

Teachers' Guide – Weathering and Corrosion

About the activity

This activity looks to link ideas found in Geography, History and Science curriculums. Pupils will need to draw on their observational skills, looking for differences in objects in “The Terrace” area and “People of Aqua Sulis” room in the museum. Many of the tasks are open-ended, allowing plenty of room for discussion within groups while at the Roman Baths, but also back in the classroom. This activity aims to mainly focus on the scientific aspect of properties of materials and their use. This activity also lends itself to link with topics looking at comparisons of lifestyles between the present day and Roman times.

Curriculum links

At Key Stage 2 this activity can be linked to Geography, looking at physical and human processes, particularly the effect of water on landscapes and people. It can also be linked to Science units focusing on physical properties.

At Key Stage 3, links can be made to the Science units: 7E- Acids and Alkalis and 8G - Rocks and Weathering from the National Curriculum 2011. Again, links can be made to Geography.

Pre-visit suggestions

Looking at the effect of Acid Rain on rocks and statues:

- Perform an Acid Rain demo using an upturned bell jar, cotton wool with indicator and matches to burn (or similar demo). This provides explanations for the reasons behind Acid Rain (remember all rain is naturally slightly acidic, however production of certain gases enhances this).
- Perform practical experiments looking at the corrosion of stone in dilute acid (it is possible to use vinegar as a substitute) – this can be left for an extended time. Links should be made to Acid Rain and its effects.
- Look at the rate of weathering for different types of stone and different types of materials. Try to answer questions such as “Why is marble often used for statues?” or “How do soft materials change over long periods of time compared to metals?”

Supporting pupils

The worksheet is very self-explanatory, however below is some guidance to aid pupils in their learning. We would recommend that pupils complete the activities in groups of around four, with each pupil having their own worksheet.

Possible reasons why statue faces become worn away:

- Acid rain (chemical weathering)
- Wind
- Extreme change in temperature (can be known as freeze-thaw but not for all materials)
- Biological weathering (e.g. moss on the statues)
- People/tourists touching statues

Possible ideas to help protect statues:

- Put a roof above the terrace
- Add a protective layer e.g. a coating (this is the technique that is used at the Roman Baths presently, it means the layer is worn away rather than the stone, and this artificial layer is replaced frequently)
- Shelter the statues using items such as wind breakers

- Pupils may suggest ideas such as moving statues, using different materials to make the statues or completely covering them from view, however emphasis should be placed on the statues remaining available for public viewing in their original state.

Likely uses of drains:

- Sewage/toilets (sanitation)
- As a rubbish disposal
- Drinking water
- Bathing water
- Flooding/storm run off

Possible reasons for difference in drain sections:

- The force of the water corrodes the stone (advanced pupils could compare square drains (original shape) to rounded drains, and suggest reasons why they have formed this shape).
- Some pupils may relate this to similarities in river bed corrosion.
- The movement of sediment causes wearing away of the stone.
- This question is rather open-ended and pupils may discuss the idea that the drains were different shapes to begin with (rounded versus square), the second question provides pupils with the opportunity to discuss and share these ideas.

Items which are more likely to survive 2000 years:

- Metal objects e.g. coins, jewellery, pencil case zip
- Glass objects e.g. bottles
- Some parts of electronic equipment e.g. mobile phones (but will not remain whole)
- Some plastic products may survive but they are likely to have broken up into smaller pieces (unlikely to be recognisable)

Post-visit suggestions

If not already covered, weathering/erosion of the drainage system can be linked to changes to the shape of rivers and flow of water.

The diagram activity looking at materials used for different objects is an open ended task that can be brought into a classroom environment, comparing resources from different time periods.

For further extension, classes could look to create a time capsule – using information on corrosion they should decide on what to put in the capsule and what material to use on the outside to provide the best protection for objects inside.