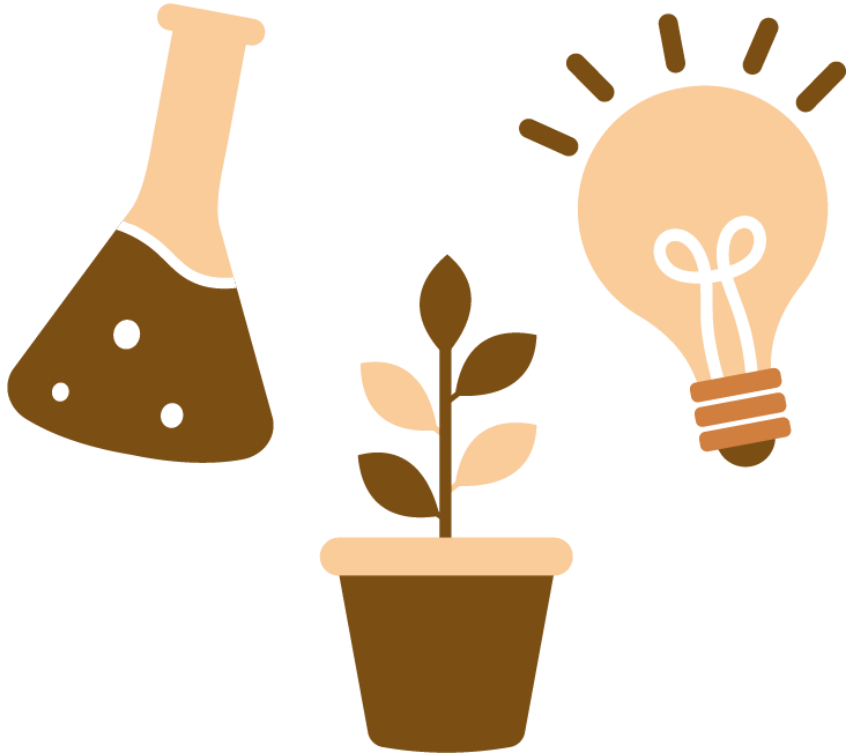
United Curriculum

Primary Science

For Teachers



United Curriculum
Primary
Part of United Learning

United Curriculum Principles

Building on the Framework for Excellence, The United Learning Primary Curriculum has six core principles:

- **Entitlement**
  All pupils have the right to learn what is in the United Learning curriculum, and schools have a duty to ensure that all pupils are taught the whole of it
- **Coherence**
  Taking the National Curriculum as its starting point, our curriculum is carefully sequenced so that powerful knowledge builds term by term and year by year. We make meaningful connections within subjects and between subjects
- **Mastery**
  We ensure that foundational knowledge, skills and concepts are secure before moving on. Pupils revisit prior learning and apply their understanding in new contexts
- **Adaptability**
  The core content – the 'what' – of the curriculum is stable, but schools will bring it to life in their own local context, and teachers will adapt lessons – the 'how' – to meet the needs of their own classes
- **Representation**
  All pupils see themselves in our curriculum, and our curriculum takes all pupils beyond their immediate experience
- **Education with character**
  Our curriculum - which includes the taught subject timetable as well as spiritual, moral, social and cultural development, our co-curricular provision and the ethos and 'hidden curriculum' of the school – is intended to spark curiosity and to nourish both the head and the heart

Subject-specific rationales are built on these six principles.

United Curriculum Principles: Science

The United Curriculum for science provides all pupils, regardless of their background, with:

Substantive knowledge:

- Ensuring pupils **master** core content through the development of key concepts and **timely revisiting** of key knowledge
- Sequencing the curriculum and selecting knowledge to allow for gradual development of **vertical concepts** – the 'big ideas' in science – to provide firm foundations for KS3 and KS4
- **Preventing common misconceptions** that are often formed at an early age and prove problematic at the later stages of pupils' science education
- Purposefully teaching appropriate knowledge that **goes beyond the KS1 and KS2 national curriculum**, to aid current and future understanding, and to smooth the transition to KS3
- Encouraging pupils to apply and **make connections** between the disciplines of science, the wider curriculum and the wider world

Disciplinary knowledge:

- Sequencing Working Scientifically elements so that they are **explicitly taught** and practised alongside the substantive knowledge, and regularly reviewed and built upon across the years and key stages
- Making deliberate and **explicit links to other curriculum areas** – particularly geography and mathematics – to ensure there is a consistent approach to teaching content, and that pupils are always **first taught content in the most relevant subject**. For example, pupils are taught how to construct bar charts or calculate the mean in mathematics before they are applied in science
- Planning practical tasks that have a **clear purpose**: to demonstrate or prove substantive concepts, or to allow pupils to deliberately practice working scientifically skills in a relevant context

Curiosity and excitement about science:

- Selecting examples and applications of science that **inspires pupils' curiosity** about the world and natural phenomena
- Ensuring that all pupils **can see themselves reflected** in the science curriculum, by highlighting present-day role models and the contributions of scientists from a wide range of backgrounds; and considering social and cultural values around scientific ideas

United Curriculum: Science

	N3-4	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn 1	**It's getting cold outside / Bears** Weather where we live, habitats where bears live		**BIOLOGY** **Plants** Identifying and naming common plants and describing basic structures	**BIOLOGY** **Plant growth** Plants grow from seeds, and require water, light and a suitable temperature	**CHEMISTRY** **Rocks** Comparisons of types of rocks and how fossils are formed	**BIOLOGY** **Classifying organisms** Introduction to classifying animals and their environment	**CHEMISTRY** **Separating mixtures** Identifying and separating mixtures; reversible and non-reversible changes	**PHYSICS** **Electricity** Investigating variations in series and parallel circuits, and how electricity is generated
Autumn 2	**Polar express / Special days** Melting and freezing; natural and artificial materials		**BIOLOGY / PHYSICS** **Seasonal changes** Observing changes across four seasons and describing associated weather	**BIOLOGY** **Needs of animals** Animals need water, food and air to survive and to have offspring	**PHYSICS** **Light** Relationship between light and how we see; the formation of shadows	**BIOLOGY** **Food & digestion** The human digestive system and simple food chains	**BIO / CHEM / PHYSICS** **Energy** Introducing the concept of energy stores and energy transfers; relate this to prior knowledge	**BIOLOGY** **Evolution** Fossils; introduction to the idea that adaptation may lead to evolution
Spring 1	**On the Move / Toys** Exploring pushes, pulls and magnets		**CHEMISTRY** **Everyday materials** Distinguishing objects from their material, and describing simple properties	**CHEMISTRY** **Uses of materials** Comparisons of an object's material with its use; impact of bending, twisting on solid objects	**BIOLOGY** **Organisms** The role of muscles and skeletons; the importance of nutrients	**CHEMISTRY** **Particle model and states of matter** States of matter in relation to particle arrangement	**BIOLOGY** **Life cycles** Life cycles of a mammal, amphibian, insect, bird, and some reproduction processes	**PHYSICS** **Light** How light travels and is reflected, and how this allows us to see
Spring 2	**On the Farm / Food Glorious Food** Life cycles of farm animals and plants	**Spring in our step** Wildlife and weather in spring and winter; habitats around our school	**Consolidation and review**	**BIOLOGY** **Living things & habitats** Introduction to habitats, micro-habitats, and simple food chains	**BIOLOGY** **Plants** Features of flowering plants and what they need to survive	**PHYSICS** **Sounds** Relationship between strength of vibrations and volume of sound	**BIOLOGY** **Human development** Human development to old age	**BIOLOGY** **Further classification** Further classification of organisms based on characteristics
Summer 1	**Once upon a time 1 / 2** Properties of materials and exploring mixtures		**BIOLOGY** **Animals** Naming reptiles, fish, amphibians, birds and mammals; carnivores, herbivores, omnivores	**CHEMISTRY** **Solids, liquids and gases** How the same substances can exist as solids, liquids and gases	**PHYSICS** **Forces & motion** Introducing pushes and pulls; opposing forces, and balanced forces	**PHYSICS** **Electricity** Simple series circuits	**PHYSICS** **Forces** Gravity, air and water resistance and friction; introduction to pulleys	**BIOLOGY** **Functions of the human body** Human circulatory system; transport of nutrients within the body
Summer 2	**All creatures great and small 1 / 2** Life cycles of animals in trop. rainforests, sea, and grasslands	**Science detectives** Properties of materials and habitats around the world	**BIOLOGY** **Humans** Human body parts and senses	**Consolidation and review**	**PHYSICS** **Magnetism** Contact and non-contact forces, including friction and magnetism	**CHEMISTRY** **Properties of materials** Considering physical and chemical properties	**PHYSICS** **Earth and space** Movements of planets and the Moon, and relationship to day and night	**CHEMISTRY** **Physical and chemical changes** Identifying physical and chemical changes