# AQA GCSE Physics
## Student Checklist

# P6 Molecules and matter

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

| Lesson | Aiming for 4 | | Aiming for 6 | | Aiming for 8 | |
|---|---|---|---|---|---|---|
| P6.1 Density | I can describe density as a property of a material and not a particular object. | ☐ | I can explain why some materials will float on water. | ☐ | I can use the density equation in a wide variety of calculations. | ☐ |
| | I can state that the density of a material is the mass per unit volume. | ☐ | I can calculate the density of materials. | ☐ | I can use appropriate significant figures in final answers when measuring density. | ☐ |
| | I can calculate the volume of some regular shapes and the density of materials, with support. | ☐ | I can measure the density of a solid and a liquid. | ☐ | I can evaluate in detail the experimental measurement of density, accounting for errors in measurements. | ☐ |
| P6.2 States of matter | I can describe the simple properties of solids, liquids and gases. | ☐ | I can describe the arrangement of the particles in a solid, liquid, and gas. | ☐ | I can describe the forces acting between particles in a solid, liquid, and gas. | ☐ |
| | I can name the changes of state. | ☐ | I can explain the behaviour of a material in terms of the arrangement of particles within it. | ☐ | I can describe the changes in the energy of individual particles during changes of state. | ☐ |
| | I can state that there are changes in stores of energy associated with a material when its temperature is increased. | ☐ | I can describe the changes in behaviour of the particles in a material during changes of state. | ☐ | I can explain in detail why the density of a material changes during a change of state, using a particle model. | ☐ |
| P6.3 Changes of state | I can state that the melting point of a substance is a temperature at which it changes from a solid to a liquid and vice versa. | ☐ | I can state that the melting and boiling points of a pure substance are fixed. | ☐ | I can describe how the melting and boiling points of a substance can be changed. | ☐ |
| | I can state that the boiling point of a substance is the temperature at which it changes from a liquid to a gas and vice versa. | ☐ | I can use the term ‘latent heat’ to describe the energy gained by a substance during heating for which there is no change in temperature. | ☐ | I can describe in detail the behaviour of the particles during changes of state. | ☐ |
| | I can describe the process of melting and boiling. | ☐ | I can find the melting or boiling point of a substance by using a graphical technique. | ☐ | I can evaluate data produced by a heating experiment to discuss the reproducibility of the measurement of a melting point. | ☐ |

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| P6.4 Internal energy | I can state that the internal energy of a system increases as it is heated. | ☐ | I can describe how the internal energy of an object can be increased by heating. | ☐ | I can use the concepts of kinetic and potential energy to explain changes in internal energy. | ☐ |
| | I can identify which changes of state are related to increases in internal energy and which are related to decreases. | ☐ | I can describe how the behaviour of particles changes as the energy of a system increases. | ☐ | I can describe the changes in the size of intermolecular forces during changes of state. | ☐ |
| | I can outline the behaviour of particles in solids, liquids, and gases. | ☐ | I can describe the energy changes by heating between objects within the same system. | ☐ | I can explain in detail why the pressure of a gas increases as it is heated. | ☐ |
| P6.5 Specific latent heat | I can state that heating a material will increase its internal energy. | ☐ | I can describe the changes in particle bonding during changes of state. | ☐ | I can perform a variety of calculations based on the latent heat equation. | ☐ |
| | I can describe energy changes during melting and vaporisation. | ☐ | I can calculate the latent heat of fusion and latent heat of vaporisation for a substance. | ☐ | I can combine variety of equations to solve problems involving heating. | ☐ |
| | I can measure the latent heat of vaporisation for water. | ☐ | I can measure the latent heat of fusion for water. | ☐ | I can evaluate the reproducibility of a measurement of latent heat based on collated data. | ☐ |
| P6.6 Gas pressure and temperature | I can state that as the temperature of a gas in a sealed container increases, the pressure of the gas increases. | ☐ | I can describe the behaviour of particles in a gas as the gas is heated. | ☐ | I can describe the linear relationship between changes in temperatures and pressure for a gas. | ☐ |
| | I can describe a gas as consisting of a large number of rapidly moving particles. | ☐ | I can outline Brownian motion and how this provides evidence for the particle nature of matter. | ☐ | I can explain Brownian motion in terms of particle behaviour and collisions, relating the speeds of smoke particles and air molecules. | ☐ |
| | I can describe pressure as being caused by collisions of gas particles with the walls of its container. | ☐ | I can describe the relationship between an increase in the temperature of a fixed volume of a gas and the increase in pressure of the gas. | ☐ | I can describe in detail how the relationship between the pressure of a gas and its temperature can be investigated. | ☐ |

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| P6.7 Gas pressure and volume | I can state that the temperature of a gas is related to the kinetic energy of the gas particles. | ☐ | I can describe how the pressure of a gas can change when it is compressed or allowed to expand. | ☐ | I can explain in terms of particle behaviour why the pressure of a gas increases when its volume decreases. | ☐ |
| | I can state that the pressure of a gas increases when it is compressed (at a constant temperature). | ☐ | I can use the relationship pV = constant to calculate the constant. | ☐ | I can calculate the pressure or volume of a gas. | ☐ |
| | I can state that forces are required to compress a gas. | ☐ | I can explain why the temperature of a gas increases when it is compressed. | ☐ | I can solve a variety of problems in which gas pressure or volume changes. | ☐ |