



Year 3

Year 3 • Animals Including Humans

Unit overview

KEY KNOWLEDGE

Animals (including humans) need the right types and amounts of food (nutrition). Unlike plants, animals can't make their own food – they need to transfer energy in through food. Humans (and some other animals) have skeletons and muscles for support, protection and movement

KEY VOCABULARY

Nutrition, photosynthesis, energy, transfer, diet, carbohydrate (sugar), protein, fat, vitamins, minerals, fibre, balanced, unbalanced, obesity, starvation, skeleton, bones (various, humerus, ulna, radius), joint (hinge), vertebrate, invertebrate, muscles (triceps, biceps), tendon, antagonistic, pull force, push force, number line, division, table of results, cause, effect, pictogram, block, block chart, bar, bar chart, axes, coordinate.

PRIOR LEARNING

Can label human body parts / compare (Animals Yr1) Knows & identifies a push & pull force (Forces Yr1) Vertebrates have a backbone & skeleton (Animals Yr1) Know 7 processes of life – movement, nutrition (Living Yr2) Animals need food to grow and repair our body (Animals Yr2) Need 5 food types in right amounts for health Animals Yr2) Food provides energy. Some more than others (Animals Yr2)

DISCIPLINARY KNOWLEDGE & SKILLS

Animals get nutrition from food they eat (nutrients). Unlike plants, animals can't make their own food. • Know which foods they should eat more/less of. Balanced diet = contains the right nutrients, in the right • Food provides energy. Some foods more than others. Not all food provides energy – water, vitamins & • Skeleton helps us move, protect organs and support the Can name & identify main bones of the human body • Muscles work with bones to help us move. Muscles are attached to the ends of bones by tendons. • Vertebrate skeleton is an internal endoskeleton. Invertebrates have either an exoskeleton or no skeleton

ENQUIRY TYPES

Researching; Classification; Finding Patterns; Observing over time; Fair testing

SCIENTISTS / STEM LINKS

Henry Grey (1827–1861) English Doctor who wrote the anatomical guide 'Grey's Anatomy', published in 1860, that is still used by medical students all over the world today. Giovanni Alphonso Borelli (1608–1679) Italian scientist who used the scientific method to first show how muscles move bones by using them as levers. He also was the first to suggest muscles worked in pairs. Doris Howes Calloway (1923–2001) American scientist whose research set the Recommended Daily Amounts (RDAs) for foods that reduced...

WHY THIS? WHY NOW?

Retrieves Year 2 health, nutrition, growth and survival. Pupils deepen understanding of nutrition and introduce skeletons and muscles as body systems. This prepares for Year 4 digestion and teeth and, later, Year 6 circulation and lifestyle.

CAREERS LINK

Physiotherapist • Dietitian • Doctor • Sports scientist
Gatsby: BM4 – connect body systems to health careers; BM5 – encounter a clinician/sports scientist; BM6 – explore a healthcare or sports setting.

Year 3 • Animals Including Humans

Learning sequence • knowledge, disciplinary skills and enquiry

Learning objectives / key knowledge	Disciplinary knowledge / skills	Enquiry opportunities	Enquiry type
What are the main food types?	Animals get nutrition from food they eat (nutrients). Unlike plants, animals can't make their own food.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	Researching; Classification; Finding Patterns; Observing over time; Fair testing
How can we improve our diet?	Know which foods they should eat more/less of. Balanced diet = contains the right nutrients, in the right	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
Which foods contain the most energy?	Food provides energy. Some foods more than others. Not all food provides energy – water, vitamins &	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
Why do we have a skeleton?	Skeleton helps us move, protect organs and support the Can name & identify main bones of the human body	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How do we move?	Muscles work with bones to help us move. Muscles are attached to the ends of bones by tendons.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How do other animals move?	Vertebrate skeleton is an internal endoskeleton. Invertebrates have either an exoskeleton or no skeleton	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	

Year 3 • Forces and Magnets

Unit overview

KEY KNOWLEDGE

Be able to describe a force using a Force Arrow Model. Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces). Magnets attract or repel each other. Magnets have two poles. Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not.

KEY VOCABULARY

Force, force arrow, contact force, push force, pull force, twist force, friction force, non-contact force, gravity force, movement, magnet (types), attract, repel, poles (north and south), magnetic, non-magnetic, magnetism, variable, cause, effect, prediction, comparative test, fair test, pattern, method, relationship, trend, data range, data interval.

PRIOR LEARNING

Recognise & name push & pull forces (Forces Yr1) Force needed to move an object; force changes the direction & speed of a moving object; more force more change (ForcesYr1) Bigger force needed to move a heavier object (Forces Yr1) Begins to use Force Arrow Model to describe force (ForcesYr1) Knows a range of materials, including metals (Materials Yr1/2) Links materials to property (Materials Yr1/2)

DISCIPLINARY KNOWLEDGE & SKILLS

Recall Force Arrow Model to describe a force. Can use Force Arrows correctly to show the size and • Can investigate & name contact forces such as push, Friction force = force that resists/opposes the sliding of • Can investigate & name other contact forces such as Can use Force Arrows correctly to describe. • Non-contact force = forces that acts even when objects Gravity force is a pull force of attraction between • Magnets have two poles (ends) – North & South. Same poles facing repel (push) each other. • Magnetic = materials attracted to magnets (contain Non-magnetic = materials that do not attract or repel

ENQUIRY TYPES

Researching; Classification; Finding Patterns; Fair testing

SCIENTISTS / STEM LINKS

Isaac Newton (1643-1727) English scientist who develop the Laws of Motion and said that an object will stay still until a force is applied. We measure forces in Newtons (N). Galileo Galilei (1564-1664) Italian scientist who was the first to describe forces using a 'scientific method'. He is often described as the 'father of modern science'. He also studied the planets & tides. William Gilbert (1544-1603) English scientist who was the first to study magnets using the scientific method.

WHY THIS? WHY NOW?

Builds on KS1 observations of pushes, pulls and changes in materials. Pupils now compare contact and non-contact forces, investigate friction and magnetic attraction/repulsion and use the Force Arrow Model. This prepares for Year 5 forces, including gravity, air resistance and mechanisms.

CAREERS LINK

Mechanical engineer • Automotive engineer • Physicist • Robotics engineer
Gatsby: BM4 – link force testing to engineering; BM5 – encounter an engineer;
BM6 – explore forces in transport, manufacturing or robotics.

Year 3 • Forces and Magnets

Learning sequence • knowledge, disciplinary skills and enquiry

Learning objectives / key knowledge	Disciplinary knowledge / skills	Enquiry opportunities	Enquiry type
Can you describe a push or a pull force	Recall Force Arrow Model to describe a force. Can use Force Arrows correctly to show the size and	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	Researching; Classification; Finding Patterns; Fair testing
Which forces need contact?	Can investigate & name contact forces such as push, Friction force = force that resists/opposes the sliding of	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
Which forces need contact?	Can investigate & name other contact forces such as Can use Force Arrows correctly to describe.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
Which forces do not need contact?	Non-contact force = forces that acts even when objects Gravity force is a pull force of attraction between	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How do magnets behave? No Model.	Magnets have two poles (ends) – North & South. Same poles facing repel (push) each other.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
Which materials are magnetic?	Magnetic = materials attracted to magnets (contain Non-magnetic = materials that do not attract or repel	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	

Year 3 • Light

Unit overview

KEY KNOWLEDGE

We need light to see things. Dark is the absence of light. There are natural and artificial sources of light energy. Light from the sun can be dangerous. We protect our eyes. Light can be reflected from surfaces (reflected light energy). Shadows are formed when light is blocked by an opaque object (shadow = absence of transmitted light energy). Know how to change the size of a shadow.

KEY VOCABULARY

Light, dark, energy, quantity, transfer, source, eye, reflected, reflection, reflective, shiny, dull, transmitted, transparent, translucent, opaque, blocked, shadow, absorbed, variable, cause, effect, prediction, fair test, method, relationship, trend, data range, data interval.

PRIOR LEARNING

Identify a range of light sources (natural & man-made). Identify the sun as a light source. Light/sun safety (Light Yr1) Light is brighter closer to a light source. Reflective materials (shiny/dull). Light passes through transparent. Opaque blocks light; forms shadow (Materials Yr1/2, Light Yr1) Sun moves across the sky. Day-length (Seasons, Light Yr1) Plants need light to survive & make food (Plants Yr2)

DISCIPLINARY KNOWLEDGE & SKILLS

Need light to see. Comes from a light source. Light = Light energy. • Re-cap natural and artificial light sources. Secure. Can use Energy Transfer Model to quantify intensity • Some materials (shiny) reflect more light energy than Can sequence materials using the Model to quantify. • Some materials (transparent) transmit more light Can sequence materials using the Model to quantify. • A shadow is dark. Dark is the absence of light energy. Opaque materials form a shadow (lack of transmitted • Height of a light source affects the length of a shadow. Closeness of the light source to an object changes the

ENQUIRY TYPES

Classification; Finding Patterns; Observing over time; Fair testing

SCIENTISTS / STEM LINKS

Ibn al-Haytham (965–1040) Iraqi is described as the first true scientist. Used maths to describe vision due to light reflecting off an object into your eye. Vision then occurs in your brain. Euclid (325BC–265BC) Ancient Greek scientist who proposed light came out of your eye in straight line ‘feelers’ that touched an object to create a sensation of vision. Popular theory through medieval times. Leonardo Da Vinci (1452–1519) Italian scientist and artist who proposed that light came in through the pupil and formed...

WHY THIS? WHY NOW?

Builds on Year 1 sources, shadows, reflection and transparency. Pupils now understand that light is needed to see, travels from sources and can be reflected, and investigate how shadows change. This prepares for Year 6 Light, where pupils use a more developed light-ray model.

CAREERS LINK

Optical engineer • Ophthalmologist • Photographer • Astronomer
Gatsby: BM4 — connect light science to optics and imaging; BM5 — encounter an optics professional; BM6 — explore an observatory, studio or optical workplace.

Year 3 • Light

Learning sequence • knowledge, disciplinary skills and enquiry

Learning objectives / key knowledge	Disciplinary knowledge / skills	Enquiry opportunities	Enquiry type
What is light?	Need light to see. Comes from a light source. Light = Light energy.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	Classification; Finding Patterns; Observing over time; Fair testing
What are the sources of light energy?	Re-cap natural and artificial light sources. Secure. Can use Energy Transfer Model to quantify intensity	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
What materials reflect light energy?	Some materials (shiny) reflect more light energy than Can sequence materials using the Model to quantify.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
What materials let light energy through?	Some materials (transparent) transmit more light Can sequence materials using the Model to quantify.	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
What is a shadow?	A shadow is dark. Dark is the absence of light energy. Opaque materials form a shadow (lack of transmitted	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How can we change a shadow?	Height of a light source affects the length of a shadow. Closeness of the light source to an object changes the	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	

Year 3 • Plants

Unit overview

KEY KNOWLEDGE

Identify & describe the functions of parts of flowering plants (roots, stem, leaves, etc) and the flower in detail. (Introduce conceptual link between structure & function). Plants need air, light, water, nutrients from soil, and room to grow to survive and grow well. Water is moved within plants from the roots to the leaves through tubes called xylem vessels. Flowers support reproduction through pollination, seed formation and seed dispersal (link to the life cycle).

KEY VOCABULARY

Life cycle, leaf, photosynthesis, mid-rib, leaf- veins, petiole, stem, xylem vessels, flower, bud, petal, sepal, anther, filament, stigma, pollen, style, ovary, ovule, shoot, root, tap root, lateral root, root hairs, seed, seed coat (testa), bulb, grow, radicle, plumule, cotyledon, seedling, adult, water, light, temperature, survive, reproduction, absorb (absorbed), transported, healthy, nutrients, carbon dioxide, oxygen, germinate (germination), pollen, pollination, fertilise (fertilisation), dispersal, variable

PRIOR LEARNING

Know structure/function of a flowering plant (Plants Yr1/2) Can identify garden, wild plants & trees (Plants Yr1) Knows seasonal life cycle of deciduous trees (Plants Yr1) Knows 7 processes of life – growth, nutrition (Living things Yr2) Habitat provides basic needs – light, water, warmth (Living Yr2) Can investigate need for light, water and warmth (Plants Yr2) Knows soil is a source of water & nutrients (Rocks Yr3)

DISCIPLINARY KNOWLEDGE & SKILLS

Can identify and detail functions of root (tap, lateral, Link parts of plant to photosynthesis (food production) • Can investigate the need for light, water, nutrients and Uses the term germination to describe when a plant • Water is taken up from the 'soil' by roots (hairs). Water is transported, from the root, around the plant • Knows the function of the flower is to carry out sexual Can identify and give the functions of parts of the • Pollination = transfer of pollen to the ovule. Can describe the stages of insect pollination. Knows • Dispersal = way in which a plant spreads its seed. Dispersal is important to ensure new plants are spread

ENQUIRY TYPES

Finding Patterns; Observing over time; Fair testing; Researching

SCIENTISTS / STEM LINKS

Janaki Ammal (1897-1984) Indian scientist that bred the sweetest sugar cane in the world and meant India could stop importing sugar. She was also a strong environmental activist. Gregor Mendel (1822-1884) Austrian scientist and Monk. He is one of the most important scientists in history through his work on breeding pea plants. He developed the science of genetics. Joseph Kolreuter (1733-1806) German scientist who pioneered the study of plant fertilisation and was the first to describe the role of nectar.

WHY THIS? WHY NOW?

Retrieves KS1 plant structure, growth requirements and life cycles. Pupils now explain the functions of roots, stems, leaves and flowers and explore water transport, pollination, seed formation and dispersal. This prepares for later ecosystems, reproduction and adaptation.

CAREERS LINK

Botanist • Agronomist • Horticultural scientist • Ecologist
Gatsby: BM4 – link plant function to agriculture/environment; BM5 – encounter a plant scientist; BM6 – fieldwork in gardens, farms or habitats.

Year 3 • Plants

Learning sequence • knowledge, disciplinary skills and enquiry

Learning objectives / key knowledge	Disciplinary knowledge / skills	Enquiry opportunities	Enquiry type
What are the parts of a plant?	Can identify and detail functions of root (tap, lateral, Link parts of plant to photosynthesis (food production)	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	Finding Patterns; Observing over time; Fair testing; Researching
What conditions do plants need to grow?	Can investigate the need for light, water, nutrients and Uses the term germination to describe when a plant	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How is water moved inside the plant?	Water is taken up from the 'soil' by roots (hairs). Water is transported, from the root, around the plant	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
What are the parts of a flower?	Knows the function of the flower is to carry out sexual Can identify and give the functions of parts of the	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How does pollen get to the ovule?	Pollination = transfer of pollen to the ovule. Can describe the stages of insect pollination. Knows	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How do plants spread their seeds?	Dispersal = way in which a plant spreads its seed. Dispersal is important to ensure new plants are spread	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	

Year 3 • Rocks

Unit overview

KEY KNOWLEDGE

Identify & describe different kinds of rocks using appearance and physical properties. Sedimentary rock is laid down in layers in lakes, seas and deserts. Metamorphic rock is formed deep within the earth. Igneous rock is formed when volcanoes erupt. Rocks have lots of uses in our everyday lives. Fossils are formed when things that have lived are trapped within rock over millions of years. Soils are made from rocks and organic matter.

KEY VOCABULARY

Rocks (e.g. sandstone, limestone, chalk, shale, coal, conglomerate, granite, slate, marble, basalt, obsidian, pumice, etc), texture, crystals, minerals, sedimentary, layers / bands, metamorphic, heat, pressure, igneous, magma, larva, fossil (body, trace, cast, mould), petrification, soil, clay, silt, sand, organic matter, key, spider key, criteria, classify (classification), sort, group, material, property, application.

PRIOR LEARNING

Can identify types of rock as materials (Materials Yr1) Can describe uses of rock as a material (Materials Yr2) Forces change materials shape (Forces Yr1/3; Materials Yr2) Can identify a range of animals/plants (Plants Yr1; Animals Yr1) Habitats contain soil (Living things Yr2) Volcanoes, rocks & soil (Geography KS1/2)

DISCIPLINARY KNOWLEDGE & SKILLS

Can sort rocks using appearance and physical Can identify & name a range of rocks (sedimentary, • Rocks are made from tiny 'particles' that are too small Erosion breaks up old rock into smaller 'grains' that • Sedimentary rocks can be squashed and heated as they Rock deep in the Earth melts into a liquid (magma) and • Can test rocks for physical properties. Can link to Know uses of specific rocks (can link properties to an • Living things have been on Earth for millions of years Living things die and may form fossils in sedimentary • Know components of soil. Soil is made from rock and plant matter. Know that soil

ENQUIRY TYPES

Classification; Finding Patterns; Observing over time; Fair testing; Researching

SCIENTISTS / STEM LINKS

James Hutton (1726–1797) Scottish scientist known as the 'father' of modern geology. He used careful observation to describe that rocks are not still but undergo constant change over long periods of time. Charles Lyell (1797–1875) Scottish scientist that demonstrated the power of natural causes (e.g. volcanoes) on Earth's geological history over 'deep time'. Also gave explanations for climate change. Barnum Brown (1873–1963) American fossil hunter known as 'Mr Bones'. He discovered the first Tyrannosaurus rex in...

WHY THIS? WHY NOW?

Builds on KS1 material properties and observations of the natural world. Pupils classify rocks, compare formation and properties, explore soils and fossils and connect evidence to Earth's history. This prepares for later work on evolution, inheritance and environmental science.

CAREERS LINK

Geologist • Palaeontologist • Archaeologist • Geotechnical engineer
Gatsby: BM4 — link rocks/fossils to geoscience careers; BM5 — encounter a geologist; BM6 — explore a quarry, museum, coastline or geology workplace.

Year 3 • Rocks

Learning sequence • knowledge, disciplinary skills and enquiry

Learning objectives / key knowledge	Disciplinary knowledge / skills	Enquiry opportunities	Enquiry type
Are all rocks the same?	Can sort rocks using appearance and physical Can identify & name a range of rocks (sedimentary,	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	Classification; Finding Patterns; Observing over time; Fair testing; Researching
How are rocks made?	Rocks are made from tiny 'particles' that are too small Erosion breaks up old rock into smaller 'grains' that	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How are other rocks made?	Sedimentary rocks can be squashed and heated as they Rock deep in the Earth melts into a liquid (magma) and	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
What can we use rocks for?	Can test rocks for physical properties. Can link to Know uses of specific rocks (can link properties to an	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
How are fossils formed?	Living things have been on Earth for millions of years Living things die and may form fossils in sedimentary	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	
What is soil?	Know components of soil. Soil is made from rock and plant matter. Know that soil	Use scientific vocabulary/models; predict, observe, measure, classify or record data as appropriate.	