St Bernadette's Catholic Primary Voluntary Academy

Science Medium Term Planning - KS2 Advent Term Cycle B - Thrills Of The Theme Park - Forces and Electricity

MATERIALS	Learning Objective	Activity	Key Knowledge (By the end of the lesson)		Vocabulary (Tier 3)
			Substantive	Disciplinary	
Lesson 1	L.O.28: To be able to explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Explore forces through identifying pictures as pushes or pulls. Draw arrows showing the direction of gravity and resistance forces on diagrams. Write observation statements that support the science behind these diagrams.	• Know forces as pushes and pulls. • Know the different forces acting on objects.		force push pull gravity air resistance water resistance friction
Lesson 2	L.O.28: To be able to explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Explore the force of gravity by dropping a range of objects to the ground. Discuss how Sir Issac Newton developed his theory of gravity. Measure the weight and mass of different objects using a newton meter.	• Know the effect of gravity on unsupported objects. • Know Isaac Newton's role in developing a theory of gravity.	**Enquiry Skill Focus** <u>Observing and measuring</u> • Accurately measure the force of gravity pulling on objects.	gravity force Issac Newton newton newton meter
Lesson 3	L.O.29: To be able to identify the effects of air resistance that act between moving surfaces.	Discuss Galileo's experiment which shows that gravity causes objects of the same size and shape but of different mass to fall at the same rate. Explore the force of air resistance, and how this affects objects falling when on Earth, by conducting an investigation using parachutes.	• Know how air resistance affects moving objects (surface area).	**Enquiry Skill Focus** <u>Setting up tests</u> • Decide on the method and equipment to use to conduct an investigation into the effects of air resistance.	gravity force air resistance Galileo Galilei surface area

Lesson 4	L.O.29: To be able to identify the effects of water resistance that act between moving surfaces.	Discuss experiences of water resistance using images as a stimulus. Explore the force of water resistance by conducting an investigation - testing the speed at which different shapes fall through water.	• Know how water resistance affects moving objects (streamlining).	**Enquiry Skill Focus** <u>Recording data</u> • Use tables, drawings and other means to note observations and measurements of the water resistance investigation.	water resistance force streamline
Lesson 5	L.O.29: To be able to identify the effects of friction that act between moving surfaces.	Discuss statements about friction and decide if they are true or false. Discuss how brakes on a theme park ride use the force of friction. Explore the force of friction by conducting an investigation - testing the best material for a sack on a helter-skelter ride.	• Know the effects of friction created by different materials.	**Enquiry Approach Focus** <u>Comparative/fair testing</u> • Change one variable (material) to see its effect on friction, whilst keeping all other variables the same.	friction force
Lesson 6	L.O.30: To be able to recognise that some mechanisms, including levers, allow a smaller force to have a greater effect.	Make a simplified lever using a ruler, pencil and two coins. Discuss the components of a lever: beam and a fulcrum or pivot. Demonstrate the usefulness of a lever to lift heavy objects by conducting an investigation.	• Know how a lever works.	**Enquiry Skill Focus** <u>Predicting</u> • Predict and measure how far a weight needs to be from the fulcrum in order to make the beam balance.	mechanism lever beam fulcrum
Lesson 7	L.O.30: To be able to recognise that some mechanisms, including pulleys, allow a smaller force to have a greater effect.	Watch a clip of a working pulley. Discuss the components of a pulley: a rope running through a wheel. Demonstrate the usefulness of a pulley to lift heavy objects by conducting an investigation.	• Know how a pulley works.	**Enquiry Skill Focus** <u>Interpreting and communicating results</u> • Compare the relationship between the force needed to lift a load with a pulley and the force needed to lift it without a pulley.	mechanism pulley

Lesson 8	L.O.30: To be able to recognise that some mechanisms, including gears, allow a smaller force to have a greater effect.	Show a gear demonstration board. Discuss the components of a gear: a wheel with raised parts called teeth. Explore the different uses of gears. Look at gear train diagrams and identify the direction and speed of the gears.	• Know how a gear works.		mechanism gear
Lesson 9	L.O.35: To be able to use recognised symbols when representing a simple circuit in a diagram.	Explore the different electrical components that make up electrical circuits. Label parts of a circuit and then convert circuit diagrams using informal pictures into a circuit diagram using scientific circuit symbols.	• Know the scientific symbols for the main parts of a circuit.		bulb battery/cell wires switch motor buzzer
Lesson 10	L.O.30: To be able to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.	Explore different circuit diagrams. Predict how bright the bulbs will be in each circuit and place them in order of brightness. Use simple apparatus to construct the circuits shown in the diagrams - test predictions and explain observations.	• Know the effects of changing the number or voltage of cells used in a circuit.	**Enquiry Skill Focus** <u>Observing and measuring</u> • Use simple apparatus to set up different circuits and observe the brightness of the bulbs.	bulb battery/cell wires switch motor buzzer
Lesson 11	L.O.30: To be able to compare and give reasons for variations in how components function, including the brightness of bulbs,the loudness of buzzers and the on/off position of switches.	Outline different types of scientific enquiries that can be chosen to investigate. Select a type of enquiry - plan and undertake an investigation.	• Know variations in how components function.	**Enquiry Skill Focus** <u>Ask questions</u> • Ask questions that can be answered using a scientific enquiry, e.g. Does wire length affect how components in a circuit work?	bulb battery/cell wires switch motor buzzer
Lesson 12	End of Unit Assessment				