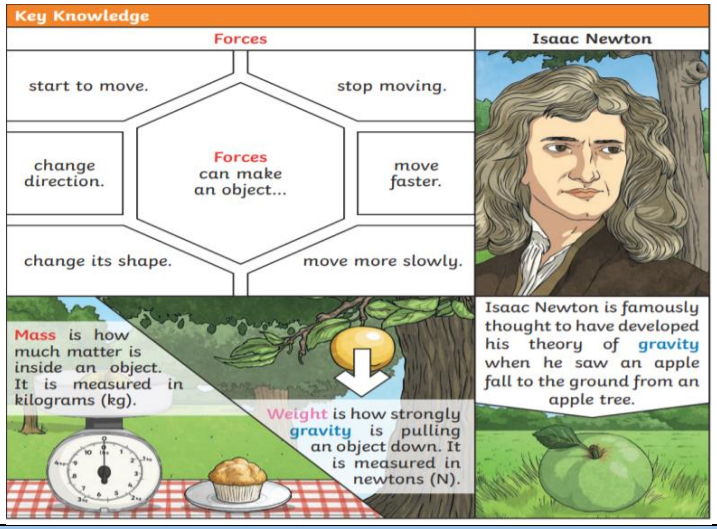
Learning together. Respecting each other. Achieving our potential.

Knowledge Organiser

Year Group	Subject	Topic
5	Science	Forces- Let's get moving

The Big Picture

In this topic children learn about forces and machines. Starting with the force of gravity, they then study friction forces, including air and water resistance, before investigating how simple machines work.



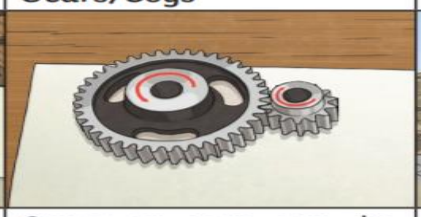
Enquiry Questions

What is gravity?
What would happen if there no gravity?
What would happen if the force of gravity on Earth was bigger?
What's the best way to do a fair test?
How might you make the test as accurate as possible?
What happens if some of the results don't look sensible?
What is meant by a machine?
Does a machine have to be complicated?
How do machines work?Give examples.
How do machines differ?

Key Knowledge

Examples of forces in action:

Water resistance and air resistance are forms of friction. Friction is sometimes helpful and sometimes unhelpful. For example, air resistance is helpful as it stops the skydiver hitting the ground at high speed. Friction on a bike chain can make the bike harder to pedal so it is unhelpful.

Pulleys	Gears/Cogs	Levers
		
Pulleys can be used to make a small force lift a lighter load. The more wheels in a pulley, the less force is needed to lift a weight.	Gears or cogs can be used to change the speed, force or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.	Levers can be used to make a small force lift a lighter load. A lever always rests on a pivot.

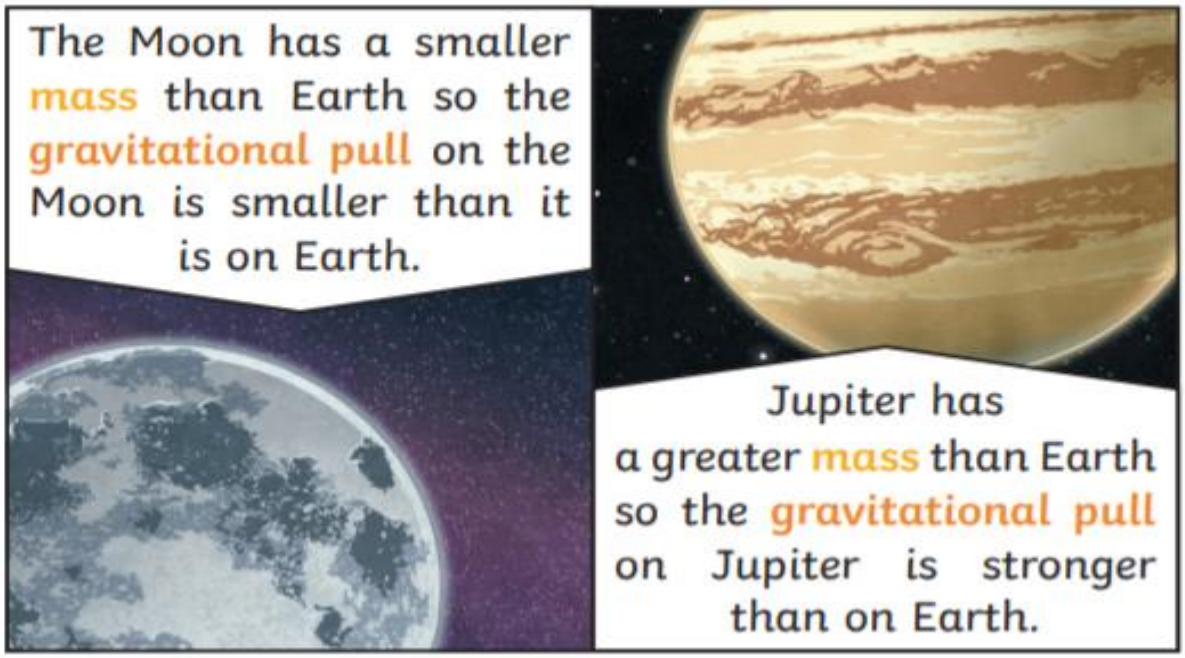
Key Vocabulary

Gravity: the natural force of attraction exerted by a celestial body.
Weight: the force with which something is attracted to the Earth.
Newton: the unit of force.
Friction: the force made when two objects rub against each other.
Air resistance: the resistance of air to forward movement.
Water resistance: the resistance of water to forward movement.
Lever: a rigid bar that transmits force and motion.
Spring: a coil of wires that can transmit a force and motion.
Gear: a toothed wheel that fits into another gear to transmit motion.
Pulley: a mounted rotating wheel with a grooved rim over which a chain or string can move to change the direction of a pulling force.

Objectives.

To explain some of the effects of gravity.
To plan, carry out and explain fair tests.
To observe a variety of forces that slow things down.
To set up, carry out and make sense of a variety of investigations.
To be able to explain how levers, pulleys, springs and gears transfer force and motion.
To design and make machines that use levers, pulleys, springs and gears.

Thinking Scientifically

Did you know?

Albert Einstein didn't believe that gravity was a force at all. He believed that gravity was a distortion of space and time.
Modern submarines have a teardrop-shaped hull, which is the best shape to help them reduce water resistance.
The ancient Greeks, Egyptians, Indians and Chinese all used simple machines to build marvellous structures like the pyramids and the Great Wall of China.
Some racing bikes can have as many as 27 or 33 speed gears.
Rube Goldberg's cartoons are actually mocking modern society's dependence on complex technology.