Video question script: Weathering limestone: with my own breath

Question/Activity	Likely response	Rationale
In teaching about the Earth we use practical activities to explore Earth processes. This example explores chemical weathering, and is called 'Weathering limestone – with my own breath'		Preparation for bridging from the model to real Earth processes
Explain that we are going to put some tap water into a small container, add some Universal Indicator, and then blow into the coloured liquid using a couple of straws		Concrete preparation = explaining the apparatus and the method
Ask what colour the Universal Indicator is likely to turn in tap water	Most will say 'green' if they understand that the indicator scale runs from purple (strongly alkaline, through blue to green (neutral) to yellow, orange and then red (strongly acid) and if they think that tap water is likely to be neutral	Construction = applying a pattern learned previously to a new substance Cognitive conflict = if the answer is unknown
Add the Universal indicator, it usually goes green or slightly bluish green (tap water is usually slightly alkaline, because alkali is added to our water supplies, to reduce the corrosion of pipes)		
Ask, when you blow into the water, how the colour is likely to change	Some will know that our breath contains carbon dioxide, which might dissolve in the water creating an acid and turning the colour yellow, but most will not	Construction = applying a pattern learned previously to a new substance Cognitive conflict = if the answer is unknown
Ask someone to blow into the water. After around 30 seconds it usually goes yellow (but can be just greenish yellow or orange, depending on the tap water)		
Explain that we now have a weak acid called carbonic acid		
Ask what will happen if we now add powdered limestone (crushed chalk)	Some may predict that the limestone will neutralise the acid, changing the colour back to green	Construction = applying a pattern learned previously to a new substance Cognitive conflict = if the answer is unknown
Add some powdered limestone and stir		
The liquid becomes a milky green, because some of the powdered limestone is held in suspension , but when it settles, the colour can be seen to be green again or even a slightly bluish green		
Ask if this means that 30 seconds of someone's breath can make an acid powerful enough to attack limestone	Yes	Bridging = from the activity to a larger scale
Ask, where on Earth this might be happening on a large scale	This illustrates how the carbonic acid of rain and soil water reacts with limestone, dissolving it. It simulates normal rain and soil water (which are dilute carbonic acid) and acid rain, where extra carbon dioxide and other gases have been absorbed by rainwater in industrial areas	Bridging = from the activity to larger scale