

# Hastings Cave and Thermal Springs



## Activity Sheet - How do Sedimentary Rocks Form?

- **Curriculum Strands:** SI, BK - Matter, Earth and Space
- **Stages:** 7 -15

Sedimentary rock forms where layers of rock fragments (sediments) are deposited one on top of another over long periods of time. Sometimes these sediments may be deposited on land, such as in desert areas, but more often they mix with water and eventually settle on the bottom of the sea or in lakes in layers: they may contain fossils deposited within the layers.

### What are sediments made from?

The sediments are made up of particles of soil, broken-up pieces of rocks, sometimes seashells and other mineral deposits. Often sedimentary rock contains fossils and other debris that are deposited within the layers. Each different type of sediment makes up one of the distinct layers in the rock.

Over geologic time (thousands or millions of years), the layers are compressed and changed into solid sedimentary rock. Over two-thirds of the land mass on Earth is covered in sedimentary rock!

### What do I need?

- mixture of different-sized (not too large!) rock, gravel, sand, and soil particles
- plastic bag, sealable
- tablespoon
- 1 ½ liters of water
- large plastic water bottle (with top cut off to form a cylinder, or laboratory measuring cylinder (250ml)
- table salt (NaCl)
- optional: seashells or shell fragments, small fish bones

### How do I do it?

1. Collect up different particles that vary in size, type, and texture, e.g. mud, sand, gravel, rocks.
2. Add several tablespoons of each material to a plastic bag then seal the bag and shake it to mix the materials together.
3. Carefully pour your mixture sample into the water bottle.
4. Fill the bottle to the top with water. Pour the water in slowly so that the particles have time to absorb it and don't float out of the bottle.
5. Cover the top of the bottle completely with your hand and shake it up and down about 20 times, to thoroughly mix the particles and the water.
6. Add a pinch of ordinary table salt (NaCl) to the bottle
7. Leave the bottle undisturbed for a few days, or until *all* of the water has evaporated (position it in a sunny place if possible so that the water will evaporate and the layers will harden).
8. When the water is clear or all evaporated, measure the width of each layer in millimetres (mm). Write the measurements in a data table, like this one:



Layer	Thickness (mm)	Description (colour, shape, consistency, etc)
1		
2		
3		
4		
5		
6		
7		
8		

### Questions

- Does the number of layers that formed match the number of sources?
- Do any of the layers look like one of the original sources?
- Do any of the layers look like a portion of one of the original sources?
- Is there a difference between the types of things that ended up on the bottom and those that ended up at the top?
- Which layers do you think settled first, or last, and why?
- Can you see the shells etc which have formed fossils?

### Further Study

You can use a similar test to analyse soil types. Prepare more bottles and use them to collect soils from different places. Label each bottle and half-fill with a sample, add water, cover and shake.

- Does the pattern and number of layers change or stay the same from sample to sample?
- What do the layers tell you about the soil?  
*wTry the same experiment but don't add any salt. Leave it for a few days.*
- What does/doesn't happen? Can you find out why?

### For further information see:

<http://www.coaleducation.org/lessons/sme/elem/7.htm>

[http://www.windows2universe.org/teacher\\_resources/teach\\_makerock.html](http://www.windows2universe.org/teacher_resources/teach_makerock.html)

[http://www.nvmineraleducation.org/Activities/Make\\_Your\\_Own\\_Sedimentary\\_ROCK\\_Revised.pdf](http://www.nvmineraleducation.org/Activities/Make_Your_Own_Sedimentary_ROCK_Revised.pdf)