



St Felix RC Primary School- Progression Map



Physics – Study of Forces, Energy and Matter

<p><u>Understanding of the World: Science</u></p> <p style="text-align: center;"><u>Age 3/4</u></p> <ul style="list-style-type: none"> • Talk about what they see, using a wide vocabulary. • Explore how things work. • Explore and talk about different forces they can feel. <p style="text-align: center;"><u>Reception</u></p> <ul style="list-style-type: none"> • Understand some important processes and changes in the natural world around them, including the seasons. 	<p><u>KS1 National Curriculum Statement:</u></p> <p style="text-align: center;"><u>Year 1</u></p> <ul style="list-style-type: none"> • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and day length varies. <p style="text-align: center;"><u>Year2</u></p> <ul style="list-style-type: none"> • Find out how the shapes of solids made from some materials can be changed by squashing, bending, twisting and stretching. 	<p><u>KS2 National Curriculum Statement:</u></p> <p style="text-align: center;"><u>Year 3</u></p> <ul style="list-style-type: none"> • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find ways in which the size of the shadow changes. • Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • 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 magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing. <p style="text-align: center;"><u>Year 4</u></p> <ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise that sounds get fainter as the distance from the sound source increases. • Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
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- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators, and associate metals with being good conductors.

Year 5

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Describe the movement of the Moon relative to the Earth
- Describe the Sun, Earth and Moon as approximately spherical bodies
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Year 6

- Recognise that light appears to travel in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Use recognised symbols when representing a simple circuit in a diagram.

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<i>Forces</i>	<p>Journeys They will encounter planes, trains, bicycles, rockets and even hot air balloons when they think about how people can travel on journeys. They will learn that some people take journeys across water and that special kinds of transport are used for these journeys. Floating and sinking.</p>	<p>Transport- past and present Forces: push, pull, twist Air transport Water transport Transport in the winter; snow ploughs, gritting roads, snow tyres.</p>	<p>Materials and Magnets Classification of materials, magnets, magnetic attraction.</p>		<p>Forces and Magnets Forces, friction, magnets, magnetic poles, magnetic fields, law of magnetic attraction, compasses.</p>		<p>Forces Gravity, friction, air resistance, water resistance, pulleys, gears and levers.</p>	
<i>Energy</i>				<p>Electricity Circuits, conductive and non-conductive materials, safety rules.</p>	<p>Light How light travels, shadows, transparent and opaque objects, reflection, mirrors: plane, concave, convex, how shadows change throughout the day</p>	<p>Electricity Electric current, circuits, switches, conductors and insulators Sound How sound is created, how sound travels, sound waves, speed of sound, pitch, intensity, the human voice, hearing, the human ear.</p>		<p>Electricity Brightness, buzzers, voltage, switches, simple circuits and symbols Light How light travels, Our eyes, light sources, shadows, periscopes</p>

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Matter	<p>Seasons of the year Temperatures getting colder as winter approaches.</p> <p>Journeys Look at some recent memorable journeys, e.g, Perseverance landing on Mars.</p> <p>Heroes and Adventures Boats in water – explore floating and sinking. How many pennies can my boat hold? Contrasting landscapes; what does a lunar landscape look like? What might we see if we walked on the moon?</p>	<p>Seasons of the year: Spring. The first signs of spring; lighter evenings.</p> <p>Space Our planet Earth, land and sea, plants and animals, weather, gravity. The moon, the sun, the planets in our solar system, space travel, astronauts.</p>	<p>Seasons and Weather The four seasons, tools to record the weather, daily weather and weather forecasts, weather symbols, weather around the world, floods and hurricanes.</p>	<p>Astronomy Our solar system, orbit and rotation, sun, moon, planets, stars, constellations.</p>			<p>Astronomy The Big Bang theory, gravity, the Universe, our Solar System, the moon and our galactic neighbourhood</p> <p>Meteorology Weather and climate, the atmosphere, the Ozone layer, air movement and wind direction, cold and warm fronts, thunder and lightning.</p>	
END POINTS	<p>Journeys Children will think about journeys to the coldest places on earth. They will learn that the North Pole and the South Pole are very</p>	<p>Children will learn about toy vehicles and explore how they move.</p>	<p>Materials and Magnets</p> <ul style="list-style-type: none"> • Objects around us are made from types of materials. • Some everyday materials that objects are made from include wood, 	<p>Electricity</p> <ul style="list-style-type: none"> • Identify things that use electricity • A battery is a store of electrical energy • Electricity is energy that we 	<p>Forces and Magnets</p> <ul style="list-style-type: none"> • A force is a push or a pull. • Gravity is a force that makes objects fall to the ground. 	<p>Electricity</p> <ul style="list-style-type: none"> • Electricity can be very dangerous. • We can use electricity safely by not putting fingers in plug sockets, not using electrical items 	<p>Astronomy</p> <ul style="list-style-type: none"> • Astronomers believe the universe started with the Big Bang 14 billion years ago and that the universe is still expanding today 	<p>Electricity</p> <ul style="list-style-type: none"> • Electricity can flow from one place to another - this is called electrical current • We can control the flow of

	<p>cold and travelling there is very difficult. <i>Heroes and Adventures</i> Some objects float and some sink.</p>	<p>They will learn about our sun and how it warms our planet, how gravity keeps us from falling off the ground, about people who study the stars including Galileo and Caroline Herschel, about astronauts including Mae Jaimeson, about the International Space Station and the planets in our solar system. They will look at stars and constellations, the Apollo 11 mission to the moon and the Mars 2020 mission that has put a rover on the red planet. The content of</p>	<p>plastic, glass and metal.</p> <ul style="list-style-type: none"> • Each material can be used to make many different things, for example plastic can be made into cups, plates, toys, chairs. • Properties of materials are things we can measure, see or feel. • Materials have different properties that make them useful for different tasks. • Some materials will be better suited to certain purposes than others. • Certain materials are attracted to magnets. • We cannot see the force of magnetism. <p>Seasons and Weather</p> <ul style="list-style-type: none"> • We have four seasons; spring, summer, autumn and winter 	<p>store and use to make things work</p> <ul style="list-style-type: none"> • Electricity can be dangerous • An electrical circuit is a loop that allows electricity to travel around it • An electrical circuit must have wires and a battery • If a circuit is broken, electricity will not be able to flow around it • Materials that allow electricity to pass through them are conductors • Materials that do not allow electricity to pass through them are insulators • Many, but not all, metals conduct electricity 	<ul style="list-style-type: none"> • The effect of a force is to make something move, or change speed, direction or shape. • We can change the amount of force we use when we push and pull things. • Friction is the force between two surfaces. • Rough surfaces create greater friction. • Smooth surfaces create less friction. • Magnetic force is an invisible push or pull force. • When a magnet pushes an object away, we say it repels it. If a magnet pulls an object 	<p>with wet hands and checking that wires are not frayed.</p> <ul style="list-style-type: none"> • An electrical circuit is a loop that allows electricity to travel around it. • An electrical circuit must have wires and a battery. • If a circuit is broken, electricity will not be able to flow around it. • A switch opens and closes a circuit. • Opening a circuit prevents electricity from flowing. • Thomas Edison invented the first lightbulb suitable to use in homes. • Lewis Latimer invented a lightbulb that could last for a long time. • Materials that allow electricity to pass through them are conductors. 	<ul style="list-style-type: none"> • Galaxies are groups of stars held together by gravity • Our galaxy is the Milky Way and our nearest neighbour is Andromeda galaxy • Gravity is the force which pulls all objects towards each other • Although all objects attract all others by the force, gravity, it is too weak to notice unless one object (like the Earth) is huge • The Earth's gravity holds us to the Earth's surface; the Sun's gravity holds the Earth in orbit around it • The Sun is at the centre of our solar system • Our solar system contains 8 planets, 4 terrestrial planets and 4 Jovian planets 	<p>electricity in a circuit</p> <ul style="list-style-type: none"> • Circuit components need electricity to work • Circuits components turn electrical energy into different energy forms • Voltage is the pressure from a battery that pushes electricity around a circuit • The voltage of a battery or the number of batteries can change the brightness/volume of components • Switches control the flow of electricity in a circuit • A switch creates a complete or incomplete circuit • Making a gap in a circuit prevents
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		<p>this unit has been chosen to inspire children to think beyond their immediate environment and begin to ask scientific questions about what we know and understand about space.</p>	<ul style="list-style-type: none"> • Our weather is warmer during the spring and summer and cooler during the autumn and winter • Our days of sunlight are longest in the summer and shortest in the winter • Know that tools (rain gauge, temperature and weather vane) are used to gather data about the weather • Data is information that we can represent using graphs • There are different types of cloud and that clouds can indicate the weather we are about to experience • Recognise weather symbols used in weather forecasting and explain the importance of accurate forecasts • Scientists that study the weather 	<ul style="list-style-type: none"> • Identify things that use electricity • A battery is a store of electrical energy • Electricity is energy that we store and use to make things work • Electricity can be dangerous • An electrical circuit is a loop that allows electricity to travel around it • An electrical circuit must have wires and a battery • If a circuit is broken, electricity will not be able to flow around it • Materials that allow electricity to pass through them are conductors • Materials that do not allow electricity to 	<p>towards it, we say it attracts it.</p> <ul style="list-style-type: none"> • A lodestone is a naturally occurring rock that has magnetic properties • A magnet has two opposite poles: the north and south pole. • A magnetic field is the space around a magnet where the magnetic force can be felt. • Larger magnets are often, but not always, the strongest. • Magnetic strength can be weakened over time. <p>Light</p> <ul style="list-style-type: none"> • Light enables us to see things • Darkness is the absence of light 	<ul style="list-style-type: none"> • Materials that do not allow electricity to pass through them are insulators. • Many (but not all) metals conduct electricity. <p>Sound</p> <p>Sound is caused by a back and forth movement called vibration</p> <ul style="list-style-type: none"> • Sound waves move out from a vibrating object • Sound can travel through different types of matter (solid, liquid, gas) • Sound is fainter the further from the source it is • Pitch is how high or low a sound is and relates to the speed of vibrations • Volume is how loud or quiet a sound is and relates to the 	<ul style="list-style-type: none"> • There are trillions of smaller rocks called asteroids, as well as dwarf planets like Pluto and Ceres • The moon is the Earth's natural satellite • The moon is a planet, it does not make its own light • Depending on the position of the Sun, we see all, part or none of the Moon; these are known as the phases of the Moon • Neil Armstrong and Buzz Aldrin were the first humans to land on the moon • Our home supercluster is called Laniakea and contains over 100,000 galaxies <p>Meteorology</p>	<p>electricity from flowing</p> <p>Light</p> <ul style="list-style-type: none"> • Light enables us to see by entering our eyes • Light travels in straight lines • Some light sources are natural, and some are artificial • The iris helps the pupil to open and close • Inside the retina, light rays become electrical signals which are sent to the brain • Shadows are always the same shape as the object that made them • The size of shadows can change but the outline shape stays the same as the object
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			<p>are called meteorologists</p> <ul style="list-style-type: none"> • Some weather can be dangerous, for example, hurricanes <p>• Objects around us are made from types of materials.</p> <ul style="list-style-type: none"> • Some everyday materials that objects are made from include wood, plastic, glass and metal. • Each material can be used to make many different things, for example plastic can be made into cups, plates, toys, chairs. • Properties of materials are things we can measure, see or feel. • Materials have different properties that make them useful for different tasks. • Some materials will be better suited 	<p>pass through them are insulators</p> <ul style="list-style-type: none"> • Many, but not all, metals conduct electricity <p>Astronomy</p> <ul style="list-style-type: none"> • The Sun is a star at the centre of our solar system. • There are eight planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. • Planets travel around the Sun. We call this journey an orbit. • As the planets orbit the Sun, they also spin around. We call this rotation. • Night and day occur due to the Earth rotating. • The Moon orbits the Earth. 	<ul style="list-style-type: none"> • The sun is an important source of light for life on earth • Light travels in straight lines • Transparent material allows light to pass through it • Opaque material blocks light from passing through it • Mirrors reflect light • Mirrors of different shapes reflect light differently • A shadow is created when an object blocks the path of light • The sun appears to move across the sky as our planet revolves on its axis 	<p>strength of the vibrations</p> <ul style="list-style-type: none"> • Louder sounds are made by bigger vibrations • Quieter sounds are made by smaller vibrations • Faster vibrations make higher-pitched sounds • Slower vibrations make lower-pitched sounds • We hear through soundwaves entering the ear, travelling through it and the messages sent to the brain 	<ul style="list-style-type: none"> • Meteorology is the study of the weather. • The atmosphere is made up of several layers of air which protect Earth from the Sun's energy. • The atmosphere is essential for life on Earth. • Ozone is a gas that absorbs some of the sun's UV radiation. • By using certain harmful chemicals, humans created a hole in the ozone layer over Antarctica. • Since the harmful chemicals were banned, the hole in the ozone layer has been repairing. • Our climate is called a maritime climate, because it is largely influenced by the sea. 	<ul style="list-style-type: none"> • Light from the sun is made up of the colours of the rainbow • When light travels through a prism, the glass slows it down and changes its course • Different colours are slowed down different amounts when going through a prism • A periscope uses reflects an image out of sight using light and mirrors
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			<p>to certain purposes than others.</p> <ul style="list-style-type: none"> • Certain materials are attracted to magnets. • We cannot see the force of magnetism. 	<ul style="list-style-type: none"> • The Moon reflects the light of the Sun. • As the Moon's position changes, we can see different parts of it. • A constellation is a group of stars that, when seen from Earth, form a pattern. • People have given constellations names and have told stories that imagine how the constellations were formed. • Astronomers have studied the stars for many years, learning from each other and making new discoveries. • Scientists, including astronomers, study space to find out more about what lies 	<ul style="list-style-type: none"> • Shadows change in size and shape throughout the day 		<ul style="list-style-type: none"> • The polar maritime and the tropical maritime air masses bring wetter weather from the sea. • The polar continental and the tropical continental air masses bring drier weather from land. • The boundary where warm and cold air meet is called a front. • Warm fronts are symbolised by a line with red semi-circles. • Cold fronts are symbolised by a line with blue triangles. • When electrical charge builds up and moves through the atmosphere, it creates a flash of light and sound. • Light travels faster than sound, so we often see lightning before we hear thunder. 	
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				<p><i>beyond our planet.</i></p> <ul style="list-style-type: none"><i>• The International Space Station orbits earth and allows scientists to find out more about space.</i><i>• Scientists have sent a rover to Mars to look for signs of life long ago.</i>				
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