
WORKSHOP 8

Prospecting for Minerals by Soil Sampling

The activity in brief		Students are asked to plot given values of copper and lead concentrations on a map of an imaginary area. They draw contours of equal concentration and then assess the resultant patterns
Suitable for	WJEC	A2 GL5, Theme 2 - geochemical prospecting using river sediment..., soil sampling (p 44)
	OCR	A2 F794, Module 3 - geochemical exploration using stream sediment and soil sampling (pg 36)
Suitable for teaching/assessing investigative skills		
Topic addressed		The use of geochemical sampling to identify the locations of possible ore mineral deposits.
Student practical or teacher demonstration?		Student follow-up work, e.g. homework.
Time needed to complete activity		30 minutes
Resource list		Download and print at school before workshop: <ul style="list-style-type: none">• GW8 SS1: Prospecting for Minerals by Soil Sampling (NB 3 pages)
Ideas for introducing/leading into the activity:		<p>Ask students how they think the ore deposits at Ecton were found in the first place. (Loose lumps of copper or copper ores; changes in vegetation; snow melts at different rates over veins, owing to different thermal conductivity).</p> <p>What methods might be used today? (Display any data available at the centre, e.g. air photo of Ecton Hill; resistivity lines etc. Satellite imagery is often used in the search for new mineral deposits, followed up by ground surveys, such as geochemical sampling).</p>

- Ideas for following up the activity** Chapter 3, An overview of the mineral industry, in Nuffield Advanced Science (see below), gives an excellent summary of this topic, with photographs and case studies.
- Web searches for satellite images or for information on large modern ore deposits, such as Bingham or Chucicamata.
- Preparation and set-up time:** Nil
- Source of activity:** This activity was written by Alastair Fleming for Nuffield Advanced Science, Chemistry, Mineral Process Chemistry, A Special Study.
- Note that an attempt was made to test soil samples obtained from the hillside near Dutchman Mine at Ecton. However, this was unsuccessful, because there is very little release of metallic ions into the soil at Ecton, owing to the alkaline environment. The technique is much more relevant in the acidic environments where copper ores more usually occur. Also, any results could be misleading because so much waste from the mines and smelters has been scattered over the hillside over the centuries.