

Knowledge Progression Document for KS1 Science -

Procedural Knowledge (knowing how):

1. Observational Skills:

- Developing the ability to observe and describe objects, organisms, and natural phenomena.
- Using the senses (sight, touch, smell, hearing, taste) to gather information.
- Practising careful and systematic observation techniques.

2. Inquiry and Investigation:

- Learning to ask questions about the natural world.
- Conducting simple experiments and investigations using basic equipment.
- Developing the skill of making predictions and recording observations.

3. Scientific Method:

- Understanding the steps of the scientific method: asking questions, making hypotheses, testing, analysing data, and drawing conclusions.
- Recognising the importance of fair tests and controlling variables.
- Beginning to interpret simple data and draw basic conclusions.

4. Safety in the Science exploration:

- Developing safety awareness and following basic lab safety rules.
- Identifying potential hazards and risks.

Declarative Knowledge (knowing that):

1. Living Things:

- Identifying and classifying common plants and animals.
- Understanding the basic needs of living organisms, including food, water, and shelter.
- Recognising life cycles (e.g., plants growing from seeds).

2. Materials and Their Properties:

- Recognising and categorising materials as solid, liquid, or gas.
- Identifying common materials and their properties (e.g., wood, plastic, water).
- Understanding the concept of change in materials (e.g., melting ice).

3. Seasons and Weather:

- Recognising the four seasons and their characteristics.
- Describing different types of weather conditions (e.g., sunny, rainy, windy).
- Making connections between weather and seasons.

4. Forces and Motion:

- Identifying basic forces (e.g., pushing, pulling, gravity).
- Recognising that forces can change the shape or motion of objects.
- Understanding simple concepts of motion (e.g., fast, slow, straight, curved).

5. Earth and Space:

- Awareness of the Earth as part of the solar system.
- Recognising the Sun as a source of light and heat.
- Basic understanding of day and night and the concept of the Earth's rotation.

This knowledge progression document outlines the key procedural and declarative knowledge areas for primary school science in KS1. It provides a clear pathway for pupils to develop their scientific understanding, skills, and vocabulary as they progress through the primary curriculum.

What skills and knowledge do our EYFS children take into the y1 curriculum?

In EYFS, children develop foundational skills and knowledge that set the stage for Year 1 science.

They explore the natural world through observation, identifying basic elements like plants, animals, and weather patterns. They begin understanding the concept of cause and effect, which is crucial in scientific inquiry. Early exposure to simple experiments and hands-on exploration fosters their curiosity and critical thinking. EYFS also emphasises asking questions and using basic scientific vocabulary (see EYFS vocabulary section), preparing students for more structured investigations as they progress.

Implementation

Each key strand of science across the three disciplines of biology (plants; animals including humans; living things and their habitats; evolution and inheritance), chemistry (everyday materials; uses of everyday materials; rocks; states of matter; properties and changes of materials) and physics (seasonal changes; Earth and space; light; sound; forces and magnets; electricity) is covered and revisited in line with the National Curriculum so that pupils retain and build upon prior learning. Long term memory of key science knowledge objectives is supported by this repetition. Specific investigations are plotted for each year group, covering all age/phase appropriate enquiry types (comparative and fair testing; pattern seeking; identifying, classifying and grouping; observing over time; research using secondary sources). Plotting specific investigations across each year group ensures that a child will experience the whole range of enquiry types on their learning journey through the school, including formal experiment write-ups based on scientific working guidelines.

Learning to be a scientist at East Tilbury Primary

Intent

At East Tilbury Primary School, we are committed to delivering a dynamic and stimulating science curriculum that adheres to the national curriculum guidelines. Our intent is to ignite curiosity, wonder, and a lifelong love for science in every student. We believe in hands-on exploration, encouraging our pupils to become inquisitive thinkers and problem solvers. Through engaging experiments, scientific investigations, and immersive experiences, we aim to nurture a deep understanding of the natural world. Our intent is to cultivate scientific skills, knowledge, and inquiry that empower our students to comprehend the complexities of our universe and become informed and responsible citizens of tomorrow.



Knowledge Progression Document: Science (KS2)

Procedural Knowledge (knowing how):

1. Scientific Inquiry:

- Formulating testable hypotheses and conducting controlled experiments.
- Collecting and recording data systematically using appropriate tools.
- Analysing data, identifying patterns, and drawing conclusions.
- Communicating findings through written reports and presentations.

2. Practical Skills:

- Developing practical skills for using scientific equipment, such as microscopes, thermometers, and scales.
- Conducting investigations involving variables, fair testing, and multiple trials.
- Applying safety procedures in the laboratory and during fieldwork.

3. Research and Investigation:

- Conducting independent research using various sources, including books, online databases, and scientific journals.
- Summarizing information, evaluating sources for reliability, and citing references.
- Developing research questions and designing investigations.

4. Problem Solving:

- Applying critical thinking and problem-solving skills to address scientific challenges.
- Identifying and troubleshooting errors or unexpected outcomes in experiments and developing and testing solutions to scientific problems.

Declarative Knowledge (knowing that):

1. Life Processes and Living Things:

- Understanding the characteristics of living organisms, including cells, growth, reproduction, and response to stimuli.
- Exploring ecosystems, food chains, and the interdependence of species.
- Recognizing the role of adaptation and natural selection in evolution.

2. Materials and Their Properties:

- Investigating the properties of materials, including states of matter, solubility, conductivity, and thermal properties.
- Exploring changes of state, chemical reactions, and conservation of mass.
- Understanding the periodic table and the properties of elements.

3. Energy and Forces:

- Understanding energy forms, transfers, and conservation.
- Exploring electrical circuits, conductors, insulators, and energy sources.
- Investigating forces, motion, gravity, magnetism, and sound waves.

4. Earth and Space:

- Studying Earth's structure, plate tectonics, and geological processes.
- Exploring the solar system, celestial bodies, and the Earth-Moon-Sun system.
- Investigating weather, climate, and the impact of human activities on the environment.

5. Scientific History and Discovery:

- Learning about influential scientists, discoveries, and scientific advancements throughout history.
- Understanding the scientific method and its application in various fields.

6. Environmental Science:

- Exploring environmental issues, conservation, sustainability, and the importance of biodiversity.
- Studying the impact of human activities on ecosystems and the Earth's natural resources.



Vocabulary Progression Document: Science

Foundation Stage (EYFS):

1. Basic Scientific Terms:

- Science, observe, explore, investigate, question, discover, experiment

2. Everyday Science Vocabulary:

- Nature, plants, animals, weather, seasons, light, sound, materials

3. Descriptive Words:

- Big, small, heavy, light, hot, cold, wet, dry, fast, slow

Key Stage 1 (KS1):

1. Living Things:

- Animals, plants, humans, growth, habitat, environment, life cycle, offspring

2. Materials and Properties:

- Solid, liquid, gas, transparent, opaque, properties, change, materials, objects

3. Forces and Motion:

- Push, pull, gravity, motion, speed, force, magnet, attraction, repulsion

4. Earth and Space:

- Earth, sun, moon, stars, day, night, orbit, planet, space, galaxy

5. Scientific Methods:

- Observation, prediction, testing, fair test, recording, data, conclusion

Key Stage 2 (KS2):

1. Classification and Adaptation:

- Species, vertebrates, invertebrates, mammals, reptiles, amphibians, birds, fish, adaptations, survival

2. Properties of Matter:

- Mixture, solution, reversible, irreversible, chemical change, physical change, properties, states of matter

3. Energy and Forces:

- Energy, electricity, circuit, conductor, insulator, magnetism, sound, light, gravity, friction, air resistance

4. Earth and the Environment:

- Erosion, climate, climate change, conservation, pollution, natural resources, sustainability, ecosystem

5. Scientific Inquiry:

- Hypothesis, variables, data analysis, patterns, correlation, experimentation, control, variables, evidence

6. Human Body and Health:

- Organs, systems, digestion, respiration, circulation, senses, nutrition, exercise, hygiene, health

This vocabulary progression document outlines the key scientific terms and concepts for primary schools following the national curriculum. It provides a guideline for developing students' vocabulary and understanding of terms as they progress through the school.

Resources to use:

Twinkl science modules

Current planning resources

Outdoor Classroom and nature area

STEM resources in the computing suite

