Springbank Academy

Curriculum Overview
Science

Year	Discover Autumn term	Explore Spring term	Belong Summer term
N	SN1:Explore the natural world around them, making observations and drawing pictures of animals and plants. Children should be given the opportunity to go on seasonal walks. They should use the school grounds to look at the local environment. Discuss healthy eating with children Talk with parents about oral hygiene (Brushing Buddies) Explore how things work. Ask children to bring in baby pictures from home. Compare pictures of the children as babies to now. How have they changed? What can they do now that they could not do as babies? Use all their senses in hands on exploration of natural materials.	SN2:Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. They should use the school grounds to look at the local environment. Place ice cubes containing frozen fruit in the water tray. Children to explore what happens as the ice melts and identify the fruits. • Talk about the animals found in England and the animals found in Kenya. Talk about who works on a farm. What jobs need to be done? • Talk about how to look after the animals on a farm. Do any of them have experience looking after a pet? • Sort animals into two groups – which animals live on a farm? Which live in the jungle? • Learn in depth about an animal of the children's choice.	SN3:Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps. Lifecycles of various minibeasts • Children to choose a minibeast to learn about in depth. • Minibeast hunt • Observe minibeasts and their habitats – can children create their own habitats using the small world? • Planting a variety of seeds – what do they need to grow? • Woodland walk • Sorting natural materials – leaves and seeds. • Plant growth sequencing activity. • Operating the CD player to play minibeast songs and stories. • Set up a planting area outside. (Wildflowers – bees and pollination) Explore how things work. Explore and talk about different forces they can feel.

	Explore collections of materials with similar properties. Begin to understand the need to respect and care for the natural environment and all living things. Talk about the differences between materials and changes they notice (Seasonal) Go on a Woodland walk – Forest School • Learn about different animal habitats. • Take a trip to Colliers Wood (Homework) • Make pine cone bird feeders and talk about the importance of caring for wildlife. • Place a small pile of leaves in a tray and programme the Hedgehog (BeeBot) to find the leaves. • Make porridge and talk about how it changes when it's cooked. Is it hot or cold? How has the texture changed? • Talk about the bears beds being hard and soft. Can you sort which objects are hard and which are soft?	• Set the Beebot up as a pig or wolf, Use it to follow the Three Pigs Map. • Create a small world farm tray for the children to explore, cereal, grains, real vegetables alongside small world animals. • Children to explore matching adult and baby animals.	Talk about the differences between materials and changes they notice. Pirate treasure sensory bottles to explore magnets. • Make ice creams – what happens when they get warm? • Add a selection of household objects and decide which objects a pirate would use and which just belong in a house. • In the water provide children with a range of different treasure, some which float and some which don't. • Hide and seek pirate themed objects – children to work out what the objects are used for. • Sort pirate treasure made of metal and wood.

R	SR1:Explore the natural world around them, making observations and drawing pictures of animals and plants; SR2:Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; Complete an autumn walk around school- looking at the changing colours of leaves on the trees. Explore bread around the world with our senses. (Baguette, pitta bread, soda bread, bagel, brioche, naan, ciabatta and their corresponding counties	SR3:Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. Understand the effect of changing seasons on the natural world around them. Explore the different types of weather. Compare the weather in England and Tanzania. Create thunderstorms in a cup and show rainfall using food colouring.	SR4:Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps. Compare the weather in England and Tanzania. Create thunderstorms in a cup and show rainfall using food colouring. SR5:Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
Y1	**Animals including humans** S1:6 Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense (sight, hearing, smell, taste and touch). S1:3 Identify and name a variety of common animals including fish, amphibians, reptiles, birds, mammals and invertebrates.	**Everyday Materials** S1:7 Distinguish between an object and the material from which it is made. S1:8 Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock S1:9 Describe the simple physical properties of a variety of everyday materials	**Plants** S1:1 Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. S1:2 Identify and describe the basic structure of a variety of common flowering plants, (roots, stem, leaves, flower, and seeds).

	S1:5 Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). S1:4 Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes.	S1:10 Compare and group together a variety of everyday materials on the basis of their simple physical properties Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. **Animals including humans** Identify and name a variety of common animals including fish, amphibians, reptiles, birds, mammals and invertebrates. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Children should be familiar with common names of flowers, examples of deciduous and evergreen trees and plant structures including leaves, flowers, 'blossom', petals, fruits, roots, bulb, seed, trunk, branches, stem. Identify and describe the basic structure of a tree (roots, trunk, branches and leaves). **Seasonal changes** S1:11 Observe changes across the four seasons. S1:12 Observe and describe weather associated with the seasons and how day length varies. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.
Y2	**Uses of everyday materials** S2:10 Identify and compare the suitability of a variety of everyday	**Animals including humans** S2: 7 Notice that animals, including humans, have offspring which grow into adults.	**Plants** S2:5 Observe and describe how seeds and bulbs grow into mature plants

	materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. S2:11 Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.	S2:8 Describe the basic needs of animals, including humans, for survival (water, food and air). S2:9 Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene They should also be introduced to the processes of reproduction and growth in animals. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. **Living things and their habitats** S2:1 Explore and compare the differences between things that are living, dead, and things that have never been alive. S2:2 Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other S2:3 Identify and name a variety of plants and animals in their habitats, including microhabitats.	S2:6 Describe how plants need water, light and a suitable temperature to grow and stay healthy. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.

		S2:4 Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.	
Y3	**Animals including humans** S3:5 Identify 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 S3:6 Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.	**Rocks** S3:7 Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. S3:8 Describe in simple terms how fossils are formed when things that have lived are trapped within rock. S3:9 Recognise that soils are made from rocks and organic matter. Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. **Light** S3:10 Recognise that they need light in order to see things and that dark is the absence of light.	**Plants** S3:1 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers S3:2 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. S3:3 Investigate the way in which water is transported within plants S3:4 Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

	Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out. **Forces and Magnets** S3:15 Compare how things move on different surfaces. S3:16 Notice that some forces need contact between two objects, but magnetic forces can act at a distance. S3:17 Observe how magnets attract or repel each other and attract some materials and not others. S3:18 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.	S3:11 Notice that light is reflected from surfaces. S3:12 Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. S3:13 Recognise that shadows are formed when the light from a light source is blocked by an opaque object. S3:14 Find patterns in the way that the size of shadows changes. Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.	Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

	S3:19 Describe magnets as having two poles S3:20 predict whether two magnets will attract or repel each other, depending on which poles are facing. Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).		
Y4	**Animals including humans** S4:4 Describe the simple functions of the basic parts of the digestive system in humans (mouth, oesophagus, stomach, small intestine, large intestines, anus and liver). S4:5 Identify the different types of teeth in humans (incisors, canines, molars and premolars) and describe their functions S4:6 Construct and interpret a variety of food chains, identifying producers, predators and prey.	**Living things and their habitats** S4:1 Recognise that living things can be grouped in a variety of ways S4:2 Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment S4:3 Recognise that environments can change and that this can sometimes pose dangers to living things. Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the	**Sound** S4:10 Identify how sounds are made, associating some of them with something vibrating. S4:11 Recognise that vibrations from sounds travel through a medium to the ear. S4:12 Find patterns between the pitch of a sound and features of the object that produced it S4:13 Find patterns between the volume of a sound and the strength of the vibrations that produced it.

	Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. **Electricity** S4: 15 Identify common appliances that run on electricity. S4:16 Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. S4:17 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. S4:18 Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. S4:19 Recognise some common conductors and insulators, and associate metals with being good conductors	habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. **states of matter** S4:7 Compare and group materials together, according to whether they are solids, liquids or gases. S4: 8 Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). S4:9 Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.	S4:14 Recognise that sounds get fainter as the distance from the sound source increases. Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.

	Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity.		
Y5	**Light** 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	**Animals including humans** S5:3 Describe the changes as humans develop to old age. Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. **Living things and their habitats** S5:1 Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. S5:2 Describe the life process of reproduction in some plants and animals.	**Properties and changes of materials** S5:4 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. S5:5 Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. S5:6 Use knowledge of solids, liquids and gases to decide how mixtures might be

	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Earth and Space** S5:10 Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. S5:11 Describe the movement of the Moon relative to the Earth. S5:12 Describe the Sun, Earth and Moon as approximately spherical bodies. S5:13 Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn 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). They should understand that a moon is a celestial body that orbits a planet (Earth has	Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. **Forces** S5:14 Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. S5:15 Identify the effects of air resistance, water resistance and friction that act between moving surfaces. S5:16 Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the	separated, including through filtering, sieving and evaporating. S5:7 Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ♣ S5:8 Demonstrate that dissolving, mixing and changes of state are reversible changes S5:9 Explain 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. Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example,

	one moon; Jupiter has four large moons and numerous smaller ones).	effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.
Y6	**Electricity** S6:13 Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. S6:14 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 S6:15 Use recognised symbols when representing a simple circuit in a diagram. Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.	**Living things and their habitats** S6:1 Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals S6:2 Give reasons for classifying plants and animals based on specific characteristics. Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification	**Animals including humans** S6:3 Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. S6:4 Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function S6:5 Describe the ways in which nutrients and water are transported within animals, including humans. Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and

	Note: Pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity. **Light** S6:9 Recognise that light appears to travel in straight lines S6:10 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 S6:11 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 S6:12 Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions.	**Evolution and Inheritance** S6:6 Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago S6:7 Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. S6:8 Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution	other substances can be harmful to the human body.

Each individual class has a set of lessons for each topic with resources, national curriculum links and activities for them to complete.