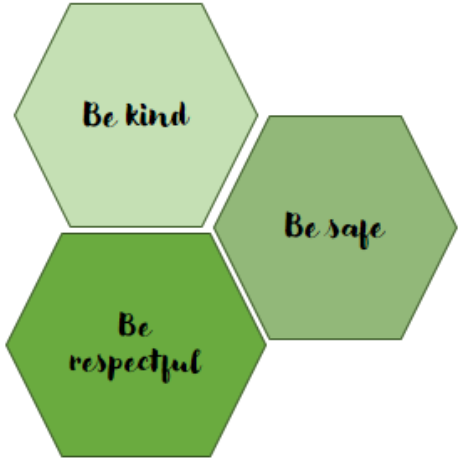
Strathmore Infant and Nursery School

Our Vision and Values

As members of the Strathmore family, our children will grow intellectually and emotionally in a supportive and stimulating environment.
We foster a lifelong love of learning that is attentive to our students' needs and interests.
Our well-rounded curriculum promotes critical thinking, perseverance, and health and wellbeing. They learn to value themselves, others and the world we live in.
Children are at the heart of our vision.

Nurturing Brilliant, Resilient Minds



Our Curriculum Intent

At Strathmore Infant and Nursery School, we aim to provide a high-quality science education that provides children with the foundations they need to recognise the importance of science in every aspect of daily life.

- Encourage children to be inquisitive throughout their time at the school and beyond.
- We follow an enquiry led approach to allow children to be in the driving seat of their own learning!
- We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes.
- Throughout the programmes of study, children will acquire and develop the key knowledge that has been identified within each unit and across each year group.

- The science curriculum fosters a healthy curiosity in children about the world around them and promotes respect for the living and non-living.
- The key knowledge identified by each year group is informed by the National Curriculum. Our current scheme of learning identifies the key skills which are in accordance with the Working Scientifically skills expectations of the National Curriculum.
- Our sequence of learning is designed to ensure that children able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently.

- Children are encouraged to ask questions and be curious about their surroundings and a love of science is nurtured through a whole school ethos and a varied science curriculum. Our curriculum has been designed to link with Cornerstone's 10 big ideas. These ideas are **humankind, processes, creativity, nature, investigation, significance, materials, change, place and shape** and **comparison.**
- The school's approach to science takes account of the school's own context, ensuring access to people with specialist expertise and places of scientific interest as part of the school's commitment to learning outside the classroom.

Our Curriculum Implementation

At Strathmore, teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science.

Our whole school approach to the teaching and learning of science involves the following;

- Science is planned using Cornerstones and taught weekly by the class teacher. Science is taught in topic blocks to enable the achievement of greater depth of knowledge.
- Each new unit of work begins with a recap of the previous related knowledge from previous years. This helps children to retrieve what they have learnt in the earlier sequence of the programme of study and ensures that new knowledge is taught in the context of previous learning to promote a shift in long term memory. Key vocabulary for the new topic is also introduced as part of this 'unit introduction' and children are shown the topic vocabulary which is then placed on the working wall throughout the topic block. This provides definitions and accompanying visuals for each word to ensure accessibility to all. This approach also means that children are able to understand the new vocabulary when it is used in teaching and learning activities and apply it themselves when they approach their work.
- Within all lessons, teachers plan a phase of progressive questioning which extends to and promotes the higher order thinking of all learners. Questions initially focus on the recall or retrieval of knowledge. Questions then extend to promote application of the knowledge in a new situation and are designed to promote analytical thinking, such as examining something specific.

•Through our planning, we involve problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Teachers use Cornerstones to create engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion.

•We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

•Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the topics.

•Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.

•Children are offered a range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.

•Events, such as Science Week, allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.

•At the end of each topic, key knowledge is reviewed by the children and checked by the teacher and consolidated as necessary.

Inclusive Learning

Lessons incorporate a range of teaching strategies from independent tasks, paired and group work, as well as practical and formal lessons that allow the children to focus on evaluating their work. This variety means that lessons are engaging and appeal to all learning styles. Teachers are able to adapt and differentiate each lesson based on the needs and requirements of their class, enabling all children to access the objective for the lesson as well as stretch the children's learning where appropriate. Some key changes we may make for children with SEND are:

Hearing Impairment

- Using pictorial representations, vocabulary lists and explanations, careful positioning within class.

Visual Impairment

- Enlarged resources, use of technology

Dyspraxia

- Alternative ways of recording, simplification of diagrams

Memory/Processing

- Dual coding, pre and reteaching

ASC

- Dual coding, visual representation

ADHD

- Dual coding, step by step instructions

Cognition

- Graphic organisers, dual coding, alternative methods of recording

SEMH

- Clear end points, clear expectations, clarity of modelling and explanations

Our Journey Through Science

What does Science look like in Early Years ?

Nursery

Use all their senses in hands on exploration if natural materials.

Explore collections of materials with similar/ different properties.

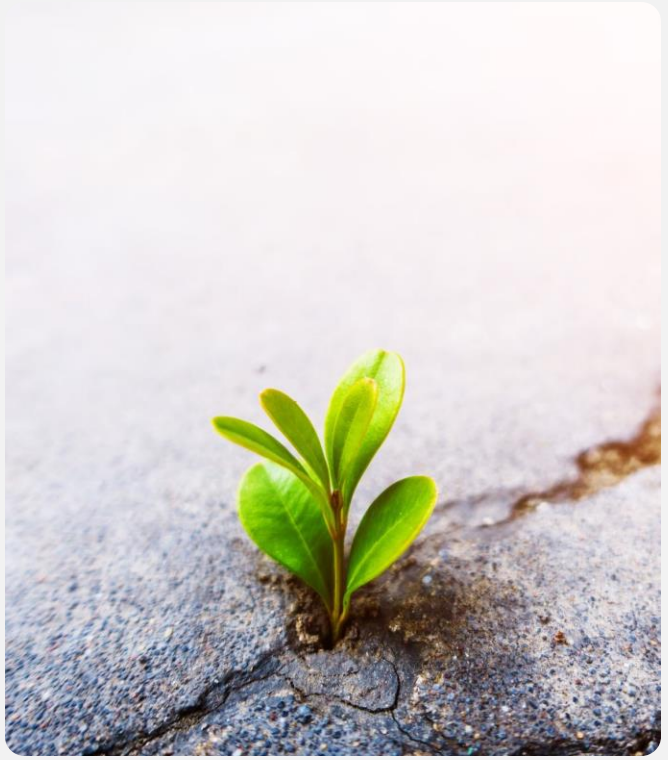
Plant seeds and care for growing plants.

Understand the key features of the life cycle of a plant.

Begin to understand the need to respect and care for the natural environment.

Explore and talk about forces.

Talk about the difference between materials and the changes they notice.



Reception

Describe what they see, hear, and feel whilst outside.

Explore the natural world around them.

Understand the effect of changing seasons on the natural world around them.

Changing states of matter.

Our Journey Through Science

What does Science look like in Year One?

Identify and name a variety of common wild and garden plants, including deciduous and evergreen tree

Identify and describe the basic structure of variety of common flowering plants, including trees

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.

Identify, name, draw and label the basic parts of the human body and say which part is associated with each sense.

Distinguish between an object and the material from which it is made

Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock

Describe the simple physical properties of a variety of everyday objects

Compare and group together everyday materials

Observe changes across the four seasons

Observe and describe weather associated with the seasons and how the day length varies

Our Journey Through Science

What does Science look like in Year Two?

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

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

Identify and name a variety of plants and animals in their habitats, including micro habitats

Explore and compare the differences between things that are living, dead, and things that have never been alive

Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, identify and name different sources of food

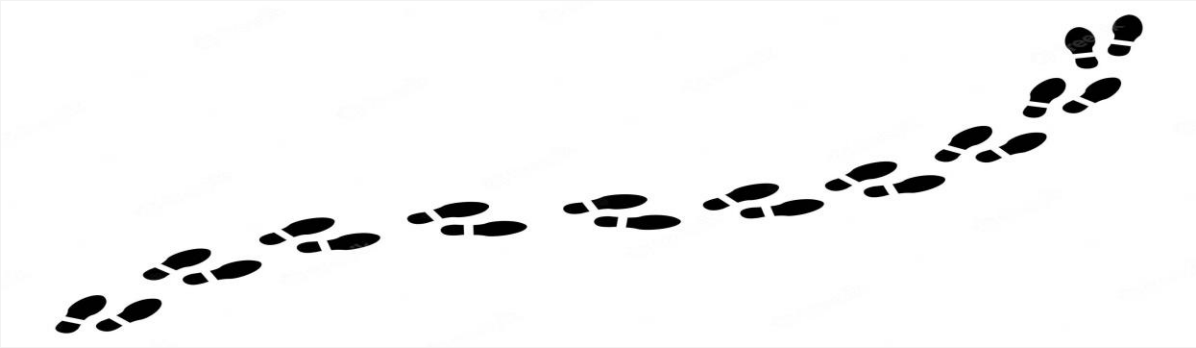
Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other

Identify and compare the suitability of a variety of everyday materials for uses

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Our Journey Through Science

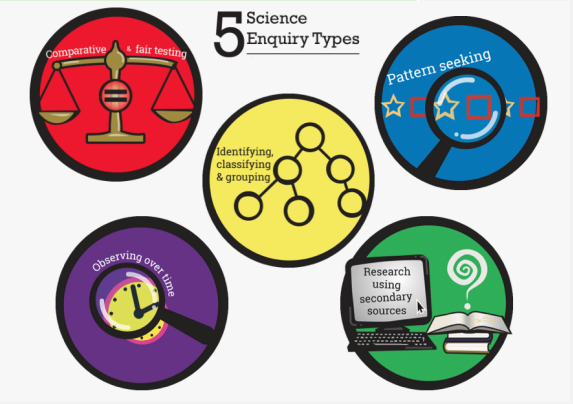
Reception	Year One	Year Two
Explore the natural weather around them.	Observe and describe weather associated with the seasons and how the day length varies	Identify and name a variety of plants and animals in their habitats, including micro habitats



Working Scientifically

	Year One	Year Two
● Asking simple questions and recognising that they can be answered in different ways ● Observing closely, using simple equipment ● Performing simple tests ● Identifying and classifying ● Using their observations and ideas to suggest answers to questions ● Gathering and recording data to help in answering questions	**Biology** Animals, including Humans Plants **Chemistry** Everyday materials **Physics** Seasonal Change	**Biology** Animals, including Humans All living things and their habitats Plants **Chemistry** Everyday materials

https://www.youtube.com/watch?v=nvIltte6kDc



Working Scientifically

Seasonal Change	Everyday materials	Animals including humans	Plants
● Gather and record data about weather conditions in autumn, drawing on observation and using simple equipment (such as a container to measure rainfall) *.* ● Use data to create a pictogram and use this to describe changes in day length over the seasons. ● Use their evidence to describe some other features of the weather, surroundings, themselves, animals, and plants found in autumn. ● Demonstrate their knowledge in different ways e.g. creating seasonal artwork, creating a pictogram (and use this to ask and answer related questions)	Compare and group together a variety of everyday materials on the basis of their simple physical properties. ● Classify objects made of one material in different ways e.g. a group of objects made of metal. ● Classify one type of object made from a range of materials e.g. a collection of spoons made of different materials. ● Chosen an appropriate method for testing an object for a particular property. ● Use their test evidence to answer the questions about properties e.g. Which cloth is the most absorbent? ● Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters.	Make first hand close observations of animals from each of the groups (city farm) ● Compare the structure of two animals from the same or different group e.g. wings, feathers, vertebrates/invertebrates. ● Classify animals using a range of features e.g. lay eggs/give birth to live young. herbivore, omnivore (these terms do not have to be explicitly taught). ● Identify animals by matching statements to named images. ● Take measurements of parts of the body and present results in a table to interpret. ● Conduct simple sense experiments. Which part of my body is good for feeling, which is not? Which food/flavours can I identify by taste? Which smells can I match?	● Can sort and group parts of plants using similarities and differences e.g. the shape of leaves, the colour of the flower/blossom. ● Can use simple charts and Venn diagrams etc. to identify and classify plants. ● Use photographs and their own observations to talk about how plants change over time (e.g. seed to sapling to tree) and over the year (deciduous and fruit bearing trees). * ● Plant seeds and observe how they grow and change by making simple observations. * ● Point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green, the leaves are different shapes.

Working Scientifically

Animals and humans	Every day materials	Living things and their habitats	Plants
Ask questions and use secondary sources to find out about the life cycles of some animals ● Observe animals growing over a period of time e.g. chicks, caterpillars, a baby ● Ask questions of a parent about how they look after their baby ● Ask pet owners questions about how they look after their pet	Investigate the effect of exercise on their bodies ● Classify food in a range of ways, including using the Eatwell guide ● Investigate washing hands, using glitter gel ● Describe, using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a life cycle book for a younger child ● Measure/observe how animals, including humans, grow. ● Collate what they know about looking after a baby/animal by creating a parenting/pet owners' guide ● Explain how development and health might be affected by differing conditions and needs being met/not met	Classify and sort materials by their properties e.g. manmade, natural • Investigate and observe what happens to different materials during testing and use this to inform explanation of their properties • Investigate which materials are fit for a purpose e.g. What is the best material for an umbrella? • Explain from their observations how materials change when a force is exerted on them by squashing, bending, twisting and stretching. • Investigate the transparency of objects, recording class data in a table and drawing simple conclusions from the findings. • Ask and answer questions about everyday materials	Explore the outside environment regularly to find objects that are living, dead and have never lived ● Classify objects found in the local environment ● Observe animals and plants carefully, drawing and labelling diagrams ● Create simple food chains for a familiar local habitat from first hand observation and research ● Create simple food chains from information given e.g. in picture books (Gruffalo etc.) ● Can sort into living, dead and never lived ● Can give key features that mean the animal or plant is suited to its microhabitat ● Using a food chain can explain what animals eat ● Can explain in simple terms why an animal or plant is suited to a habitat

Our Journey Through Science (Knowledge)

Reception	Year One	Year Two
· **Know about the similarities and differences in relation to places, objects, materials and living things.** · **Talk about the features of their own immediate environment and how environments might vary from one another.** · **Explore the natural world around them.**	· Knows when each of the four seasons occurs · Knows what the features of autumn are and what happens to trees in this season · Knows that days are longer in summer (sunshine hours) than in winter · Observe changes across the four seasons · Distinguish between an object and the material from which it is made · Can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock · Describe the simple physical properties of a variety of everyday materials · Know how the properties of a material can make it useful for a range of different purposes (for example, plastic is waterproof so it can be used to coat fabric for clothing but can also be used for outdoor play equipment) · knows why and how the properties of materials make them particularly useful for specific purposes (for example, stone is a hard, heavy and durable material so is useful for construction of buildings). · knows that different materials can share the same properties (for example glass and plastic can be transparent). · Knows and can identify and name a variety of common animals including fish amphibians, reptiles, birds and mammals e.g. cat, robin, adder, frog, salmon. · Knows and can identify and name a variety of common animals that are carnivores, herbivores and omnivores. · Can identify, name, draw and label the basic parts of the human body and say which part · of the body is associated with each sense · Knows and can identify and name a variety of common wild and garden plants, including · deciduous and evergreen trees · Knows and can identify and describe the basic structure of a variety of common flowering · plants, including trees. · Knows about and can describe weather in different seasons over a year. · Knows and can describe the features of different seasons and how they change · through the year.	· Can describe how animals including humans have offspring which grow into adults, using the appropriate names for the stages · Knows that to survive animals need sunlight, water, air, food and a suitable habitat (including shelter for protection from predators and the environment · Knows that exercise is important to humans and can explain why. · Knows about general hygiene and its importance and can state examples of hygienic practice. · Knows which food groups common foods belong to. · Knows the different food groups and the benefits of each as part of a healthy, balanced diet. · Knows and can explain why some materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard are particularly suited to specific purposes · Knows how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching · Knows the difference between materials that are transparent, translucent and opaque. · Knows and can explain the differences between things that are living, dead, and things that have never been alive ● Knows that most living things live in habitats to which they are suited ● Knows and can describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Knows and can name a variety of plants and animals in their habitats, including micro-habitats · Knows and can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and make the different sources of food. · Knows that plants may grow from either seeds or bulbs. · knows that seeds and bulbs can germinate and then grow into seedlings and then continue to grow into mature plants. · Knows that mature plants may have flowers which then develop into seeds, berries and fruits etc. · Knows that seeds and bulbs need to be planted at particular times of the year and will germinate and grow at different rates. · Knows that some plants are better suited to growing in full sun and some grow better in partial and full shade. · Knows that plants need water, light and a suitable temperature to grow and stay healthy.

Key Vocabulary

Reception

growth
human body
nature
temperature
floating
sinking
melting
freezing
weather
health
exercise
plants
fossils

Year One

Abdomen, absorbent, paper, property, stretchy, material, metal, transparent, metal alloy, natural, waterproof, opaque, bark, meadow, blade, petal, blossom plant, branch, root bud season, bulb seed, deciduous shelter, evergreen, soil flower, stalk, fruit, stem garden, tree garden, plant, trunk, hedgerow, vein, leaf wild, plant, margin, woodland.

Year Two

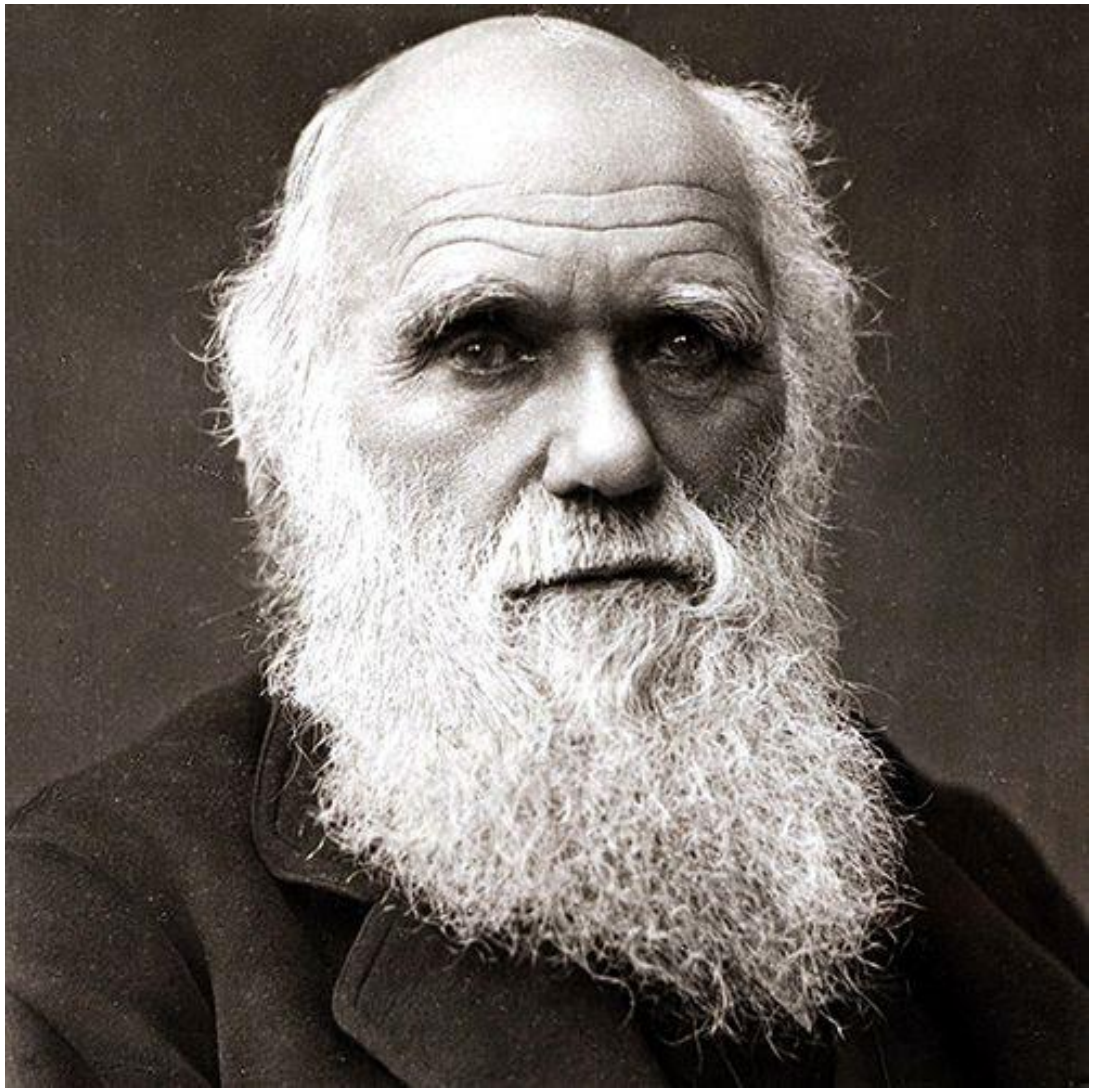
Earth, soil, seeds, grow, tadpole, seedlings, germinate, human, baby, toddler, child, teenager, adult, material, metal, plastic ,magnetic, transparent, translucent, opaque, synthetic fabric, synthetic fabric, habitat, micro habitat, living, non-living, deciduous, conditions

A SCIENTIST JUST LIKE ME.

It is fundamental for our children to see a diverse range of representation within the science curriculum. Recently, current framework has been reviewed and links to Scientists have been carefully considered to support all units of teaching.

At Strathmore, we aim for every child to view themselves as a Scientist. We aim to do this by:

Raising awareness in diversity in science related jobs (careers week).
Challenge gender stereotypes about science related jobs.
Show a range of Scientists from ethnic minority backgrounds.
Share examples of powerful women in science.



What does assessment look like in science?

- Each science topic begins with an overarching question.
- At the end of the topic, children are given a prove it opportunity to show taught knowledge and skills.
- Cornerstones is used to track learning.
- Formative assessment is used often throughout each lesson.
- Dig deeper questions are used to promote deeper thinking.

Subject impact

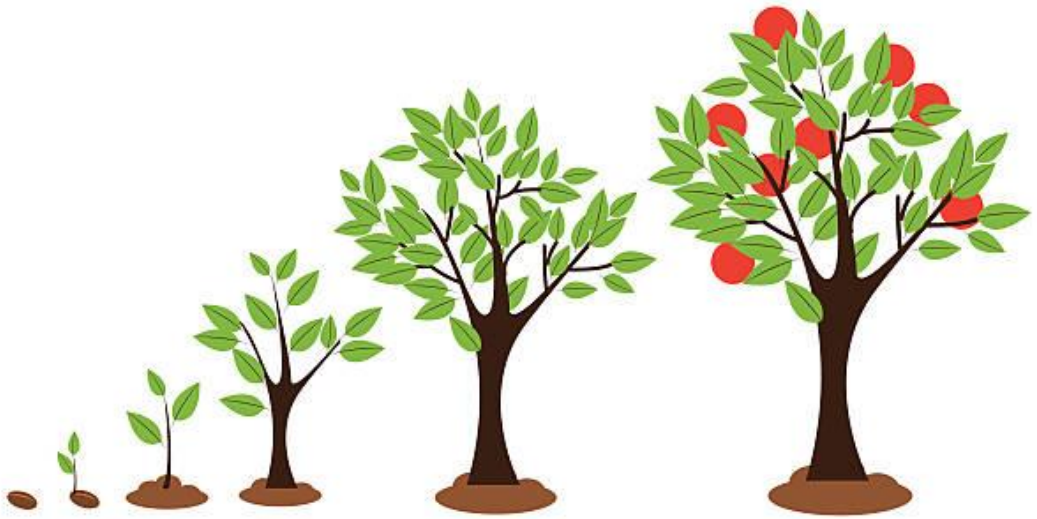
- The successful approach at Strathmore results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. Our children love Science!

- Children will know more, remember more and understand more about the curriculum. Children retain prior-learning and explicitly make connections between what they have previously learned and what they are currently learning.

All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills
- A richer vocabulary which will enable them to articulate their understanding of taught concepts
- Confidence and a love of learning for all things science

Enrichment opportunities



- Science week
- External visitors
- Staff meetings
- Trips
- Forest school
- School grounds
- Designated STEM areas

Future opportunities

- Training sessions for staff
- External speakers
- Plan visits to other settings
- Science ambassadors
- Science clubs