Theale Primary School

Science

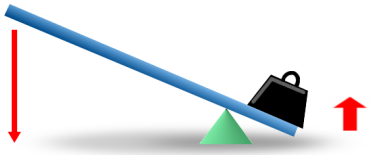
Topic: Forces

Year: 5

Key Knowledge	
What do forces acting on an object do?	A net **force** acting on an **object** causes the **object** to change its shape or size, to start or stop moving, to get faster, slow down, or change direction. If forces are balanced (the same in all directions), no change in motion will be observed. This is called equilibrium.
Why do objects fall to the ground?	**Gravity** is the force acting between the **Earth** and all **objects**. Gravity pulls **objects** to the **ground**.
What is friction? 	**Friction** is a force between two surfaces that are sliding, or trying to slide, across each other. **Friction** always slows a moving object down. The amount of **friction** depends on the materials from which the two surfaces are made. The rougher the surfaces, the more **friction** is produced.
What are air and water resistance? What effect do they have?	**Air resistance** is the frictional force **air** exerts against a moving object. As an object moves, **air resistance** slows it down. The faster an object's motion, the greater the **air resistance** exerted against it. **Water (or liquid) resistance** is a force that tries to slow things down that are moving through **water**. It is a type of friction and is sometimes called drag.
What is a lever?	A **lever** is simply a plank or rigid beam that is free to pivot on a **fulcrum**. It is perfect for lifting or moving heavy things. It is a very useful simple machine, and you can find them everywhere. By adjusting the distance between the load and the fulcrum, the amount of force required to lift an object can be reduced.
How can a pulley help?	A **pulley** is a simple machine and comprises of a wheel on a fixed axle, with a groove along the edges to guide a rope or cable. When **pulleys** are used together, they reduce the amount of force needed to lift a load. A crane uses **pulleys** to help it lift heavy loads.

Investigate
Measure and compare the masses and weights of a range of objects. Which falls faster, a heavy object or a light object? Investigate air and liquid resistance. Make a simple mechanism to help you lift a load. How can you slow down a moving object? Design a parachute.

Diagram – Air Resistance		
Air resistance acts against gravity to slow a parachute down.		Air resistance pushes upwards Gravity pulls downwards

Diagram – Levers		
Small downward input force		Large upward output force

Key Vocabulary	
air resistance	**Air resistance** is the frictional force **air** exerts against a moving object.
drag	**Drag** (also called resistance) is a force which tends to slow the movement of an object through a liquid or gas. As a moving object pushes the liquid or gas out of its way, the fluid pushes back on the object. **Drag** can affect the speed of a moving object.
force	A **force** is a push or pull on an object. A **force** can cause an object to start moving, stop moving, speed up (accelerate), slow down (decelerate), remain in place, or change shape.
friction	**Friction** is the resistance of motion when one object rubs against another.
gear	A **gear** is a simple machine consisting of wheels with teeth that interlock. Gears are used to transmit a force from one place to another, to change the size or direction of a force or to change the speed or direction of rotation.
gravity	A **force** which tries to pull two objects towards each other. **Gravity** causes objects to fall to Earth.
lever	A **lever** is a stiff bar that rests on a support called a fulcrum, used to lift or moves heavy loads.
machine	A device which alters the size of direction of a force on an object, making it easier to move.
mass	The **mass** of an object is the amount of matter it contains. The **mass** of an object doesn't change when the object is moved from place to place.
pulley	A **pulley** is a simple machine using a grooved wheel and rope to raise, lower or move a load.
water resistance	**Water resistance** is a force that tries to slow things down that are moving through **water.**
weight	The **weight** of an object is the force it experiences due to gravity. It depends on the **mass** of the object and the mass of the planet it is measured on. It is bigger on Earth than on the Moon because the Moon has a lower mass.