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Teaching –learning module compiled by the PARSEL consortium  
as part of an EC FP6 funded project (SAS6-CT-2006-042922-PARSEL) on  
Popularity and Relevance of Science Education for scientific Literacy

# How Best to Maintain a Metal Bridge?

A grade 8-9 science (chemistry) module on  
Rusting and Corrosion of Metals

## Abstract:

This set of activities allows students to consider factors which can be involved in determining the best way to protect a metal (iron) bridge. In tackling this issue, students are guided to realise that they need to be aware of the factors that cause iron to rust and also that sacrificial metals can protect iron. The sacrificial metals can be put in a series such that the metal s higher in the series protect those below from corrosion (rusting). The decision making on which method to use to protect the bridge involves the consideration of a range of social factors from the need to provide employment to people, to ensuring maximum safety, to cost and also the bridge being aesthetically suitable for the surroundings.

Sections included		
1.	<a href="#">Student activities</a> (for students)	Describes the scenario in more detail and the tasks the students should perform
2.	<a href="#">Teaching guide</a>	Suggests a teaching approach
3.	<a href="#">Assessment</a>	Gives suggested formative assessment strategies
4.	<a href="#">Teacher notes</a>	Gives student worksheets and information for decision making

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**Developer: Jack Holbrook**

Institute: ICASE  
Country: UK

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**Overall Objectives/Competencies:** The students are expected to:

- \* ability to use previous and acquired knowledge to decide how best to protect an iron bridge;
- \* ability to appreciate that ‘most appropriate’ can apply to a particular; situation and can change if circumstances change;
- \* ability to suggest experimental procedures for testing factors that are necessary for rusting to occur;
- \* ability to suggest suitable methods to protect iron from rusting;
- \* ability to utilise information presented in tabular format;
- \* ability to discuss meaningfully in groups;
- \* understand the factors that are needed for iron to rust;
- \* understand the corrosion process that may occur when two dissimilar metals are put together.

**Curriculum content:** Rusting of iron, prevention of rusting, corrosion

**Kind of activity:** Devising and carrying out experiments related to rusting, formulating the reactivity series from experimental outcomes, discuss ways to prevent iron from rusting, selecting the most appropriate method to protect a metal bridge.

**Anticipated time:** 6 lessons

This unique teaching-learning material is intended to guide the teacher towards promoting students’ scientific literacy by recognising learning in 4 domains – intellectual development, the process and nature of science, personal development and social development.

Its uniqueness extends to an approach to science lessons which is designed to be popular and relevant. For this the approach is intentionally from society to science and attempts to specifically meet student learning needs.

This uniqueness is specifically exhibited by:

1. a society related and issue-based title (supported in the student guide by a scenario);
2. student-centred emphasis on scientific problem solving, encompassing the learning of a range of educational and scientific goals;
3. including socio-scientific decision making to relate the science acquired to societal needs for responsible citizenship.

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