Long term Plan for Science 2022/2023						
Phase	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
EYFS	Our Early Years curriculum has been designed using the statutory educational programmes of study and the development matters to ensure that all children are equipped with knowledge and skills to achieve expected in the Early Learning Goals that link to Science. The following Early Learning Goals link to Science: **Communication and Language (Listening, Attention and Understanding)** • Make comments about what they have heard and ask questions to clarify their understanding. **Personal, Social and Emotional Development (Managing Self)** • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. **Understand the World (The Natural World)** • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and difference between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some importance processes and changes in the natural world around them, including the seasons and changing states of matter. Throughout the year, the children will observe and talk about the changes that they can see in their local environment including the weather, trees, plants and animals.					
Nursery	**Marvellous Me** To know simple body parts such as head, shoulder, arm, leg, foot	**Amazing Animals** To know basic animals that live on a farm including pigs, cows and sheep * To know baby animals are sometimes known by different names to the adult * To know the names of some animals and their babies * To know some baby animals do not look like the adult. * To know the leaves fall off the trees in autumn	**Amazing Animals** To know dinosaurs lived a long time ago * To name at least two dinosaurs * To know some dinosaurs are big and some are small * To know polar bears and penguins live where it is cold * To know it is cold in the winter	**Terrific Tales** To begin to know some food that is healthy or unhealthy for them * To know in spring flowers start to grow	**Off We Go!** To know there are some different planets * To know in spring flowers start to grow	**Come Outside!** To know plants need water to help them to grow * To know the name of at least 3 minibeasts* To know the lifecycle of a butterfly * To know it is hot in the summer

Nursery Curricular Goals	Linked to Science: **Children will know how to follow a simple recipe to make play dough** Children will make playdough using a range of materials and notice how it has changed state. To observe changes in playdough. **Children will know names of resources, how they can be used and will know the right resources to use for their chosen task/purpose** Children will know the name of some resources and equipment that may, in the future, link to Science experiments. **Children will know about their family, living in Barnsley and begin to know about how to look after things that are important to them e.g. pets, animals and the environment** Children will begin to know what animals need to survive and how to care for them.

Reception	**All About Me!** To know the names of basic parts of the body and also other parts of the body including elbow, wrist, kneecap, ankle* To know it is important to stay healthy by eating a balanced diet, exercising, drinking enough water, getting enough sleep, following good hygiene.* To know we have five senses - taste, touch, sight, hearing, smell.* To know about the importance brushing their teeth. * To know there are 4 seasons are Autumn, Winter, Spring and Summer. To know about and recognise signs of autumn To know in Autumn some leaves change colour and start to fall off the trees.	**Our Amazing World** To know animals that live on a farm including basic such as pigs, cows and sheep and also other animals such as goat, geese, ducks, horses.* To know where animals live on the farm e.g. in a field / sty / barn * To know the names of farm animals and their babies * To know Dinosaurs are extinct** To know some dinosaurs are herbivores and eat plants* To know some dinosaurs are carnivores and eat meat* To know the names of at least 3 dinosaurs including T Rex* To know Dinosaur bones are known as fossils ** To know that some animals are nocturnal and this means they sleep during the day. * To know some nocturnal animals including bat, fox, hedgehog and owl*	**Our Amazing World** To know there are 8 Planets * To know the name of some planets* To know Neil Armstrong was the first man on the moon ** To know we live on the Earth* * To know there is more sea than land on earth. * To know Polar regions are cold, icy and have snow and not many plants grow there. * * To know Polar bears live in the arctic and penguins live in the Antarctic * To know Polar bears have a layer of fat to keep them warm* To know about and recognise signs of winter To know not much grows in Winter. It is cold and can be snowy and icy.	**Once Upon a Time** To know and talk about the lifecycle of a chick – egg, chick, hen * To know which materials are best to build houses and begin to understand why e.g. waterproof* To know about goats / pigs – where they live? What they like to eat? Any special features of the animals. *	**Growing and Changing** To know we have a responsibility to look after our world. ** To know plants grow from seeds or bulbs. * To know parts of a plant including roots, stems/stalks, leaves and flowers. * To know plants need light, warmth, water and food to grow * To know about and recognise signs of spring To know in Spring it starts to get warmer and things start to grow again.	**Growing and Changing** To know spiders have 8 legs. * To know insects have 6 legs and three body sections * To know the name of at least 3 minibeasts* To know some minibeasts have soft and slimy bodies, some have a shell and some have an exoskeleton * To know the lifecycle of a butterfly and a frog * To know what some animals that live in the sea and name at least 3* To know where we might find a lighthouse and what its job is To know in Summer it can be hot and lots of things grow.

<table>
<tr><td>Reception Curricular Goals</td><td colspan="3">Children will know and understand hygiene rules and routines around toileting, eating, hand washing and brushing of teeth.
Children will know about their health including germs, bacteria, healthy/unhealthy hygiene.
Children will know about the world beyond Barnsley including countries, celebrations, animals and environments.
Children will know about animals, environments and habitats. Children will begin to know how animals have made adaptions to their habitat.</td></tr>
<tr><td rowspan="2">KS1</td><td colspan="3">(Biology) Seasonal Changes to be taught throughout the year through observations:
Observe changes.
Describe weather associated with seasons.
Understand that the length of day changes throughout the year.
Guidance
Make tables and charts about the weather after observing and talking about changes.
Make displays of what happens in the world around them including day length as the seasons change.
Key Scientists
George James Symons (Meteorologist)
Anders Celsius (Astronomer, Physicist and Mathematician)</td></tr>
<tr><td>(Chemistry) Everyday Materials:
Y1 Objectives
Distinguish between an object and the material from which it is made
Identify and name materials such as wood, plastic, glass, metal, water and rock
Describe simple properties such as hard, soft, bumpy etc.
Compare and group materials based on their properties.
Y2 Objectives
Identify and compare suitability of materials e.g. wood, metal, plastic, glass, brick, rock, paper and cardboard
Find out how the shape of objects can be changed by squashing, bending, twisting and stretching.
Guidance:</td><td>British Science Week 10-19 March 2023
‘Connections’

(Biology) Animals including humans
Y1 Objectives
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.</td><td>(Biology) Plants:
Y1 Objectives
Identify and name common wild and garden plants.
Identify and name deciduous and evergreen trees.
Identify and describe basic structure of common flowering plants and trees.
Y2 Objectives
Observe how seeds and bulbs grow into plants.
Find out why plants need water, light and temperature.
Guidance:
Plant structures include: leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem.</td></tr>
</table>

	• Perform simple tests such as 'What is the best material for an umbrella?' • Raise and answer questions about a range of everyday materials to become familiar • Look at how one material can be used for more than one thing e.g. metal for coins, can, cars, table legs. • Observe everyday material around school, identify and classify materials and record observations. Key Scientists • Charles Mackintosh (waterproof coat) • John Dunlop (inflatable rubber tyre) • Ole Kirk Christiansen (creator of Lego)		Y2 Objectives • 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. Guidance: • Use the local environment throughout the year to answer questions about animals in habitats. • Understand how to take care of animals and how to return them safely after study. • Use games, actions and rhymes to learn body parts. • Recognise growth in chickens, butterflies, frogs, sheep and adults. • Ask questions about survival and how to stay healthy. Key Scientists • Jane Goodall (Primatologist) • Joan Beauchamp Proctor (Zoologist) • Maria Sibylla Merian (Entomologist) • Louis Pasteur (Biologist)		• Experiment growing seeds and bulbs in different environments and compare findings. • Observe growth of plants they have planted by drawing diagrams and using magnifying glasses to look closely. • Look at the local environment and see how plants grow. Key Scientists • Beatrix Potter (Botanist and Natural Scientist) • John Ray (Naturalist) • Jane Colden (Botanist) • Agnes Arber (Botanist)	
LKS2	(Physics) Forces and Magnets: • Compare how things move on different surfaces. • Notice that some forces need contact between objects but magnetic forces work at a distance.	(Biology) Animals including humans: Year 3 Objectives • Identify the right types of nutrition for animals and humans and that they get nutrition from what they eat.	(Chemistry) Rocks: • Compare and group different kinds of rocks based on their appearance and physical properties. • Describe how fossils are formed when things that have	British Science Week 10-19 March 2023 'Connections'	(Biology) Living Things and their Habitats: • Group living things in a variety of ways. • Use classification keys to help group, identify and name living things in the local	(Chemistry) States of Matter: • Compare and group materials based on whether they are solid, liquid or gas. • Observe materials that change state when heated or cooled and measure the temperature

	• Observe how magnets attract and repel and how some materials attract and not others. • Compare and group materials based on whether they are attracted to a magnet and identify magnetic materials. • Describe magnets as having 2 poles. • Predict whether magnets will repel or attract depending on which poles are facing. Guidance • Explore behaviour and everyday uses of different magnets. • Raise questions and carry out tests and gather and record data. • Explore the strengths of different magnets and find a fair way to compare them. • Look for patterns in the way that magnets behave. Key Scientists • Isaac Newton (Physicist) • John McAdam (Engineer)	• Identify skeletons and muscles for support, protection and movement. Year 4 Objectives • Know the basic parts of digestive system. • Identify different teeth in humans and their functions. • Construct and interpret food chains using producers, predator and prey. Guidance • Identify and group animals with and without skeletons and observe their movement. • What would happen if humans didn't have skeletons? • Group animals based on what they eat. • Design healthy meals. Key Scientists • Marie Maynard Daly (Biochemist studied cholesterol, super, protein) • Pierre Fauchard (father of modern dentistry)	lived are trapped within rock. • Recognise that soils are made from rocks and organic matter. Guidance • Link to Geography. • Observe different types of rocks, why they might change and whether they have grains or crystals in them. • Research different fossils that are found in sedimentary rock. • Investigate what happens when rocks rub together or changes in water. Key Scientists • Mary Anning (Paleontologist) • Florence Bascom (Geologist)		area and wider environment. • Recognise that environments can change through human impact and this can pose dangers. Guidance • Put vertebrate animals into groups such as fish, amphibians, reptiles, birds and mammals. • Put invertebrates into snails, slugs, worms, spiders and insects. • Explore positive and negative effects e.g. nature reserves, ecologically planned parks, garden ponds against population, developments, litter and deforestation. Key Scientists • Rachel Carson (Marine Biologist) • Jacques Cousteau (Ocean Explorer)	this happens at in °C. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Guidance • Develop simple descriptions of states of matter. • Note change of water when heated and cooled. • AVOID chemical changes e.g. baking/burning • Explore the effect of temperature on chocolate, butter, cream. • Observe a change over time such as a puddle evaporating, washing drying etc. Key Scientists • Daniel Gabriel Fahrenheit (physicist) • Antoine Lavoisier (Chemist)

UKS2	(Physics) Earth and Space: • Describe the movements of the Earth and other planets in relation to the Sun. • Describe the movements of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximate Spherical bodies. • Use the idea of the Earth's rotation to explain day, night and the apparent movement of the sun across the sky. Guidance • Use a model to explain day and night. The Sun is a star at the centre of our Solar System. There are 8 planets. The moon is a celestial body that orbits a planet. • Understand how the geocentric model gave way to the heliocentric model. • Compare the time of day at different places on the Earth.	(Chemistry) Properties and Changes of Materials: • Compare and group materials on the basis of their properties: hardness, solubility, transparency, conductivity (electrical/thermal), response to magnets. • Know some materials dissolve in liquid to form solution and describe how to recover a substance from a solution. • Use knowledge of solid, liquid and gas to decide how mixtures might be separated though filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests for use of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible. • Explain that some changes result in the formation of new materials and this is	(Biology) Living Things and their Habitats: Y5 objectives • Describe the differences in life cycles of mammals, amphibians, insects and birds. • Describe reproduction in plants and animals. Y6 objectives • Describe how living things are classified according to common characteristic including micro-organisms, plants and animals. • Give reasons for classifying plants and animals based upon characteristic. Guidance • Observe life cycle in vegetable garden, animals. • Find out about the work of the key scientists listed. • Sexual and asexual reproduction in plants and sexual	British Science Week 10-19 March 2023 'Connections'	(Physics) Forces: • Explain that unsupported objects fall towards the Earth because of gravity. • Identify effects of air resistance, water resistance and friction that act between moving surfaces. • Recognise that some mechanisms (levers, pulleys and gears) allow a smaller force to have a greater effect. Guidance • Explore air resistance through parachutes and sycamore seeds. • Explore how friction makes objects stop or slow. • Explore falling paper cones of cupcake cases and design and make parachutes and carry out fair tests. • Make and test boats of different shapes. Key Scientists	(Biology) Animals including humans: Y5 objectives • Describe the changes as humans develop to old age. Y6 objectives • Identify human circulatory system and describe functions of the heart, blood vessels and blood. • Recognise impact of diet, exercise, drugs and lifestyle. • Describe how nutrients and water are transported in animals and humans. Guidance • Draw a timeline to indicate growth and development of humans • Changes in puberty • Compare gestation periods of animals with humans • Find out and record length and

	• Create simple models of the Solar System. • Construct shadow clocks and sundials • Understand how Stonehenge might have been used as an astronomical clock. Key Scientists • Galileo Galilei (Astronomer) • Mae Jemison (Astronaut) • Claudius Ptolemy (Roman Astrologer) • Nicolaus Copernicus (Astronomer)	usually not reversible including burning and baking. Guidance • Find out about how Chemists create new materials. • Observe how come conductors will create a brighter bulb or some materials will be hotter than others when placed against a heat source. • Most effective questions based on findings. • Research how chemical changes have impact on our lives. Key Scientists • Spencer Silver (invented glue for sticky-notes) • Ruth Benerito (invented wrinkle-free cotton)	reproduction in animals. • Compare life cycles in local area to animals in rainforests, oceans, deserts etc. • Grow new plants from parent plant using seeds, stems, root cuttings, bulbs and observe. • Compare how different animals reproduce and grow. • Broad groupings can be subdivided. • Decide where unfamiliar animals would belong on a classification system. Key Scientists • May Agnes Chase • David Attenborough • Carl Linnaeus • Jane Goodall		• Isaac Newton • Albert Einstein • Archimedes	mass or a baby as it grows. • Use learning in Y3/4 on skeletal, muscular and digestive systems to answer questions that help to understand circulatory system. • How to keep bodies healthy and what can be harmful to humans Key Scientists • Elizabeth Blackwell (Doctor) • Marie Curie (Physicist and Chemist) • Alexander Fleming (Physicist and Microbiologist)