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|  | National curriculum | Lesson outline | Key questions | Key vocab | Factual knowledge | Scientific enquiry |
| New topic – fossils  Lesson 1 – What is a fossil? | • Describe in simple terms how fossils are formed when things that have lived are trapped within rock.  • Working scientifically − Asking relevant questions and using different types of scientific enquiries to answer them. | In the previous block, children learnt about different types of rock and had opportunities to group and test them. In this small step, children build on this knowledge to explore fossils. A fossil is described as the remains or trace of a living thing that lived a long time ago. Fossils have led scientists to discover important information about living things from the past, such as dinosaurs. Children should understand that fossils are usually formed from the shells or bones of living things, but can also be formed from animal tracks and footprints.  Children should be given opportunities to observe replicas of fossils, as well as pictures, to allow them to group fossils and describe their features. Additionally, children could suggest what animals and plants in the past may have looked like and compare this to modern-day animals and plants. In this step, children begin a research enquiry to explore how fossils are formed. | • What is a fossil?  • What could this animal have looked like?  • What could this plant have looked like?  • Which parts of an animal usually turn into a fossil?  • How long does it take for a fossil to form?  • Why are fossils useful for scientists? | Fossil, rock, skeleton, shell | • A fossil is the remains or trace of a living thing that lived a long time ago.  • Both animals and plants can become fossils.  • Older fossils are found deeper underground.  • Fossils are usually formed from the shells or bones of living things.  • Animal footprints and tracks can also form fossils. |  |
| Lesson 2 - Can you make a fossil? | • Describe in simple terms how fossils are formed when things that have lived are trapped within rock.  • Working scientifically − Asking relevant questions and using different types of scientific enquiries to answer them. | Children could create their own fossil. Or draw a fossil and the animal that the fossil may belong to.  **Create Impressions:** Each child presses their chosen object into the clay to create a mold (impression).   * Discuss: “What does this impression show about the organism?” |  How can we classify fossils?   What can fossils tell us about the past?   Why don’t all organisms become fossils? | Fossil, Body Fossil, Trace Fossil, Mold, Cast. |  Fossils form when organisms are preserved under specific conditions.   There are different types of fossils, including body fossils, trace fossils, molds, and casts.   Fossils provide important evidence about extinct species and past environments. |  |
| Lesson 3 – What is fossilisation? | • Describe in simple terms how fossils are formed when things that have lived are trapped within rock.  • Working scientifically − Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions | In this small step, explore the process of fossilisation. Children should understand that fossilisation is a rare process and will only happen under certain conditions. Usually, fossilisation occurs when an animal dies in a watery environment and is buried in mud.  By the end of this step, children should understand that after an animal dies, the soft parts of the animal’s body break down, leaving behind the hard parts, such as the skeleton and teeth. The hard parts become buried by sediment. Sediment contains soil, sand, gravel and small pieces of rock. Over time, many layers of sediment build up on top of the skeleton, which leads to a lot of pressure. Eventually, sediment surrounding the skeleton begins to compact and turn to rock. Water seeps into the rock, causing the bones to break down and be replaced by minerals in the water. This leads to the formation of a fossil, which is a rock replica of the original bones or teeth. | • What is fossilisation?  • What is sediment?  • What are the key stages of fossilisation?  • What conditions are needed for fossilisation to occur?  • How has this animal turned into a fossil?  • How long does fossilisation take? | Fossilisation, rock, skeleton, fossil, sediment | • Fossilisation is the process that explains how a fossil is formed.  • Fossilisation is a rare process that only occurs under certain conditions.  • When an animal dies, the soft parts of its body break down, leaving behind the hard parts such as the skeleton.  • The process of fossilisation takes thousands of years |  |
| Lesson 4 – What is fossil formation? | • Describe in simple terms how fossils are formed when things that have lived are trapped within rock.  • Working scientifically − Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions | **Main Practical Activity (40 minutes)**  **Activity 1: Simulating Fossil Formation (20 minutes)** **Objective:** To demonstrate how fossils form under layers of sediment. **Materials for Groups:**   * Clear plastic cups or jars. * Sand, soil, and small pebbles. * Small "organisms" to fossilize (leaves, small toys, shells). * Water spray bottles.   **Steps:**   1. **Layering:** Children build their "fossil" model by layering the materials:    * Place the "organism" at the bottom.    * Add layers of sand, soil, and pebbles on top, spraying water lightly between each layer to mimic how sediment builds up over time. 2. **Compression:**    * Gently press the top layer to represent pressure over millions of years. 3. **Discussion Questions:**    * “What do you think happens to the buried organism?”    * “Why do we need layers of sediment to make a fossil?” |  What happens to an organism during fossilization?   Why are certain conditions needed for fossils to form?   Why do we find fossils in sedimentary rock? | **Fossilisation,** **Sediment, Mineralisation, Pressure, Erosion** |  Fossilization occurs under specific conditions: rapid burial, absence of oxygen, and the presence of minerals.   Sediments compact over time, turning into rock and preserving organisms.   Mineral replacement turns remains into stone. |  |
| Lesson 5 - End of topic test |  |  |  |  |  |  |
| New topic – Soils  Lesson 6 – What are the different types of soil? | • Recognise that soils are made from rocks and organic matter.  • Working scientifically – Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables | In this small step, children explore different types of soil and what they are made up of. It is important to note that children have not studied soil before. As a result, they may have a limited understanding of the key terms and the various types of soil.  Children should have opportunities to explore different types of soil, such as sandy, clay, peat and chalky soils. They can undertake simple practical activities such as closely observing the soils using hand lenses and drawing what is seen, sieving the soils to separate the larger and smaller matter and adding water to the soil to see if any parts float or sink. Testing different types of soil will allow children to describe their features and compare them. | • What is soil?  • What are the different types of soil?  • What is soil made up of?  • What are the features of chalky soil?  • What are the features of sandy soil?  • What are the features of clay soil?  • What are the features of peat soil?  • What are the differences between these types of soil? | Soil, sandy soil, clay soil, peat soil, chalky soil, organic matter | • Organic matter is the remains of dead plants and animals.  • Soils are made from rocks, organic matter and water.  • There are different types of soil including sandy, chalk, clay and peat soil.  • These soils have different properties |  |
| Lesson 7 – Why is soil important? | • Recognise that soils are made from rocks and organic matter.  • Working scientifically – Using straightforward scientific evidence to answer questions or to support their findings. | In this small step, children learn about the importance of soil. This includes why many living things need soil to survive. It is important that children are aware of the importance of soil to both animals and plants. This includes providing nutrients and water for plants and habitats for many animals.  Children should have opportunities to research the importance of soil and ask relevant questions of their peers and adults to further their understanding. There is also an opportunity within this step for children to learn about how human activities such as deforestation and construction work may cause soil loss and the impact this has on both animals and plants. | • Why do plants need soil?  • What does soil provide plants with?  • Why do animals need soil?  • What does soil provide animals with?  • What impact has human activity had on soil?  • How does this impact animals, plants and humans? | Soil, nutrients, haitat loss, deforestation, habitat | • Many living things need soil to survive.  • Soils can act as a habitat for many small animals.  • Soils provide nutrients for plants.  • Soils can also prevent flooding, as they absorb water. |  |
| Lesson 8 – Which soil absorbs the most water?  (Experiment plan) | • Recognise that soils are made from rocks and organic matter.  • Working scientifically – Setting up simple practical enquiries, comparative and fair tests. | In this small step, children plan a comparative test to explore the absorbency of different soils. Children test four different soils to see if they retain the same volume of water. Children use filter funnels, measuring cylinders and filter paper. They add the same mass of soil and volume of water to each soil sample. They should then record how much water passes through the soil and filter paper into the measuring cylinder below. Encourage them to use a plan proforma in small groups for support in making a prediction and creating a logical experiment plan.  Children in Year 3 do not need to be specifically aware of the terms independent, dependent and controlled variables. However, they should be able to identify what they will change, measure and keep the same in the experiment. | • What will you use to measure the amount of soil?  • What will you use to measure the volume of water?  • What types of soil are you using in this experiment?  • What will you change in this experiment?  • What will you measure in this experiment?  • What will you keep the same?  • How will you record your results? | Independent variable, dependent variable, controlled variable |  |  |
| Lesson 9 – Which soil absorbs the most water?  (Investigate) | • Recognise that soils are made from rocks and organic matter.  • Working scientifically – Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. | In this small step, children carry out a comparative test to explore which type of soil absorbs the most water. They should use their plans from the previous step to set up practical equipment and make careful observations throughout.  When undertaking this experiment, it is important that children measure the mass of the soil correctly. In addition, they also need to correctly measure the amount of water that enters the measuring cylinder. By the end of this step, children should compare the amount of water absorbed by different types of soil. | • What is your experiment plan?  • What are you changing?  • What are you measuring?  • What are you keeping the same?  • What was the volume of water in the measuring cylinder?  • What was the mass of the soil? | Soil, filter paper, filter funnel, measuring cylinder |  |  |
| Lesson 10 – Which sols absorbs the most water?  (Evaluate) | • Recognise that soils are made from rocks and organic matter.  • Working scientifically – Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. | In this small step, children evaluate their soil experiment. They should work scientifically to analyse data, make conclusions and evaluate their experiment. Within this step, children should be given the opportunity to answer the enquiry question. This is the first time children have evaluated an experiment and therefore modelling how to write a written evaluation is essential. They should also be encouraged to think of some relevant questions for further investigations linked to soil.  Children could compare their data or results to other groups to allow them to spot patterns and whether their results are similar or different. They should also be given opportunities to reflect on their experiment and then discuss how any improvements could be made. | • Which soil absorbed the most water?  • Which soil absorbed the least water?  • What is an experiment evaluation?  • If you were to repeat this experiment, how could you improve your results?  • What questions do you have for further investigation? | Soil, absorb, conclusion, evaluation, data |  |  |
| Lesson 11 – End of topic test |  |  |  |  |  |  |