

Video question script: Make your own rock – compaction and cementation

Question/Activity	Likely response	Rationale
In teaching about the Earth we use practical activities to explore Earth processes. This example explores the lithification of sediments into sedimentary rocks, and is called 'Make your own rock'		Preparation for bridging from the model to real Earth processes
What is this? And this?	We have loose sand, cups, spoons, water, powdered clay and Plaster of Paris. Also a piece of sandstone	Concrete preparation = familiarising pupils with the apparatus and materials
Explain that we are going to try, artificially, to change the loose sand to a rock-like material using the materials we have available		
<p>Ask the pupils to follow these recipes:</p> <ol style="list-style-type: none"> 1. Put some damp sand in a syringe which has had the nozzle cut off 2. Put the open end of the syringe on the palm of your hand and press the plunger in hard. 3. Carefully push the sand pellet out of the syringe onto a piece of paper, label it and leave it on one side. 4. Mix three parts of damp sand with one part clay. 5. Repeat steps 1, 2 and 3 using the sand/clay mix instead of the sand. 6. Repeat the same three steps but this time use a mix of five parts of damp sand and one part of plaster of Paris powder. 7. Leave the "rocks" to dry 	By the end of the lesson the sand/plaster rock should be set enough to tap on the bench – but it is best to keep the pellets overnight for the pupils to try their tests on the following day	
Ask the pupils to plan an investigation to test the pellets when they are dry (e.g. overnight) to test which is most rock-like	<p>A range of different tests can be planned, but if these are used, be sure to run the least damaging one first, e.g.:</p> <ul style="list-style-type: none"> • pile masses on top • drop masses on them • hang masses from them • drop them on the floor • jump on them • drop them from the window • pour water on them • pour acid on them • freeze and thaw them 	Cognitive conflict = planning a series of tests
Test the rocks	Pupils will find that the sand/plaster 'rock' is by far the toughest	Construction = a pattern is revealed
Explain that the sand/plaster rock is the toughest because the plaster sets hard, like the 'glue' that sticks the grains of sedimentary rocks together which we call cement (a different meaning from the Portland cement used to make concrete and mortar). Natural cements include silica (quartz), calcium carbonate (calcite) and iron minerals		
Take some loose sand in your hand, and squeeze it as hard as you can, before pouring it out again. Explain that it is impossible to change sand to sandstone or lime sand to limestone by squeezing, you must have cement – these rocks need both compaction and cementation (although mud can be changed to mudstone by compaction only)		Bridging = applying the concept to sedimentary rock-formation.