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## WORKSHOP 2

### Modelling Primary Mineralisation

<b>The activity in brief</b>		Calculate the concentration factor for copper ores at Ecton. Model the processes by which mineral deposits have been formed – rising fluids versus descending ones. Undertake a mine visit to look for evidence of the origin of ores in the mine.
<b>Suitable for</b>	<b>WJEC</b>	<b>AS</b> GL1 – recognition of minerals (p 13) <b>A2</b> GL5, Theme 2 - processes of formation of metalliferous ores and non-metalliferous minerals (p 42), porosity, permeability (pg 43)
	<b>OCR</b>	<b>A2</b> F794, Module 3 – concentration factors, hydrothermal processes and veins (p 34-35)
<b>Suitable for teaching/assessing investigative skills</b>		Analysing evidence & drawing conclusions
<b>Topic addressed</b>		Syngenetic mineral formation
<b>Student practical or teacher demonstration?</b>		Teacher demonstration, led by Ecton Tutor
<b>Time needed to complete activity</b>		30 minutes
<b>Resource list</b>		Geological map of Ecton area Download and print at school before workshop: <ul style="list-style-type: none"> <li>• <a href="#">GW2 SS1 - Modelling primary mineralization</a></li> <li>• <a href="#">GW IS2– List of minerals recorded at Ecton</a></li> </ul> For The Salt's Level visit: <ul style="list-style-type: none"> <li>• <a href="#">GW IS6(C6): Salt's Level Base Map</a></li> </ul> should be issued to students and Teacher should download: <ul style="list-style-type: none"> <li>• <a href="#">GW IS7(C7): Salt's Level Geological Details</a></li> </ul> but withhold it until after the Salt's Level visit.

**Ideas for introducing/leading into the activity:**

It is essential for students to have an understanding of what 'ions' are.

Students should be prepared for the visit by studying the Student Sheets in advance, so that they are familiar with the layout of Ecton Hill and the mines.

They could also examine appropriate specimens of copper and lead ore minerals and their associated gangue minerals.

**Ideas for following up the activity**

On the mine visit look for:

- spaces within the rock
- any impermeable layer
- evidence for primary minerals having originated from below or from above
- any primary ores still there
- banding of minerals in veins, e.g. the Shack Vein at the cross cut
- or better seen where the Shack Vein occurs again in the 19th Century workings.

See Workshop 3: Investigating secondary mineralization.

See Workshop 7. What makes an ore deposit worth working?



**Fig 2.1 Chalcopyrite on calcite**



**Fig 2.2 A plume of warm solution rising through a hole in a limestone slab**

Remind your students to bring their Student Sheets on the day.