Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic : 14_Particle model

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

Question	Indicative content	Mark
	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1 • ice melts at 0 °C • water boils at 100 °C • 0 to 1 minute temperature of ice rising • 1 to 7 minutes ice melting • 1 to 7 minutes energy supplied is used to increase (potential) energy of ice particles • 1 to 7 minutes energy supplied is used to break bonds (between ice particles) • 7 to about 15 minutes temperature of water rising • 7 to about 15 minutes energy supplied is used to increase (kinetic) energy of water particles • about 15 to 20 minutes water boiling • about 15 to 20 minutes energy supplied is used to break bonds (between water particles)	**(6)** **AO1.2**

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) • Presents a description which is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) • Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) • Presents a description that has a well-developed structure which is clear, coherent and logical. (AO1)

Level	**Mark**	**Additional Guidance**	**General additional guidance – the decision within levels** e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material	
Level 1	1–2	<u>Additional guidance</u> limited description including isolated facts for any section	<u>Possible candidate responses</u> temperature of ice/solid increases OR ice melts OR water boils
Level 2	3–4	<u>Additional guidance</u> limited description relating knowledge and understanding to interpretation of graph in **one** section plus an isolated fact	<u>Possible candidate responses</u> temperature of ice/solid increases for 1 minute AND temperature of the water increases

Level 3	5–6	Additional guidance detailed description relating knowledge and understanding to interpretation of graph in **two** sections plus an isolated fact	Possible candidate responses temperature of ice/solid increases for 1 minute AND ice melting while 0 °C for 6 minutes AND water boils

Q2.

Question number	Indicative content	Mark
*	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. Equipment • Thermometer • Measuring cylinder / balance • Power supply • Stirrer • Joule meter / ammeter / voltmeter • Stopwatch / clock Measurements • Mass / volume of water • Initial / final / change of temperature of water • Voltage / current / energy / power • Time (heated for) Detail • Lid/insulation to reduce energy loss • Ensure heater fully immersed / keep stirring the water • Use of equation $\Delta Q = m \times c \times \Delta\theta$ / calculation of input energy • Repeat and find average • Plot graph of temp change and time / energy Credit can be given for correctly labelled diagrams	**(6)** **AO1**

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) • Presents a description which is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) • Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) • Presents a description that has a well-developed structure which is clear, coherent and logical. (AO1)

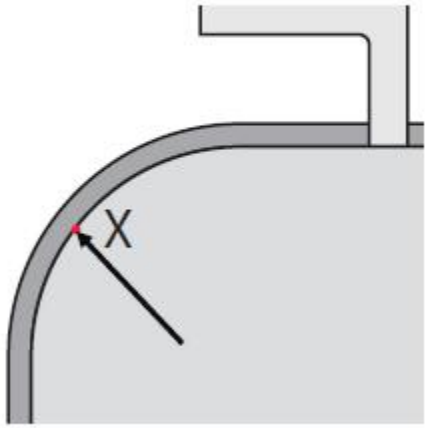
Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	Additional guidance one measurement **or** two items of equipment **or** one piece of detail	Possible candidate responses measure the temperature of the water to start with **or** the student needs a power supply and a thermometer **or** insulated material around the beaker
Level 2	3–4	Additional guidance two items of equipment and at least one measurement **or** one piece of equipment and two measurements **or** two items of equipment and one piece of detail **or** one measurement and one piece of detail	Possible candidate responses The student needs a measuring cylinder to measure the volume of water. They also need a thermometer **Or** Measure the temperature rise of the water and use a balance to measure the mass **or** They need a power supply for the heater and a voltmeter. Keep the heater in the water. **or** Measure temperature rise of the water. Keep stirring the water all the time.
Level 3	5–6	Additional guidance two items of equipment and two measurements and one piece of detail.	Possible candidate responses The student needs a balance to find the mass of water. They also need a thermometer to measure the rise in temperature of the water. Then use the equation $\Delta Q = m \times c \times \Delta\theta$

Q3.

Question number	Answer	Additional guidance	Mark
	A description to include any three from from P to Q temperature (of ice) increases (1) from Q to R temperature (of ice and water mixture) stays constant (at 0°C) (1) from R to S temperature (of water) increases (1) any reference to melting / melts (1)	accept time interval references as equivalent to PQ, QR and RS intervals take PQ as from -8/-9°C to Q take RS as from R to to 11/12 °C accept solid/ice turns to liquid/water	**(3) AO3**

	melting from Q to R (1) PQ (contents are) solid (1) QR (contents are) {solid + liquid} / {ice + water} (1) RS (contents are) liquid / water (1)	temperature stays constant when melting if no other mark scored, allow one mark for correct description of temperature changes without references to PQRS or time	

Q4.

Question number	Answer	Additional guidance	Mark
(i) **Clip with fig 6**	arrow normal to surface at point x  	Judge by eye may be inside or outside the container	**(1)** **AO1**

Question number	Answer	Additional guidance	Mark
(ii)	particles are in (random) motion (1) collide with sides (of container) (1)	 particles bounce off sides of container award 2 marks for change in momentum of particles.	**(2)** **AO1**