

## Key idea: Forces

## Possible applications and activities related to new NC

### Yr 6

Air resistance and water resistance are forces against motion caused by objects having to move air and water out of the way

Friction is a force against motion caused by two surfaces rubbing against each other

Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.

- Children should use the idea of gravity (teach gravity (see Earth and Space) before this topic) to explain why objects fall towards the Earth and explore falling objects, raising questions about the effects of air resistance. Children might explore how the ideas of Galileo and Newton helped to develop our ideas about gravity and air resistance.
- Children should explore the effects of friction on movement and find out how it slows or stops moving objects. Children should be encouraged to picture what is happening at the point of contact between two surfaces moving past each other.
- Children should explore how the use of levers, pulleys and simple machines can appear to make movement easier.
- Children should explore the behaviour and uses of springs and elastic materials, for example in catapults.

### Yr 4

Magnets exert attractive and repulsive forces on each other

Magnets exert **non-contact** forces, which work through some materials

Magnets exert attractive forces on some materials

Magnetic forces are affected by:

- Magnet strength
- Object mass
- Distance from object
- Object material

Children should be given opportunities to explore the way magnets interact with a range of different materials and each other. At this stage, children should begin to appreciate that magnetism can 'pull' objects without touching them. Similarly, magnets can 'push or pull' each other without being in contact.

(The effects of pushes and pulls can also be explored through work on the skeleton and movement in animals. Muscles contract pulling bones; bigger muscles exert bigger forces requiring stronger bones to support them)

### Yr 2

Pushing and pulling can make things move faster or slower

Larger masses take bigger pushes and pulls to move or stop them

Bigger pushes and pulls have bigger effects

Pushing and pulling can make things move or stop

Things can move in different ways

Pushing and pulling can change the shape of things

**Effects of pushing and pulling**

**Investigating magnets**

**Contact forces, increasing abstraction**

Provide children with a variety of experiences with moving objects such as toys – inside and outside – balls and hoops in PE. They might investigate questions like:

How can I make my paper boat move?

How can we get the hoop to roll further?

How can we get a ball to bounce higher?

Is it always true that a steeper slope makes the toy car go further/faster?

Making different mass object move, e.g. blowing different balls in a race, which fruit can you throw the furthest