

DEMO #3 WEATHERING

General Description:

There are two demonstrations here, one of chemical weathering (dissolution of calcite) and one of physical weathering (ice wedging). The chemical weathering demo simply involves handing out chunks of carbonate rock and 10% HCl and letting students make the rock fizz. It sounds mundane, but the students are very intrigued! The ice wedging demo involves drilling holes in a small rock, filling the holes with water, and freezing the water in liquid nitrogen. The rock/ice makes popping sounds and breaks apart.

Materials:

In cabinet:

- small slabs of marble, limestone, or fine-grained sedimentary rock not more than 1 inch thick
- 5 small hand samples of carbonate-rich rock
- shallow cardboard box

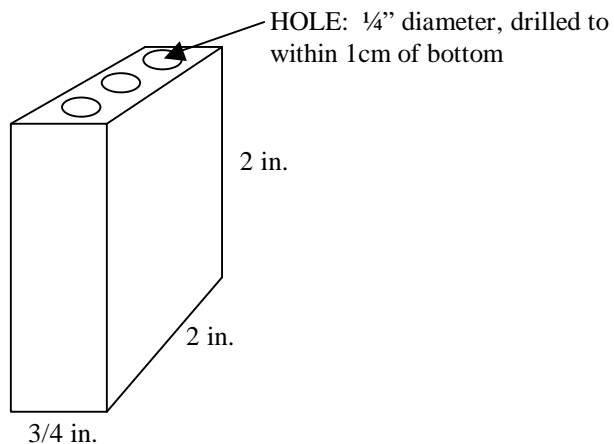
Get from Craig Sanders:

- 5 bottles of 10% HCl

You will also need:

- at least 1 liter of liquid nitrogen
- tongs or pliers
- 1000 ml beaker
- glove
- drill press
- 1/4" masonry drill bit

Instructions for ice wedging demo:



- Cut the rock slabs into small pieces of the size shown above. Coordinate use of the rock saw in the Mines Building with Quintin Sahratian.
- Drill 3 or 4 holes as shown. I drilled to within about 1 cm of the bottom of the rock. Cooling the bit with water speeds this up.
- Fill holes with water.
- Fill beaker about half full with LN₂.
- Put rock in beaker, keeping it upright. Make sure the top is submerged. I wore safety glasses!

- Make the class stay quiet and listen. Within about 30 seconds, the rock/ice will make some popping sounds and it will crack.
- Remove the broken rock with the tongs, show it to the class (handle it with a glove), put it in the box, and pass it around for the class to inspect.

Comments:

- Both demos worked very well and students were intrigued. I was surprised how interested students were in simply making rock fizz! I ice-wedged two pieces of rock prior to class and 2 in class, and they all worked. I did not play with pieces of different dimensions, so I don't know how other geometries would work. The rock types I chose were soft and relatively easy to cut and drill (siltstone and marble), so the samples could be prepped in less than an hour.