Video question script: Exploring rock, soil, water, fossil:
Circus activity 2: Will my rock hold water?

Question/Activity	Likely response	Rationale
When teaching about the Earth we often use practical activities to explore Earth processes. This activity investigates the porosity and permeability of rocks.		Preparation for bridging from the model to real Earth processes
What is this?	Two rocks – red sandstone and white granite; two clear beakers of water; paper towels; tongs	Concrete preparation seeing the materials
Predict what will happen to the masses of the rocks when they are placed into a beaker of water. There are three possibilities, each rock could: • stay the same weight; • get heavier; • become lighter.	Most respond that: the sandstone will increase in mass; the granite mass will stay the same. They usually explain that: the sandstone will become heavier because it absorbs water; the granite won't absorb water and so stays the same.	To respond to this question, you have to construct a scenario of what will happen to the rock and use this to make your prediction. Differences of opinion cause cognitive conflict Explaining predictions involves metacognition.
Now put both rocks into one or two beakers half full of water at the same time and **watch very carefully**. After a timed 30 seconds, remove the rocks and dry them off.	The sandstone increased in mass because it absorbed water; the mass of the granite stayed the same.	This discussion involves constructing a picture of what actually happened to the rock when the activity was carried out.
When you were watching very carefully, what did you see?	Most will say that they saw a few small bubbles on the surface of the granite, but that trains of bubbles flowed out of the sandstone and rose to the surface.	
Did the bubbles from the sandstone come from the bottom, middle or top of the rock?	In most rocks they come from the top (but sometimes, if the rock has a crack, they may come from the middle or bottom).	
Why did the air come out in bubbles?	Air is less dense than water and so rises.	Constructing a response based on density
If air was coming out of the top of the sandstone, what must have been happening at the bottom?	Water must have been flowing in to replace the air.	Constructing a picture of how the fluids flowed
What was pushing the water into the bottom?	Some people will realise that the pressure is caused by air (atmospheric) pressure (there is not enough depth of water for hydrostatic pressure to be important).	Application of previous knowledge or construction of a new knowledge picture
Explain that the fluids were filling the pore spaces (porosity) in the sandstone and could flow through the rock, because the pore spaces are interconnected and large enough for fluid flow – the rock is permeable. Conversely, the granite is non-porous and impermeable.		Consolidate understanding by explaining the correct terms, porosity and permeability
Try out a selection of the other rocks which were used in Activity 1 and try to find the order of "bubbliness"	Most will see that the sedimentary rocks are more porous than the crystalline rocks.	Cognitive conflict when a different sandstone has a different porosity from the first one,
Suggest uses of some of the rocks	Granites and metamorphics for decorative hard wearing stone; slate	Cognitive conflict when a sandstone can be used

	for roofs; sandstone for building	for building when it is relatively porous; Bridging from the specimen to the uses of the rock on a large scale