

Rollercoasters – Syllabus

By Louise Lopes

YEAR 7

Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117)

- investigating the effects of applying different forces to familiar objects
- investigating common situations where forces are balanced, such as stationary objects, and unbalanced, such as falling objects
- exploring how gravity affects objects on the surface of Earth

YEAR 8

Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within systems (ACSSU155)

- recognising that kinetic energy is the energy possessed by moving bodies
- recognising that potential energy is stored energy, such as gravitational, chemical and elastic energy
- investigating different forms of energy in terms of the effects they cause, such as gravitational potential causing objects to fall and heat energy transferred between materials that have a different temperature
- recognising that heat energy is often produced as a by-product of energy transfer, such as brakes on a car and light globes
- using flow diagrams to illustrate changes between different forms of energy

YEAR 10

Energy conservation in a system can be explained by describing energy transfers and transformations (ACSSU190)

- recognising that the Law of Conservation of Energy explains that total energy is maintained in energy transfer and transformation
- recognising that in energy transfer and transformation, a variety of processes can occur, so that the usable energy is reduced and the system is not 100% efficient
- comparing energy changes in interactions such as car crashes, pendulums, lifting and dropping
- using models to describe how energy is transferred and transformed within systems

The motion of objects can be described and predicted using the laws of physics (ACSSU229)

- gathering data to analyse everyday motions produced by forces, such as measurements of distance and time, speed, force, mass and acceleration
- recognising that a stationary object, or a moving object with constant motion, has balanced forces acting on it
- using Newton's Second Law to predict how a force affects the movement of an object
- recognising and applying Newton's Third Law to describe the effect of interactions between two objects

Stage	Guidance				
	Demonstrated inquiry	Prescribed inquiry	Structured inquiry	Guided inquiry	Open inquiry
Formulate, question and predict	No question	Provided question	Sharpened question	Learner selects	Learner poses questions
Plan	No planning	Provided procedure	Discussion with teacher	Guided during planning	Learner determines plans
Conduct	Teacher conducts	Conducting and recording method told	Sharpened plan and conduct	Guided during conducting and recording	Learner conducts and records
Process and analyse	Teacher analyses	Analysis method told	Discussed analysis	Guided analysis	Learner analyses data studying trends
Reason, solve and link back	No problem solving	Teacher provides reasoning and links	Discussed reasoning and conclusion	Guided reasoning and formulating conclusion	Learner reasons to formulate conclusions
Communicate and justify	No conclusion	Teacher writes conclusion	Student writes	Guided justification and findings	Learner justifies findings and conclusions