East Midlands Academy Trust
Science Curriculum Overview

Why Teach Science?

We believe that Science will allow pupils to make informed decisions and choices throughout their lives. By fostering and maintaining a curiosity throughout their education, our pupils will be able to:

- Understand how the world around them works
- Adapt to a life in a modern world
- Experience and share the cultural capital that Science provides
- Show resilience when solving problems
- Decipher fact from fiction by learning how to look for reliable sources of information.

Working Scientifically

Our curriculum details the scientific enquiry skills involved in the processes of science, including an understanding that questions are fundamental alongside the design of experiments; reasoning and arguing with scientific evidence a analysing and interpreting data.

- Observing and Measuring
- Asking Questions
- Recording Data
- Making Predictions
- Interpreting and Communicating Results
- Setting up Tests
- Evaluating

Key Vocabulary

'Rocket Words' are identified for each unit. These are displayed in a table so pupils and teachers can make connections and revisit vocabulary from previous years/units.

The 8 Big Ideas of the Science Curriculum

Curriculum maps detail the sequencing of substantive knowledge from the disciplines of biology, chemistry, and physics to enable pupils to build schemata of important concepts over time through eight 'big ideas'.

- Organisms
- Ecosystems
- Genes
- Waves
- Forces
- Electricity and Magnets
- Matter
- Earth

Each unit focuses on one or two of these big ideas. Knowledge relating to each of the big ideas is mapped progressively so that connections can be made to previous learning.

Assessment

Pupils' learning of the curriculum is assessed on an ongoing basis to monitor progress and identify the next steps in learning. In lessons, teachers check pupils can understand and remember the key knowledge and working scientifically skills built into the curriculum. Multiple choice quizzes are built into each unit to assess recall and understanding, these act as a diagnostic tool to inform teaching and provide pupils with feedback on their learning.

Scientific Enquiry Approaches used to develop Disciplinary Knowledge

Pattern Seeking
Identify patterns and look for relationships in enquiries where variables are difficult to control.

Observation Over Time
Observing changes that occur over a period of time ranging from minutes to months.

Research
Using secondary sources of information to answer scientific questions.

Identifying, Grouping and Classifying
Making observations to name, sort and organise items.

Comparative/Fair Testing
Changing one variable to see its effect on another, whilst keeping all others the same

Problem Solving
Applying prior scientific knowledge to find answers to problems.

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Science Curriculum Map – EYFS into Key Stage 1

Science Big Ideas	Earth	Matter	Organisms	Ecosystems	Genes

EYFS

Early Learning Goal: The Natural World
Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- 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.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Reception Understanding the World Milestones
Milestone 1

- Notices detailed features of objects in their environment.
- Can talk about some of the things they have observed such as plants, animals, natural and found objects.
- Enjoys playing with small world reconstructions, building on first-hand experiences, e.g. visiting farms, garages, train tracks, walking by river or lake.

Milestone 2

- Shows care and concern for living things and the environment

Milestone 3

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world
- Developing an understanding of growth, decay, and changes over time

Milestone 4

- 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.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
- Begin to understand the effect their behaviour can have on the environment

Typical learning experiences include:

Everyday materials

- Exploring a variety of materials and their characteristics.
- Joining materials together
- Investigating properties – experimenting with floating and sinking, magnetic properties, strength, natural vs man made.
- Investigating effectiveness of materials e.g. making a paper plane made from different materials like a paper towel, or card.
- Recycling and reusing materials. Junk modelling areas as well as explicit teaching.

Plants

- Categorising different types.
- Naming common plants and different parts e.g. petals, stem, leaves, roots.
- Exploring natural environment.
- Growing plants e.g. cress, beans, potatoes, sunflowers.
- Caring for plants.

Animals including humans

- Taking care of our bodies, teeth, body, healthy food, sun safety, enough sleep etc. Being able to discuss how to keep healthy.
- Identifying and naming and grouping different animals. Linking to habitats and environments.

Seasonal Changes

- Observing changes in the environment e.g. keeping a year long record, providing context for seasonal changes.
- Observe changes in weather. Be able to name different types of weather e.g. fog.
- Discussions about why we wear types of clothing at different types of year.

	Year 1	Year 2
Autumn 1	Animals Including Humans (About Me) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Living Things and Their Habitats • Explore and compare the differences between things that are living, dead, and things that have never been alive. • Identify and name a variety of plants and animals in their habitats, including microhabitats. • 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.
Autumn	Everyday Materials (Exploring and Uses) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Distinguish between an object and the material from which it is made. • Compare and group together a variety of everyday materials on the basis of their simple physical properties. • Describe the simple physical properties of a variety of everyday • materials.	Animals Including Humans 1 (Health and Survival) • 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.
Spring 1		Plants • 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. • Understand the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants.
Spring 2	Plants • Become familiar with common names of flowers and pant structures including seeds. • Identify and describe the basic structure of a variety of common flowering plants, including trees. • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Understand how plants change over time. • Observe the growth of planted flowers and keep records of how plants change over time.	Uses of Everyday Materials • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting, and stretching.
Summer 1	Animals Including Humans (About Animals) • 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)	Animals Including Humans 2 (Life Cycles) • Notice that animals, including humans, have offspring which grow into adults.
Summer 2	Seasonal Changes • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	Living Things and Their Habitats (Habitats Around the World) • 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 name a variety of plants and animals in their habitats, including microhabitats.