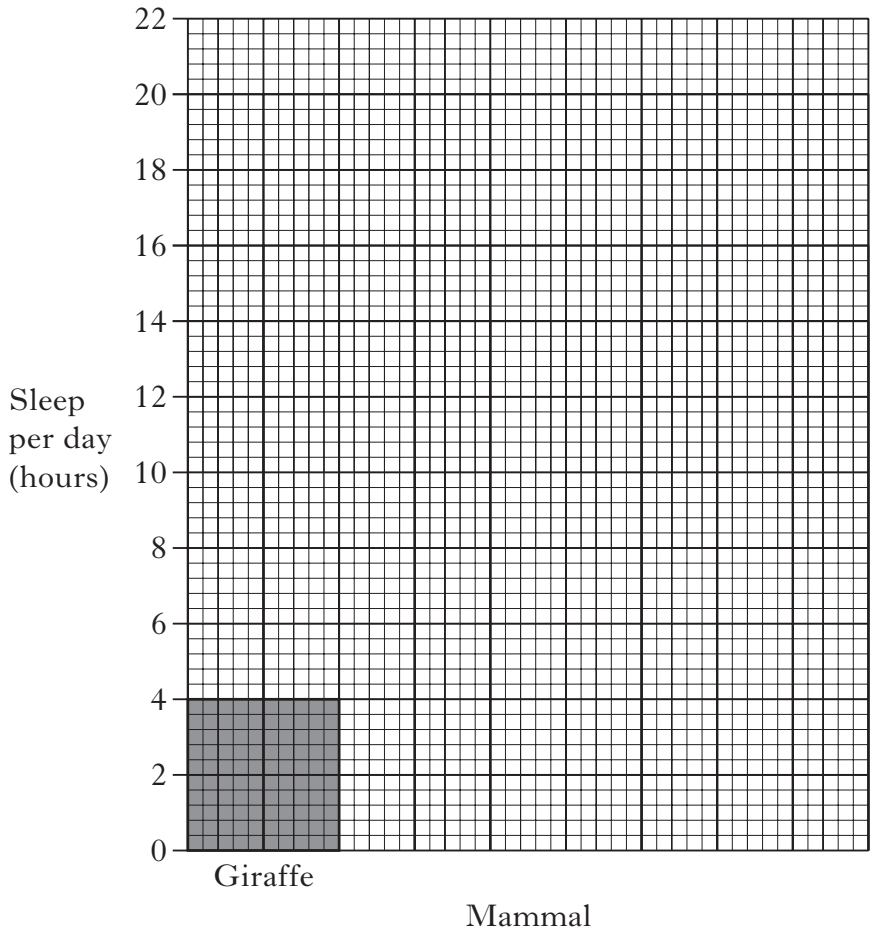
(*b*) How much **more** energy is there in 100 g Cheddar compared with 100 g of Ricotta?

Space for working

Answer .....kJ **2**

[*END OF QUESTION PAPER*]

ADDITIONAL COPY OF GRAPH FOR QUESTION 15(*b*)



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