

## Questions in science

*Why do metals corrode?*

### **Narrator:**

You may be familiar with corrosion that occurs when something metallic, like a bicycle, is left out in the rain. Corrosion is the deterioration of metals by chemical reaction with their environment.

This chemical process has a huge economic impact as it can affect the safety of structures (such as bridges and buildings), and the reliable and efficient operation of equipment.

Rusting is a special case of corrosion that only happens to iron and its alloys (such as steel). We use rust as a general term for any iron oxides formed by the reaction of iron with oxygen and water.

Given enough time, any iron that is exposed to the environment will become rust completely and disintegrate. Corrosion can also be accelerated in some circumstances. For example, metals will corrode quickly in coastal environments due to high salt levels.

Other metals, such as aluminium or zinc, also react with oxygen in the presence of water to form oxides.

However, these oxides can stick to the surface of the underlying metal, forming thin but hardy layers that can protect the metal underneath from further corrosion.

This protection from corrosion is the basis of galvanising, where a metal surface is given a coating of zinc.

A sacrificial metal is another approach of managing corrosion by attaching a block of an easily oxidised metal such as aluminium to large metallic structures, such as ships.

Therefore, by understanding the process of corrosion, it is possible to design metal structures in such a way that they do not rapidly deteriorate.

To discover more about the impressive chemistry of metals and develop your scientific thinking, explore our introductory science module Questions in Science.

**<https://www.open.ac.uk/courses/modules/s111>**

