Physics Year 10		***Curriculum Checkpoints: What do students know and what can they do?***				***YT Clips***	Further guidance
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**		
3. Particle model of matter	**Substantive Knowledge**	To be able to describe changes of state as physical changes. To be able to describe how heating raises the temperature of a system. To be able to state that when an object changes state there is no change in temperature. To be able to recall that gases can be compressed or expanded by pressure changes. To be able to state that in the particle model the higher the temperature the faster the molecules move.	To be able to describe how mass is conserved when substances change state. To be able to explain that changes of state are physical, not chemical, changes because the material recovers its original properties if the change is reversed. To be able to describe that heating raises the temperature or changes the state of a system but not at the same time.	To be able to explain that changes of state conserve mass. To be able to describe that the temperature of a gas is related to the average kinetic energy of the molecules. To be able to use the particle model to explain that increasing the volume of a gas, at constant temperature, can lead to a decrease in pressure.	To be able to explain that internal energy is the total kinetic energy and potential energy of all the particles that make up a system.	https://www.youtube.com/playlist?list=PLidqqlGKox7UVC-8WC9djoeBzwxPeXph7 Video 25-31	Knowledge organiser Particle Model of Matter Exam Questions Particle Model of Matter extended writing questions Revision Book pages 38-42
3. Particle model of matter	**Disciplinary Knowledge**	To be able to use particle diagrams to communicate ideas about relative densities of different states. To be able to use density = mass/volume to calculate density.	To be able to use the particle model to explain the effect on temperature of increasing the pressure of a gas at constant volume.	To be able to use the particle model to explain the effect on temperature of increasing the pressure of a gas at constant volume. To be able to use the particle model to explain why the latent heat of vaporisation is much larger than the latent heat of fusion. To be able to use the specific heat capacity equation to calculate mass, specific heat capacity or temperature change.	To be able to use the specific heat capacity equation to calculate mass, specific heat capacity or temperature. To be able to use the specific heat capacity equation to calculate mass, specific heat capacity or temperature change. To be able to use the equation pV = constant to calculate the pressure or volume of a gas at constant temperature. Use the equation E = mL		

Physics Year 10		***Curriculum Checkpoints: What do students know and what can they do?***				***YT Clips***	Further guidance
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**		
5. Forces 2	**Substantive Knowledge**	To be able to apply Newton's first law to a stationary object and an object moving in a straight line at a constant speed. To be able to recall the equations for uniform motion. To be able to state Newton's second law and recall the equation F = ma. To be able to explain what is meant by momentum and elasticity	To be able to link Newton's first law to the idea of a zero resultant force. To be able to calculate the resultant force acting on an object. To be able to apply the equation for uniform motion. To be able to use F = ma to determine force, mass or acceleration. To be able to explain the difference between weight and mass. To be able to state Newton's third law.	To be able to explain what is meant by inertia. To be able to select and apply the appropriate equation for uniform motion. To be able to explain what is meant by inertial mass. To be able to apply Newton's third law to simple equilibrium situations. To be able to make suggest the effect of factors that affect braking distance	To be able to rearrange the equations for uniform motion. To be able to relate the ideas of weight and mass to Newton's second law. To be able to explain how Newton's third law applies. To be able to explain how different factors affect braking distance To be able to apply the principle of conservation of momentum to collisions.	https://www.youtube.com/playlist?list=PLidqqlGKox7UVC-8WC9djoeBzwxPeXph7 Video 40-60	Knowledge organiser Forces Exam Questions

5. Forces 2	Disciplinary Knowledge	To be able to explain the significance of the gradient of a distance–time graph.	To be able to interpret a journey represented on a distance–time graph. To be able to explain the significance of the gradient of a velocity–time graph	To be able to determine the instantaneous speed from the tangent to a distance–time graph of an accelerating object. To be able to interpret a journey represented on a velocity–time graph.	To be able to determine total distance travelled from a velocity –time graph. To be able to interpret a graph that relates speed to stopping distance for different vehicles.		Forces extended writing questions Revision Book pages 51-72
Physics Year 10		***Curriculum Checkpoints: What do students know and what can they do?***				***YT Clips***	Further guidance
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**		
5. Forces 1	Substantive Knowledge	To be able to describe how a fluid exerts a pressure on a surface. To be able to describe how pressure varies with depth in a fluid. To be able to explain that a moment is the turning effect of a force.	To be able to calculate pressure at any depth in a fluid and explain what causes atmospheric pressure. To be able to calculate the size and direction of a moment.	To be able to explain how a partially (or totally) submerged object experiences upthrust and why atmospheric pressure decreases with height. To be able to explain how gears and levers transmit the rotational effect of a force.	To be able to describe the factors which influence floating and sinking. To be able to apply the idea of moments to contexts such as the balancing of a seesaw.	https://www.youtube.com/playlist?list=PLidqqIGKox7UVC-8WC9djoeBzwxPeXph7 Video 40-60	Knowledge organiser Forces Exam Questions
5. Forces 1	Disciplinary Knowledge	To be able to know that forces are vectors and have magnitude and direction.	To be able to explain the difference between contact and non-contact forces.	To be able to represent vector quantities by arrows.	To be able to determine the components of a force using a vector arrow diagram.		Forces extended writing questions Revision Book pages 51-72
Physics Year 10		***Curriculum Checkpoints: What do students know and what can they do?***				***YT Clips***	Further guidance
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**		
2. Electricity	Substantive Knowledge	To be able to recall that an electric current is a flow of electrical charge and is measured in amperes (A). To be able to recall that the current through a component depends on the resistance of the component and the potential difference across it. To be able to understand that everyday electrical appliances bring about energy transfer. To be able to recall that power is measured in watts (W) and 1 kW = 1000 W.	To be able to remember that charge is measured in coulombs (C) and recall and use the equation Q = It. To be able to recall and apply the equation V = IR and for series circuit R total = R1 + R2. To be able to recall and use the equation energy transferred E = Pt. To be able to recall and use the equation P = V × I. To be able to recall that the National Grid is a system of cables and transformers linking power stations to consumers.	To be able to remember the concept that current is the rate of flow of charge. Rearrange and apply the equation Q = It. To be able to recall and apply the equation V = IR and for series circuit R total = R1 + R2 and for parallel circuits 1/R total = 1/R1 + 1/R2. To be able to recall and apply the equation energy transferred E = QV. To be able to describe how step-up and stepdown transformers change the potential difference in the National Grid.	To be able to explain the concept that current is the rate of flow of charge. Rearrange and apply the equation Q = It. To be able to explain the effect of adding more resistors to series and parallel circuits. To be able to recall, use and rearrange the equations P=VI and P=I2R. To be able to explain why electrical power is transmitted at high voltages in the National Grid.	https://www.youtube.com/playlist?list=PLidqqIGKox7U	Knowledge organiser Electricity Exam Questions

2. Electricity	Disciplinary Knowledge	To be able to set up a circuit to investigate the relationship between V, I and R for a fixed resistor. To be able to identify live, neutral and earth wires by their colour-coded insulation.	To be able to set up a circuit to investigate the relationship between V, I and R for a range of electrical components. To be able to explain why a live wire may be dangerous even when a switch in the main circuit is open.	To be able to draw I–V graphs for a fixed resistor and other components. To be able to explain the dangers of providing any connection between the live wire and earth or our bodies.	To be able to analyse and interpret I–V graphs for a fixed resistor and other components. To be able to use I–V graphs to determine if the characteristics of components are ohmic or nonohmic.	VC-8WC9djoeBzwxPeXph7 Video 14-24	Electricity extended writing questions Revision Book pages 24-37
Physics Year 10		***Curriculum Checkpoints: What do students know and what can they do?***				***YT Clips***	Further guidance
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**		
4. Atomic Structure	Substantive Knowledge	To be able to recognise that some isotopes called radioisotopes are unstable and decay. To be able to list the three types of ionising radiation resulting from nuclear activity. To be able to explain the meaning of background radiation.	To be able to list some uses of radioisotopes in medicine. To be able to describe the structure of each type of ionising radiation. To be able to list different sources of background radiation. To be able to list the hazards of radioactive contamination.	To be able to use nuclear notation to show subatomic particles in an isotope. To be able to write balanced nuclear equations for different types of nuclear reaction. To be able to describe, using a nuclear equation, how an uncontrolled nuclear fission chain reaction can result in a huge release of energy.	To be able to calculate the half- life of a radioisotope. To be able to solve for unknown particles or elements in nuclear equations. To be able to describe methods used in nuclear p ower plants to control nuclear fission.	https://www.youtube.com/playlist?list=PLidqqIGKox7U VC-8WC9djoeBzwxPeXph7 Video 32-39	Knowledge organiser Atomic Structure Exam Questions Atomic Structure extended writing questions Revision Book pages 43-50
4. Atomic Structure	Disciplinary Knowledge	To be able to state that the number of protons in an element is the atomic number and the total number of protons and neutrons is the mass number. To be able to recognise the symbols used in a nuclear equation. To be able to define nuclear fission.	To be able to understand that atoms of an element all have the same number of protons but can have different numbers of neutrons, giving different isotopes. To be able to write nuclear equations involving alpha and beta decay. To be able to describe nuclear fission using a nuclear equation.	To be able to use nuclear notation to show subatomic particles in an isotope. To be able to write balanced nuclear equations for different types of nuclear reaction. To be able to describe, using a nuclear equation, how an uncontrolled nuclear fission chain reaction can result in a huge release of energy.	To be able to calculate the half- life of a radioisotope. To be able to solve for unknown particles or elements in nuclear equations. To be able to describe methods used in nuclear p ower plants to control nuclear fission.		