

Hopton C of E Primary Academy

Science Subject Overviews

UKS2

Title	<u>Earth and Space Y5</u> We will describe the movement of the Earth and moon, and other planets, in the solar system We will use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Overview of Unit	In this unit, pupils explore the Earth, Moon and planets within our solar system. They learn about the movement of the Earth and Moon and investigate how the Earth's rotation causes day and night. Pupils compare planets and learn that the Sun, Earth and Moon are approximately spherical bodies. Children use models and observations to explain patterns such as the apparent movement of the Sun across the sky and the phases of the Moon. Throughout the unit, pupils use scientific vocabulary to describe movement in space and develop explanations based on observations and models.
Key Vocabulary	<i>Earth, Sun, Moon, Solar System, planet, planets, star, stars, orbit, orbits, rotation, rotate, axis, day, night, daytime, nighttime, year, month, shadow, lunar, lunar cycle, phases, moon phases, waxing, waning, eclipse, solar eclipse, lunar eclipse, gravity, spherical, space, universe, geocentric, heliocentric, model, observe, pattern, compare, predict</i>
Key Learning Objectives	- I am learning to identify the planets in the solar system. - I am learning to describe the movement of the Earth and planets around the Sun. - I am learning to describe the movement of the Moon around the Earth. - I am learning to explain how the Earth's rotation causes day and night. - I am learning to explain the apparent movement of the Sun across the sky.
Key knowledge	The Earth and planets orbit the Sun. The Moon orbits the Earth. The Earth rotates on its axis once every 24 hours. Day and night are caused by the Earth's rotation. The Sun appears to move across the sky because the Earth rotates. The Sun, Earth and Moon are approximately spherical.
Skills to be Covered	• Describe the movement of the Earth and other planets relative to the sun in the solar system • Describe the movement of the moon relative to the Earth • Describe the sun, Earth and moon as approximately spherical bodies • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky
Suggested Learning Activities	• Creating scale solar system models • Using torches and globes to model day and night • Investigating shadows throughout the day • Moon phase observation diaries • Planet comparison research challenges • Creating orbit demonstrations outdoors



	- Using digital planetarium software - Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> - What does the Earth orbit? - What causes day and night? - What does the Moon orbit? - What shape are the Earth and Moon? - How long does the Earth take to rotate once? - Why does the Sun appear to move across the sky?

Title	Evolution and Inheritance Y6 We will recognise that living things produce offspring of the same kind, but these can vary and are not identical to their parents. We will look at adaptation and evolution. We will look at how living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. We will focus on the works of Charles Darwin.
Overview of Unit	In this unit, pupils learn that living things have changed over time and explore how fossils provide evidence of life millions of years ago. They investigate variation within species and understand that offspring are similar to, but not identical to, their parents. Children explore adaptation and learn how plants and animals become suited to their environments over time. Pupils study the work of Charles Darwin and understand how evidence supports the theory of evolution by natural selection.
Key Vocabulary	<i>evolution, inheritance, inherited, characteristics, variation, variations, adaptation, adapted, environment, natural selection, survival, survival of the fittest, offspring, reproduce, reproduction, genes, genetic, DNA, species, species variation, fossil, fossils, extinct, extinction, ancestor, similar, different, classification, evidence, change, generation, compare, observe</i>
Key Learning Objectives	- I am learning to explain how fossils provide evidence about the past. - I am learning to identify inherited characteristics and variation. - I am learning to compare similarities and differences between offspring and parents. - I am learning to explain how plants and animals adapt to their environments. - I am learning to understand how adaptation can lead to evolution.
Key knowledge	- Fossils provide evidence about living things from the past. - Offspring inherit characteristics from their parents. - Variation exists within species. - Adaptations help living things survive. - Evolution happens over long periods of time. - Environmental changes can affect survival.
Skills to be Covered	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago



	• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
Suggested Learning Activities	• Fossil investigations and fossil making • Adaptation survival games • Comparing inherited characteristics • Researching Charles Darwin and the Galápagos Islands • Classifying animal adaptations • Investigating camouflage outdoors • Timeline activities showing evolutionary change • Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What is a fossil? 2. What does inherited mean? 3. Why are offspring not identical to their parents? 4. What is an adaptation? 5. Who developed the theory of evolution by natural selection? 6. How can adaptation help survival?

Title	<u>Forces Y5</u> We will investigate gravity, identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Overview of Unit	
Key Vocabulary	<i>force, forces, gravity, gravitational force, air resistance, water resistance, friction, upthrust, weight, mass, Newton, newtons, meter, measurement, surface area, streamlined, resistance, drag, pulley, gear, lever, mechanism, balanced, unbalanced, motion, accelerate, decelerate, speed, investigate, variables, prediction</i>
Key Learning Objectives	- I am learning to explain how gravity pulls objects towards the Earth. - I am learning to investigate how gravity affects falling objects. - I am learning to identify the effects of friction between surfaces. - I am learning to compare movement on different surfaces. - I am learning to investigate the effects of air resistance. - I am learning to investigate the effects of water resistance. - I am learning to explore how streamlined shapes reduce resistance. - I am learning to investigate how levers make work easier. - I am learning to investigate how pulleys and gears allow a smaller force to have a greater effect. - I am learning to use evidence from investigations to explain forces and movement.
Key knowledge	1. Gravity is a force that pulls objects towards the Earth. 2. Friction acts between surfaces and slows movement down.



	- Air resistance and water resistance are forces that oppose motion. - Streamlined shapes reduce air and water resistance. - Mechanisms such as levers, pulleys and gears make work easier. - Forces can affect the speed and direction of movement. - Balanced forces do not change motion, but unbalanced forces do.
Skills to be Covered	- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object - Identify the effects of air resistance, water resistance and friction, that act between moving surfaces - Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect
Suggested Learning Activities	- Parachute investigations to explore air resistance - Water resistance races using different shaped boats or objects - Friction ramp investigations with different surfaces - Gravity drop experiments comparing objects - Designing and testing streamlined vehicles - Building simple pulley systems to lift objects - Exploring gears using bicycles or mechanical toys - Lever challenges using rulers and weights - Measuring forces using Newton meters - Fair testing investigations linked to forces and movement - Outdoor force and motion relay challenges - Retrieval quizzes and scientific vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> - What force pulls objects towards the Earth? - What does friction do? - What is air resistance? - Why do streamlined objects move more easily? - What is the purpose of a pulley? - Name one force that can slow movement down.

Title	<u>Animals including Humans Y5</u> We will describe the changes as humans develop to old age. We will describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird and describe the life process of reproduction in some plants and animals.
Overview of Unit	In this unit, pupils learn about the stages of human development from birth to old age. They explore how humans grow and change during infancy, childhood, adolescence, adulthood and old age. Pupils investigate physical and emotional changes that happen across the human lifespan and compare these stages with the development of other animals. Children also learn about reproduction in humans and understand that offspring grow and develop into adults over time. Throughout the unit, pupils use scientific vocabulary to describe growth, development and changes in the human body.



Key Vocabulary	<i>life cycle, human development, growth, development, infant, child, adolescent, teenager, adult, elderly, old age, reproduction, offspring, gestation, embryo, foetus, birth, stages, changes, compare, observe</i>
Key Learning Objectives	- I am learning to identify the stages of human development. - I am learning to describe changes from infancy to adulthood. - I am learning to explain how humans change in old age. - I am learning to understand that humans reproduce and produce offspring. - I am learning to compare stages of growth and development in humans.
Key knowledge	1. Humans go through different stages during their lives. 2. Human bodies change as they grow older. 3. Babies develop before birth as embryos and foetuses. 4. Humans reproduce to produce offspring. 5. Growth and development continue throughout life.
Skills to be Covered	• Describe the changes as humans develop from birth to old age. • Compare stages of growth and development in humans. • Understand that humans reproduce and offspring grow into adults.
Suggested Learning Activities	• Creating human life cycle timelines • Comparing baby, child and adult features • Growth and change discussion activities • Sequencing development stages • Interviewing family members about changes over time • Human development matching games • Creating labelled diagrams of life stages • Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What is the first stage of human life? 2. What does development mean? 3. What is an offspring? 4. What changes happen as humans grow older? 5. What is a foetus? 6. What stage comes after childhood?

Title	<u>Animals including Humans Y6</u> We will identify and name the main parts of the human circulatory system, and describe the functions of the heart and blood vessels. We will discuss the impact of diet, exercise, drugs and lifestyle on the body. We will learn about nutrients and water within animals, including humans.
Overview of Unit	In this unit, pupils learn about the human circulatory system and explore how the heart, blood and blood vessels transport nutrients and oxygen around the body. They identify the functions of arteries, veins and capillaries and investigate how exercise affects heart rate.



	Children also learn about the impact of diet, exercise, drugs and lifestyle choices on the body. Pupils investigate how nutrients and water are transported within animals and use scientific vocabulary to explain how body systems work together to keep humans healthy.
Key Vocabulary	<i>heart, blood, blood vessels, artery, vein, capillary, circulation, circulatory system, oxygen, carbon dioxide, nutrients, exercise, healthy, lifestyle, diet, drugs, alcohol, impact, function, transport, heart rate, pulse, body, system, health, fitness, impact</i>
Key Learning Objectives	- I am learning to identify the main parts of the circulatory system. - I am learning to explain the functions of the heart and blood vessels. - I am learning to describe how nutrients and water are transported in the body. - I am learning to investigate how exercise affects the body. - I am learning to explain how lifestyle choices affect health.
Key knowledge	1. The circulatory system transports blood around the body. 2. The heart pumps blood through blood vessels. 3. Blood carries oxygen and nutrients. 4. Exercise, diet and lifestyle affect health. 5. Drugs and alcohol can negatively affect body systems. 6. Nutrients and water are transported through the bloodstream.
Skills to be Covered	• Identify and name the main parts of the human circulatory system, and describe the functions of the heart and blood vessels. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans
Suggested Learning Activities	• Measuring pulse rates before and after exercise • Creating circulatory system models • Investigating the effect of exercise on heart rate • Designing healthy lifestyle plans • Exploring blood flow using practical demonstrations • Comparing healthy and unhealthy lifestyles • Diagram labelling challenges • Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What is the job of the heart? 2. What do blood vessels transport? 3. Why does heart rate increase during exercise? 4. How can diet affect health? 5. What is the role of blood in the body? 6. Name one factor that can negatively affect health.



Title	Properties and Changes of Materials Y5 We will compare and group together materials on the basis of their properties, solutions and mixtures. We will investigate separating materials through filtering, sieving and evaporating. We will look at fair testing, reversible changes and Irreversible changes.
Overview of Unit	In this unit, pupils investigate and compare materials based on their properties, including hardness, transparency, conductivity and solubility. They explore mixtures and solutions and learn how materials can be separated using methods such as filtering, sieving and evaporation. Children carry out fair tests to investigate reversible and irreversible changes and learn that some changes create new materials. Throughout the unit, pupils use evidence from investigations to explain how materials behave and why particular materials are suitable for different purposes.
Key Vocabulary	<i>materials, material, properties, hardness, solubility, transparency, conductivity, thermal, electrical, conductor, insulator, dissolve, solution, mixture, mixture separation, reversible, irreversible, change, reaction, chemical change, physical change, compare, test, fair test, variable, evidence, investigate</i>
Key Learning Objectives	- I am learning to compare and group materials based on their properties. - I am learning to investigate which materials dissolve to form solutions. - I am learning to separate mixtures using filtering, sieving and evaporation. - I am learning to plan and carry out a fair test using variables. - I am learning to compare reversible and irreversible changes.
Key knowledge	1. Materials have different properties that make them suitable for different uses. 2. Some materials dissolve in liquids to form solutions. 3. Mixtures can be separated using filtering, sieving and evaporation. 4. Reversible changes can be undone. 5. Irreversible changes create new materials. 6. Fair tests help scientists compare results accurately.
Skills to be Covered	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
Suggested Learning Activities	• Solubility investigations using different materials • Filtering, sieving and evaporation practicals • Conductivity testing challenges • Reversible and irreversible change experiments • Mystery mixture separation investigations



	• Designing fair tests using variables • Comparing thermal conductors and insulators • Creating material property classification charts • Investigation stations linked to material properties • Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What is a solution? 2. Which method could separate sand from water? 3. What is a reversible change? 4. Name one property of a material. 5. What happens during evaporation? 6. Why is a fair test important?

Title	<u>Electricity Y6</u> We will associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. We will compare and give reasons for variations in how components function. We will use symbols to represent a circuit.
Overview of Unit	In this unit, pupils build on their understanding of electrical circuits by investigating how the number and voltage of cells affects the brightness of bulbs and the volume of buzzers. They compare how components function in circuits and explain variations using scientific reasoning. Children also learn to represent circuits using recognised scientific symbols and diagrams. Through practical investigations, pupils explore current, resistance and energy transfer while developing their ability to predict, test and explain electrical outcomes safely.
Key Vocabulary	<i>electricity, electrical, circuit, circuit diagram, voltage, volts, current, resistance, symbol, symbols, series circuit, parallel circuit, component, components, battery, cell, cells, switch, bulb, buzzer, motor, wire, conductor, insulator, energy, transfer, brightness, speed, affect, predict, investigate, variable, measurement, safety</i>
Key Learning Objectives	- I am learning to investigate how the number of cells affects a circuit. - I am learning to compare how components function in circuits. - I am learning to explain why bulbs vary in brightness and buzzers vary in volume. - I am learning to use recognised symbols in circuit diagrams. - I am learning to predict and test how changes affect electrical circuits.
Key knowledge	1. Electricity flows through complete circuits. 2. More cells can increase brightness or volume. 3. Components can affect how circuits function. 4. Circuit diagrams use recognised symbols. 5. Conductors allow electricity to flow. 6. Resistance can affect electrical circuits.
Skills to be Covered	• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit



	• Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Use recognised symbols when representing a simple circuit in a diagram
Suggested Learning Activities	• Building circuits with varying numbers of cells • Investigating bulb brightness and buzzer volume • Circuit troubleshooting challenges • Creating and interpreting circuit diagrams • Resistance investigations using different components • Designing electrical quiz games • Practical investigations using motors and buzzers • Circuit symbol matching games • Electrical safety discussions and scenarios • Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What happens when more cells are added to a circuit? 2. Why might one bulb be brighter than another? 3. What is a complete circuit? 4. Why are circuit symbols used? 5. What does a conductor do? 6. Name one component found in a circuit.

Title	Light Y6 We will investigate that light appears to travel in straight lines and use this idea to explain that objects are seen because they give out or reflect light into the eye. We will look at how we see things because of the way light travels, and how shadows are created.
Overview of Unit	In this unit, pupils investigate how light travels and learn that light appears to travel in straight lines. They explore how objects are seen because they reflect light into the eye and investigate how light behaves when it passes through different materials. Children use models and practical investigations to explain shadows, reflection and how light travels from sources to objects and then to the eye. Pupils also explore how shadows are formed and why they have the same shape as the objects that cast them. Throughout the unit, pupils use scientific vocabulary and evidence from investigations to explain how light behaves.
Key Vocabulary	<i>light, light source, reflection, reflect, ray, rays, straight lines, travel, shadow, shadowing, transparent, translucent, opaque, absorption, absorbed, refraction, refract, lens, lenses, prism, spectrum, visible light, colour, rainbow, pupil, retina, eye, diagram, investigation, compare, predict, pattern</i>
Key Learning Objectives	- I am learning to explain that light travels in straight lines. - I am learning to investigate how light reflects from surfaces. - I am learning to explain how we see objects. - I am learning to investigate how shadows are formed. - I am learning to use evidence to explain patterns in light and shadows.



Key knowledge	8. Light travels in straight lines. 9. Objects are seen because light reflects from them into the eye. 10. Light can pass through transparent materials. 11. Opaque objects block light and create shadows. 12. Shadows have the same shape as the objects casting them. 13. Reflection changes the direction of light.
Skills to be Covered	- Recognise that light appears to travel in straight lines - Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye - Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes - Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Suggested Learning Activities	- Shadow investigations using torches - Mirror and reflection challenges - Creating periscopes or simple light viewers - Investigating transparent, translucent and opaque materials - Exploring how shadows change with distance - Prism and rainbow investigations - Modelling how light travels using string or lasers - Eye and light pathway diagrams - Light ray drawing activities - Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> - How does light travel? - Why can we see objects? - What is reflection? - What type of material blocks light completely? - Why do shadows have the same shape as objects? - What happens when light reflects from a mirror?

Title	<u>Living things and their Habitats Y5</u> We will describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals.
Overview of Unit	In this unit, pupils explore the life cycles of mammals, amphibians, insects and birds. They compare how different animals reproduce, grow and change throughout their lives and investigate stages such as hatching, metamorphosis and adulthood. Children also investigate reproduction in flowering plants and learn about pollination, fertilisation, seed formation and seed dispersal. Pupils compare plant and animal life cycles and use scientific vocabulary to explain how living things reproduce and survive



Key Vocabulary	<i>life cycle, reproduction, reproduce, offspring, mammal, amphibian, insect, bird, metamorphosis, egg, hatch, tadpole, caterpillar, chrysalis, pupa, froglet, pollination, fertilisation, seed formation, seed dispersal, juvenile, adult</i>
Key Learning Objectives	- I am learning to compare the life cycles of mammals, amphibians, insects and birds. - I am learning to explain the stages of metamorphosis. - I am learning to describe reproduction in animals. - I am learning to explain pollination and fertilisation in flowering plants. - I am learning to compare plant and animal life cycles.
Key knowledge	1. Different animals have different life cycles. 2. Some animals undergo metamorphosis. 3. Reproduction allows living things to produce offspring. 4. Flowering plants reproduce through pollination and fertilisation. 5. Seeds are dispersed in different ways to help new plants grow.
Skills to be Covered	• Describe the differences in the life cycles of mammals, amphibians, insects and birds. • Describe reproduction in some plants and animals. • Explain the stages of metamorphosis and plant reproduction.
Suggested Learning Activities	• Raising caterpillars or observing metamorphosis videos • Creating life cycle wheels and foldables • Pollination role-play activities • Seed dispersal investigations outdoors • Comparing eggs and offspring from different animals • Sorting animals by life cycle stages • Investigating flowers and seed formation • Retrieval quizzes and vocabulary games
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What is a life cycle? 2. What is metamorphosis? 3. Which animal begins life as a tadpole? 4. What is pollination? 5. What is fertilisation? 6. Name one way seeds can be dispersed.

Title	<u>Living things and their Habitats Y6</u> We will look at classification, micro-organisms, plants and animals We will give reasons for classifying plants and animals based on specific characteristics.
Overview of Unit	In this unit, pupils learn how living things are classified into broad groups based on shared characteristics. They explore classification systems used by scientists and investigate how plants, animals and micro-organisms can be grouped according to similarities and differences. Children learn about vertebrates, invertebrates and micro-organisms including bacteria, fungi and algae. Pupils use classification keys and dichotomous keys to



	identify and group living things and explain their reasoning using scientific evidence. Throughout the unit, pupils develop observation, comparison and classification skills while using accurate scientific vocabulary.
Key Vocabulary	<i>classification, classify, classification system, grouping, characteristics, observable characteristics, similarities, differences, vertebrates, invertebrates, mammals, reptiles, amphibians, birds, fish, plants, animals, micro-organisms, microorganism, bacteria, virus, fungi, algae, microscope, environment, habitat, species, kingdom, broad group, taxonomy, key, classification key, dichotomous key, feature, structure, function, adaptation, adapted, evidence, reason, compare, identify, describe</i>
Key Learning Objectives	- I am learning to describe how living things are classified into broad groups. - I am learning to compare similarities and differences between living things. - I am learning to identify and classify vertebrates, invertebrates and plants. - I am learning to use classification keys and dichotomous keys. - I am learning to give reasons for classifying living things based on observable characteristics.
Key knowledge	1. Living things can be classified into broad groups. 2. Classification is based on observable characteristics. 3. Vertebrates and invertebrates are grouped differently. 4. Micro-organisms include bacteria, fungi and algae. 5. Classification keys help identify living things. 6. Scientists use evidence and characteristics to classify organisms.
Skills to be Covered	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics
Suggested Learning Activities	• Creating and using dichotomous keys • Classifying mystery organisms challenges • Micro-organism investigations using images or microscopes • Outdoor classification hunts • Sorting vertebrates and invertebrates using branching diagrams • Designing classification posters or fact files • Comparing observable characteristics of living things • Classification relay games and retrieval quizzes
End of assessment quiz	<i>Each quiz should also revisit two questions from previous units</i> 1. What is classification? 2. What is the difference between a vertebrate and an invertebrate? 3. What is a dichotomous key used for? 4. Name one type of micro-organism. 5. Why do scientists classify living things? 6. What are observable characteristics?

