Progression in Science at Welwyn St Mary's Primary School

Forces

	Expectations	Key words
EYFS	• observe and describe movements they and objects make	Push, pull, twist, squash, stretch
Y3 Forces and 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 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*	Force, push, pull, speed up, slow down, change shape, change direction, movement, direction, friction, magnets, magnetic, surface, magnetism, north pole, south pole, repel, attract,

	• *describe how lodestone was found to be a naturally occurring magnet and was used as the first compass for navigation*	

Y5 Earth and Space Forces	• identify and name the components of the solar system (i.e. Sun, Moon, Earth and other planets) • locate the Sun, Earth and other planets in the solar system • recognise that the Earth and other planets orbit the Sun • recall that the Earth takes one year to orbit the Sun • recall that the Earth rotates on its' axis and this takes one day • **describe the movement of the Earth, and other planets, relative to the Sun in the solar system** • *use simple physical models to explain effects that are caused by the movement of the Earth* • recognise that the Moon orbits the Earth • *explain that gravity is a force of attraction and it is what holds the planets in orbit around the Sun and the Moon in orbit around the Earth* • **describe the movement of the Moon relative to the Earth** • *explain that the changes in the appearance of the Moon over a period of 28 days arise from the Moon orbiting the Earth once every 28 days* • **describe the Sun, Earth and Moon as approximately spherical bodies** • recognise that the Earth, Sun and Moon are spherical and support this with some evidence • recognise that it is daylight in the part of the Earth facing the Sun • recall that a shadow from the Sun changes over the course of a day • explore and describe how a shadow from the Sun changes over the course of a day • explain in terms of the rotation of the Earth why shadows change and the Sun appears to move across the sky during the course of the day • **use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky** • explain why it is night time in Australia when it is day time in England • *explain how ideas about the solar system have changed over time*	Earth, Sun, planet, Mercury, Venus, Mars, Jupiter, Moon, Saturn, Uranus, Neptune, solar system, spherical, moon, day and night, celestial body, rotation, hemisphere, orbit, gravity, shadow, daylight force, air resistance, water resistance, magnetic attraction, gravitational

	• 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*	attraction, direction, force, motion, weight, upthrust, Newton, forcemeter, stationary, surface area, force applied, pulley, lever, gear

	• *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*	