Scotholme Science

Year 3

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Subject- Science

Contents

Threshold Concepts and Milestones

Threshold Concept	Year 3	Content
WORK SCIENTIFICALLY This concept involves learning the methodologies of the discipline of science.	• Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Begin to make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record and present data. • Record findings using simple scientific language and drawings. • Report on findings from enquiries, including oral and written explanations. • Use results to draw simple conclusions. • Use straightforward, scientific evidence to answer questions or to support their findings.	Use these skills in all discussion and experiment sessions. Begin to think like a scientist. Be curious and want to find out more. Begin to understand the concept of fair tests. Carry out a range of fair tests, measure and record results and begin to draw evidence based conclusions. Predict what you think will happen and give reasons for your answer, drawing on prior learning. Use equipment to make measurements accurately, record measurements in a variety of ways and use them to draw simple conclusions. Present the data collected to others using a graph or table. Use appropriate vocabulary and scientific language when explaining. Create video explanations.

BIOLOGY 1 **Understand plants** This concept involves becoming familiar with different types of plants, their structure and reproduction.	• Identify and name a wider range of plants. Use simple keys and variations of species.	Recall and build on knowledge from KS1. Name a wider range of plants and trees. Understand and explain the function of all the main parts of a flowering plant. Look at a range of species and describe variation and the possible reasons for it. Use simple keys to identify common plants and trees. Plant and grow 4 different types of herbs. Recall how to care from them to ensure growth. Create a key to identify them, using the senses. Test the key on children in other classes.

BIOLOGY 2 **Understand animals and humans** This concept involves becoming familiar with different types of animals, humans and the life processes they share.	• Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Identify the different types of teeth in humans and their simple functions.	Recall and build on knowledge from KS1 What do humans need to survive? Discuss. Sort a range of food items into the main food groups. Why is each group important to humans? **Eating a healthy diet resource** Draw food simple food chains, discussing the relationships between producers, predators and prey. **Food chain resources** **Food chains intro clip:** https://www.stem.org.uk/resources/elibrary/resource/32076/habitats-and-food-chains-fox-and-hedgehog Investigate different types of teeth and find out about their function. Discuss dental health and why it is important. Organise a visit to a dentist's surgery or ask a dentist to visit school. Create an Enliven presentation about teeth. Discuss animal teeth and how they are used by different creatures in different ways.

BIOLOGY 3 **Investigate living things** This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.	• Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. • Explore and use classification keys.	Research and draw simple food chains, giving clear explanations for how they work. Explore a range of keys to identify different animals. Construct a range of keys to identify animals and test them on your peers.
BIOLOGY 4 **Understand evolution and inheritance** This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.	Understand how creatures have adapted to live in a particular environment	Recall knowledge from KS1 Look at variation in species and see how this relates to the animals' habitat. What about the animal means that it is adapted to live where it does? Watch extracts from the Planet Earth episode with animals living in cities – how have they changed to adapt to this new environment? **Variation in monkeys resource** **Mini beasts resource**

CHEMISTRY **Investigate materials** This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	• Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics.	Recall and build on knowledge from KS1 Talk about and define solid, liquid and a gas? What do you know about them already? Find examples of each and display with a clear definition. Investigate heating and cooling materials. Looking at water: Design and carry out a fair test experiment to melt a block of ice in the fastest time. Cooling water in different ways. Design and carry out a fair test experiment to see how to cool water - Measure the rate of cooling of water. Draw a graph of your results and use them to draw a conclusion. DATA LOGGER What happens to ice when it melts? Observe changes and describe. How can we reverse that change? Try it! What happens to a kettle when it boils? Look at a boiling kettle – observe and describe what is happening. How can we reverse that change? Try it! Investigate a range of materials and their properties, carrying out fair tests, measuring and analysing data and drawing evidence based conclusions. Which ball is the bounciest? Which materials makes the most absorbent cloth? Which material is the most waterproof? Which material will keep a cup of soup warm for the longest? **Waterproof dinosaur experiment resource**

		Which material would make the best chocolate box? - experiment resource

PHYSICS 1 **Understand movement, forces and magnets** This concept involves understanding what causes motion.	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effect of forces, such as air resistance, water resistance.	Understanding gravity and air resistance. **Gravity resource:** https://www.activewild.com/gravity-for-kids/ Experiment – how quickly do certain objects fall to earth? Carry out a fair test by dropping objects from a certain height. Draw conclusions from evidence collected. Why is this the case? Talk about air resistance. Make paper planes, fly them inside and outside, observing what happens and develop understanding of how and why air resistance slows them down. Experiment with parachutes. https://www.sciencekids.co.nz/experiments/freefall.html https://www.bbc.co.uk/teach/class-clips-video/investigating-what-makes-a-good-parachute/zjps382 Make a range of parachutes to allow a small action figure to float to earth. Vary the size of the canopy and carry out a fair test. Make a table to record your findings. Present what you have discovered to your peers. Experiment with floating and sinking. Which objects float and which sink? Why? Understand the forces acting on the objects. https://www.coolkidfacts.com/sink-and-float-facts-for-kids/

PHYSICS 2 **Understand light and seeing** This concept involves understanding how light and reflection affect sight.	• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.	Recall and build upon knowledge from KS1 **Teacher's guide to Light resource** Begin to understand the idea of shadows. Investigate a range of shadows. How are they made? How do they appear? Experiment with a range of materials and torches – carry out a fair test to find out which materials are opaque and which ones are transparent. Why? Draw a conclusions about the type of material and its transparency. Which materials will reflect light? Investigate a range of materials to see if they reflect light. Make detailed observations and draw conclusions to explain which surfaces will reflect light and which ones will absorb it. DATA LOGGERS Talk about the sun as a source of light. Why is it dangerous? Understand why we must not look directly at the sun. How do sunglasses work and how can we wear them safely?

PHYSICS 3 **Investigate sound and hearing** This concept involves understanding how sound is produced, how it travels and how it is heard.	• Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear.	Recall and build upon knowledge from KS1 Use **Sound resource** Talk about how sounds are made. Investigation: Use tuning forks to investigate how sounds are made by vibrations. Carry out investigation, making detailed observations and draw conclusions. Share findings as a class. Investigate which materials will allow sound to pass through them and which materials will block sound. Draw conclusions to generalise about materials. Look at and understand the **decibel scale resource.** Can you add any sounds to the list and guess their decibel reading from research? Share what you have discovered. DATA LOGGERS

PHYSICS 4 **Understand electrical circuits** This concept involves understanding circuits and their role in electrical applications.	• Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	Recall and build upon knowledge from KS1 Investigate circuits. Make a range of circuits independently, using different components. Explain how you have done this and what you have used. Why does your circuit work? Investigate circuits. Look at a circuit which doesn't work and identify the fault, putting it right and explaining what you have done. Investigate different switches in a circuit. How do switches work? Make your own switch and present how and why it works to others.