Video question script, KS2: Circus activity 7: 'Brickquake' – can earthquakes be predicted?

Question/Activity	Likely response	Rationale
When teaching about the Earth we often use practical activities to explore Earth processes. Here, we are going to ask if earthquakes are predictable, and try a practical activity to find out.		
Ask pupils to study the photograph and ask them what they think kills people in an earthquake. (Photo of damage in Nepal after the earthquake of 2015. *(httpsen.wikipedia.orgwikiList_of_aftershocks_of_the_April_2015_Nepal_earthquake Creative Commons Attribution-ShareAlike License*	Falling masonry and glass, collapsing highways, landslides, associated fires etc, but should also include the difficulty of knowing exactly when and where an earthquake will strike. If we could predict when earthquakes would strike, people could be told to move out until the danger was over).	Revising previous knowledge
Earthquakes are either caused by volcanic activity or by the movement of millions of tons of rock against each other underground. We'll see if we can produce a mini quake on the table (bench?) to see if we can find out what happens when rock masses move against each other underground. What is this?	4 house bricks, one tied round with string; elastic cord with marker tied on; shallow dish of water; G cramp; ruler; slinky; strain gauge (Newton meter)	Concrete preparation = asking them to describe the items
What do you think will happen if I clip the elastic cord onto the brick with the string and pull steadily on the other end of the cord? What will you see happening to the cord itself? Will the brick move as soon as I start pulling?	The brick will not move at first, because of friction between the bricks. The cord will gradually stretch and then the brick will suddenly move. The sudden movement is equivalent to rocks suddenly giving way underground and shaking the ground around them.	A pattern is established that a steadily increasing stress leads to sudden failure.
Let's see if the top brick moves by the same amount, each time I pull the elastic cord. What do you think?	Measure the amount of displacement each time. It usually varies.	The variation in the force required to produce such failure making it difficult or impossible to predict provides cognitive conflict.
Was the pull (force) which was needed to move the brick the same each time? We'll try to find out with this strain gauge, which is really a spring balance. Watch the reading just as the brick moves, and see if it is the same each time.	The force varies between pulls. (Give the equivalent in kg acting under the Earth's gravity.)	As above
Could we put a Newton meter across an earthquake zone and use it to predict when an earthquake will occur? Photo of strain gauge being installed (*USGS.gov)*	The strain gauge will tell when tension is building up in the Earth below, but cannot say when it will suddenly break and produce an earthquake.	As above. Applying the model to real earthquake situations is a bridging skill.
If we put a dish of water beside the bricks, what might you see happening in the water when I pull on the strain gauge and make an "earthquake"?	The sudden movement might make ripples in the water. This might happen in a lake or the sea and could produce a tsunami wave. Ripples can also happen in solid rock and these would be felt as an earthquake.	Applying the model to real earthquake situations is a bridging skill.
If I attach a slinky spring to the un-	The spring might jiggle up and	Applying the model

derside of the table, what might you see happening to it when I produce an “earthquake” with the bricks above it? How might this model what happens in the real Earth?	down or from side to side. This is showing how earthquake waves can travel through the rocks of the Earth and can even affect the land on the opposite side of the Earth if they are strong enough.	to real earthquake situations is a bridging skill.
Suggest ways in which you could either decrease the friction between the bricks, so that they gave way more easily. How could you increase the friction, to make it more difficult?	Suggestions might include wetting the surface between the bricks; sprinkling sand between them; adding another brick etc. We’ll leave you to try these ideas for yourself, but just watch out that your bricks don’t fall off the table onto your feet!	Metacognition is involved as pupils discuss the possibilities.