Video question script, KS3 Geography: Circus activity 6. Ice – grinding, gouging and depositing

Question/Activity	Likely response	Rationale
When teaching about the Earth we often use practical activities to explore Earth processes. Here we are going to see how glaciers can erode the bedrock beneath them.		
What is this?	Ice cubes and a piece of painted wood.	Concrete preparation
You know that glaciers, sometimes called “rivers of ice” can erode deep valleys as they move over the bedrock, so we’ll try wearing away (“eroding”) a piece of painted wood. What do you expect to happen?	Some may expect the ice to scratch the wood, but it simply slides over the surface. Ice itself is too soft and uniform to do any damage.	Using previous experience
What does this picture suggest might be involved in enabling a glacier to erode its bed? How could we imitate this with our ice cubes? (Glacier snout with rock debris beneath it) (*Photo: P. Kennett)*	The ice might be able to pick up bits of rock from the valley sides or bed; or from weathered rock which has fallen onto the surface of the glacier and melted its way down. Try dipping the ice cube into sand and then rub it across the wood.	Thought processes of construction are involved when observing the outcomes of the demonstration. Metacognition is involved in the discussions
Why are there scratch marks on the rock in the photo taken in Glacier National Park, Montana, USA? (*Photo: US Geological Survey)* How can the direction of the scratch marks be explained?	A glacier once flowed over this rock surface and embedded debris in its base scratched the rock. The direction of the scratch marks gives an indication of the trend of flow of the glacier (it could have flowed in either direction, in this photo, either up or down the picture). If you wanted to know which of the two directions it flowed in, you would need to look for other evidence, such as the general slope direction of the valley or the direction in which erratic boulders have been moved from their source.	Bridging skills are needed to relate the observations to the real world.
How could the large boulder on Allt Coire Roill have been deposited there? (Photo: © Chris Eilbeck)	Moving ice sheets and glaciers transport debris of all sizes from boulders to clay; when the ice melts, all the sediment is deposited, including boulders like this one. Glacial erratics can be carried far away from their original source rocks.	As above
The U-shaped valley in Moffatt Hills in the Scottish Southern Uplands was carved by ice. How could this possibly have happened? (Photo: *Ailith Stewart, Creative Commons 2.0*)	A valley glacier armoured with boulders and sand, carved this valley as it ground its way over the rock beneath. Since valley glaciers erode both the sides and base of the valleys they flow through, glacier-carved valleys have typical straight U-shapes, like the one in the photo. In contrast, river-eroded valleys have V-shapes (since most of the erosion takes place at the base of the ‘V’).	As above