Over St. John's CE Primary School

'Let your light Shine before others.' Matthew 5:16

Progression of Knowledge and Skills in Science

Skills Progression	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Five types of experimental skills **1. Observe over time** **2. Pattern seeking** **3.Identifying, classifying and grouping** **4. Comparative and Fair test** **5. Research using secondary sources**	1. I can observe changes over time 2. I can observe changes and patterns 3. I can identify and classify 4. I can perform simple tests 4. I can perform a fair test with adult support	1. I can observe changes over time 2. I can observe changes and patterns 3. I can identify and classify 4. I can perform simple tests 4. I can perform a fair test with adult support	1. I can use simple equipment to observe closely including changes over time 2. I can use observations and ideas to suggest answers to questions noticing similarities, differences and patterns 3. I can identify, group and classify 4. I can perform simple comparative tests 5. I can gather and record data to help in answering questions including from secondary sources of information	1. I can make systematic and careful observations over time 2. I can ask questions surrounding patterns I have found in data. 3. I can gather, record, classify and present data in a variety of ways 4. I can set up simple practical enquiries, comparative and fair tests 5. I can use secondary sources with adult support to help clarify results seen.	1. I can make systematic and careful observations over time, looking at similarities and differences. 2. I can ask questions surrounding patterns I have found in data. 3. I can gather, record, classify and present data in a variety of ways to help in answering questions 4. I can set up simple practical enquiries, comparative and fair tests 5. I can use secondary sources with adult support to help clarify results seen.	1. I can observe over time, asking pertinent questions about similarities and differences. 2. I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. 3. I can classify, group and present data in a series of ways to help in answering questions 4. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision. 5. I can use secondary sources to help interpret results seen.	1. I can recognise things change over time, and can ask pertinent questions and suggest reasons for similarities and differences over time 2. I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. 3.I can develop and use keys and other information to classify and describe objects in ways to help answer questions 4. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate 5. I can use secondary sources to help interpret results seen.
Questions	I can ask simple questions.	I can ask simple questions and recognise that they can be answered in different ways. I can use my observations and ideas to suggest answers to questions. I can communicate my ideas, what I can do and what I can find out in different ways.	I can ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum. I can communicate my ideas, what I can do and what I can find out in different ways.	I can ask relevant questions to answer my questions in different ways using scientific language from the national curriculum.	I can ask questions surrounding patterns I have found in data. I can ask relevant questions and use different types of scientific enquiries to answer them using scientific language from the national curriculum. I can ask questions surrounding patterns I have found in data. I can develop a deeper understanding through talk, asking questions about scientific phenomena, analysing functions and interactions more systematically.	I can plan different types of scientific enquiries to answer questions, including recognising variables where necessary. I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. I can observe over time, asking pertinent questions about similarities and differences.	I can plan different types of scientific enquiries to answer my own or others' questions, including recognising and controlling variables where necessary. I can recognise things change over time, and can ask pertinent questions and suggest reasons for similarities and differences over time.

Using Scientific Equipment	I can use magnifying glasses to look at objects in more detail I can measure out ingredients using scientific and mathematic equipment.	I can use simple equipment to observe closely I can use hand lenses and egg timers.	I can use simple equipment to observe closely including changes over time. I can ask my own questions about what I notice I can use hand lenses and egg timers.	I can set up simple practical enquiries, comparative and fair tests. I can make systematic and careful observations over time. I can take measurements using standard units, using a range of equipment. I can set up simple practical enquiries, comparative and fair tests.	I can set up simple practical enquiries, comparative and fair tests. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision.	I can make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	I can take measurements, using a range of scientific equipment, including thermometers and data loggers, with increasing accuracy and precision, taking repeat readings when appropriate. I can make my own decisions and select the most appropriate type of scientific enquiry to use and recognise how to set up a comparative and fair test.
Recording Data	I can record observations in ways that are important and meaningful to me.	I can gather and record data to help in answering questions. I can use simple scientific language such as: with help.	I can gather and record data to help in answering questions including from secondary sources of information.	I can gather, record, classify and present data in a variety of ways. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	I can gather, record, classify and present data in a variety of ways to help in answering questions. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. I can use test results to set up further comparative and fair tests.	I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. I can use test results to make predictions to set up further comparative and fair tests.
Reporting on Findings				I can report on findings from enquiries, using presentations of results and conclusions I can use results to draw simple conclusions. I can use secondary sources with adult support to help clarify results seen.	I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. I can use results to draw simple conclusions, make predictions for new values and suggest improvements. I can use secondary sources with adult support to help clarify results seen. I can classify, group and present data in a series of ways to help in answering questions.	I can report and present findings from enquiries in oral and written forms such as displays and other presentations. I can use results to draw more complex conclusions, make predictions for new values and suggest improvements. I can use secondary sources to help interpret results seen. I can classify, group and present data in a series of ways to help in answering questions.	I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. I can use results to draw more complex conclusions, make predictions for new values and suggest improvements and raise further questions. I can use secondary sources to help interpret results seen. I can develop and use keys and other information to classify and describe objects in ways to help answer questions.

Using Scientific Evidence				I can identify differences, similarities or changes related to simple scientific ideas and processes. I can use straightforward scientific evidence to answer questions or to support my findings.	I can identify differences, similarities or changes related to simple scientific ideas and processes. I can use straightforward scientific evidence to answer questions or to support my findings .	I can identify scientific evidence that has been used to support or refute ideas or arguments.	I can justify and evaluate my own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.
Vocabulary	question, answer, find out, observe, measure, record.	question, answer, find out, identify, observe, classify, sort, group, describe, test, compare, contrast, measure, length, height, mass/weight, time, temperature, record, results, table, chart, map, pictograph, block graph, bar chart, diagrams, equipment, data.		research, comparative test, fair test, systematic, careful observation, accurate measurements, data, gather, record, classify, present, labelled diagrams, keys, bar chart, tables, explanations, conclusion, predictions, differences, similarities, changes, evidence, improve, secondary sources, guides, construct, interpret.		plan, variable, measurements, accuracy, precision, repeat readings, reporting, scientific diagrams, labels, classification, keys, scatter graph, bar graph, line graph, causal relationship, explanation, degree of trust, evidence, support, refute, describe, patterns, systematic, quantitative measurements.	

	Progression of knowledge and skills based on subject areas			
Plants	**Hatchmere**	**Sandymere**	**Delamere**	**Oakmere**
	I know that plants need sun and water to grow. I know some plants grow from seeds. I know most plants need soil and nutrients (food) to grow. *Key vocabulary:* *Flower, plant, bulb, seed, root, leaves.*	NC Statements -Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. -Identify and describe the basic structure of a variety of common flowering plants, including trees Knowledge Plants that we choose to grow in a garden are called garden plants. There are lots of different types of garden plants. Some grow flowers but others do not. Examples of garden plants are sweet pea, sunflower, rose, lavender, iris, fuchsia and pansy. A wild plant seed grows where it falls. It doesn't need to be planted or cared for as it grows. Examples of wild plants are buttercup, nettles, ivy, dog rose, clover brambles, dandelion and daisy. A plant is made of different parts. Plants have roots, a stem, leaves and flowers. Some plants also have fruit. A tree is also a type of plant. Trees have roots, a trunk, branches, bark and leaves. A tree might also have blossom or fruit. A deciduous tree loses its leaves in Autumn. An evergreen tree keeps its green leaves all year round, even in the winter. Vocabulary garden plant, wild plant, deciduous, evergreen, roots, stem, leaves, flowers, fruit, trunk, bark	NC Statements -Observe and describe how seeds and bulbs grow into mature plants. -Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Knowledge Plants grow from a seed or a bulb. Inside a seed or bulb is everything that the plant needs to start growing (germinate). To germinate the seed or bulb needs water and the right temperature. All plants have a lifecycle. Different types of plants have slightly different life cycles. Bean plant – seed, gemination, roots, leaves, flowers, fruit, seed dispersal, dies. Daffodil – blub, roots, shoots, stem and leaves, flower, wilts. Oak tree- seed, seedling, sapling, oak tree, seed dispersal. A plant needs water, light and the right temperature to grow and stay healthy. If a plant does not get everything it needs it they begin to die and this can be seen in their leaves or stems. Different plants need different amounts of water and light and different temperatures to grow and stay healthy. Vocabulary germination, shoot, seed dispersal, sunlight, water, temperature	NC Statements -Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. -Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. -Investigate the way in which water is transported within plants. -Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal Knowledge Flowering plants have these different parts; roots, stem or trunk, leaves and flowers. They might also have fruit. Roots support the plant, take up water, air and nutrients from the soil and can store food and water. Stem or trunk supports the plant and hold leaves and flowers. It also transports water and food around the plant. Leaves absorb sunlight to make the plant's food. Flowers produce seeds that can grow into new plants. Fruit encases a plant's seeds and is often eaten by animals. For plants to grow and stay alive they need air, light, water, space, nutrients and the correct temperature. The roots and stem are important for transporting water around a plant. First, plants absorb the water they need through their roots. Then, the water is transported up through the stem and to the leaves and flowers. Flowers play an important role in the life cycle of flowering plants. They hold all the parts that a plant needs to produce new plants. This is called reproduction. Flowers have different parts that help the plant to reproduce. The main parts are that are needed are the anther, stigma, petal and ovary. For a flower to reproduce, pollination needs to happen. Pollination is when pollen from the anther is transferred to the stigma. Some flowers are pollinated by animals and some by the wind. After pollen has landed on the stigma it moves down to the flower's ovary. This is called fertilisation. When the

				plant has been fertilised, seeds grow inside the ovary. This is called seed formation. After the seeds have formed, many plants spread their seeds over a wider area. This is called seed dispersal. Seeds can be dispersed by wind, water, exploding or being carried or eaten by animals. <u>Vocabulary</u> pollination, seed formation, seed dispersal, roots, nutrients, stem/trunk, leaves, flowers, reproduction, growth, pollen, anther, stigma, ovary, pollinator.

	Hatchmere	**Sandymere**	**Delamere**	**Linmere**	**Blakemere**
Materials/ State of matter	I know that objects are made from different materials. I know about similarities and differences in relation to places, objects, materials and living things. I know about the features of my immediate environment and how environments might vary from one another. I know how to make observations of animals and plants and explain why some things occur, and talk about changes. *Key vocabulary:* *melt, freeze, ice, mix, stir*	I know how to distinguish objects from materials, describe their properties, identify and group everyday materials. I know how to distinguish between an object and the material from which it is made. I know the name of a variety of everyday materials, including wood, plastic, glass, metal, water, and rock and can identify them. I know the simple physical properties of a variety of everyday materials and can describe them. I know how to compare and group together a variety of everyday materials on the basis of their simple physical properties.	I know how to distinguish objects from materials, describe their properties, identify and group everyday materials and compare their suitability for different uses. I know the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses and how to identify and compare them. I know the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching and how to describe them. *Key vocabulary:* *Waterproof, fabric, rubber, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending,*	I know whether materials are solids, liquids or gases and can compare and group materials together, according to these properties. I know that some materials change state when they are heated or cooled and can observe and measure or research the temperature at which this happens in degrees Celsius (°C). I know the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. I know how to use my knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	I know how to compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. I know that some materials will dissolve in liquid to form a solution, and can recognise this and describe how to recover a substance from a solution. I know how to give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

		Key vocabulary: hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, opaque, see-through, cardboard, foil, elastic, paper, fabric, rock, brick, object, material, wood, plastic, glass, metal, rubber, wood, clay.	*matches, flexible, rigid, opaque, transparent, translucent, reflective/non-reflective.*	*Key vocabulary: Solid, liquid, gas, molecules, state change, properties, matter, melt, freeze, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection, melting point, boiling point, water cycle.*	I know that dissolving, mixing and changes of state are reversible changes and can demonstrate this. I know that some changes result in the formation of new materials and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda and can explain this. *Key vocabulary:* *Thermal, electrical, insulator, conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible change, irreversible change, burning, rusting, new material, pure, impurity*

Animals, including humans	**Hatchmere**	**Sandymere**	**Delamere**	**Oakmere**	**Linmere**		**Blakemere**
	I know that different animals have different body parts. I know that different animals like different foods and live in different places. I know that some animals are big and some animals are small. I know that butterflies do not start out looking like butterflies. I know how to talk about different places animals might live. I know that some animals hibernate. I know that some animals are adapted to live under the sea and that humans are adapted to live on land.	<u>NC Statements</u> · identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. · identify and name a variety of common animals that are carnivores, herbivores and omnivores. · describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). · identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. <u>Knowledge</u> There are lots of different animals. Scientists sort them into groups to help to identify them. The five animal groups I know are amphibians, birds, fish, mammals, reptiles.	<u>NC Statements</u> - Notice that animals, including humans, have offspring which grow into adults. - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. <u>Knowledge</u> Some animals give birth to live young. Some animals lay eggs which the young hatch from. Both of these types of young then develop into adults. Some offspring look like their adult when they are born and some do not. All young animals change as they go through the different stages of their life cycle and grow into adults.	I know that animals, including humans, need the right types and amount of nutrition and that they cannot make their own food; they get nutrition from what they eat and can identify this. I know that humans and some other animals have skeletons and muscles for support, protection and movement. *Key vocabulary:* *Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates, muscles, contract, relax, sugar, ribs, spine, skull, support, protect, move.*	I know the simple functions of the basic parts of the digestive system in humans and can describe them. I know the different types of teeth in humans and their simple functions and can identify them. I know a variety of food chains, identifying producers, predators and prey and can construct and interpret them. *Key vocabulary:* *Herbivore, Carnivore, omnivore, digestive system, tongue, mouth, teeth, oesophagus, stomach, small intestine, large intestine, canine, incisor, molar, premolar, producer, consumer, digestion, saliva, nutrients, rectum, anus, predator, prey, food chain*	*(Taught in Living Things unit and in Y5 PSCHE lessons)* I know the changes as humans develop to old age, including changes experienced in puberty and how to describe them. *Key vocabulary:* *Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Sexual, Asexual, reproduction, fertilisation, pregnancy, adolescent, death*	<u>NC Statements</u> - identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood -describe the ways in which nutrients and water are transported within animals, including humans. -recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function <u>Knowledge</u> The human circulatory system has three parts: the heart, blood vessels (veins, arteries, capillaries) and blood. The heart is a muscle that pumps blood around the body. It is made up of four chambers (enclosed spaces). Blood vessels carry blood around the body. Arteries carry oxygenated blood away from the heart. Veins carry deoxygenated blood toward the heart. Capillaries are the

	I know that if I wash my hands then that will kill off germs. I know about the importance of a healthy diet. I know I cannot eat foods like chips and pizza every day and I need a variety of food. I know about the importance of a healthy exercise regime. I know that exercise is good for my body. *Key vocabulary: baby, child, toddler, adult, body part (naming them)*	All living things need to eat. We call what they eat their diet. Animals can be sorted into three groups of diets: carnivore, herbivore, omnivore. The human body is made up of lots of different parts and each part has its own job to do. Humans have 5 senses: sight, hearing, touch, taste, smell and these link to different parts of the body. Our senses help us to understand the world. They also help to keep us safe. <u>Vocabulary</u> amphibians, birds, fish, mammals, reptiles, carnivore, herbivore, omnivore, senses, sight, hearing, touch, taste, smell.	To stay alive, all animals have three basic needs for survival: air, water, food. To grow into a healthy adult, we must eat the right types of food in the right amount and exercise. Being active and exercising keeps our bodies and minds healthy. To stop germs from spreading, it is important to be hygienic. This means keeping ourselves and things around us clean. <u>Vocabulary</u> Adult, develop, life cycle, offspring, young, live young, diet, exercise, germs, hygiene.				smallest blood vessels in the body and they carry blood into organs and tissues. Blood is very important. It transports gases (mostly oxygen and carbon dioxide), nutrients (including water) and waste products. Blood is made up of four parts. Plasma is the liquid part of blood and contains water and protein. Red blood cells carry oxygen through your body. Platelets help you stop bleeding when you get hurt. White blood cells fight infection when you are ill. To stay healthy, humans must maintain a healthy body through their diet and exercise. Diet: A healthy diet involves eating the right types of nutrients in the right amounts. Regular exercise: strengthens muscles including the heart muscle; improves circulation; increases the amount of oxygen around the body; releases brain chemicals which help you feel calm and relaxed; helps you sleep more easily; strengthens bones. Drugs, alcohol and smoking have negative effects on the body. *Key vocabulary: Oxygenated blood, Deoxygenated blood, nutrients, drugs, alcohol.*

Living things and their habitats	Hatchmere	Delamere	Oakmere	Linmere	Blakemere
	I know similarities and differences in relation to living things and their habitats. I know about the features of my own immediate environment and how environments might vary from one another and can talk about them. I know how to make observations of animals and plants and explain why some things occur, and talk about changes. *Key vocabulary: nocturnal, woodland, forest, pond*	I know whether things are alive, dead or have never lived and can identify these. I know the differences between things that are living, dead, and things that have never been alive and how to explore and compare them. I know the names of different plants and animals and why they are suited to different habitats. I know that most living things live in habitats to which they are suited and can identify why, and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. I know the names of a variety of plants and animals in their habitats, including micro-habitats and can identify them. I know how animals obtain their food from plants and other animals, using the idea of a simple food chain, and can identify and name different sources of food. *Key vocabulary:* *living, dead, never been alive, habitats, food, food chain, shelter, sea shore/beach, woodland, ocean, rainforest, conditions, desert, damp, shade, suited, suitable, basic needs, pond.*	<u>NC Statements</u> -Recognise that living things can be grouped in a variety of ways. -Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment -Recognise that environments can change and that this can sometimes pose dangers to living things. <u>Knowledge</u> Animals can be grouped/classified in lots of different ways based upon their features for example physical features, habitat, diet. Scientists split animals into two main groups: vertebrates and invertebrates. Vertebrates are animals that have a backbone, also known as a spine. Invertebrates are animals that do not have a spine. Vertebrates can be sorted into five main groups with their own characteristics. Mammals (warm-blooded), bird (warm-blooded), reptiles (cold-blooded), amphibians (cold-blooded), fish (cold-blooded). Invertebrates can be sorted into many different groups. Here are four of them: Arthropods, Molluscs, Annelids, Echinoderms. You can use classification keys to identify, group and name living things and Venn diagrams to sort into different categories. Living things live in a habitat which provides an environment to which they are suited. These environments may change naturally, for example through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (positive human impact) such as setting up nature reserves or in a bad way (negative human impact) such as littering. <u>Vocabulary</u> classification, vertebrates, invertebrates, cold-blooded, warm-blooded, environment, Arthropods, Molluscs, Annelids, Echinoderms.	<u>NC Statements</u> -Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. -Describe the life process of reproduction in some plants and animals. <u>Knowledge</u> As part of their lifecycle, plants and animals reproduce. Humans develop inside the female and depend on caregivers for many years until they are old enough to look after themselves. Birds are hatched from eggs and are looked after by their parents until they are able to live independently. Amphibians, such as frogs, are laid in eggs, then once hatched go through many changes until they become an adult. Some animals, such as butterflies, go through metamorphosis to become an adult. Mammals use sexual reproduction to produce their offspring. The male sex cell, called the sperm, fertilises the female sex cell. The fertilised cell will form a baby with a beating heart. The baby will grow inside the female until the end of the gestation period when the baby is born. Some living things, such as humans, contain either the male or female sex cell. Plants contain both the male and female sex cells. Most plants contain both the male sex cell (pollen) and the female sex cell (ovule), but most plants cannot fertilise themselves. Wind and insects help to transfer pollen to a different plant. The pollen from the stamen of one plant is transferred to the stigma of another. The pollen then travels down a tube, through the style and fuses with an ovule. <u>Vocabulary</u> Life cycle, reproduction, sexual reproduction, asexual reproduction, fertilise, gestation, metamorphosis, pollination	I know how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals and can describe them. I know that plants and animals are classified based on specific characteristics and can give reasons for classifying them. *Key vocabulary:* *flowering, non-flowering, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation, bacteria, microorganism, organism, birds*

	Oakmere	**Linmere**
Forces and magnets	NC Statements -Compare how things move on different surfaces. -Notice that some forces need contact between 2 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 2 poles. -Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. Knowledge Forces are pushes or pulls. Forces can make an object start or stop moving, change speed, change direction or change shape. Many forces are called contact forces. These are forces that occur between two or more objects that are touching. In a contact force, the objects involved must touch or make contact for the push or pull to happen. Friction affects how things move across surfaces. Different surfaces create different amounts of friction. The rougher (more bumpy) a surface, the higher the friction becomes. Magnets have a North pole and a South pole. Magnets produce an area of force around them called a magnetic field. Magnetic fields are an invisible force. Magnets create a non-contact force which causes magnets to attract or repel. When magnets repel, they push each other away. When magnets attract, they pull together. Objects which are attracted to a magnet are magnetic. They usually contain the metals iron, nickel or cobalt. Vocabulary force, push, pull, contact force, non-contact force, friction, magnet, magnetic, magnetic force, poles, attract, repel	NC Statements -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. Knowledge Gravity is a non-contact force. It acts over a distance without needing to touch the object. The force of gravity keeps objects on the ground and causes them to fall when they are unsupported. Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Isaac Newton, Ibn al-Haytham and Galileo Galilei developed theories of gravity. Friction always acts in the opposite direction to the direction the object is moving in. Friction always slows down a moving object. The effects of forces can be helpful and unhelpful. On Earth, air creates an opposite force to gravity called air resistance. Air resistance slows down falling objects. Water resistance happens when water (or any liquid) pushes against an object moving through it. Water resistance slows down moving objects. The shape of an object affects air and water resistance. Streamlined shapes reduce the amount of resistance and so they can move more efficiently against the force. This helps them to travel faster through air or water. Vocabulary Force, gravity, Newton (N), friction, air resistance, water resistance, streamlined, lever, pully, gear
Rocks	**Oakmere**	
	I know some differences in rocks based on their appearance and simple physical properties and how to compare and group them together based on this. I know how fossils are formed when things that have lived are trapped within rock. I know that soils are made from rocks and organic matter. *Key vocabulary: appearance, physical, properties, hard/soft, shiny/dull, rough/smooth, permeable/ impermeable fossils, sedimentary, igneous, metamorphic, rock, soils, organic matter, buildings, gravestones, grains, crystals, classification*	

<table>
<tr><td></td><td>Oakmere</td><td>Blakemere</td></tr>
<tr><td>Light</td><td>I know that we need light in order to see things and that dark is the absence of light.

I know that light is reflected from surfaces.

I know that light from the sun can be dangerous and that there are ways to protect eyes.

I can find patterns in the way that the size of shadows change.

I know that it is not safe to look directly at the sun, even when wearing dark glasses.

I know that shadows are formed when the light from a light source is blocked by an opaque object
shadows change.

Key vocabulary:
Light source, dark, reflect, ray, mirror, bounce, visible, straight, opaque, shadow, block, transparent, translucent, absence of light, shiny, matt, surface, sunlight, ray, visible.</td><td><u>NC Statements</u>
· 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.

<u>Knowledge</u>
We need light to be able to see things.

Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light.

Objects are seen because they give out or reflect light into the eye.

We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.

A shadow is always the same shape as the object that casts it. This is because when an opaque object is in the path of light travelling from a light source, it will block the light rays that hit it, while the rest of the light can continue travelling.

Shadows can also be elongated or shortened depending on the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light.

<u>Vocabulary</u>
Light, light source, reflection, incident ray, reflected ray, law of reflection, refraction, visible spectrum, prism, shadow, transparent, translucent, opaque</td></tr>
<tr><td>Sound</td><td colspan="2">Linmere

I know how sounds are made, associating some of them with something vibrating.

I know that vibrations from sounds travel through a medium to the ear.

I know how to find patterns between the pitch of a sound and features of the object that produced it.

I know how to find patterns between the volume of a sound and the strength of the vibrations that produced it.

I know that sounds get fainter as the distance from the sound source increases.
Key vocabulary:
sound, source, vibrate, vibration, travel, pitch, high, low, volume, faint, loud, quiet, insulation, soundwaves, decibels, ear, ear drum, particles.</td></tr>
<tr><td>Electricity</td><td>Linmere

<u>NC Statements</u>
-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.
-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.</td><td>Blakemere

I know the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit.

I know how to 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.

I know recognised symbols for representing a simple circuit in a diagram and can use them.

Key vocabulary:</td></tr>
</table>

	Knowledge Many everyday appliances rely on electricity for them to work. Some appliances use mains electricity (are plugged into a socket) and others have a battery to make them work. Examples of mains-powered appliances include toasters and televisions. Battery-powered appliances can include mobile phones and torches. A circuit is a pathway that electricity can flow around. It is based around wires and a power supply. Examples of components (parts) you can add in to a circuit are bulbs, switches, buzzers and motors. A series circuit is where the components are connected in a loop. Electricity flows through each component in a single pathway. A complete circuit is needed so that the electricity can flow and make the components work. If there is a break in the circuit then it is incomplete. This prevents the electricity from flowing and the components will not work. Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow. Materials can be tested in a circuit to see if they are electrical conductors or electrical insulators. A conductor of electricity is a material that will allow electricity to flow through it. Materials that are electrical insulators do not allow electricity to flow through them. Vocabulary Electricity, appliances, mains, wires, bulb, battery, cell, buzzer, switch, conductor, electrical insulator, component, circuit, complete circuit, incomplete circuit.	*Electricity,* ***neutrons, protons, electrons, nucleus, atom,*** *electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, conductor,* ***voltage,*** *circuit.*
Earth and space	**Linmere**	
	I know the movement of the Earth, and other planets, relative to the Sun in the solar system and can describe them I know the movement of the Moon relative to the Earth and can describe it. I know the Sun, Earth and Moon are approximately spherical bodies. I know the Earth's rotation can explain day and night and the apparent movement of the sun across the sky. I know that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). I know that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).	

	Key vocabulary: Phases of the Moon, star, constellation, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Dwarf planet, Earth, planets, Sun, solar system, Moon, celestial body, sphere/spherical, rotate/rotation, night & day, orbit, opinion/fact, support/refute, accuracy, precision, scatter graphs, line graphs, geocentric & heliocentric models, shadow clocks, sundials, eclipse, light, reflection, telescope, satellite, tide, mass, gravity	
Evolution and inheritance	**Blakemere**	
	I know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I know that animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. *Key vocabulary:* *Fossils, Reproduction, Genetics, Mutation, Competition, Survival of the Fittest, Evidence, offspring, characteristics, vary/variation, inherit/inheritance, suited/suitable, environment, natural selection, evolution, adapted/adaptation, fossils, theory, opinion*	
Seasonal changes	**Hatchmere**	**Sandymere**
	I know the seasons of Autumn, Winter, Summer and Spring and ways to identify them. I know there are seasonal colours and can identify some. I know that lots of new life begins in the Spring time. I know appropriate clothing for the seasons and can choose which they are. *Key vocabulary:* *seasons, winter, summer, spring, autumn, weather*	I know there are changes across the four seasons and can identify them. I know the weather associated with the seasons and can describe them and how day length varies. I know that it is not safe to look directly at the sun, even when wearing dark glasses. *Key vocabulary:* *weather, sunny, rain/rainy, wind/windy, snow/snowy, seasons , winter, summer, spring, autumn, sun, sunrise, sunset, day, length, monsoon, storm, thunder, overcast, temperature, lightening, cloud/cloudy, forecast, warm, cold, hot, night, shadow*