
WORKSHOP 3

Investigating Secondary Mineralisation

The activity in brief		Students learn or revise how to identify relevant minerals at the Centre. The leader establishes the concept of the water table. Students gather evidence from the mine visit for a) secondary alteration of minerals and b) levels of water table in the hill. Follow up; using standard diagrams of enrichment of ore bodies.
Suitable for	WJEC	AS GL1 – recognition of minerals (p 13) A2 GL4, E4 - water table (p 38) GL5, Theme 2 – processes of formation of metalliferous ores and non-metalliferous minerals (p 42), porosity, permeability (p 43)
	OCR	A2 F794 Module 1 - water table (p 30); Module 3 – identification of minerals, concentration factor, cut-off grade (p 34), secondary enrichment of chalcopyrite (p 35).
Suitable for teaching/assessing investigative skills		<ul style="list-style-type: none"> Analysing evidence and drawing conclusions
Topic addressed		Secondary enrichment of primary ores in a hydrothermal mineral deposit
Student practical or teacher demonstration?		Practical work on minerals followed by mine visit to locate them in situ. Follow up work.
Time needed to complete activity		30 minutes + mine visit

Resource list

Download and print at school before workshop:

- *WS3 SS1: Investigating secondary mineralisation*
- *WS IS2: List of minerals recorded at Ecton*

For The Salt's Level visit:

- *GW IS6(C6): Salt's Level Base Map*

should be issued to students and Teacher should download:

- *GW IS7(C7): Salt's Level Geological Details*

but withhold it until after the Salt's Level visit.

Ideas for introducing/leading into the activity:

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

Provide data on the relative value of ores – primary versus secondary.

Discuss the factors which could lead to a mine being deepened, or closed... See Workshop 7.

Copper prices are currently high because of demand from China. Would you recommend considering reopening Ecton Mine, to extract ores from the current deepest part at 400m?

To what extent might the water table seen today at Ecton have been affected by artificial mine drainage?

Preparation and set-up time:

10 minutes



Fig 3.2 a) Malachite in a vein at the cross-cut



Fig 3.2 b) Copper staining in flowstone at the pipe vein