THE ABBEY SCHOOL
A BUSINESS & ENTERPRISE ACADEMY

Subject: Physics

Year 10
Scheme of Learning 2025-2026

Subject leader: Mr S Brock

Topics by term	Topic overview for Year 9					
	Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Topics taught	**Physics** – P4; atomic structure	**Physics** – P5a; force basics	**Physics** – P5b; forces and elasticity P5c; forces and motion	**Physics** – P5c; forces and motion	**Physics** – P5c; forces and motion	**Physics** – P5d; car safety and momentum

Exam Board AQA							
Topic Big question	**Lesson questions**	**Lesson objective**	**Outcomes**	**Key Terms** **Literacy** **Numeracy** **Practical activities**	**Assessment and homework tasks**	**Resources**	**Personal Development curriculum links (SMSC, British Values, PSHE)**
Term 1							
P4 – atomic structure							
What do we know about atoms and their interactions?	How has our understanding of the atom developed over time?	To be able to describe and explain how the atomic model has evolved over time.	- To describe how and why the atomic model has changed over time. - To describe the difference between the plum-pudding model of the atom and the nuclear model of the atom. - To describe why the new evidence from the scattering experiment led to a change in the atomic model.	Alpha particle scattering experiment Electron Shell Ernest Rutherford Geiger and Marsden J. J. Thompson James Chadwick John Dalton Neils Bohr Plum pudding model	Termly assessment linked to atomic structure Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	What do scientists understand about the structure of the atom?	To be able to describe and explain the structure of an atom.	- To recognise elements and compounds of the first 20 elements from their formulae. - To describe how atoms of different elements differ. - To distinguish between atoms using their nuclear symbols.	Compound Element Atomic number Mass number To calculate the number of protons, neutrons and electrons in an atom.			
	How can unstable atoms become	To be able to describe the differences between alpha, beta and gamma radiation.	- To describe how alpha, beta and gamma radiation behaves in terms of ionising ability, distance	Alpha beta gamma			SMSC – Possible discussion around the

	stable through nuclear decay?		travelled, and what it can penetrate. - To balance nuclear equations.	Nuclear equation Radiation			impacts of radiation disasters.
	How does the radioactive substances activity change over time?	To be able describe and explain the differences between irradiation and contamination.	- To define the terms irradiation and contamination. - To describe the differences between irradiation and contamination. - To explain ways to reduce irradiation and contamination.	Contamination Irradiation			
	What is the difference between irradiation and contamination ?	To be able to define what the specific heat capacity of a material is and calculate it using the equation.	- To describe how energy relates to changes in temperature. - To explain why land heats up and cools down quicker than water. - To be able to rearrange the specific heat capacity equation and substitute relevant values.	Energy store Energy transferred To calculate specific heat capacity using the equation: $\Delta E = mc\Delta\theta$			
Term 2							
P5a – Force basics							
What forces act on an object?	How can forces be defined as contact and non-contact?	To be able to describe a force as either contact or non-contact and show all forces acting on an object.	- To describe the difference between vector and scalar quantities. - To give examples of vector and sclar quantities. - To state examples of contact and non-contact forces. - To describe the forces acting between two interacting objects. - To explain the forces acting on an object by representing forces as vectors.	Contact interacting pair Non-contact Scalar vector	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	How can gravity and mass be used	To be able to explain the difference between weight and	- To describe the difference between weight and mass. - To recall that weight is a force due to gravity .	Gravitational field strength Gravity Mass			

	to calculate weight?	mass, and calculate weight.	- To understand that weight is dependent on the gravitational field strength at the object's location.	Weight To calculate weight using the equation: W = mg			
	How can the resultant of two forces be calculated? *(Some higher content)*	To describe what a resultant force is and be able to calculate it..	- To recall that the resultant force has the same effect as all individual forces on an object combined - To describe the forces acting on a given object. - *To analyse a force, representing it as two components*	*Components* *Resolving forces* Resultant force To calculate the resultant force by simple subtraction. *To calculate the resultant forces by resolving forces*.			
	How are energy transfers involved when work is done on an object?	To be able to define work done and be able to calculate it..	- To reecall that if a force is applied to an object and displaces it, then the force has done work on the object - To describe the Energy transfers that are involved when work is done on an object - To explain that work done against friction can cause a rise in the temperature of an object and its surroundings - To calculate work done on an object.	Energy transfer Work done To calculate work done on an object by using the equation: W = Fs			
Term 3							
P5b – Forces and elasticity							
What forces act on an object?	How can forces applied to an object make it	To be able to describe the difference between elastic and inelastic objects and	- To state that energy is transferred when an object is stretched or compressed	Compressing Deformed Elastic	Homework tasks linked to the lesson question.	Knowledge organiser CGP textbook	British values – respect through silence is a key

	elastically or inelastically deform?	calculate extension and elastic potential energy for various objects.	- To describe that the force applied to an elastic object is directly proportional to the extension of the object, up to the limit of proportionality. - To define the terms elastic and inelastic. - To calculate extension and elastic potential energy. -	Energy transfer Inelastic Spring constant Stretching To calculate spring constant by rearranging the equation: F = ke To calculate elastic potential energy by using the equation: Ee = 1/2 ke^2	Plenary questions at the end of every lesson.	Lesson PowerPoint presentations	aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	How does an object which can be elastically deformed behave when a force is applied?	To be able to describe the relationship between the force applied to a spring and its extension.	- To recall the relationship between the force applied to a spring and its extension. - To understand how to find the spring constant from a force-extension graph. - To explain what the limit of proportionality is.	Compressing Deformed Elastic Energy transfer Inelastic Limit of proportionality Spring constant Stretching.			
	What is the relationship between force and extension of a spring? **REQUIRED PRACTICAL**	To be able to investigate how the force applied to a spring affects its extension.	- To be able to follow a set method to investigate the effect of adding masses to the extension of a spring. - To use this data to draw a graph and calculate the spring constant. - To be able to draw valid conclusions and evaluate the method used.	Compressing Deformed Elastic Energy transfer Inelastic Limit of proportionality Spring constant Stretching. To calculate spring constant by rearranging the equation: F = ke			

				To investigate the effect of force on the extension, **practical activity**. .			
P5c – Forces and motion.							
How do forces affect motion?	What is the difference between vector and scalar quantities? *(Some higher content)*	To be able to define speed, velocity, distance and displacement, describe the differences between them and label them as either vector or scalar quantities.	- To recall the difference between vector and scalar quantities. - To define distance, displacement, speed and velocity. - To describe the differences between speed and velocity, and distance and displacement and identify them as vector or scalar quantities. - *To explain that an object can have a constant speed but a changing velocity (circular motion)* -	Displacement Distance Scalar Speed Vector Velocity	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to and respect others' opinions.
	How is acceleration different to speed?	To be able to explain how acceleration is different to velocity and speed and be able to calculate it.	- To state that acceleration is a change of velocity over time. - To calculate acceleration from given data. - To explain what uniform acceleration is and be able to calculate it.	Acceleration Velocity To calculate acceleration by using one of the following equations: $a = \Delta V/t$ Or $v^2-u^2 – 2as$			

Term 4							
P5c – Forces and motion.							
How do forces affect motion?	How are changes in distance represented on a graph? *(Some higher content)*	To be able to describe what the lines on a distance-time graph mean and be able to calculate the speed of the object represented.	- To recall that an object moving in a straight line can be shown on a distance-time graph - To be able to describe what is happening at each point of a distance time graph based on the line. - To describe how to take the gradient of a distance-time graph to work out speed. - *To explain that the speed of an accelerating object is equal to the gradient of the tangent to the graph at a given time.*	Acceleration Distance-time graph Gradient Speed *Tangent* To plot a distance-time graph. To calculate speed at different parts of the graph by calculating the gradient of the line. *To estimate the speed of an accelerating object by calculating the gradient of the tangent.*	Termly assessment focussed on topics 5a, 5b and 5c up to velocity-time graphs. Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	How is a velocity-time graph different to a distance-time graph? *(Some higher content)*	To be able to describe and explain the differences between a distance-time graph and a velocity-time graph.	- To recall that the gradient of the line represents acceleration. - To be able to describe what is happening at each point of a velocity-time graph based on the line. - To describe how to take the gradient of a distance-time graph to work out speed. - *To explain that the area under the graph represents the distance travelled.* -	Acceleration Gradient Velocity-time graph To plot a velocity-time graph. To calculate acceleration at different parts of the graph by calculating the gradient of the line. *To calculate the distance travelled by calculating the area under the graph.*			

	What is terminal velocity?	To be able to describe and explain terminal velocity and apply the idea to different scenarios.	- To recall that frictional forces try to oppose the movement of an object - To understand that the frictional forces on an object increase with the object's speed - To explain how an object falling through a fluid accelerates due to gravity until the frictional forces equal the object's weight.	Terminal velocity Velocity Weight			
Term 5							
P5c – Forces and motion							
How do forces affect motion?	What happens to an object moving at constant speed if there is no resultant force?	To be able to define Newton's first law and link it to different scenarios.	- To recall Newton's First Law: an object will remain stationary or remain moving at constant velocity if there is no resultant force - To understand that a vehicle with a driving force equal to resistive forces will not change speed. - To explain the effect that a non-zero resultant force will have on an object with regard to speed or direction of movement.	Balanced force Equilibrium Newton's first law Resultant force	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to and respect others' opinions.
	How are force, mass and acceleration linked? *(Some higher content)*	To be able to define Newton's second law and link it to different scenarios.	- To recall Newton's Second Law as an equation: F = ma - To describe, by estimating, the resultant forces acting in everyday accelerations - *To explain that the inertia of an object is the tendency for its motion to remain unchanged.*	Gravitational mass Inertia Inertial mass Newton's second law Resultant force To calculate force using the equation: F = ma. *To calculate inertial mass using the equation:* *m = F/a*			

	How can we experimentally test Newton's second law? **REQUIRED PRACTICAL**	To investigate the relationship between force, mass and acceleration.	- To follow a set method to investigate the link between force, mass and acceleration. - To use this data to draw a graph and describe the relationship. - To be able to draw valid conclusions and evaluate the method used.	Balanced force Newton's second law Resultant force To investigate the link between force, mass and acceleration, **practical activity**.			
	How can we describe the forces acting on interacting objects?	To be able to define Newton's second law and link it to different scenarios.	- To recall Newton's Third Law in that two interacting objects will exert equal and opposite forces on each other - To understand the application of Newton's Third Law to different situations - To explain why some equilibrium situations are examples of Newton Third Law or not -	Equal Interacting pair Newtons third law opposite			
Term 6							
P5d – Car safety and momentum							
Why is driving one of the safest modes of transport?	What factors affect a person's ability to drive safely?	To be able to define the terms thinking distance, breaking distance and stopping distance and explain how various factors could affect these distances .	- To recall the definition of thinking and braking distances - To describe the relationship between stopping distance, thinking distance and braking distance - To calculate stopping distance. - To explain the factors that affect both braking and thinking distances and their implications on safety	Breaking distance stopping distance Thinking distance	End of year assessment focused on all topics covered throughout the year. Homework tasks linked	Knowledge organiser CGP textbook Lesson PowerPoint presentations	SMSC – Discussion around risks of drink/drug/ texting whilst driving. British values – respect

	How do you measure reaction time?	To be able to investigate the effect of a factor on human reaction time.	- To carry out the ruler drop test under normal conditions, and 'distracted' conditions. - To draw valid conclusions from the results and evaluate the method used. - To determine other factors that could be tested and/or another method to measure reaction time.	Reaction time Variables To be able to calculate the mean from results collected. Ruler drop test, **practical activity**	to the lesson question. Plenary questions at the end of every lesson.		through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to and respect others' opinions.
	Why do a car's brakes get hot when used?	To be able to describe the energy transfers that occur when a vehicle brakes.	- To recall the energy transfers which occur when a vehicle brakes. - To describe that a greater speed will need a larger braking force to stop a vehicle in a given distance - *To estimate the force required to produce a deceleration of a vehicle in a typical situation.*	Braking Deceleration Energy transfer			
	How is momentum linked to mass and velocity? **(Higher only)**	To be able to explain the motion of molecules within a gas, and how this changes as the gas is heated.	- To recall the formula p = mv - To understand what momentum is and that it must be conserved - To explain and describe an event in terms of momentum -	Conservation Momentum To calculate momentum using the equation: p = mv			