

## Video question script: Crystallisation – why igneous rocks have different crystal sizes

Question/Activity	Likely response	Rationale
In teaching about the Earth we use practical activities to explore Earth processes. This example explores crystallisation through the Earthlearningidea, 'Why do igneous rocks have different crystal sizes?'		Preparation for bridging from the model to real Earth processes
I have here what and what?	Some solid Salol in a boiling tube, a beaker, a kettle of hot water, some microscope slides on a piece of paper. Ensure the slides are clean	Concrete preparation = introduction to what we will be using
Salol (phenyl salicylate) melts and crystallises at 42°C. What do you think will happen when we put this boiling tube containing solid Salol crystals into a beaker of hot water?	It will melt	Construction = applying a pattern of previous knowledge to a new situation
Do the activity	It melts	
What do you think will happen when we put the liquid Salol onto the clean room temperature slide?	It will go below 42°C and crystallise	Construction = applying a pattern of previous knowledge to a new situation
Do this – but put a second clean room temperature slide on top (to make the result easier to see and aid the crystallisation)		
What do you think will happen if we repeat this using two clean slides taken from the freezer?	A tough question to answer if you don't know the background. Some will say that it will crystallise more quickly	Cognitive conflict = trying to work out the answer
Do this	It does crystallise more quickly, and so makes smaller crystals	
Now, what do you think will happen if we repeat this, but using a pair of clean slides warmed in the beaker?	<ul style="list-style-type: none"> <li>• It will crystallise even more slowly than the room temperature slide</li> <li>• The crystals will be even larger than the room temperature slide</li> </ul>	Construction = pupils should see the pattern that the warmer the slide, the more slowly it crystallises and the larger the crystals are
Do this	It crystallises more slowly than the room temperature slide, and so makes larger crystals	
Show them the images of the large crystal and small crystal slides – ask which is which	The slower cooling gives the larger crystals	Construction = pupils should see the pattern
Explain that your class may never before have seen crystals growing – but now they have. Point out that as the crystals grow together, they form interlocking shapes – just like crystals in igneous rocks		
Show them specimens of a coarse-grained and a fine-grained igneous rock. Ask which cooled the more quickly and which more slowly	The fine-grained rock cooled more quickly – at Earth's surface The coarse-grained rock cooled more slowly – deep underground	Bridging = from the activity to reality
Ask why rocks deep underground cool more slowly	They cool more slowly because they have kilometre thicknesses of insulation of all the rocks on top	