

NC Purpose of Study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Intent	Implementation	Impact
At Broadway Junior School we believe that a high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational 'Big Ideas', pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. The staff here ensure that all children are exposed to high quality teaching and learning experiences, which allow children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills. They are immersed in scientific vocabulary, which aids children's knowledge and understanding not only of the topic they are studying, but of the world around them. We intend to provide all children regardless of ethnic origin, gender, class, aptitude or disability, with a broad and balanced science curriculum.	Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following: Science will be taught in planned and arranged blocks by the class teacher, to have a subject specific approach. This is a strategy to enable the achievement of a greater depth of knowledge. Through our planning, we involve problem solving opportunities that allow children to find out 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. Planning involves teachers creating 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 children regularly to identify those children with gaps in learning, so that all children keep up. Teachers build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and 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 these skills are being 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.	The impact and measure of this is to ensure children not only acquire the appropriate age related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives. 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 to articulate their understanding of taught concepts - High aspirations, which will see them through to further study, work and a successful adult life.

Key Vocabulary

Life cycle, reproduction, sexual reproduction, asexual reproduction, metamorphosis, mammal, amphibian, insect, bird, classification, classify, vertebrate, invertebrate, microorganism, fungi, bacteria, algae, characteristics, species, observable, grouping, similarities, differences.

Knowledge	Skills
Children will know: - Living things can be classified based on shared characteristics. - Vertebrates and invertebrates are major animal groups. - Animals have different life cycles depending on their species. - Some animals undergo metamorphosis. - Plants and animals reproduce in different ways. - Microorganisms are living things that can only be seen under a microscope. - Classification systems help scientists organise and understand living things. - Living things can be grouped based on observable features.	By the end of the unit, pupils will be able to: - Classify living things using observable characteristics. - Compare life cycles of different animals. - Describe the process of reproduction in plants and animals. - Use scientific classification keys. - Record observations systematically. - Identify patterns in life cycles. - Explain reasoning for classification choices. - Use scientific vocabulary accurately.

Enrichment Opportunities

- Pond dipping or school habitat study
- Visit a local wildlife centre or nature reserve
- Grow plants from seeds and observe reproduction
- Observe tadpoles or caterpillars over time
- Create a class mini-beastary or field guide
- Use microscopes to observe microorganisms (if available)

Learning Objectives/End Points

Pupils will be able to:

- Classify living things into groups based on characteristics
- Describe and compare life cycles of animals
- Explain how animals and plants reproduce
- Use classification keys accurately
- Describe microorganisms as living things
- Explain why classification is useful in science

Key Questions/Learning Objectives/End Points

To classify living things using observable characteristics. Sort animals into vertebrates and invertebrates, then further into groups.	To describe and compare animal life cycles. Compare life cycles of frog, butterfly, bird and mammal. Create diagrams.	To describe the life process of reproduction in plants and animals. Investigate seed dispersal and plant reproduction.	(TAPS Focused Assessment) To investigate classification and grouping of living things. Classification Key Investigation (TAPS): create and use keys to identify unknown organisms.	To describe microorganisms and their role in classification. Microscope or image-based investigation of bacteria, fungi and algae.	To apply knowledge of classification, life cycles and reproduction. Create a mini field guide of living things or complete end-of-unit assessment.
Lesson 1 – Classifying Living Things Learning Objective: To classify living things using observable characteristics. Starter (10 mins) Show a mixed set of animals. Ask: How could we organise these into groups? Main (40 mins)	Lesson 2 – Life Cycles Learning Objective: To compare life cycles of different animals Starter (10 mins) Ask: Do all animals grow in the same way? Main (40 mins) Teach life cycle stages of frog, butterfly, bird and mammal.	Lesson 3 – Reproduction Learning Objective: To describe reproduction in plants and animals. Starter (10 mins) Ask: Where do new plants and animals come from? Main (40 mins) Explain sexual reproduction in animals and plants.	Lesson 4 – TAPS Focused Assessment: Classification Keys Learning Objective: To investigate classification using keys. Starter (10 mins) Show mystery organisms. Ask: How could we identify them? Main (40 mins)	Lesson 5 – Microorganisms Learning Objective: To describe microorganisms and their role in classification. Starter (10 mins) Ask: What is the smallest living thing you can think of? Main (40 mins) Introduce bacteria, fungi and algae.	Lesson 6 – Applying Learning Learning Objective: To apply knowledge of classification, life cycles and reproduction. Starter (10 mins) Quick recap quiz of key vocabulary. Main (40 mins) Create a "Living Things Field Guide" including:

Introduce vertebrates and invertebrates. Explain vertebrate groups (mammals, birds, fish, reptiles, amphibians). Children sort animal cards and justify choices. Plenary (10 mins) Share one classification rule used today.	Children create diagrams comparing life cycles. Plenary (10 mins) Which life cycle is most different? Why?	Investigate seed dispersal methods. Children match reproduction methods to organisms. Plenary (10 mins) True or false quiz on reproduction	Children use classification keys to identify unknown organisms. Then create their own simple branching key. Record reasoning for choices. Plenary (10 mins) Swap keys and test if another group can use them successfully.	Use microscopes or images to observe. Discuss helpful and harmful microorganisms. Plenary (10 mins) Which microorganism surprised you most?	classification groups life cycles reproduction facts diagrams and explanations Plenary (10 mins) Exit ticket: One thing I can classify One life cycle I understand One question I still have
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Substantive Knowledge

- Living things are grouped according to similarities and differences.
- Vertebrates are grouped into mammals, birds, reptiles, amphibians and fish.
- Invertebrates include insects and many other groups.
- Life cycles vary between species but all involve growth and reproduction.
- Some animals undergo metamorphosis (e.g. butterflies, frogs).
- Plants reproduce using seeds or spores; animals reproduce sexually or asexually.
- Microorganisms are very small living things that can be helpful or harmful.
- Classification helps scientists organise and identify living things.

Careers

Linking Curriculum Learning to Careers

Discuss how the skills developed in this unit are used in a range of careers, including:

- Zoologist
- Wildlife Biologist
- Animal Behaviourist
- Wildlife Ranger
- Zookeeper
- Botanist
- Plant Scientist
- Marine Biologist
- Oceanographer
- Countryside Officer
- Park Ranger
- Forestry Officer

Transferable skills such as Fieldwork Pattern Spotting Curiosity Observation Investigation Problem solving Teamwork Communication Research Organisation Attention to detail Classification Data handling Critical thinking Decision making Creativity Resilience Responsibility Confidence Environmental Awareness

Learning from Career and Labour Market Information

- Introduce pupils to the wide range of careers involved in studying, protecting and managing living things, including ecologists, zoologists, botanists, conservationists, wildlife rangers, microbiologists, vets and environmental scientists.
Addressing the Needs of Each Pupil
- Provide varied opportunities including outdoor learning, fieldwork, practical investigation, classification, drawing, research, observation and discussion. Highlight that different careers suit different strengths, including scientific thinking, practical skills, creativity, communication, organisation and working outdoors.
Linking Curriculum Learning to Careers
Explicitly connect classification to zoologists and taxonomists; life cycles to biologists and animal scientists; reproduction to botanists and reproductive scientists; microorganisms to microbiologists; and habitats to ecologists and conservationists.
Encounters with Employers and Employees
- Invite a wildlife ranger, ecologist, vet, gardener, conservationist, scientist or environmental professional to discuss their work and how they study and protect living things.
Experiences of Workplaces
- Explore workplaces such as nature reserves, wildlife centres, zoos, botanical gardens, laboratories, veterinary practices, universities, farms and environmental organisations through visits, photographs or virtual tours.