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| **Topic** | **Here and There** |
| **Science Unit** | Rocks  |
| **Curriculum Objectives** | Content: * Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
* Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
* Recognise that soils are made from rocks and organic matter.

Working scientifically: * Begin to ask some relevant questions using scientific language. (Anchor Task)
* Begin to talk about criteria for grouping, sorting, and classifying. (L2)
* Make some decisions about what to observe and how long to make observations for. (L3)
* Begin to identify the main parts of a method and the order of steps. (L3)
* With support and scaffolds, record the main parts of how to set up and complete an investigation (question, prediction, equipment, method). (L3)
* Begin to make careful and systematic observations using a range of equipment, including pipettes, timers. (L4)
* Begin to make some decisions about which type of enquiry will be the best way of answering questions including: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.
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| **Lesson Objectives** | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 |
| To learn about sedimentary, metamorphic and igneous rocks. | To learn to compare and group a range of rocks.  | To learn to plan an investigation. | To learn to investigate rocks.  | To learn to describe fossil formation. | To learn what soil is made of. |
| **Key Vocabulary**  | **soil** | **organic matter** | **sand** | **clay** | **fossils** | **sediment** |
| **organisms** | **rocks** | **pebbles** | **stones** | **marble** | **chalk** |
| **granite** | **slate** | **sandstone** | **limestone** | **concrete** | **sedimentary** |
| **igneous** | **metamorphic** | **man-made** | **durable** | **permeable** | **impermeable** |
| **porous**  | **texture** | **minerals** | **crystals** | **grains** | **layers** |
| **Possible lesson ideas** | * Lesson 1: Chocolate rock activity to show the different types of rocks (below)
* Lesson 1: Edible sedimentary, metamorphic and igneous rocks
* Sedimentary <https://rainydaymum.co.uk/edible-sedimentary-rock-activity/>
* Igneous <https://rainydaymum.co.uk/edible-igneous-rock-activity/>
* Metamorphic <https://www.tinasdynamichomeschoolplus.com/metamorphic-edible-rocks-notebooking-pages/>
* Lesson 2: Sort and classify rocks – research whether rocks are sedimentary, metamorphic or igneous.
* Lesson 3 and 4: Investigations: What type of rock is the most durable/permeable/floats?
* Lesson 5: Show fossil formation with bread and gummy worms <https://teachbesideme.com/sedimentary-rocks-fossil-experiment/>
* Lesson 5: Learn about Mary Anning – <https://www.bbc.co.uk/teach/class-clips-video/ks1-ks2-mary-anning/zn7gd6f> (See Hamilton Trust Lesson 4)
* Lesson 5: Videos <http://www.planet-science.com/categories/under-11s/our-world/2011/10/what-makes-fossils.aspx> <http://www.oum.ox.ac.uk/thezone/fossils/intro/form.htm>
* Lesson 6: Soil sediment jars <https://inspirationlaboratories.com/sediment-jars/>
* Lesson 6: Bring in different types of soil and compare them. Go out to the Wild School site or the field and look closely at the soil.
* Rock Quest: they did a rock survey of the local area and found what type of rock was used for different buildings
* Whole unit: <https://www.hamilton-trust.org.uk/science/year-3-science/rocks-rocks-and-fossils/>
* Whole unit: https://developingexperts.com/s/unit-library/units/13

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Making Chocolate Rocks

Serves a class of 30

**Ingredients**

* 200g grated milk or dark chocolate
* 200g grated white chocolate
* 30 cups
* 30 squares of cling film

**Sedimentary**

**– created from sediment layers under the sea.**

Sandstone, Limestone, Chalk, Shale

1. Place the cling film into the cup.
2. Place 2-3 teaspoons of grated milk or dark chocolate into the cup.
3. Place 2-3 teaspoons of grated white chocolate into the cup.
4. Repeat with a second layer of milk or dark chocolate.
5. Fold the cling film over the top.
6. Push down hard with fingers until the chocolate feels like is has stuck together.
7. Pull out gently and unwrap.
8. Break the rock in half to reveal the layers.
9. Put a some of this rock to one side and use the rest to make metamorphic rock.

**Metamorphic**

**– sedimentary or (igneous) rock that has been changed by heat and pressure underground.**

Marble, Slate.

1. Start with a sample of chocolate sedimentary rock (see above).
2. Put the sample into the square of cling film and seal it in.
3. Squeeze the chocolate into a sphere.
4. Massage the sphere with fingertips until the heat from your fingers begins to melt the surface of the chocolate sphere.
5. The longer and harder you squeeze the stronger the finished rock will be. The *heat* and *pressure* change the shape of the rock. (Link metamorphic with root ‘morph’ – to change shape – animorph from Harry Potter – Morph on Art Attack)
6. If you squeeze too hard you just get a slimy mess of melted chocolate covering the cling film – keep the sphere shape.
7. Allow to cool for a couple of minutes.
8. Unwrap and use a metal or plastic spreading knife to cut through the sphere.

**Igneous**

 **– formed from molten rock from underground forced up the surface e.g. through volcanoes.**

Granite, Basalt

***N.B. This is probably best done as a demo due to the hot liquid involved.***

1. Start with a sample of chocolate sedimentary rock (see above).
2. Put the sample into the square of cling film and seal it in.
3. Squeeze the chocolate into a sphere.
4. Dip the sphere in it’s cling film into a cup of hot water (or tea) for 30 secs to a minute depending on size.
5. Leave to cool.
6. Unwrap and use a metal or plastic spreading knife to cut through the sphere.

**Sampling**

If your rocks have been made in hygienic conditions the children can now sample the rocks. Talk them through it. Encourage them to taste and feel the differences in the internal structure and strength of the different types of rocks.

***N.B. Check for allergies especially nut allergies.***