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Primary Academy



Long Term Science Planning Upper KS2

Year 5 and 6

<https://pstt.org.uk/resources/curriculum-materials/city-science-stars>

(Engaging practical science activities for upper KS2 (9-11 year old) primary school children, using links to football, other sports and space)

Topic	Life on the Home Front	Extreme Earth		Stocks and Dungeons	
Year 5/6 Year A	Light.	Animals, including humans	Earth and space	Evolution and inheritance.	Living things and their habitats.
National Curriculum Knowledge Focus Year 5 Objectives	<p>Recognise that light appears to travel in straight lines.</p> <ul style="list-style-type: none"> 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 	Describe the changes to humans as they develop to old age	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <ul style="list-style-type: none"> 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 	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <ul style="list-style-type: none"> Recognise that living things produce offspring of the same kind, but normally offspring vary 	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <ul style="list-style-type: none"> Describe the life process of reproduction in



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<p>Year 6 objectives</p> <p>See Knowledge Matrices for planning:</p> <p>https://drive.google.com/drive/u/0/folders/1yYGC_Q3IASMPzSSMJCuYEsIsI8xMgmeP</p>	<p>objects that cast them</p>		<p>rotation to explain day and night and the apparent movement of the sun across the sky.</p>	<p>and are not identical to their parents.</p> <ul style="list-style-type: none"> Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution 	<p>some plants and animals.</p>
<p>Possible unit enquiry questions</p> <p>(linked to Ogden Trust Big Questions and Explorify Enquiries see google drive links:).</p> <p>https://drive.google.com/drive/u/0/folders/1VnKpDfMMkP7An6zqQOguoso_z3WYyA70</p> <p>https://docs.google.com/document/d/1</p>	<p>Comparative testing: Which material is most reflective? Fair Tests: How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? See round the bend Ideas over time: Cameras detect light – how has our understanding of light and its effects changed camera design throughout history? Identifying and classifying: Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? Now you see me... Observing over time: How does my shadow change over the day?</p>	<p>Fair Tests: How does age affect a human's reaction time? Ideas over time: How and why has life expectancy in the UK changed since the Middle Ages? Identifying and classifying: Can you identify all the stages in the human life cycle? Pattern seeking: Are the oldest children in our school the tallest? Research: Why do people get</p>	<p>Comparative testing: How does the length of daylight hours change in each season? Fair tests: How does the angle of launch affect how far a paper rocket will go? Ideas over the time: How have our ideas about the solar system changed over time? How is astronomer and planetary scientist Sara Seager changing our ideas about the</p>	<p>Comparative or fair testing: How much variation is there in how we look? Observing changes over time: Alien Shapes Ideas over time: What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize? Pattern seeking: On thin ice Identifying and classifying:</p>	<p>Identifying and classifying: Compare this collection of animals based on similarities and differences in their lifecycle. Observing over time: How do brine shrimp change over their lifetime? Pattern seeking: Is there a relationship</p>



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<p>DA6SFoXzT-Guzlu-Qh_KaYffBK-2z_pD/edit#heading=h.gjdgxs</p>	<p><u>Light and time</u> Pattern seeking: Is there a pattern to how bright it is in school over the day? And, if there is a pattern, is it the same in every classroom? <u>Find your focus</u> Research: Why do some people need to wear glasses to see clearly? <u>What if there were two suns?</u></p> <p>Look at Ogden Trust Phizzi Forces Teacher's handbook for KS2 Enquiry plans. (copy on Science google drive) Resources in the Ogden Trust boxes at Brisley, Rudham and Weasenham.</p>	<p>grey/white hair when they get older? <u>What if the average lifespan of a human was 200?</u></p>	<p>universe? Identifying and classifying: How could you organise all the objects in the solar system into groups? Pattern seeking: Is there a pattern between the size of a planet and the time it takes to travel around the Sun? Research: How have our ideas about the solar system changed over time? Ogden Trust Phizzi boxes will be in schools 2023/24.</p>	<p>Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? Can you classify these observations into evidence for the idea of evolution, and evidence against? <u>Perfect pinchers</u> Research: What happened when Charles Darwin visited the Galapagos islands? <u>What if we could bring back woolly mammoths?</u></p>	<p>between a mammal's size and its gestation period? Research: What are the differences between the life cycle of an insect and a mammal?</p>
<p>Vocab https://docs.google.com/document/d/1G7BfDHFTz9UK08xOYnxvgMKbttkWTZO2/edit#heading=h.gjdgxs</p>	<p>light dark (absence of light) reflect shadow opaque mirror reflective surface light sources periscope</p>	<p>puberty gestation period</p>	<p>solar system planets: Mercury, Venus, earth, Mars, Jupiter, Saturn, Neptune, Uranus moon stars spherical bodies rotation orbit satellite</p>	<p>evolution evolve adaptation variation inherit inheritance</p>	<p>life cycles reproduction life processes sexual and asexual reproduction (plants)</p>



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Scientific Enquiry

Working Scientifically skills document:

<https://drive.google.com/drive/u/0/folders/0AOwPXDnvrIH8Uk9PVA>

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

- Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry.
- Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
- The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

- The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale.
- During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).



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Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

- The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.
- Children present the same data in different ways in order to help with answering the question.

Identifying scientific evidence that has been used to support or refute ideas or arguments

- Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer.
- They talk about how their scientific ideas change due to new evidence that they have gathered.
- They talk about how new discoveries change scientific understanding.

Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

- In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
- They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used.
- They identify any limitations that reduce the trust they have in their data.
- They communicate their findings to an audience using relevant scientific language and illustrations.

Using test results to make predictions to set up further comparative and fair tests

- Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

Scientific Enquiry Vocab:

variables, evidence, justify, accuracy, precision, scatter graphs, bar graphs, line graphs, argument (science) , causal relationship



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Topic	Life in Norfolk		Titanic		Long boats and Invaders
Year 5/6 Year B	Animals, including humans	Living things & their habitats.	Electricity	Forces	Properties and changes of materials
National Curriculum Knowledge Focus Year 5 Objectives Year 6 objectives	<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. 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. 	<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. <ul style="list-style-type: none"> 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 	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. <ul style="list-style-type: none"> 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. 	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 <ul style="list-style-type: none"> 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



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<p>See Knowledge Matrices for planning:</p> <p>https://drive.google.com/drive/u/0/folders/1yYGC_Q3IASMPzS5MJCuyEslsI8xMgm_eP</p>					<p>changes of state are reversible changes.</p> <ul style="list-style-type: none">• 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.
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		about disease and medicine changed over time?	Look at Ogden Trust Phizzi Forces Teacher's handbook for KS2 Enquiry plans. (copy on Science google drive) Resources in the Ogden Trust boxes at Rudham and Weasenham.	Spinning spiral Research: How do submarines sink if they are full of air? What if there was no gravity? What if brakes were automatic? Look at Ogden Trust Phizzi Forces Teacher's handbook for KS2 Enquiry plans. (copy on Science google drive) Resources in the Ogden Trust boxes at, Rudham and Weasenham.	
Vocab https://docs.google.com/document/d/1G7BfDHFTz9UK08xOYnxvgMKbttkWTZO2/edit#heading=h.gjd_gxs	circulatory system heart lungs blood vessels blood lifestyle disease water transportation nutrient transportation oxygen air breathing exercise diet drugs	environment non-flowering plants ferns mosses flowering plants grasses vertebrate animals: fish, birds, mammals, amphibians, reptiles invertebrate animals: snails, worms, slugs, spiders, insects human impact – litter, deforestation, population increase, nature reserves	electricity simple circuit light bulb cell wire buzzer switch motor battery series circuit conductor insulator voltage components symbols circuit diagram	move movement surfaces forces push pull contact distance magnet bar magnet ring magnet gravity air resistance water resistance friction levers pulleys gears springs	properties hardness solubility transparency electrical conductivity thermal conductivity magnetism dissolve solution substance separating mixing filtering sieving reversible change burning rusting reactions irreversible change