

Year 10: Physical World- Objects in Motion

	Check	Date
ASSUMED KNOWLEDGE STAGE 4 OUTCOMES SC4-10PW describes the action of unbalanced forces in everyday situations SC4-11PW discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations	<input type="checkbox"/>	
PW2 The motion of objects can be described and predicted using the laws of physics. (ACSSU229)		
CHARACTERISTICS OF MOTION		
<i>5PW2b. explain qualitatively the relationship between distance, speed and time</i>	<input type="checkbox"/>	
Define the terms distance, speed and time	<input type="checkbox"/>	
Define the terms qualitative and quantitative	<input type="checkbox"/>	
Numeracy: Solve a range of problems requiring $\text{speed} = \text{distance} / \text{time}$	<input type="checkbox"/>	
CODE: 10PW1 First-hand Investigation: $\text{speed} = \text{distance} / \text{time}$ Determine the average speed of a range of activities. e.g. walking, running over different distances. 20m, 50m, 100m	<input type="checkbox"/>	
Define the terms instantaneous and average in relation to speed	<input type="checkbox"/>	
Explain the difference between instantaneous and average speed	<input type="checkbox"/>	
CODE: 10PW2 First-hand Investigation: YouTube video: Usain Bolt 100m and 200m races. Students to determine his average speed. Measure out his distance covered in 1 second. Discuss.	<input type="checkbox"/>	
CODE: 10PW3 First-hand Investigation: Use a ticker timer to qualitatively and quantitatively describe speed (Oxford pg203)	<input type="checkbox"/>	
CODE: 10PW5 First-hand Investigation: Student design task- Balloon car race (Oxford pg207)	<input type="checkbox"/>	
LITERACY SET 1: COSMOS ARTICLE	<input type="checkbox"/>	
Assessment: Oxford online test- Characteristics of motion Students to achieve 100% in Support and Consolidate OR Consolidate and Extend	<input type="checkbox"/>	

FORCE, MASS AND ACCELERATION		
5PW2a. describe qualitatively the relationship between force, mass and acceleration	<input type="checkbox"/>	
5PW2c. relate acceleration qualitatively to a change in speed and/or direction as a result of a net force	<input type="checkbox"/>	
5PW2d. analyse qualitatively everyday situations involving motion in terms of Newton's laws	<input type="checkbox"/>	
Define the terms force, mass, acceleration and inertia	<input type="checkbox"/>	
Identify Newton's three laws of motion	<input type="checkbox"/>	
Newton's First Law	<input type="checkbox"/>	
Describe the law of inertia	<input type="checkbox"/>	
CODE: 10PW6 First-hand Investigation: Investigating inertia I (Oxford pg211)	<input type="checkbox"/>	
Describe real life scenarios that demonstrate the law of inertia	<input type="checkbox"/>	
CODE: 10PW7 First-hand Investigation: Investigating inertia II (Oxford pg212)	<input type="checkbox"/>	
Analyse friction in terms of Newton's first law	<input type="checkbox"/>	
CODE: 10PW8 First hand Investigation: Resultant forces (Oxford pg213)	<input type="checkbox"/>	
Newton's Second Law	<input type="checkbox"/>	
Recall Newton's second law of motion	<input type="checkbox"/>	
Describe real life scenarios that demonstrate Newton's second law ($F=ma$)	<input type="checkbox"/>	
CODE: 10PW9 First-hand investigation: To investigate Newton's second law- $F=ma$	<input type="checkbox"/>	
Solve a range of problems requiring $F=ma$	<input type="checkbox"/>	
CODE: 10PW10 First-hand Investigation: Accelerating masses. Attach fixed mass to weight run over a pulley. Change mass on trolley and use ticker timer to determine acceleration (Oxford pg217)	<input type="checkbox"/>	
Analyse everyday situations in terms of Newton's second law	<input type="checkbox"/>	
Newton's Third Law	<input type="checkbox"/>	
Recall Newton's third Law of motion	<input type="checkbox"/>	
Describe real life scenarios that demonstrate Newton's third law	<input type="checkbox"/>	
CODE: 10PW11 First-hand Investigation: Newton's laws. Balloon experiment using a string and straw.	<input type="checkbox"/>	
Solve a range of problems requiring Newton's third law	<input type="checkbox"/>	
Distinguish between speed and acceleration e.g. 10m/s v's 10m/s/s	<input type="checkbox"/>	
LITERACY SET 2: MIXED ACTIVITIES	<input type="checkbox"/>	
Assessment: Oxford online test- Characteristics of motion Students to achieve 100% in Support and Consolidate OR Consolidate and Extend	<input type="checkbox"/>	

PW4 Energy conservation in a system can be explained by describing energy transfers and transformations (ACSSU190)		
COLLISIONS AND ENERGY TRANSFER		
<i>5PW4a. apply the law of conservation of energy to account for the total energy involved in energy transfers and transformations</i>	<input type="checkbox"/>	
Define the term energy, transfer and conservation	<input type="checkbox"/>	
Recall the Law of Conservation of Energy	<input type="checkbox"/>	
Outline that energy can be transferred between objects	<input type="checkbox"/>	
CODE: 10PW12 First-hand Investigation: Balls in motion (Oxford pg222)	<input type="checkbox"/>	
Define kinetic energy and relate it to mass ($KE = \frac{1}{2} \times m \times v^2$)	<input type="checkbox"/>	
Define gravitational potential energy and relate it to mass and height ($GPE = m \times g \times h$)	<input type="checkbox"/>	
CODE: 10PW13 First-hand Investigation: One Newtown and One Joule (Oxford pg224)	<input type="checkbox"/>	
CODE: 10PW14 First-hand Investigation: Conservation in Action (Oxford pg225)	<input type="checkbox"/>	
<i>5PW4b. describe how, in energy transfers and transformations, a variety of processes can occur so that usable energy is reduced and the system is not 100% efficient</i>	<input type="checkbox"/>	
Define the term efficiency	<input type="checkbox"/>	
Describe how seatbelts, crumple zones and airbags reduce the effect of a collision in terms of 'work' and Newton's laws	<input type="checkbox"/>	
CODE: 10PW15 First-hand investigation: Crash testing (Oxford pg 227)	<input type="checkbox"/>	
Describe specific energy transformations and transfers using sporting examples	<input type="checkbox"/>	
NUMERACY AND SKILLS SET	<input type="checkbox"/>	
Assessment: Oxford online test- Collisions and energy transfer Students to achieve 100% in Support and Consolidate OR Consolidate and Extend	<input type="checkbox"/>	
Assessment: Motion And Energy Chapter Test	<input type="checkbox"/>	
Comments and Suggested improvements		
Date: _____ Signature: _____		