HISTORY learning springboards

Fieldwork: Lichenometry – using plants to date old stone - KS3

An historical study of rocks, trees stone structures or old school buildings, using plants

Aim: To use research skills to understand how nature gives us clues as to the passing of time and to carry out an historical investigation.

Lichenometry is a method that uses lichen growth to determine the age of exposed rock, based on a presumed specific rate of increase in radial size over time. Pupils use lichens as evidence to date churches, sculptures, monuments, exposed rocks, gravestones, buildings, and the exposure of surfaces in general. This can be part of an historical investigation into an area.

Activity:
Pupils look at built structures to find lichen growth. If there is lichen growing it has most likely been living there since the time the structure was installed. The age of the lichen can help deduce the age of the structure, even if it was hundreds of years ago. The method is used with lichen species that exhibit predictable growth behaviour (see Resources). The surfaces that have been undisturbed for longer will have lichen colonies with larger diameters.

- Identify the largest lichen. Measure the maximum diameter in millimetres from edge to edge, to calculate its age.
- Take lots of measurements from similar time periods. Does the 'lichen' age match the known age of the structure?
- Pupils graph their results (lichen diameter vs. known age) and use them to date other sites.
- Ask pupils to think about factors that would influence the accuracy of this method of aging a structure – for example, specific growth rates, climate change or microclimate, cleaning, pollution.

The method was first developed by Roland Beschel in the 1950s, by measuring lichen diameters on gravestones of different ages. The burial dates from the gravestones were taken as the starting point for lichen growth and used to create a graph of lichen diameter vs. age. Scientists have developed sophisticated methodology to create more accurate calibration tables for various lichens.

Find out more about this by searching Beschel's work on the internet.

Lichen identification

Roland Beschel

Resources:
- Clipboard and chart on which to record findings, pencil, ruler
- Structures with lichen
- Lichen ID guide
- Photos of key indicator species of lichen most often used in scientific studies, such as *Rhizocarpon geographicum*, also known as "map lichen" (yellow-green, black-speckled lichen, crusty) which has an estimated average growth rate 1mm a year.

More springboards:
- History Springboard: Mummification
- Science Springboard: Pollution investigations

Key vocabulary:
lichen, substrate, pollution, (crustose, fruticose, foliose - types of lichen)

Success criteria:
- ✓ I can explain how to measure the passing of time using lichen growth
- ✓ I can work scientifically to collect, analyse and communicate with a range of data gathered through fieldwork
- ✓ I understand the adaptation of living things to suit their environment

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