

## Rocks & Minerals – Rocks: Chemical Weathering

We tend to think that rocks last forever but if you break a rock open you'll often see the outside looks different than the inside. The outside has weathered (a destructive process that breaks down the rock's surface). Since weathering is a slow process we don't see the change but if you visit old Hillside Cemetery in Kin Coulee you can see the rock gravestones have changed. Sometimes these changes are the result of chemical weathering.



### Materials:

- lemon juice
- \*two pieces of limestone, calcite, chalk and quartz
- vinegar
- medicine droppers

(\*If you don't know rock types visit a landscape business; they may even give you a free samples.)

**Procedure:** (Remember to have your parent's permission and have them watch and help you.)

- Put a few drops of lemon juice on one piece of each of the four rock types.
- Put a few drops of vinegar on the other piece of each of the four types.
- Look and listen carefully each time you add the lemon juice or the vinegar.

### What's Happening:

What happens when you put lemon juice on each rock? What happens when you put on the vinegar? Did the lemon juice and vinegar act the same way on each rock? Why did some of the rocks react differently? What does this experiment have to do with weathering?

Lemon juice and vinegar are both weak acids. The lemon juice contains citric acid and the vinegar contains acetic acid. These mild acids can dissolve rocks that contain calcium carbonate. The lemon juice and vinegar should have bubbled or fizzed on the limestone, calcite, and chalk, which all contain calcium carbonate but not the quartz, which has none. Water, such as rain falling through polluted sky, can contain weak acids that dissolve rocks containing calcium carbonate and other minerals.

### Extension:

Pop or carbonated beverages such as 'coke' contain carbonic acid. Test your rocks with pop. Does it cause the same reaction?

We often think of weathering as a bad thing because it ruins buildings and statues. However, as rock is destroyed, valuable products are created. The major component of soil is weathered rock. The growth of plants and the production of food depend on weathering. Some metallic ores (aluminum, copper) are concentrated by weathering. Dissolved products of weathering are carried by water to the rivers, lakes and oceans, where they nourish things living there. As rocks weather and erode, the sediment eventually becomes rock again – a sedimentary rock.

This activity is based on our Rocks & Minerals kit. The source for this lab was: <http://www.scienceviews.com/geology/activity4.html>. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Mark your calendars, our next community event will be the Family Science Olympics Oct 13, 2012. Also, please consider volunteering as a classroom speaker or allow your business as a field trip location.

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