



**Knowledge**

Why do objects fall towards the centre of the Earth?	<p><b>Identifying and classifying</b></p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p>
Does the weight of an object impact on the gravitational force?	<p><b>Comparative Testing</b></p> <p>Consider what weight is and how the impact caused by falling objects can vary depending on their size, shape, mass and the height they fall from.</p> <p>Look at how a feather, for example, falls in comparison to a pencil. Does the height impact how it falls? Does the weight impact the speed?</p>
What are the effects of friction acting between moving surfaces?	<p><b>Comparative Testing</b></p> <p>Learn about what friction is and some ways in which it can be measured. Identify instances of high and low friction and conduct friction investigations comparing surfaces and the friction created.</p>
How does air resistance work on moving objects?	<p><b>Pattern Seeking</b></p> <p>Conduct an investigation showing how air resistance affects moving objects . Look at the parachute investigation and compare against an aeroplane flying. What observations do they notice?</p>
Why are the Wright brothers significant?	<p><b>Research</b></p> <p>Gather information about the first aeroplane and the wright brothers.</p>
How has our understanding of air resistance evolved over time?	<p><b>Pattern Seeking/ Ideas over Time</b></p> <p>Notice the differences between the first aeroplanes and modern planes. Consider the impact air resistance has and how planes have become quicker.</p>
What is water resistance?	<p><b>Pattern Seeking</b></p> <p>Notice what happens when objects move through water. Learn about water resistance and how it can slow a moving object through water. Investigate water resistance and record the patterns between the force and the object's movement.</p>
How was the titanic effected by forces?	<p><b>Research</b></p> <p>Research the implications and causes of forces and speed had on titanic and the reasons why it sank. Consider why water resistance didn't slow the ship down quick enough. Write a report.</p>
What impact do levers and pulleys have when a small force is applied: is it a greater effect or smaller effect?	<p><b>Identifying and classifying</b></p> <p>Learn how simple machines can make it easier to move objects using levers and pulleys. Understand the difference between the two and make models to test and find out how they allow a smaller force to have a greater effect. They may need to make improvements to their models and explain why they have needed to change parts of their model.</p>
Do gears allow a smaller force to have a greater effect?	<p><b>Research</b></p> <p>Gather information about gears and how they work together in transmissions. Look at a variety of transmission. Make models from the research to explore in greater depth about how gears work and discuss whether they are like pulleys and levers and when a small force is applied they have a greater effect.</p>



# Vocabulary

<b>Force</b>	A push or pull
<b>Gravity</b>	A force that pulls objects towards the centre of the Earth
<b>Friction</b>	A force caused by two surfaces touching each other
<b>Air Resistance</b>	A kind of friction that slows objects down when they travel through air
<b>Water Resistance</b>	A kind of friction that slows objects down when they travel through water
<b>Buoyancy</b>	An object's ability to float
<b>Up thrust</b>	A force that pushes objects in water or air
<b>Streamline</b>	To shape an object in a way that reduces the effect of air resistance or water resistance

## Hurst Hill Primary School Knowledge Organiser

Science

**Forces**

Year 5

Spring

**Physics**

Physics is the science that understands the nature and properties of energy and matter.

### 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