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|  | **ROCK DETECTIVES** | | |
| This section uses the idea that the Jurassic Coast was formed over a long period of time and in a different sort of environment from the one it is in now. Pupils develop skills to describe and classify rocks and link them to the types of rocks that can be seen across the coast. | | | |
| **Key Stage 2** | **Timing: 2 Lessons** | **Science, Geography** | |
| **ACTIVITY** | | **LEARNING OUTCOMES** | **RESOURCES** |
| **Lesson 1: What’s beneath your feet? Starter:** Take children outside and ask them to make a note of the sorts of things beneath their feet. Collect a soil sample, if possible, from an area of the school yard. Some likely to be man-made, others natural.  **Experiment:** **Comparing soils and rocks.**  Give pupils samples of different rocks and soils. You may be able to hire the Jurassic Coast Fossil Box (for Dorset schools only) or from your partner secondary school. Additionally classroom rock samples can be ordered via ESTA (Earth Science Teachers Association).  Pupils conduct a series of experiments on their rock samples and note down the characteristics. Worksheet 1 guides the activity and asks pupils to use their observations to decide what the difference is between rock and soil, and to group the different sorts of rocks.  **Plenary**: Pull class together and to discuss ideas about how rocks can be classified. Some pupils may have decided to classify their rocks by colour or ‘shininess’. Explain that geologists put rocks into the categories sedimentary, igneous and metamorphic based on their appearance, which is caused by the way that they were formed. Explain that the Jurassic Coast rocks are sedimentary and that they will look in more detail at how they were formed next lesson. | | * Recognise and identify * Respond to simple questions * Make simple observations * Undertake simple measuring tasks * Select basic but appropriate information * Use simple scientific vocabulary * Describe observations * Compare and contrast * Reason * Use basic scientific skills with some judgement * Communicate views and opinions appropriately * Make simple explanations for observations | Soil samples, plastic cups, access to water, plastic spoons  Rock samples, hand lenses  Worksheet 1: Comparing soils and rocks |

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| **ACTIVITY** | **LEARNING OUTCOMES** | **RESOURCES** |
| **Lesson 2: Rock detectives.**  **Starter:** What makes rocks look the way they do? Show the pupils pictures of some of the cliffs on the Jurassic Coast and explain that these are sedimentary rocks and we are going to look at how they are made.  **Experiment: Rock Detectives.**  Explain that the students are going to make a sedimentary rock ‘cliff’. Give students access to sand, gravel, shells etc. in different colours. In the clear plastic cups, they are going to build up layers of sedimentary rock. Use Worksheet 3 to help guide the activity.  **Plenary:** Place the students into groups of 4 by joining up pairs. Each pair has to look at the other groups’ ‘cliff’ and describe what they think happened in what order. They can then check back with the pair who made the ‘cliff’ and see if they got it right! | * Recognise and identify * Make simple observations * Use simple scientific vocabulary * Describe observations * Compare and contrast * Reason * Use basic scientific skills with some judgement * Communicate views and opinions appropriately * Make simple explanations for observations * Lead an enquiry using scientific skills and reasoning * Demonstrate understanding through explanation * Make links and identify relationships between observations and outcomes | Worksheet 2: Photos of cliff faces  Plastic clear cups; sand and gravel (different colours if possible), access to water.  Worksheet 3: Making sedimentary rock cliffs  The Pebble in my Pocket – Meredith Hooper, Chris Coady  ISBN – 0-7112-1076-4 |

**Worksheet 1 Comparing Soils and Rocks**

**Part 1: Soil Sample**

**You will need to make some observations of your soil sample and fill in your results in the table**

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| **Experiment** | **Observations** |
| Look carefully at the soil sample and describe what you can see. Use a hand lens to help you. |  |
| Carefully sieve your sample. What happens? If you have more than one sieve with different size holes, what happens? |  |
| If you squash some of the soil in your hands, what happens? |  |
| Rub some soil between two fingers. What happens? |  |

**Part 2: Rocks**

Examine the different rock samples and fill in your results in the table

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| **Rock** | **Description (You might like to draw a picture)** | **Experiments** |
| **1** |  | Is it crumbly?  Does it have lines?  Can you scratch it with your nail?  Any other ideas? |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |

**Questions**

1. What do you think are the differences between soil and rock?

2. Use your observations to group the rocks into three groups. In the table below, fill in the letters of the rocks you are putting in each group and explain why you have put them together.

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| **Group 1** | **Group 2** | **Group 3** |
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| **Worksheet 2: Red Sandstone cliffs in East Devon** |
| http://farm2.static.flickr.com/1125/662879882_57e3ea96ff.jpg?v=0 |

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| **Worksheet 2: Yellow sandstone cliffs near Bridport, Dorset** |
| http://images.google.co.uk/url?q=http://www.battlefield-site.co.uk/east_cliff02.JPG&usg=AFQjCNGfUYk58TQmPaiNMDlD6tPV4EaVVA |

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| **Worksheet 2: Grey clay cliffs near Charmouth, Dorset** |
| Image:Blue lias cliffs at Lyme Regis.jpg |

**Worksheet 3: Making sedimentary rock cliffs**

You are going to make a model of a cliff! You will need to collect a clear plastic cup, and some sand and gravel. Follow the instructions very carefully and make sure you don’t spill!

1. Half fill your plastic cup with water
2. Carefully put different colours of sand or gravel into your bottle, one layer at a time. You will need to watch carefully to see the sand settle each time. You can put some shells in too, if you like. It is up to you which order you choose.
3. Once you have put in a few layers, gently press down the layers with your hand. This might squeeze some more water out from your layers of sand.
4. Carefully tip any extra water out of your bottle – try not to disturb your layers!
5. Now label your layers and try and tell a story of what might have happened as your rocks layers formed.

If you were making a proper cliff, you would have to gently squash your sand and gravel layers for years…eventually it would make rock!

Here is an example of what your sedimentary cliff could look like:



MY JURASSIC COAST CLIFF