# **Rocks** (ages 7-11)

# Explorify planning support

| Curriculum statements | Explorify activities | Suggested use / taking it further |
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| **TYPES OF ROCK: PROPERTIES AND USES** | | |
| **Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.**<br>*England*<br><br>**Having explored the substances that make up Earth's surface, I can compare some of their characteristics and uses.**<br>*Scotland*<br><br>**I can recognise that our planet provides natural materials and can explain why they may have been** | **Need to borrow rocks?** Lots of libraries and museums (sometimes for a small charge) offer this service. A full list is given below in the fossils section. | |
| | Big question why don't all rocks look the same? **TBQ** | This Big Question could be a great starter for the whole topic and formative assessment tool to see what the children already know. Children could bring a 'favourite' rock into school. |
| | Have you ever picked up a rock and put it in your pocket to take home? **HYE** | Relate science learning to children's prior experiences and use this as the starting point for the learning. |
| | Mysterious Material **ZIZO**<br>(Chalk) Sedimentary shows small grains<br><br>Obscure orange **ZIZO**<br>(Sandstone) Sedimentary shows layers<br><br>Surprising Surface **ZIZO**<br>(Marble) Metamorphic<br><br>Glitter and Sparkle **ZIZO**<br>(Granite) Igneous shows crystals | There is a nice range of Zoom In Zoom Outs which can be used as teaching tool to show how to look for layers, grains and crystal in rocks and develop children's observation skills. How to use a magnifying glass.<br><br>This BBC video explains the 3 main types of rock. Children would not need to remember the names but knowing how rocks have formed helps explain their properties. You could ask, 'Do you think this rock has been made by squashing layers? Or has it melted inside the Earth?' If you decide to teach children the names of the three types of rock (Igneous, sedimentary and metamorphic) then this choccy rocks activity is great. STEM learning provides a range of lessons to download too. |

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| **processes to make them useful.**<br>*Wales*<br><br>**How some materials change and decay whilst others do not such as fossil formation**.<br>*Northern Ireland* | Kaleidoscope of colour **ZIZO**<br>(Basalt) Igneous shows crystals | A handy fact sheet is available from the Geological Society. Understanding what a mineral is can also be quite tricky and a common misconception is that rocks and minerals are the same thing. Rocks are composed of minerals and this guide is helpful in defining minerals as naturally occurring inorganic solids with a definite chemical composition (a specific mixture of elements). It might be helpful to say that minerals are the chemical ingredients of rocks and different types of rock have different ingredients. Children should investigate, group, and test the properties of a selection of rocks (e.g., Limestone, chalk, sandstone, slate, marble, Granite, Basalt). The Royal Society of Chemistry have super resource materials (free registration needed).<br>Children can read these interviews with a rock and might even write their own. |
| | Blacks and Spongey **ZIZO**<br>(Igneous magma) shows air hole formed when rapidly cooling | |
| | Colourful bumps **ZIZO**<br>(Flint) Sedimentary | |
| | Glowing Depths **ZIZO**<br>(Charcoal and coal burning) Sedimentary | |
| | Erupting Rocks **OOO** | This activity links well with Black and spongey and could be used to explain that some rocks (igneous) are formed from molten rock. The geography focus could be volcanoes whilst you are learning about rocks to deepen the children's understanding. |
| | Do rocks stay the same forever? **TBQ** | This big question may form the discussion point for erosion and how this can change rocks. It links with the formation of sedimentary rocks in the rock cycle. |
| | LWCYH? Rock my world **LWCYH** | This Listen What Can You Hear activity allows children the opportunity to identify different sounds of rocks being excavated. Teachers can use this to teach how we extract rock in different ways leading to what we use different rocks for. |
| | OOO Building with rocks **OOO**<br><br>ZIZO Brown and crumbly **ZIZO**<br>(bricks) | These activities could be used as starter activities. Children can see how different rocks are used in context and how rocks can be used to make rock-like materials. If you are studying this topic in a cross-curricular way, to bring more context you may want to carry out an educational visit to a local construction site where they can explain how they use different building materials and why. Knowing about rocks and soil is especially useful for those in the building trade. Please be mindful of health and safety. You may also want to do a rock hunt in the local area (finding rocks on the ground or studying local buildings) and take rubbing of what you find. |

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| | Which rock would be best for a skate park? **TBQ** | This Big Question could lead to a lesson where children test and compare properties of rocks e.g. absorbency, rub or scratch test. Then they use their results to decide which rock is most suitable and explain why. The TAPS focused practical task Y3 Rock Reports (Select Focused Assessment Plans tab: Year3: Rock Reports) could be used and offers guidance with how to assess children's reporting skills.<br>The Big Jurassic Classroom (What makes the best building stone?) is excellent resource from the PSTT (Primary Science Teaching Trust) with complete lesson plans and resources. |
| | Book links: The Pebble in my Pocket book by Meredith Hooper and Chris Coady ISBN – 0-7112-1076-4; Street beneath my feet by Charlotte Guilian and Yuval Zommer ISBN- 9781784937317 | |
| **FOSSIL FORMATION** | | |
| **Describe in simple terms how fossils are formed when things that have lived are trapped within rock.**<br><br>**How some materials change and decay whilst others do not such as fossil formation.**<br>*Northern Ireland*<br><br>**I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction.**<br>*Scotland* | Who is Mary Anning? **WHO** | Mary Anning helped us to understand that fossils are the remains of ancient creatures which have been 'turned to stone'. This BBC film offers further details about her achievements and this longer Class Clip has 'Mary Anning' talking in the first person. |
| | Making records **OOO** | This provides a good basis to introduce pupils to fossils and gets children thinking about how fossils are long-lasting records of living things which existed at least 10,000 years ago. |
| | Frozen in Time **OOO** | This could be used to compare a cast fossil (ammonite) with footprints (trace) and insects preserved in amber (true form). Use this useful fact sheet from Geological society as it provides information on what fossils are and how they are formed. Older children could follow up with this excellent BBC activity about how dinosaur footprints can help you find the height of a dinosaur: You could look for the trend in the relationship of foot length and leg length of the children in the class (legs should be 3.5 ish longer than feet and this is the same for dinosaurs). You could then paint/ chalk footprints in the playground, and they could measure them to work out the height of the dinosaur. |
| | Animal fossils **OOO** | The background science of Animal fossils helps you feel confident explaining how fossils are formed. The BBC video and this one from the Natural History Museum are brilliant to support this learning. As |

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| **I can describe the features of organisms and recognise how they allow them to live, grow and reproduce for survival in their environment**<br>*Wales* | | a class identify the steps to make a fossil. Children can then work in small groups explaining how a fossil is formed. They could write a script and record themselves (Flipgrid could be a useful tool?) or create a cartoon or explanation or cloze text.<br><br>When looking at the photographs, children can be encouraged to think about what the fossils tell us about the original animal. Ask them: Why are some bones thick and others thin? What do the skulls and teeth tell us? Do the fossils remind them of any animal which is alive today? These are the kinds of questions palaeontologists (scientists who study fossils) use to work out what these animals might have been like when they were alive. Follow up with PSTT's 'I bet you didn't know… The fossilised secrets of the rhino and the beetle.' This pack includes a resource for children to match fossils to artist's impressions of animals. There is also an article about recent fossil discoveries and a teaching PowerPoint which includes an activity which asks children to predict what animals would look like using plaster cast 'fossils'. Find out more about the scientists who work with fossils here with 'A scientist just like me.' |
| | Black stripes(fern) **ZIZO** | When conditions are perfect, plants can form fossils like this one of a fern. |
| | A hinge in the rocks **ZIZO** | The perfect starter if you are hunting for, or looking at, fossils. The background science explores why marine fossils are the most common type found. Use this advice if you are planning a fossil hunt. Find where to go and when with an interactive regional map of UK. Before you go, find out what geological era the rocks beneath your feet are from (Clicking on your nearest City will show you the fossils found in your area). There is also a free App from the Natural History Museum which lets you do this whilst you are carrying out fieldwork. Find something that you can't identify?<br>Why not get your class to write formal letters to the Museum of Natural History in Oxford who offer an identification service (your local museum may do the same?) |

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| | | If you do not have a suitable selection of fossils for children to examine in or near your school, they can be borrowed from your local authority library service for free or (usually for a small cost) from many museums including: Lapworth, Sedgewick, Birmingham, Stoke, Scotland, Down2Earth, London or Charmouth Heritage Coast Centre |
| | Fossils didn't exist? **WI** | This What If Question could be used with younger children to explore what it tells us about the Earth millions of years ago. For older children it could be used to discuss how fossils helped scientists develop the theory of evolution by natural selection. The Natural History Museum provides short articles on latest fossil news and discoveries |
| | If fossils could talk **PS** | Practical, memorable idea which could be extended with the excellent set of plans and resources from the Natural History Museum. It might be nice to follow up with working out what fossils suggest about the animals and plants that left them, using STEM learning's Fossil hunter activity. |
| | Star shaped survivor **ZIZO** | **More challenging activity:**<br>Examines an unusual marine animal, the crinoid, which fossil records show lived in the Jurassic and can still be found today. Take your class on a Jurassic Scavenger hunt – download the spotter sheet and look for living things that would have been around in the Jurassic era with the dinosaurs. |
| | Book link:<br>Science Through Stories. Teaching Primary Science with Storytelling Chris Smith and Jules Pottle. ISBN: 9781907359453 Fossil Woman | |

# EXPLORING SOILS

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| **Recognise that soils are made from rocks and organic matter.**<br>*England*<br><br>**I can describe the major characteristic features of Scotland's landscape and explain how these were formed.**<br>*Scotland* | Why don't all soils look the same? **TBQ**<br><br>Tiny bits and pieces **ZIZO** | Both activities could be part of a 'What is soil?' introduction along with this useful BBC video.<br><br>Children could go on to look closely at different soils using magnifying glasses and microscopes. They could then compare the properties of 2 soils. This Natural History Museum guidance is fantastic to get your pupils collecting soil sample locally and noting differences. There is a useful flow chart to identify your soil type just by making soil balls. British Science Week 2022 Glorious Mud activity is useful to look at type of soils. |
| | Glorious Grains **ZIZO**<br><br>Sandcastle **WGO** | Both these show help children understand that sand is small bits of broken rock. It could lead into a discussion about what causes weathering. |
| | Hidden Lake & Alpine Lake **SWA** | The Start With Art activities offer a way to make links with art. Children are shown an image of an artwork – a painting, sculpture, installation, etc – then they find and discuss links to their learning in science. What vocabulary will they use? What misconceptions will be revealed? |
| | The Mystery grows **ZIZO** | Lichen have a key role in soil creation because they are the 'colonisers', the first organism to grow on bare rocks. Children could identify and classify the types of lichen present in your local area using this key. |
| | Drainage dilemma **PS** | A creative task which asks your class to find out which soil allows water to drain through most easily. You will need to supply a range of equipment and at least two different types of soil (clay and sand will show different drainage properties) if you want the children to carry out the investigation. They can think about how to present their results in a table. |

| ABBREVIATIONS AND DESCRIPTIONS OF THE DIFFERENT EXPLORIFY ACTIVITY TYPES | | |
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| **ZIZO** | Zoom In, Zoom Out | Visually engaging close-up photos |
| **OOO** | Odd One Out | Find similarities and differences |
| **WGO** | What's Going On? | Short, distraction-free videos |
| **HYE** | Have You Ever? | Activities linked to everyday experiences |
| **WI** | What If? | Explore ideas in new contexts |
| **TBQ** | The Big Question | Plan an investigation |
| **PS** | Problem Solvers | Think critically and creatively |
| **MS** | Mission Survive | Fun, imaginative hands-on challenges |
| **MB** | Mystery Bag | Use senses to work out contents in a bag |
| **LWCYH** | Listen What Can You Hear? | Recordings of familiar sounds |
| **SWA** | Start With Art | Using artworks to prompt science discussion |
| **WJH** | What Just Happened? | Observing changes over time |
| **WHO** | Who Is? | Learn about a diverse range of scientists |

**Other recommended resources to support planning:**

PLAN primary science assessment resources (planassessment.com)

Assessment (TAPS) - Curriculum Materials | Primary Science Teaching Trust (pstt.org.uk)

The Great Science Share - see videos on Scientific Enquiry under the tab "Great Science Skills".

Explorify is managed by STEM Learning and the Primary Science Teaching Trust

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