At-a-glance unit content, assessment criteria and guidance

To help you with assignment writing as well as assessing assignments, this table maps the Unit 6 content against the Unit 6 assessment criteria and assessment guidance, taken from the specification. For further advice and help on writing and assessing assignments please contact TeachingScience@pearson.com.

Unit 6 Learning Aim A – Investigate motion

Unit content	Assessment criteria	Assessment guidance
		The following investigations are examples that could be carried out to enable learners to gain evidence to achieve the appropriate assessment criteria: ● investigate vehicle motion ● investigate thrill-seeking experiences, e.g. rollercoaster rides ● investigate objects moving through different liquids or gases ● investigate energy changes affecting transportation and stopping distance. At level 1, learners are expected to carry out simple investigations, the conclusions of which should be clear from direct observations with no processing of data. At level 2, learners are expected to design and carry out more complex investigations that require processing of data before a conclusion can be made.
A.1 Measurement of distance and time in simple investigations.	**1A.2** Measure distance for simple experiments.	For **1A.2**, learners must **measure** distance for simple experiments, along with their units that will be recorded during the investigation.
A.2 Use the equation:	**2A.P2** Calculate speeds and velocity	For **2A.P2**, learners must use measurements from experiments and use the correct formulae and units to **calculate** speed and

distance (m) = speed (m/s) x time (s). **A.3** Use the equation: displacement (m) = velocity (m/s) x time (s). **A.4** Acceleration relates to a change in velocity of an object. **A.5** Use the equation: acceleration (m/s^2) = change in velocity (m/s) / time taken (s). **A.6** Graphical representations of uniform and non-uniform motion (for objects that are stationary, moving at a constant speed, moving with increasing or decreasing speed).	for simple experiments.	velocity.
	1A.1 Produce accurate graphs to represent uniform motion using primary data.	To achieve **1A.1**, learners are expected to **produce graphs** using primary data from simple uniform motion experiments as shown in the content A.6 for uniform motion.
	2A.P1 Produce accurate graphs to represent uniform and non-uniform motion using primary data.	To achieve **2A.P1**, learners are expected to extend the investigation they carried out in 1A.1 and include **graphs** for non-linear/non-uniform motion.
	2A.M1 Interpret graphs to identify objects that are stationary, moving at a constant speed and moving with increasing or decreasing speed.	For **2A.M1**, learners need to be able to **interpret graphs** to enable them to label/identify which objects are stationary, moving at constant speed and moving at an increasing or decreasing speed.
	2A.D1 Calculate the gradient for distance–time graphs and the gradient and area of speed–time graphs.	For **2A.D1**, learners need to use their distance–time and speed–time graphs in order to work out the gradient of any slopes. Additionally speed–time graphs should be used to work out the area under the graph.
A.7 Conservation of energy in simple experiments, including energy transformation diagrams. **A.8** Calculations of kinetic energy of moving objects in simple situations, using the following equation: KE = ½ x mass x $(\text{speed})^2$. **A.9** Calculate change in	**1A.3** Draw energy transformation diagrams for simple experiments.	For **1A.3**, learners need to be able to carry out simple energy conservation experiments and **draw** energy transformation diagrams.
	2A.P3 Describe the conservation of energy for simple experiments, including energy transformation diagrams.	For **2A.P3**, this needs to be extended to **describing** the conservation of energy and applying this to energy transformation diagrams.
	2A.M2 Calculate kinetic energy and changes in gravitational potential energy.	For **2A.M2**, learners need to **calculate** kinetic energy and changes in gravitational potential energy in simple situations using appropriate formulae and units.

gravitational potential energy using the following equation: PE = mass x acceleration due to gravity x change in height. **A.10** Energy changes affecting transportation and stopping distance.	**2A.D2** Explain how changes in energy will affect transportation and stopping distances.	For **2A.D2**, learners must **explain** how changes in energy will affect transportation and stopping distances.

Unit 6 Learning Aim B – Investigate forces

Unit content	Assessment criteria	Assessment guidance
		The following investigations are examples that could be carried out to enable learners to gain evidence to achieve the appropriate assessment criteria: • investigate the use of frictional forces for different road conditions • investigate the safety features of modern cars that involve forces • investigate the effect of unbalanced forces on an accelerating mass.
B.1 Forces arise from an interaction between two objects.	**1B.4** Identify the forces on objects.	To achieve **1B.4,** learners must provide evidence to **identify** at least two examples of balanced and two examples of unbalanced forces on objects.
B.2 The effect of balanced and unbalanced forces on objects.	**2B.P4** Describe the effects of balanced and unbalanced forces on objects.	For **2B.P4**, learners need to extend what they have done in 1B.4 by **describing** the effect on objects of balanced and unbalanced forces.
B.3 Work is done when a force	**1B.5** Describe work done in terms	For **1B.5**, learners need to **describe** the work done by forces

moves through a distance. **B.4** Use the equation: work done (J) = force (N) x distance (m). **B.5** Use the equation: force (N) = mass (kg) x acceleration (m/s^2).	of forces moving through a distance.	acting on objects for at least three different forces through different distances.
	2B.P5 Calculate the work done by forces acting on objects for simple experiments.	For **2B.P5**, learners need to **calculate** the work done by objects for at least three simple experiments, using the appropriate formulae and units.
	2B.M3 Calculate the force on objects, in relation to their mass and acceleration for an application.	To achieve **2B.M3,** learners need to use the equation in B.5 of the content to **calculate** the force on objects, in relation to their mass and acceleration for a real-life application.
B.6 Identify 'pairs' of forces that act on different objects and understand that these forces are equal in size and opposite in direction. **B.7** Applications of compressive and tensile forces. **B.8** Friction and the normal reaction force arise in response to an applied force. The size of the frictional force matches the applied force up to a specific limit. **B.9** Forces on a: a. rocket during various stages of flight b. parachutist c. car during braking and acceleration.	**1B.6** Identify friction forces and situations where they occur.	For 1**B.6,** learners need to **identify** friction forces and situations where they occur. This could be written in the form of a table.
	2B.P6 Describe how friction and normal reaction forces are produced in response to an applied force.	For **2B.P6**, learners can further develop 1B.6 and carry out a friction experiment to demonstrate friction and normal reaction forces in response to an applied force, and then write a **description**.
	2B.M4 Explain how friction and normal reaction forces are produced in response to an applied force.	To achieve **2B.M4**, learners would then need to apply what they have learnt to **explain** how friction and normal reaction forces are produced in response to an applied force.
	2B.D3 Explain the various forces involved, and their approximate sizes, in a variety of applications.	For **2B.D3**, learners need to apply their understanding of forces to a variety of applications by **explaining** the various forces involved, and their approximate sizes as shown, for example, in content B.8 and B.9.

Unit 6 Learning Aim C – Investigate light and sound waves

Unit content	Assessment criteria	Assessment guidance
		The following investigations are examples that could be carried out to enable learners to gain evidence to achieve the appropriate assessment criteria: • investigate the use of light waves with regard to mirrors, lenses and prisms • investigate the use of sound waves with regard to reflection and transmission.
C.1 Light rays to represent light moving in straight lines. **C.2** Laws of reflection, applied to plane mirrors. **C.4** Ray diagrams showing refraction of light in prisms and lenses: a. convex b. concave. **C.5** Total internal reflection in prisms and optic fibres. **C.6** A lens or mirror with a highly curved surface is more	**1C.7** Describe, using diagrams, reflection of light in plane mirrors for simple applications.	To achieve **1C.7**, learners need to **draw** diagrams to show the reflection of light in plane mirrors and demonstrate an understanding of how plane mirrors are used for simple applications.
	2C.P7 Describe, using diagrams, reflection and refraction of light for simple applications.	For **2C.P7**, learners need to extend 1C.7 by using plane mirrors and glass blocks/prisms to show reflection and refraction by drawing ray diagrams and understanding their use for simple applications.
	2C.M5 Describe how lenses and mirrors can affect rays of light.	For **2C.M5**, learners need to **describe** how lenses and mirrors, which are concave and convex, can affect rays of light.
	2C.D4 Explain how reflection and refraction of light can be used in applications.	For **2C.D4**, learners need to apply their knowledge from 2C.M5 to **explain** how reflection and refraction of light can be used as in content C.10 and C.11.

powerful than one with a less curved surface. **C.7** The eye lens focuses light onto the retina and the use of optical lenses to correct simple eye problems. **C.10** Applications of light: a. clear sightlines at road junctions b. plane and convex mirrors as a rear-view mirror c. using lenses and mirrors in telescopes d. how a simple periscope functions. **C.11** Applications of total internal reflection: a. fibre optic cables used to provide a light source for keyhole surgery b. reflectors for road safety.		
C.3 Reflection of sound (echoes). **C.8** The need for a medium for the transmission of sound	**1C.8** Describe how sound is reflected for simple applications.	To achieve **1C.8,** learners need to **describe** how sound is reflected, and how it is used by bats and in simple applications such as echo sounding and on submarines.
	2C.P8 Describe the importance of a medium for the transmission of sound waves through a variety of	For **2C.P8**, learners need to **describe** the transmission of sound waves through a variety of mediums such as air, water and wall partitions, and why the medium is important in simple

waves. **C.9** The propagation of sound waves and the subsequent air pressure changes: a. compression b. rarefaction. **C.12** Applications of sound waves: a. voice recognition b. ultrasound c. sonar d. breaking down kidney stones using ultrasound.	substances for simple applications.	applications.
	2C.M6 Describe the propagation of sound waves, including compression and rarefaction.	For **2C.M6**, learners need to **describe** the propagation of sound waves, including compression and rarefaction.
	2C.D5 Explain how sound waves can be applied in everyday uses.	For **2C.D5**, learners need to apply their knowledge to **explain** how sound waves can be applied in everyday uses, as shown in content C.12.

Unit 6 Learning Aim D – Investigate electricity

Unit content	Assessment criteria	Assessment guidance
		The following investigations are examples that could be carried out to enable learners to gain evidence to achieve the appropriate assessment criteria: ● investigate thermistors ● investigate light-dependent resistors (LDRs) ● investigate parallel and series circuits.
D.1 Electricity:	**1D.9** Describe, using diagrams, how to build series and parallel	To achieve **1D.9**, learners could carry out some simple experiments and draw circuit diagrams to **describe** how to

a. series circuits b. parallel circuits. **D.2** Connect meters in circuits to measure voltages and currents. **D.3** Use the equation: resistance (Ω) = voltage (V) / current (A). **D.4** Ohm's law (voltage, current and resistance relationships at a constant temperature). **D.5** Measure currents and voltages, and perform calculations to find resistance. **D.6** The rules governing voltage and current when components are connected to a battery in series. **D.7** The rules governing voltage and current when components are connected to a battery in parallel.	circuits.	connect electrical series and parallel circuits.
	2D.P9 Measure currents and voltages in series and parallel electric circuits.	For **2D.P9**, learners need to connect meters to **measure** current and voltage of their series and parallel circuits
	2D.M7 Calculate resistances from measured currents and voltages.	For **2D.M7**, learners could use their results from 2D.P9 to **calculate** resistance from measured current and voltage from the series and parallel circuits, using resistance = voltage / current.
	2D.D6 Analyse an everyday life situation in which the resistance of a conducting wire is not constant.	For **2D.D6**, learners could carry out an experiment to explain the limits of Ohm's law, and **analyse** a graph of their results in relation to temperature in an everyday situation (as in a filament bulb).
D.8 Voltage-current characteristics of a negative	**1D.10** Describe the use of a thermistor or LDR for an application.	To achieve **1D.10**, learners need to **describe** the role of a thermistor or LDR for an application.

temperature coefficient (NTC) thermistor or a light-dependent resistor. **D.9** Applications: thermistors (NTC) as a means of sensing temperature, or light-dependent resistors as a means of sensing the brightness of light.	**2D.P10** Investigate an application of thermistors or LDRs using primary data.	For **2D.P10**, learners need to **investigate practically** under guidance an application of thermistors or LDRs to generate data on their effectiveness in a range of conditions.
	2D.M8 Mathematically or graphically process the results of the investigation into thermistors or LDRs to draw conclusions.	For **2D.M8**, learners need to **process** the results of their investigation into thermistors or LDRs to draw conclusions mathematically or graphically, for example to conclude which of a set of LDRs is most appropriate.
	2D.D7 Evaluate the investigation into thermistors or LDRs, suggesting improvements to a real-life application.	For **2D.D7**, learners need to **evaluate** their results from the investigation into thermistors or LDRs and suggest improvements that could be used in a real-life application.