

Name ..... Class ..... Date .....

- 1 Complete the table by filling in the state of matter each substance is in. The first one has been completed for you.

Substance	State of matter
water in a beaker	liquid
carbon dioxide you breathe out	
a sugar cube	

(2 marks)

- 2 Solids can turn into liquids. Name this process.

..... (1 mark)

- 3 Give the boiling point of water ..... °C

(1 mark)

- 4 Select the correct statement below:

Particles move faster at higher temperatures.	
Particles move more slowly at higher temperatures.	
Changing the temperature does not affect how fast particles move.	

(1 mark)

- 5 Circle the correct name for the substances shown in the Periodic table:

**compounds**

**mixtures**

**elements**

(1 mark)

- 6 List two ways to stay safe when using acids:

- .....
- .....

(2 marks)

- 7 Write the name given to the vertical columns on the Periodic table.

..... (1 mark)

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8 Match each type of material to its correct description.

Ceramic	A mixture of materials. Its properties are a combination of the properties from each part of the mixture.
Composite	A substance made from a long chain of repeating groups of atoms.
Polymer	Compounds, including metal oxides and metal silicates.

(2 marks)

9 Sally carried out an investigation to see how quickly sugar dissolved in water. Three parts of her investigation are shown below. Tick the correct box to show which what part of the investigation each sentence relates to.

	Making a prediction	Identifying a control variable	Results
I will keep the amount of water the same each time.			
When the water was 30°C the water took 10 seconds to dissolve.			
I think that sugar will dissolve more quickly when the water is hotter.			

(2 marks)

10 Explain why a gas can be compressed.

.....  
 .....

(1 mark)

11 Circle the substance in the table below that has the **highest** boiling point.

Substance	Melting point (°C)
gallium	30
gold	1063
oxygen	-218
water	0

(1 mark)

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- 12** When someone puts on perfume, the scent can spread around a room. Name the process by which this happens.

..... (1 mark)

- 13** Sulfur dioxide can cause acid rain. It has the chemical formula  $\text{SO}_2$ .

**a** Circle the type of substance that correctly describes sulfur dioxide:

**atom      element      compound      mixture**

(1 mark)

**b** Explain why you chose this answer.

.....

..... (1 mark)

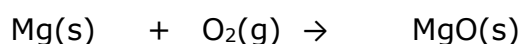
- 14** List two signs of that can be observed when a **chemical** takes place.

- .....
- .....

(2 marks)

- 15** Magnesium burns in oxygen. The word equation and symbol equations for the reaction are shown below.

magnesium + oxygen → magnesium oxide



Give the name of the substance in the reaction above that is a reactant and a solid.

..... (1 mark)

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- 16** Universal indicator has different colours when it is placed in acids, alkalis and neutral solutions. Give the colour universal indicator would become if it was added to sulfuric acid.

..... (1 mark)

- 17 a** Marco makes a cup of coffee by dissolving coffee granules in hot water.

Link each substance to its correct description.

coffee granules
water
coffee drink

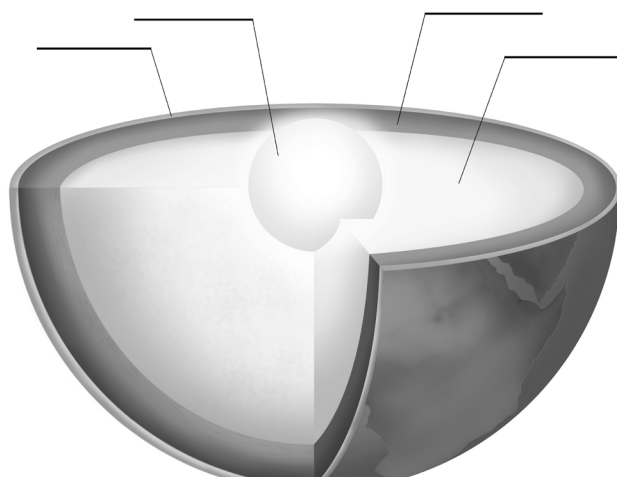
solvent
solution
solute

(3 marks)

- b** Marco realises that some coffee granules have not dissolved in the water. Give the name of a separation technique Marco could use to remove the undissolved coffee granules before drinking his coffee drink.

..... (1 mark)

- 18** Complete the diagram below by correctly labelling each part of the Earth.



(3 marks)

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**19** Name the type of rock that forms when magma cools down.

..... (1 mark)

**20** An element has a melting point of 39°C. Give the state that the element would be in if the temperature was 23°C.

..... (1 mark)

**21** Solids, liquids and gases have different properties. Some of these properties are shown in the table below. Place a tick in the correct boxes to show whether the property describes a solid, a liquid or a gas.

Property of substance	Solid	Liquid	Gas
can flow			
can be compressed			
takes the shape of the container it is in			

(3 marks)

**22 a** A bottle of perfume will diffuse into the room if it is left open. Circle the temperature of the room that would make this happen fastest.

**-10°C**

**10°C**

**18°C**

**25°C**

(1 mark)

**b** Explain why you chose this temperature.

..... (1 mark)

**23** Beth placed a bottle of air into a freezer. Several days later she checked the bottle and it had collapsed. Explain why this happened.

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

..... (4 marks)

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- 24** Copper sulfate forms crystals and has the symbol  $\text{CuSO}_4$ . Explain how you know from this formula whether copper sulfate is an element or a compound.

..... (1 mark)

- 25** Nitric acid has the formula  $\text{HNO}_3$ .

How many of each atom would be in one molecule of nitric acid?

..... hydrogen atoms ..... nitrogen atoms

..... oxygen atoms (1 mark)

- 26** For each process in the table below, identify whether it is a chemical or physical change

	Chemical change	Physical change
burning a candle		
melting ice		
dissolving sugar in water		
cooking an egg		

(2 marks)

- 27** Butane is a fuel. Complete the following word equation to show the products that form when butane is combusted.

butane + oxygen  $\rightarrow$  ..... + .....

(1 mark)

- 28** Megan placed 6.8 g hydrogen peroxide in a beaker. It decomposed to form water and oxygen. Megan found out that 3.6 g of water was left in the beaker. Calculate the amount of oxygen that formed. Show your working out.

..... g

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(2 marks)

- 29 a** The reaction between magnesium and hydrochloric acid is exothermic. What would happen to the temperature during the reaction between magnesium and hydrochloric acid?

..... (1 mark)

- b** Name the salt that forms when magnesium reacts with hydrochloric acid.

..... (1 mark)

- 30** Matias carries out an investigation to compare the solubility of three different salts in water. His method is shown below. Explain why Matias' investigation may not give him valid results.

*Add one spatula full of salt X to a test tube containing water. Shake it until it dissolves. Keep adding salt X until no more will dissolve. Record how many spatulas you added. Repeat the experiment using salt Y, then salt Z. The salt that is most soluble will be the one that has the most spatulas added to the water.*

.....

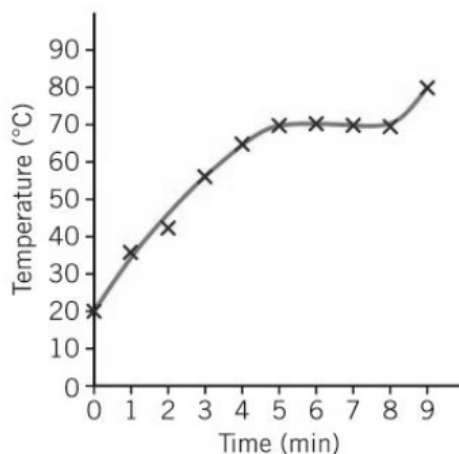
..... (2 marks)

- 31** Give one difference that could be used to distinguish a sedimentary rock sample from an igneous rock sample.

..... (1 mark)

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**32** The graph below shows how the temperature of stearic acid changes as it is heated.



Use the graph to help you explain whether stearic acid is a pure substance or a mixture.

.....  
.....  
..... (3 marks)

**33** Potassium permanganate is a purple substance that diffuses in water to make a purple solution. Suggest an investigation you could carry out to find out if the size of potassium permanganate crystals affects the rate it diffuses at.

.....  
.....  
.....  
..... (4 marks)



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**34** Explain why balloons often pop on a sunny day.

.....  
.....

..... (3 marks)

**35** Link each equation below to the type of reaction that it represents.

methane + oxygen → carbon dioxide + water
hydrochloric acid + sodium hydroxide → sodium chloride + water
copper carbonate → copper oxide + carbon dioxide

decomposition
combustion
neutralisation

(2 marks)

**36** Explain how condensation forms on windows.

In this question you get marks for how well your answer is written.  
You will get marks for:

- spelling
- grammar
- organising your ideas and information clearly
- using scientific key words.

.....  
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..... (6 marks)