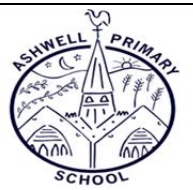
Ashwell Primary School
Science Curriculum
Forces Knowledge Organiser



EYFS

Core Knowledge / skills to be acquired:	Key Vocabulary:
▪ observe and describe movements they and objects make	Push, pull, twist, squash, stretch

Curriculum Enrichment / Cultural Capital Opportunities

Prior knowledge / skills this builds on:

What comes next: (Year 3 – Forces & Magnets)

- recognise that pushes and pulls are forces
- recognise that a force acts in a particular direction
- observe the movements, shape and direction of objects when forces act on them
- describe how to make a familiar object start moving by pushing or pulling
- describe how to use pushes and pulls to make familiar objects speed up, slow down, change direction or shape
- produce annotated drawings showing the direction of force needed to make an object move
- identify friction as a force
- observe and explore how friction affects the movement of objects
- describe some ways in which friction between solid surfaces can be increased or decreased
- **compare how things move on different surfaces**
- **observe how magnets attract or repel each other, attract some materials and not others**
- classify materials as magnetic or non-magnetic
- **compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials**
- describe the difference between a magnet and a magnetic material
- **notice that some forces need contact between two objects, but magnetic forces can act at a distance**
- describe what happens when some materials are put near a magnet
- recall that magnets have a north and a south pole
- **describe magnets as having two poles**
- describe the direction of forces between magnets
- **predict whether two magnets will attract or repel each other, depending on which poles are facing**
- *describe some everyday uses of magnets*
- *explain that a compass works by lining up with the Earth's magnetic field*
- *describe how lodestone was found to be a naturally occurring magnet and was used as the first compass for navigation*

Year 3 – Forces & Magnets

Core Knowledge / skills to be acquired:

- recognise that pushes and pulls are forces
- recognise that a force acts in a particular direction
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- identify friction as a force
- observe and explore how friction affects the movement of objects
- describe some ways in which friction between solid surfaces can be increased or decreased
- **compare how things move on different surfaces**
- **observe how magnets attract or repel each other and attract some materials and not others**
- classify materials as magnetic or non-magnetic
- **compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials**
- describe the difference between a magnet and a magnetic material
- **notice that some forces need contact between two objects, but magnetic forces can act at a distance**
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- *describe how lodestone was found to be a naturally occurring magnet and was used as the first compass for navigation*

Key Vocabulary:

Force, push, pull, speed up, slow down, change shape, change direction, movement, direction, friction, magnets, magnetic, surface, magnetism, north pole, south pole, repel, attract,

Curriculum Enrichment / Cultural Capital Opportunities

Prior knowledge / skills this builds on: (EYFS)

- observe and describe movements they and objects make

What comes next: (Year 5 – Forces)

- identify weight as a force
- identify that force is measured in Newtons
- name simple forces such as gravity, friction and air resistance
- recognise that more than one force can act on an object
- draw force diagrams with arrows showing the direction of forces acting on

	an object ▪ observe and explore the effect of several forces on objects ▪ recognise that air resistance slows things down ▪ recognise that friction can be useful or not useful ▪ **identify the effects of air resistance, water resistance and friction, that act between moving surfaces** ▪ describe some situations in which there is more than once force acting on an object ▪ describe and explain the motion of some familiar objects in terms of several forces acting on them ▪ identify forces on an object as either balanced or unbalanced ▪ use the terms 'balanced' and unbalanced' when describing several forces on an object ▪ explain that balanced forces on an object cause it to remain stationary or travel at the same speed ▪ explain that unbalanced forces on an object cause it to speed up, change shape or slow down ▪ **explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object** ▪ understand that air resistance is the frictional force of air on objects moving through it ▪ describe some of the factors that increase friction between solid surfaces and increase air and water resistance ▪ describe situations in which frictional forces are helpful as well as those in which frictional forces are unhelpful ▪ *compare the tread on bicycle tyres according to how much friction they need* ▪ *identify streamlined objects and describe why they have been designed in this way (e.g. cycling helmets, formula 1 cars, dolphins)* ▪ explore the effects of levers, pulleys and gears ▪ **recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect** ▪ *describe how levers, pulleys and gears are used in everyday life (e.g. describe how having gears can make it easier to pedal a bike, how a bottle opener makes it easier to open a bottle lid)* ▪ *explain how introducing gears onto bikes has changed cycling*

Year 5 – Forces

Core Knowledge / skills to be acquired:

- identify weight as a force
- identify that force is measured in Newtons
- name simple forces such as gravity, friction and air resistance
- recognise that more than one force can act on an object
- draw force diagrams with arrows showing the direction of forces acting on an object
- observe and explore the effect of several forces on objects
- recognise that air resistance slows things down
- recognise that friction can be useful or not useful
- **identify the effects of air resistance, water resistance and friction, that act between moving surfaces**
- describe some situations in which there is more than once force acting on an object
- describe and explain the motion of some familiar objects in terms of several forces acting on them
- identify forces on an object as either balanced or unbalanced
- use the terms 'balanced' and unbalanced' when describing several forces on an object
- explain that balanced forces on an object cause it to remain stationary or travel at the same speed
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- **explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object**
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- describe situations in which frictional forces are helpful as well as those in which frictional forces are unhelpful
- *compare the tread on bicycle tyres according to how much friction they need*
- *identify streamlined objects and describe why they have been designed in this way (e.g. cycling helmets, formula 1 cars, dolphins)*
- explore the effects of levers, pulleys and gears
- **recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect**
- *describe how levers, pulleys and gears are used in everyday life (e.g. describe how having gears can make it easier to pedal a bike, how a bottle opener makes it easier to open a bottle lid)*
- *explain how introducing gears onto bikes has changed cycling*

Key Vocabulary:

force, air resistance, water resistance, magnetic attraction, gravitational attraction, direction, force, motion, weight, upthrust, Newton, forcemeter, stationary, surface area, force applied, pulley, lever, gear

Curriculum Enrichment / Cultural Capital Opportunities

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- describe how to use pushes and pulls to make familiar objects speed up, slow down, change direction or shape

What comes next:

▪ produce annotated drawings showing the direction of force needed to make an object move ▪ identify friction as a force ▪ observe and explore how friction affects the movement of objects ▪ describe some ways in which friction between solid surfaces can be increased or decreased ▪ **compare how things move on different surfaces** ▪ **observe how magnets attract or repel each other and attract some materials and not others** ▪ classify materials as magnetic or non-magnetic ▪ **compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials** ▪ describe the difference between a magnet and a magnetic material ▪ **notice that some forces need contact between two objects, but magnetic forces can act at a distance** ▪ describe what happens when some materials are put near a magnet ▪ recall that magnets have a north and a south pole ▪ **describe magnets as having two poles** ▪ describe the direction of forces between magnets ▪ **predict whether two magnets will attract or repel each other, depending on which poles are facing** ▪ *describe some everyday uses of magnets* ▪ *explain that a compass works by lining up with the Earth's magnetic field* ▪ *describe how lodestone was found to be a naturally occurring magnet and was used as the first compass for navigation*	