Will My Gravestone Last?

Earth science out of doors for KS3 science/geography

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Earthlearningidea online video workshops

Purpose – ESEU background

• Most Earthlearningidea online video workshops are based, with permission, on workshops originally developed by the Earth Science Education Unit (ESEU).

• These were designed as interactive workshops for teachers and trainees, involving interaction, discussion and presentations by participants to others.

• Global research into professional development workshops shows that these aspects are critical to success.

• ESEU research shows that this workshop approach is highly successful in changing teaching in schools; evaluation feedback has also been very strong.
Earthlearningidea online video workshops

Purpose – Earthlearningidea development

• The Earthlearningidea Team has developed the ESEU workshops into online video workshops for those unable to take part in face to face interactive workshops
• Most workshops are led by a PowerPoint presentation and have an accompanying booklet that contains all the activity background details, resource lists, risk assessments, etc.
• The individual workshop activities have been published for open access online at the website: https://www.earthlearningidea.com/
• Each workshop activity has a question script and a video keyed into CASE principles, that can be accessed through the PowerPoint hyperlinks.
• The aim is to facilitate online Earth science learning.
Will my gravestone last? – using CASE

Teaching Earth science using the Cognitive Acceleration through Science (CASE) approach

• The activities in this workshop are keyed into the CASE approach – to develop thinking skills while teaching key Earth science material

• If you are unfamiliar with the case approach, you can access a video introduction at: https://www.earthlearningidea.com/Video/CASE.html

• An exemplar Earth science teaching activity with a question script using the CASE approach is at: https://www.earthlearningidea.com/Video/Atmosphere_ocean.html
## Will my gravestone last?

<table>
<thead>
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<th>Workshop video run times</th>
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### Will my gravestone last?

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<th>Will my gravestone last?</th>
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<td>8. Your choice</td>
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</table>
Links to gravestone videos – (i)

1. Initial briefing:  

2. Recent gravestones:  

3. Surveying:  

4. Identifying rocks:  

5. Weathering:  
Links to gravestone videos – (ii)

6. Oldest gravestones:

7. Summary:

8. Your choice: https://

For further information on some of the rock types see Virtual Rock Kit:
https://www.earthlearningidea.com/virtual_rock_kit/START.htm
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Summary

• Preparation for a ‘field visit’ to a local graveyard to use the wealth of opportunities available for scientific investigation, out of doors, in an Earth science context.

• Suitable sites include public cemeteries, mostly administered by Local Authorities and burial grounds attached to churches and administered by them.

• The case study videos were filmed in Ecclesall Churchyard, Sheffield, UK.
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Workshop outcomes
The churchyard visit provides the following outcomes:
• identification of a range of rock types;
• knowledge and understanding about weathering processes;
• the opportunity for pupils to test their own hypotheses regarding rates of weathering;
• ability to sample data from a wide range of different rock types and environments within the churchyard;
• experience of bridging school-based learning with the outside environment.
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What gravestones in unweathered conditions can look like (slides 9 to 19)

For further information on some of these rock types see Virtual Rock Kit [https://www.earthlearningideas.com/virtual_rock_kit/START.htm](https://www.earthlearningideas.com/virtual_rock_kit/START.htm)
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Igneous rocks used for gravestones

- a few examples from a wide range of igneous rocks from across the world
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“Balmoral Red” Granite, from Scandinavia
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Red granite detail. Coin is 2cm diameter
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Peterhead Granite, from Scotland, UK, containing a metamorphosed fragment of an older rock
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Larvikite – an iridescent igneous rock from Oslofjord in Norway

"Iridescent = crystals glitter with rainbow-like colours"
Metamorphic rocks used for gravestones
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Carrara Marble, from Italy, with lead lettering, inset to the marble surface
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Gneiss, from India
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Red gneiss detail showing mineral banding
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Sedimentary rocks used for gravestones
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Sandstone, from the Millstone Grit Series rocks of Derbyshire, central England, UK
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Some different environments within a churchyard
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The newest, unvegetated part, still used for burials
Will my gravestone last?

The part used between the 1880s and the 1950s, with planted trees
Will my gravestone last?

The overgrown Victorian part
Will my gravestone last?

The response of gravestones to weathering
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Chemical (oxidation) weathering, shown by orange discolouration on the edges of a broken Cornish granite
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Tree roots forcing apart gravestones
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The mason adding a new name to a weathered marble slab
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Marble, showing more weathering by carbonation-solution on the top surface than on the vertical surface, (shown by the lead letters standing further out from the marble on the top)
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“Spalling” on the east-facing side of a sandstone slab

Spalling = the breaking away of weakened flakes
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The undamaged west-facing side of the same slab
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Henry Clifton Sorby, a famous Victorian geologist – spot the different rock types!
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A local sandstone tells of family tragedy in earlier eras – discuss!
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