

Weathering (salt & water) – Teacher Notes

Oxidation reactions work faster if water is present and faster still if both salt and water are present. Mafic igneous rocks such as basalt, gabbro and dolerite are made of iron rich minerals. Where these are exposed along a sea shoreline or to the hyper-saline waters of a salt lake, a dark band of oxidised rock will form rapidly. Much of the underground water in the goldfields is more saline than the sea.



Heavily oxidised mafic rock (pillow basalt) on an island in Lake Ballard

We can test this by exposing steel wool (iron) to air, water and salty water. Steel wool represents iron rich minerals. The increased surface area of “wool” compared to a solid bar of steel or iron also increases the rate of reaction. In tropical areas rock will start to become oxidised within a year. The weathered skin of oxidised rock may in time protect the rock from further weathering

Materials per student or group

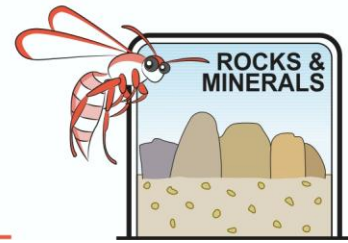
- Three small pieces of steel wool
 - Three half plastic Petri dishes
 - A marking pen
 - Water and salt water in a wash bottle
1. Mark one dish “Control”, another “Fresh water” and the third “salt water”.
 2. Place equal sized pieces of steel wool onto each Petri dish
 3. Flush steel wool in “fresh water” with fresh water and the wool in “salt water “ with salt water
 4. Leave for three days and observe results

Why did we not add anything to the control dish? **This is the control dish. Any change resulting from testing one variable can be measured against this.**

Describe any changes you notice in the other two dishes

The steel wool to which water had been added was becoming very rusty.

The steel wool to which had been added salty water was very rusty.



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The petroglyph of the kangaroo above is from the Burrup Peninsula. The rocks stick out into the sea. A band of deep weathering extends 1m above high tide lines. Explain this. [Spray from the sea contains salty water that increases the rate of oxidation/rusting to that height.](#)

Oxidation rates vary according to variation in weather, exposure and variation in rock type. This cannot be used as an accurate measurement of time to date the age of the art.

Farmers and householders use metal “star” pickets to make fences. The pickets are driven into the ground and fence wire is strung through them. What part of the picket would be most affected by weathering and where in Western Australia would pickets last longest?

[The part of the picket near the surface would be most impacted as it is exposed to air, water and possibly salt. Dry areas of WA with a low salt content would be best.](#)