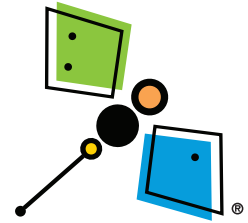


DragonflyTV: GPS Activity 7

Steam Team



**Yellowstone National Park
Canyon Visitor Center**
Yellowstone, WY
www.nps.gov/yell/



Geysers

We're Phoebe and Shannon, and we love exploring Yellowstone National Park. There are so many cool things to see: the canyon, waterfalls, wildlife, lakes, hot springs, and geysers! We went to Canyon Visitor Center to learn more about these features—especially the thermal basins, places where there are lots of geysers or hot springs. We were curious: Why doesn't every thermal basin have a geyser?

At the Canyon Visitor Center, we saw an exhibit that explained Yellowstone's unique geology. With all the different kinds of rock in the park, we thought it was time for good old-fashioned DragonflyTV field work. We headed to Mammoth Hot Springs, which doesn't have geysers, and Upper Geyser Basin, which is home to a lot of geysers. We decided to take water temperatures and check out the kinds of rock found in each area.





Icebreaker

Make a model geyser from simple household materials.



45 minutes

DragonflyTV Skill: Observing

Guide your kids as they

- 1) Acquire a film canister with a small hole in the lid, filled 3/4 with warm water. They should hold on to the canister but not remove the lid until directed to do so.
- 2) Remove the canister lid and put the antacid half-tablet in. As quickly as possible they should replace the lid, put their thumb on top and shake the canister a few times.
- 3) After shaking the canister they remove their thumbs and do one of two things; either set the canister down on the ground (or floor) or simply hold on tight. In a matter of seconds the pressure inside the canister will build up and a small geyser will erupt out of the hole in the lid.
- 4) Think about what happened inside the canister to make the geyser erupt. With a little help they should come to the conclusion that a chemical reaction between the water and the antacid built up pressure inside the canister. Enough pressure was built up to push water up through the hole in the lid. Although some of the ingredients are different in the geyser they created and in real geysers the process and result are similar.

You'll need:

- film canisters (with a tiny hole in the lid)
- warm water
- antacid seltzer tablets, cut into halves

DFTV Science Helper

Divide the class into groups of 4 or 5 students. Ask each group to come up with its own "recipe" for a natural geyser. That is, ask the groups to identify what things are required for a geyser to occur in nature. You may prompt the discussion by offering them suggestions about water, rock type, and heat. Give the groups about 15 minutes to come up with their recipes. Share recipe ideas and create a master recipe on the board. Then use the discussion as a backdrop for creating the model geysers, as described in the above activity.



For more simple activities like this one, surf to pbskidsgo.org/dragonflytv/superdoit/index.html



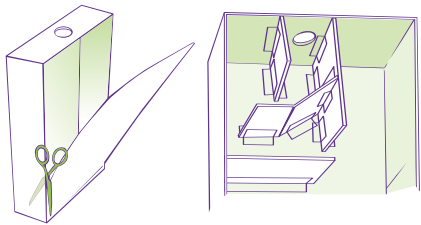
Investigation Geysers



1-2 hours

Guide your kids as they

- 1) Divide into groups of 3 or 4 people. Acquire a box, cardboard, scissors and tape. Each group should work out of sight of the other groups.
- 2) Carefully cut open the side of the box (the side will need to be re-taped into place, so remove it carefully).
- 3) Use cardboard pieces and tape to create a "plumbing system" that extends from the top of the box, down to the bottom. Give the plumbing system a number of twists and turns. (See diagram.)



- 4) Tape the side of the box back into place, hiding the plumbing system from view. Cut a hole in the top of the box that opens up directly into the beginning of the plumbing system. Label the box with the group name.
- 5) Distribute the boxes so that each group receives a box prepared by another group. Tape a white sheet of paper onto the side of the box.
- 6) Tie a small screw or nut onto the end of a piece of string. Begin by lowering the nut into the vent hole at the top. Lower the nut slowly, watching the string and listening for when the nut hits a shelf, or seems to get pushed to one side or another. Put marks on the side of the box to indicate the apparent locations of the nut as it is lowered through the vent.
- 7) Use the observation marks to sketch a complete plumbing diagram on the paper.
- 8) Open the boxes after the sketch is thought to be complete, and compare the sketch to the actual plumbing system inside the box.

You'll need:

- tall boxes, one for every 3-4 students (shoe boxes on end, or large cereal boxes work well)
- narrow strips of cardboard (about the width of the boxes)
- tape
- scissors
- string
- a small screw or nut
- paper
- pencils

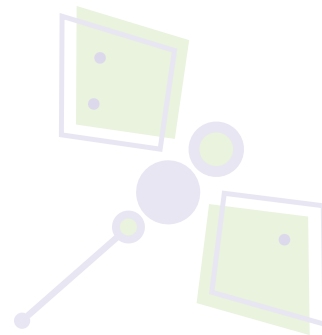
DFTV Science Helper

This activity mimics an actual investigation into the underground plumbing of Old Faithful. Temperature probes, and eventually video cameras, were lowered into the Old Faithful vent to learn about the "plumbing" beneath the ground. Relate this bit of history to the present activity.



DFTV Kids Synthesize Data and Analysis

The primary piece of data is the sketch the kids prepare. The sketch can be enhanced with "measurements" by using a centimeter ruler to estimate the distance of the various vertical drops and horizontal shelves in the plumbing system.



DFTV Adult Tip

Learn more about Old Faithful's plumbing online at www.nps.gov/yell/tours/onlinevcs/oldfaithful/flash/index.htm and www.nps.gov/yell/naturescience/cone_geyser.htm.



Keep Exploring!

Find out the latest news on the Yellowstone volcano through the Yellowstone Volcano Observatory! Increased surveillance of the Yellowstone Volcano has detected unmistakable changes in this vast underground volcanic system. This sleeping (but sometimes restless!) giant is the heat source for Yellowstone's 12,000 geysers, hot springs, mud pots and fumaroles. What has this giant been up to? What do we know about it, and when did it last shake the park? Who felt it? You can find answers to all these questions and more by visiting the Yellowstone Volcano Observatory Website. Current real-time-monitoring data are online at: <http://volcanoes.usgs.gov/yvo/monitoring.html>