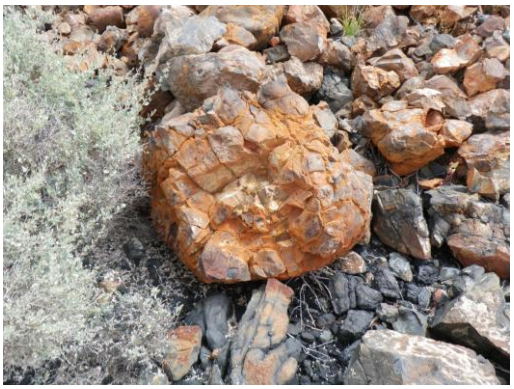
Weathering (salt & water) – Student Activity

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 dark 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.

Unweathered basalt



Heavily weathered pillow basalt in salt lake

We can test this by exposing steel wool (iron) to air, water and salty water. Steel wool represents iron rich minerals in the rock. 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.

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 Petri 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?

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Describe any changes you notice in the other two dishes.

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The fish petroglyph above is from the Burrup Peninsula. These iron rich rocks rocks stick out into the sea and have been weathered into a rusty orange colour. A band of deep dark weathering extends 1m above high tide lines. Explain why this has happened using the knowledge you have gained from your experiment.

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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?

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