P4.1 Matter Pre-Unit Quiz Mark scheme

Qu	Answer	Marks	Supporting information for fix-it tasks
1	B	1	Answering A shows that pupils have not understood the movement of particles in a solid. Answering C shows that pupils are not aware that particles in a liquid can also move around each other. *Task:* Compare the movement of particles in solids, liquids and gases.
2	C	1	Answering A or B shows that pupils are not secure in the properties of the different states of matter. *Task: Describe the movement of particles in the different states of matter and explain this movement in terms of forces of attraction.*
3	A	1	Answering B shows the common misconception that liquids can also be compressed, which comes from students drawing or being shown particle diagrams that do not show the liquid particles overlapping. overlapping. Answering C shows that students may not be clear on the different properties of solids, liquids and gases. *Task: Explain why solids and liquids are incompressible.*
4	B	1	Answering A shows that pupils have the misconception that a change of state means the particles themselves are actually changing, rather than just the arrangement. Answering C shows that pupils have possible mistaken steam for smoke and taken this as a sign of a chemical reaction. *Task: Describe the arrangement of particles in a liquid and a gas and describe what happens to the particles when a liquid boils.*
5	A	1	Answering B suggests that students have the misconception that the mass of the particles of gases are less than particles of liquids. *To fix it. Demo: Place an ice cube on a balance and allow it to melt, noting the mass before and after, to show that the mass remains the same. Ask student to explain why the mass of the ice and the mass of the water is the same.* Answering C suggests that students think that particles have properties such as hardness. *To fix it, ask students to state which arrangement of particles would be the hardest (i.e. Regular pattern, close together, joined together strongly).*
6	B	1	Answering A shows that pupils have the misconception that density and weight/mass mean the same thing. Answering C shows that pupils understand that different densities cause objects to sink or float but they have incorrectly suggested that more dense objects float on water. *7Task: Explain why a cube of metal and a sugar cube have different densities.*
7	A	1	Answering B or C shows that pupils are not clear on the meaning of density or how this applies to different states of matter. *Task: Explain the definition of density and why solids are more dense than liquids (with the exception of ice and water).*
8	B	1	Answering A suggests a misconception that particles only have a store of energy when they are moving. *To fix it, reteach the*

			definition of internal energy and how it changes throughout a heating curve. Answering C suggests a misconception that internal energy only refers to changes of state. *To fix it, reteach the definition of internal energy and how it changes throughout a heating curve.*
9	B	1	Answering A suggests a misconception that potential energy also increases when temperature increases. *To fix it, give students a copy of this graph to annotate and explain what is happening to the particles at each stage.* Answering C suggests a gap in knowledge that the temperature is related to the kinetic energy of the particles. *To fix it, give students a copy of this graph to annotate and explain what is happening to the particles at each stage.*
10	B	1	Answering A shows a gap in knowledge of how to calculate density since A is the result of calculating volume/mass. Answering C shows a gap in knowledge of how to calculate density since C is the result of multiplying volume by mass. *To fix it, reteach how to calculate density then students should write down the formula and then answer practice questions (that do NOT require rearranging).*