

In this unit: Pupils will learn about different forces and their impact on objects. They will explore the work of a local physicist e.g. Joseph Bramah, and consider how forces impacted on his work.

Children should already know:

- that forces are pushes and pulls that change the motion of an object.
- that forces will make an object speed up, slow down or even stop.
- that forces act in opposite directions to each other.
- that friction acts to slow down an object when it moves across a surface.
- that some surfaces create more friction than others.
- that gravity acts to make objects move down towards the Earth.
- that magnets create a force which act upon certain materials.
- that the ends of magnets are called poles.
- that opposite poles attract and similar poles repel.

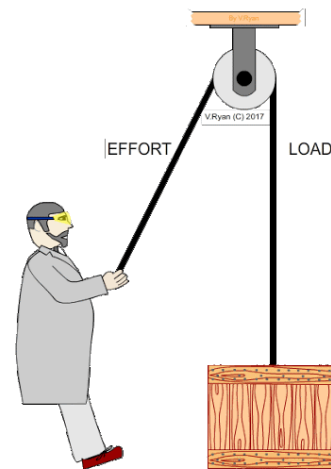
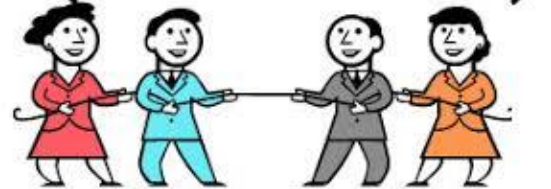
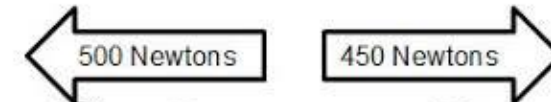
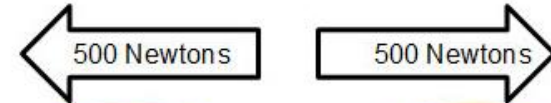
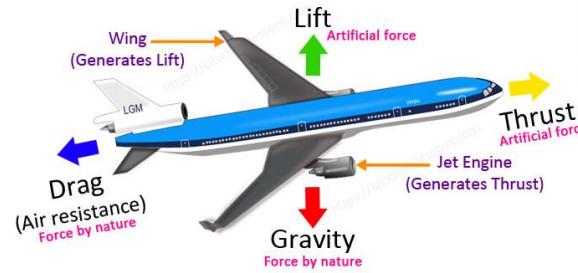
At the end of this unit, children will know:

- that objects which are unsupported will fall towards the Earth.
- that gravity is force which gives weight to objects.
- the moon and other planets have different gravitational pulls to earth.
- that forces can make an object move faster, slow down, change direction, change shape or stop.
- that water resistance and air resistance are forms of friction.
- that pulleys can be used to make a small force lift a heavier load.
- that gears and cogs can be used to change the speed, force and direction of a motion.
- that levers can be used to make a small force lift a heavy load.
- that forces are measured using newtons.

Pupils could investigate:

- how gravity changes on different planets and how that would affect our weight.
- the effect of air resistance, water resistance or friction on a moving object.
- the effect of cogs, levers and pulleys in moving heavy objects.

Forces acting on an Aeroplane



Key Vocabulary

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| balanced force | when all the forces acting upon an object are equal |
| drive force | a force created by an object in the same direction of that it is moving |
| gears | a wheel with teeth that works with others to alter the speed of the force which creates the movement |
| gravitational pull | the strength of the pull made by gravity |
| gravity | the forces that attracts, pulls, something towards the centre of the Earth |
| levers | a rigid bar resting on a pivot that is used to move a heavy object |
| mass | how heavy an object is |
| mechanism | a system of parts working together in a machine |
| newtons | a unit of measure used when measuring the power of forces |
| pulley | a wheel with a grooved rim which changes the direction a force is applied to a cord or rope |
| resistance | a force which acts in the opposite direction which the object is moving |
| thrust | the force of a jet or rocket engine to move it forward |
| unbalanced force | when all the forces acting upon an object are not equal |
| unsupported | not held in place |
| weight | the mass or amount of matter |

Key Questions:

- what is [force]?
- how are forces measured?
- what effect will friction have on a moving vehicle?
- what is a balanced force?
- what are newtons and what do they tell us?
- how can an heavy object be easily lifted?