Our Intent is: To develop inquisitive children who are excited about investigating with curiosity, "How can scientific enquiry explain the world?" Exploring answers by gathering and analysing evidence.

Forton Primary School
Science

Pendle Class
Summer 1 & 2
Year A

Etymology: Friction - the resistance that one surface or object encounters when moving over another.

Key Concept: Forces

Key Question: How do things move?

Physics for Curious Kids
By Laura Baker and Alex Foster

Unit Overview

Gravity, air resistance, water resistance and friction.

N.C. LINKS:

Forces Pupils should be taught to:

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Vocabulary:

Our Intent is: To develop inquisitive children who are excited about investigating with curiosity, "How can scientific enquiry explain the world?" Exploring answers by gathering and analysing evidence.

	Subject Specific: Gravity Forces Earth's gravitational pull Friction Weight Mass Air resistance Water resistance	Working Scientifically: Plan Variables Measurements Accuracy Precision Repeat reading Labels Classification Scatter Key graphs Predictions Bar graphs Line graphs Patterns Quantitative Interpret Measurements Systematic
New Knowledge Progression: • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction that act between moving surfaces (causing things to slow down) • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • There are different types of forces (push, pull, friction, air resistance, water resistance, magnetic	Building on Prior learning when B follow A: • Compare how some things move on different surfaces. • Notice that some forces need contact between two objects but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	

Our Intent is: To develop inquisitive children who are excited about investigating with curiosity, "How can scientific enquiry explain the world?" Exploring answers by gathering and analysing evidence.

forces, gravity) which have different effects on objects • Gravity can act without direct contact between the Earth and an object. • Friction, air resistance and water resistance can be useful or unwanted. • The effects of friction, air resistance and water resistance can be reduced or increased for a preferred effect. • More than one force can act on an object simultaneously (either reinforcing or opposing each other).	• Describe magnets as having two poles (like and unlike poles). • Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Key Skills (Disciplinary)

- Use secondary sources of information to identify and classify.
- Recognise scientific questions that do not yet have definitive answers .
- Articulate and explain findings from their research using scientific knowledge and understanding.
- Make decisions about which information to use from a wide range of sources.
- Support, listen to and acknowledge others in the group *e.g. Yes. I prefer that one too.*
- Check the clarity of each other's suggestions *e.g. are you saying you think this one is a herbivore?*
- Build on / add to someone else's idea to improve a plan or suggestion.
  Understand that it is okay to disagree with their peers and offer a reasons for their opinion.
- Use correct scientific knowledge and understanding and relevant scientific language to discuss their observations and explorations).

Our Intent is: To develop inquisitive children who are excited about investigating with curiosity, "How can scientific enquiry explain the world?" Exploring answers by gathering and analysing evidence.

- Identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the world.
- Use classification systems, keys and other information records [databases] to help classify or identify things.
- Recognise scientific questions that do not yet have definitive answers.
  i.e. ask a testable question which includes the change and measure variables, *e.g. what would happen to…if we changed…?*
  e.g. What effect would we have on … if we…?
  e.g. How would exercise affect the pulse rate?
- Independently ask a variety of scientific questions and decide the type of enquiry needed to answer them.
- Research how scientific ideas have developed over time and had an impact on our lives.

Sequence of Lessons:

1. To identify forces acting on objects.
2. To explore the effect gravity has on objects.
3. To investigate the effects of air resistance.
4. To investigate the effects of water resistance.
5. To investigate the effects of friction.
6. To explore and design a mechanism.

Enhancements:

Lancaster University – physics visit.

End of Unit Outcome:

Our Intent is: To develop inquisitive children who are excited about investigating with curiosity, "How can scientific enquiry explain the world?" Exploring answers by gathering and analysing evidence.

RAF/Stem training – in school. Paper helicopter investigation.	Repeat of lesson 6 but with the focus of paper helicopters – full investigation write up.
Oral Assessments: How do forces act on objects? What is the effect of gravity on objects? What are the effects of air resistance? What are the effects of water resistance? What are the effects of friction?	