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# Foundation Support Workbook AQA GCSE Combined Science Physics topics

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#### Section 1 • Energy changes in a system

Energy stores and systems Calculating energy changes Calculating energy changes when a system is heated Work done Power Conservation of energy Ways of reducing unwanted energy transfers Efficiency Renewable and non-renewable energy resources

#### Section 2 • Electricity

Circuit diagram symbols Electrical charge and current Electrical resistance Changing resistances Series and parallel circuits Mains electricity Energy changes in circuits Electrical power The National Grid

#### Section 3 • Particle model of matter

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#### Section 4 • Atomic structure

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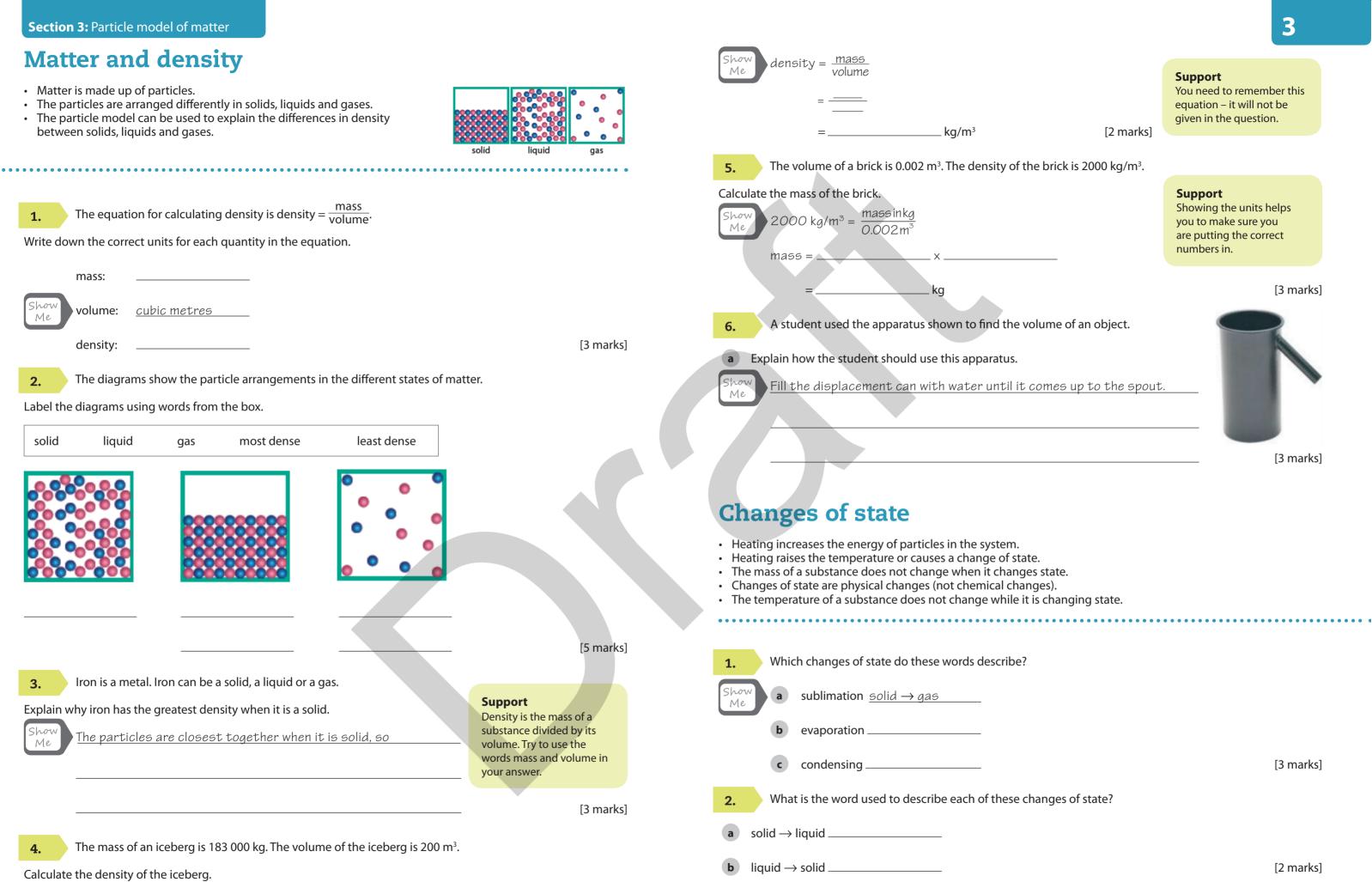
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Support

You need to remember this equation - it will not be given in the question.

[2 marks]

#### Support

Showing the units helps you to make sure you are putting the correct numbers in.

[3 marks]

3



[3 marks]

[3 marks]

[2 marks]

5

		3	
3. What happens to the number of particles in a substance when it changes state?	Latent heat		
Tick <b>one</b> box.	<ul> <li>The energy needed for a substance to change state is called latent heat.</li> </ul>		
the number increases the number stays the same the number decreases [1 mark]	<ul> <li>The temperature of a substance does not change while it is changing state.</li> <li>Energy supplied while a substance is melting or boiling changes the internal energy of the substance.</li> <li>The specific latent heat is the energy needed to change the state of 1 kg of the substance.</li> </ul>		
<b>4.</b> These statements are about physical changes and chemical changes.	•••••••••••••••••••••••••••••••••••••••	•••••••••••••••••	
Tick the boxes to show if each statement applies to a physical change, a chemical change or both.			
Physical change Chemical change		<b>Support</b> To explain <b>why</b> you need	
a     The change does not produce a new substance.	a What happens to water at 100°C? [1 mark]	to write link what happens (the temperature stops	
b A new substance is formed.	b Explain why the temperature stops hing at 100 C, even though energy is still being transferred to the water.	rising) to a <b>cause</b> . Key science words for this topic are internal energy, liquid,	
c The number of particles is the same before and after the change.		gas, state.	
d The substance recovers its original properties if the change is reversed. [4 marks]			
		[2 marks]	
5. What is the energy stored within a system called? Tick <b>one</b> box.	334 KJ/Kg.	Support This question gives the	
internal energy chemical energy [1 mark]	the ice.	mass in grams, so you first need to change the mass into kilograms. To change	
6. A student heats a solid waxy substance in a beaker until it has all melted. She measures the temperature every 30 seconds.		grams to kilograms, divide by 1000.	
The graph shows her results. $\odot$ 60 -	Show mass in kg = $\frac{500 \text{ g}}{1000}$		
a Draw an X on the graph to show when the substance is		Support The value for specific latent	
melting. [1 mark]	energy needed = kg x kJ/kg	heat is given in units of kilojoules per kilogram, so	
b What is the melting point of this	= kJ [3 marks]	the energy you work out using the formula will be in	
substance? [1 mark]	3. Water in a bowl has a temperature of 15°C. The water is put into a freezer.	kilojoules.	
The student turns off the heat and allows the substance to cool down.00<	The temperature inside the freezer is $-18^{\circ}$ C.		
c Sketch a graph to show how the temperature will change as the substance cools down.	a Describe what happens to the temperature of the water.	Support	
	Show At first the temperature	4 marks so give 4 points. For the fourth point don't	
Use the axes on the right. [2 marks] Provide a graph, it is the shape of the graph of	This is because	forget to say what happens to the temperature once all	
ber		the water has frozen.	
Support     E       When you are asked to sketch a graph, it is the shape     E	While ice is forming		
of the graph that is important. A sketch graph does not usually need numbers on the axes.		[4 marks]	

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