



Unit	Lesson name	Lesson No.	Learning objective	Expected Standard (EXS)	Greater depth (GDS)
Movement and nutrition	Skeletons	1	Knowledge: To explain the role of a skeleton. Working scientifically: To group animals based on their physical properties.	Recalling the three key functions of the skeleton (movement, support and protection). Describing a vertebrate, invertebrate, endoskeleton and exoskeleton and using this information to group animals. Explaining the key role of joints and identifying them on a skeleton.	Applying the functions of the skeleton to predict the consequences of a broken bone.
	The bones in our body	2	Knowledge: To recognise the main bones in the body. Working scientifically: To measure and sort data.	Identifying and naming the skull, spine, ribs and pelvis on a diagram. Recording measurements of different bones and using the data to sort them into size order.	Evaluating the data collected and suggesting improvements, such as ways to avoid human error and repeating results with more bones from the same species.
	Muscles and movement	3	Knowledge: To explain how muscles are used for movement. Science in action: To explore scientific advances.	Recalling that muscles cause movements in the body, some of which we can control consciously. Describing that muscles can cause a movement by shortening and pulling on a bone. Describing some ways scientific research has improved the field of bionics/prosthetics, such as the choice of materials or linking their movement to muscles in the arm.	Describing the similarities and differences between a real hand and a model or prosthetic hand.
	Eating for survival	4	Knowledge: To explain how food is an essential energy source for animals. Working scientifically: To gather and compare data to answer questions.	Recalling that animals, including humans, need to eat food to survive. Identifying examples of how the body uses energy. Making comparisons about the energy demands of different people. Finding relevant data on food packaging and making numerical comparisons.	Identifying factors which could affect energy usage of different living things.
	Nutrient groups	5	Knowledge: To identify the main nutrient groups and their simple functions. Working scientifically: To record information using secondary sources.	Listing the seven nutrient groups. Describing the role of each nutrient group in the body. Identifying foods included in different nutrient groups. You must cover: carbohydrates, proteins, fats, vitamins, minerals, fibre and water.	Making comparisons between different people's dietary needs. Justifying opinions using scientific vocabulary.
	Balanced diets	6	Knowledge: To explain what makes a balanced diet. Science in action: To explore how knowledge has progressed over time and different jobs use this information.	Comparing two different meals and explaining which is more balanced by naming the nutrient groups and commenting on the relevant proportions.	Assessing why certain meal choices may not be suitable for others and suggesting changes to a meal to suit different dietary requirements.
Forces and magnets	Pushes, pulls and twists	1	Knowledge: To describe the effects of contact forces. Working scientifically: To label a diagram using arrows and scientific vocabulary.	Defining a force and a contact force; identifying examples of pushes, pulls and twists; adding arrows and labels to create force diagrams.	Giving additional examples of pushes, pull and twists; recognising when opposing forces are acting; drawing their own examples of force diagrams.
	Friction	2	Knowledge: To recognise the effects and uses of forces. Working scientifically: To write a scientific conclusion identifying cause and effect.	Listing the effects of forces; defining the term 'friction' and listing some uses of friction; describe how surface roughness affects friction; using evidence to support a conclusion.	Suggesting and describing additional examples of friction being useful or unhelpful.
	Investigating friction	3	Knowledge: To interpret how and why things move differently on different surfaces. Working scientifically: To plan an investigation using variables.	Describing and comparing how things move on rough and smooth surfaces; explaining why things move differently on rough and smooth surfaces; identifying the variables they need to change, measure and control.	Gathering repeat data and identifying anomalous results (results that do not fit the pattern); applying their understanding of materials and friction to design a hiking shoe.
	Magnets	4	Knowledge: To describe the effects of magnets. Working scientifically: To write a method.	Defining the terms 'magnetism', 'magnetic material' and 'non-magnetic material'; describing the poles of a magnet and how they attract and repel; naming some of the magnetic metals; writing a method; sorting and classifying materials as magnetic and non-magnetic. You must cover: iron, cobalt and nickel.	Sorting and classifying a greater range of magnetic and non-magnetic materials; naming all the magnetic metals; describing the difference between a magnet and a magnetic material.

	Investigating magnet strength	5	Knowledge: To compare the properties of different types of magnets. Working scientifically: To display data using a bar chart.	Predicting whether two magnets will attract or repel, depending on which poles are facing; naming some examples of magnets; comparing the strength of different magnets; labelling the axes of a bar chart and drawing the bars accurately.	Identifying and describing how to improve a bar chart; writing a conclusion and referring to evidence.
	Uses of magnets	6	Knowledge: To explain the uses of magnets. Working scientifically: To research the uses of magnets.	Listing and describing some of the uses of magnets; identifying key information from a source and using more than one source; creating a revision aid containing key information.	Researching and recalling a greater variety of examples of the uses of magnets, including electromagnets; explaining how magnets are used to make different products work.
Rocks and soil	Rocks: Appearance	1	Knowledge: To group rocks using their appearance. Working scientifically: To observe the appearance of rocks closely, using a magnifying glass.	Defining the term 'rock'; describing the appearance of different rocks; identifying crystals and grains; using a magnifying glass correctly; making and recording detailed observations. You must cover: igneous, metamorphic and sedimentary.	Observing and describing a greater range of rocks; categorising rocks as sedimentary, metamorphic or igneous.
	Rocks: Physical properties	2	Knowledge: To group rocks using their physical properties. Working scientifically: To make predictions, suggest improvements and explain observations over time.	Grouping rocks by their absorbency, reaction to acid rain (vinegar) and hardness; using results to choose the appropriate rock type for a specific use; suggesting better choices of rock for a specific use and predicting how a rock will be affected by the weather.	Using their knowledge of rocks to consider best use and inform design decisions.
	Fossil formation	3	Knowledge: To describe the process of fossil formation. Working scientifically: To present research on fossil formation.	Describing how different factors break down rocks; using a model to demonstrate fossil formation; using a short film to sequence the steps of fossil formation; researching fossil formation using a single source (Pupil video: Fossil formation); presenting research in short film form.	Researching how different types of fossils are formed; adapting a model to show how different types of fossils are formed; using a short film to demonstrate how different types of fossils are formed.
	Fossils and palaeontology	4	Knowledge: To identify fossils and group rocks accordingly. Working scientifically: To use the fossil record to answer questions about the past.	Identifying fossils in rocks and grouping together rocks that contain fossils; describing the work of a palaeontologist; using a model to determine the relative age of a fossil; using the fossil record to suggest how a living thing has changed over time; using the fossil record to suggest what living things were around in a certain era.	Debating a theory using fossil evidence and scientific reasoning.
	Soil formation	5	Knowledge: To compare soils and how they were formed. Working scientifically: To record the drainage rate for different soils in a bar chart.	Naming, describing, comparing and grouping some different types of soil; drawing and labelling the bars on a bar chart.	Observing the grain size of different soils and linking this to how quickly they drain.
	Soil layers and earthworms	6	Knowledge: To describe a soil sample using sedimentation. Working scientifically: To draw and label a diagram.	Listing some of the benefits of earthworms to the soil; identifying and describing the layers in a sedimentation jar; accurately drawing and labelling the layers of sediment in a sedimentation jar.	Identifying and comparing different categories of soil.
Light and shadows	Sources of light	1	Knowledge: To explain the role of light sources. Working scientifically: To plan and draw a results table.	Recalling examples of light sources and objects that do not give out light; describing ways to protect eyes from light damage; recalling that darkness is the absence of light and we need some light to see.	Justifying which light source they think is most important by making comparisons with different examples.
	What is reflection?	2	Knowledge: To compare light reflecting on different s	Describing what reflection is and giving examples of materials that reflect light more; describing factors that may affect the quality of a reflected image.	Naming a broader range of light sources and reflective materials and their properties in the acrostic poem.
	Where do shadows come from?	3	Knowledge: To recognise which materials cast a shadow. Working scientifically: To ask testable questions and plan how to answer them.	Describing how shadows form; identifying patterns between opaque, translucent and transparent materials and the types of shadows formed; recalling some factors that affect the way a shadow appears; identifying if a question is testable and explaining why; beginning to plan ways of answering an enquiry question.	Suggesting their own examples of testable questions relating to shadows; using a broad range of scientific vocabulary to describe and explain their observations.

	Shadows throughout the day	4	Knowledge: To summarise how shadows change throughout the day. Working scientifically: To evaluate a method.	Recalling what causes shadows to change throughout the day and describing the pattern of change throughout the day; identifying something as an advantage or disadvantage of a method and explaining how it positively or negatively affects the results; suggesting an improvement to the method to avoid a named problem.	Describing with a broad range of scientific vocabulary the relationship between the position of the Sun and the patterns of shadows throughout the day; identifying both similarities and differences when comparing shadows between summer and winter and explaining these based on the position of the Sun.
	Investigating shadows	5	Knowledge: To investigate how the distance of the light source affects the size of its shadow. Working scientifically: To find patterns in data and form conclusions.	Naming factors that affect the size of a shadow, including the distance of the light source; describing how the distance of the light source affects the size of a shadow; describing patterns in their collected data and quoting values to prove the relationship; identifying results that do not fit the pattern and suggesting values for missing data.	Measuring the shadows more accurately and with a more precise scale; applying experiences and scientific knowledge to suggest causes of odd data; justifying predictions of missing data using scientific patterns and vocabulary.
	Using light and shadows	6	Knowledge: To tell a story using shadow puppets. Science in action: To recall how different people work with light and shadows.	Explaining that opaque materials are most suitable for the shadow puppets as they block light; positioning shadow puppets so that a shadow is cast on the screen; describing an example of how someone works with light or shadows.	Applying knowledge of shadows in more than one way, such as using different types of materials to create different effects or moving the puppet closer to the light source to make it larger.
Plant reproduction	Plant growth	1	Knowledge: To identify the growth and survival needs of plants. Working scientifically: To pose relevant questions.	Identifying the basic needs of plants; describing how some plants fulfil these needs; posing testable questions to help set up an enquiry.	Identifying testable questions for enquiries beyond those posed.
	Structure and function	2	Knowledge: To describe the relationship between structure and function in plants. Working scientifically: To describe the relationship between structure and function in plants.	Identifying parts of a flowering plant; describing the function of parts of a flowering plant; creating a table to gather a set of results. You must cover: roots, stem, leaves and flowers.	Describing plants that differ from most flowering plants; predicting which structures might be affected by lack of water.
	Transporting water	3	Knowledge: To investigate how water is transported in plants. Working scientifically: To investigate how water is transported in plants.	Describing how water moves through a plant; explaining the function of the stem; planning an enquiry using knowledge of a similar enquiry.	Making links between the structures in plants that we eat and their role in water transport.
	Flowers	4	Knowledge: To explore the role of flowers in the life cycle of a plant. Working scientifically: To complete, read and interpret data in a bar chart.	Describing the plant life cycle; explaining the role of flowers in pollination; drawing bars on a bar chart to show data. You must cover: germination, pollination and seed dispersal.	Identifying any data that does not fit the pattern in the results; identifying the importance of bees in pollination.
	Evaluating and enquiry	5	Knowledge: To apply knowledge of plant life and growth. Working scientifically: To identify and suggest changes to an enquiry.	Identifying the effects of different variables on the growth of plants and using knowledge to draw conclusions; identifying the steps in a method that were challenging to control; commenting on the quality of the results.	Suggesting further steps that could improve the method.
	Seed dispersal	6	Knowledge: To explore seed dispersal methods. Working scientifically: To use results to draw conclusions.	Identifying methods of seed dispersal; grouping seeds based on their method of dispersal; using results as evidence for a conclusion.	Suggesting ways human technology has copied seed dispersal methods.
	Does hand span affect grip strength?	Investigating grip strength - Planning	1	Knowledge: To revise the units Movement and nutrition and Rocks and soil. Working scientifically: To plan a pattern seeking enquiry.	Describing how muscles move the skeleton; identifying which rock is suitable for a specific purpose based on its properties; identifying the best prediction; sorting variables.
Investigating grip strength - Gathering data		2	Knowledge: To revise the units Movement and nutrition and Plant reproduction. Working scientifically: To gather and record data.	Describing the role of fruits in plant reproduction; listing some of the nutrients in fruits; gathering data; recording data; measuring accurately in centimetres.	Measuring in millimetres to one decimal place; recording multiple sets of data; identifying patterns and anomalies; describing relationships between variables.
Investigating grip strength - Analysing, concluding and evaluating		3	Knowledge: To revise the unit Forces and magnets. Working scientifically: To conclude and evaluate the investigation.	Describing how friction helps with grip; drawing a bar chart; writing a conclusion that refers to data; evaluating the trustworthiness of a method; suggesting improvements to a method; posing further questions.	Adding multiple sets of data to a bar chart; including details of anomalous results that do not fit the pattern and suggesting explanations for them.
Investigating grip strength - Extending		4	Knowledge: To revise the unit Uses of materials. Working scientifically: To use sets of data to inform design.	Identifying the best materials for specific uses; predicting how wearing gloves will affect my grip strength; comparing results from different tests; designing a pair of snooker gloves based on data.	Analysing multiple sets of data to make comparisons and draw conclusions; designing gloves with greater design detail.

	Investigating grip strength - Presenting	5	<p>Knowledge: To revise the units Light and shadows and Movement and nutrition.</p> <p>Working scientifically: To report on my findings using a shadow puppet display.</p>	<p>Describing how shadows are formed; describing the role of joints in the skeleton; summarising their findings; writing a script to report on their findings; presenting their findings.</p>	<p>Summarising how trustworthy the data collected was; describing how the investigation was extended.</p>
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