

Video question script, KS3 Geography: Circus activity 3.

Ice power – freezing water in a syringe to measure the expansion

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 what happens when water freezes and thaws.		
What is this?	A syringe with coloured water filled up to the 18ml mark. The end has been sealed with Blutak™	Concrete preparation
What will happen to the water if the syringe is put in a freezer for an hour or so? Will you be able to see any changes?	(Same picture) The water will freeze. It will expand. There will probably be frozen condensation on the outside of the syringe. Picture of syringe after freezing.	Using previous experience
Can you measure by how much the water expanded when it turned to ice?	The water occupied 18ml. When the same volume of water turned to ice it expanded to 19.6ml. Calculate the percentage expansion as water turned to ice as (length of ice-length of water)/(length of water) x100%. = 1.6/18 x100% = 9%	Thought processes of construction are involved when observing the outcomes of the demonstration.
Imagine that water has got into cracks in a rock or into the pore spaces between the grains which make up the rock. What do you think will happen as the water freezes and thaws many times during the winter? <i>(Photo: P. Kennett)</i>	Leave syringe picture on at first. The rock will break up into pieces. Then replace with photo of 3 weathered oolite blocks on a wall of sandstone at Grindleford in the Peak District, taken in 2005. Lens cap = 50mm.	Bridging skills are needed to relate the observations to the real world.
What will happen if freezing and thawing takes place over several years? <i>(Photo: P. Kennett)</i>	The block will break down even more. Photo of gap in wall with remains of oolite blocks in the middle, taken in 2018.	As above
Where on Earth is freeze-thaw weathering likely to be most active?: a) beneath polar ice sheets; b) on mountain tops; c) in cold arid deserts; d) in hot arid deserts. <i>(Antarctic Peninsula photo: M. Fleet)</i> <i>(Glyder Fawr, Wales Photo:P007204, BGS. Contains public sector information licensed under the Open Government Licence v2.0)</i>	Photo of Glyder Fawr, Wales - Freeze-thaw weathering is likely to be most active on mountain tops where there is frequent freezing and thawing. Photo of glacier and plateau ice at Stonington Island, Antarctic Peninsula. Freeze-thaw weathering is least active:-under polar ice sheets (it is frozen most of the time), in cold arid deserts (there is not enough water), as also in hot deserts, where it usually does not become cold enough either.	As above