

Motion

Opportunities for Breadth and Challenge: Using a velocity time graph to estimate distance travelled			
Links to Sequencing for Learning: This unit links to previous work on done in KS3 P1 Motion and Force This unit prepares pupils for work in Y10 CP7 Energy – Forces doing work			
Section	What we are learning (key knowledge)	Key words	Assessment
1	<i>SP1a Vectors and scalars</i> What are vector and scalar quantities? Wat are some examples of scalar quantities and their corresponding vector quantities? What is the connection between the speed, velocity and acceleration of an object?	Force Upthrust Magnitude Vector quantity Scalar quantity	Prior knowledge
2	<i>SP1b Distance time graphs</i> How do you use the equation relating to average speed, distance and time? In metres per second, what are the typical speeds that someone might move at during the course of the day? How do you represent journeys on a distance/time graph?	Mass Distance Speed Energy Displacement	Retrieval Qs of keywords
3	<i>SP1c Acceleration</i> How do you calculate acceleration from the change in velocity and a time? How are acceleration, initial velocity, final velocity and distance related? What is the acceleration of free fall?	Momentum Average Speed Instantaneous Speed Distance/Time Graph Gradient	Homework: independent research for poster
4	<i>SP1d Velocity/time graphs</i> How do we compare acceleration on a velocity/time graph? How can you calculate acceleration from a velocity/time graph? How can you use a velocity/time graph to work out the total distance travelled?	Velocity Acceleration Deceleration	MUM: poster

		Velocity/Time Graph	
5	Revision		Class assessment sheet
6	End of Unit Test		EUT
7	Test Feedback		Test feedback sheet

Forces and Motion

Opportunities for Breadth and Challenge: Using Newtons laws of motion effectively.

Links to Sequencing for Learning:

This unit links to previous work on Motion and Forces done in KS3 P1 Year 7

This unit prepares pupils for work in Y10 CP7 Energy forces and doing work.

Section	What we are learning (key knowledge)	Key words	Assessment
1	Resultant forces <ul style="list-style-type: none"> • What is the difference between the speed of an object and its velocity? • How do we represent all the forces acting on an object? • How do we calculate resultant forces? 	Speed, velocity, vector quantity, scalar quantity, acceleration,	Prior knowledge
2	Newtons first law of motion <ul style="list-style-type: none"> • What happens to the motion of an object when the forces on it are balanced? • What can happen to the motion of an object when there is a resultant force on it? • What is centripetal force? 	Centripetal force	Retrieval Qs of keywords
3	Mass and weight <ul style="list-style-type: none"> • What is the difference between mass and weight? • What are the factors that determine the weight of an object? • How do you calculate weight? 	Mass, weight, force meter, gravitational field strength.	Homework: independent research for poster
4	Newtons second law <ul style="list-style-type: none"> • What are the factors that affect the acceleration of an object? • How do you calculate the different factors that affect acceleration? • What is inertial mass and how is it defined? 	Inertial mass	MUM: poster
5	Core practical Investigating acceleration <ul style="list-style-type: none"> • Investigate the relationship between force, mass and acceleration by varying the masses added to trolleys. 		
6	Newtons third law of motion <ul style="list-style-type: none"> • What does Newton's Third Law tell us? • How does Newton's Third Law apply to stationary object? • How do objects affect each other when they collide? 	Action reaction forces, equilibrium	
7	Momentum <ul style="list-style-type: none"> • How is momentum calculated? • How is momentum related to force and acceleration? • What happens to momentum in collisions? 	Momentum, conservation of momentum	

8	<p>Stopping distances</p> <ul style="list-style-type: none"> • How are human reaction times measured? • What are typical human reaction times? • What are the factors that affect the stopping distance of a vehicle? 	Thinking distance, breaking distance, stopping distance, reaction time, stimulus, response,	
9	<p>Crash hazards</p> <ul style="list-style-type: none"> • What are the dangers caused by large decelerations? • How can the hazards of large decelerations be reduced? • How can you use momentum to calculate the forces involved in crashes? 	Deceleration, crumple zone	
8	Revision		
9	End of Unit Test		EUT
10	Test Feedback		Test feedback sheet

Conservation of energy

Opportunities for Breadth and Challenge: Using Newtons laws of motion effectively.			
Links to Sequencing for Learning: This unit links to previous work on P2 Energy yr7 This unit prepares pupils for work in Y10 CP7 Energy forces and doing work.			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Energy stores and transfers <ul style="list-style-type: none"> • How is energy transferred between different stores? • How can we represent energy transfers in diagrams? • What happens to the total amount of energy when energy is transferred? 	Chemical energy, Kinetic Energy, Thermal Energy, Elastic Potential Energy, Gravitational Potential Energy, Atomic(Nuclear) Energy, System, Law of Conservation of Energy, Joules, Sankey diagram	Prior knowledge
2	Energy Efficiency <ul style="list-style-type: none"> • What does efficiency mean? • How do we calculate the efficiency of an energy transfer? • How can we reduce unwanted energy transfers in machines? 	Dissipated, Lubrication, Efficiency,	
3	Keeping Warm <ul style="list-style-type: none"> • What does thermal conductivity mean? • What affects the rate at which buildings cool? • How can insulation reduce unwanted energy transfers? 	Insulation, Conduction, Conductors, Thermal Insulators, Convection, Fluid, Radiation, Infrared Radiation, Absorbed, Emitted, Thermal Conductivity	Sankey diagrams conservation of energy
4	Stored Energies <ul style="list-style-type: none"> • What factors affect the gravitational potential energy stored in an object? • How do you calculate gravitational potential energy? • How do you calculate the amount of kinetic energy stored in a moving object? 		
5	Non-Renewable sources <ul style="list-style-type: none"> • What non-renewable energy resources can we use? • How are the different non-renewable resources used? • How is the use of non-renewable energy resources changing? 	Nuclear fuels, Uranium, Fossil fuels, Non-renewables, Climate change, Renewable	
6	Renewable resources <ul style="list-style-type: none"> • What renewable energy resources can we use? • How are the different renewable resources used? 	Solar cells, Solar Energy, Hydroelectricity, Wind Turbine, Tidal Power, Bio-Fuel, Carbon Neutral	

	<ul style="list-style-type: none">• How is the use of renewable energy resources changing?		
8	Revision		
9	End of Unit Test		EUT
10	Test Feedback		Test feedback sheet