

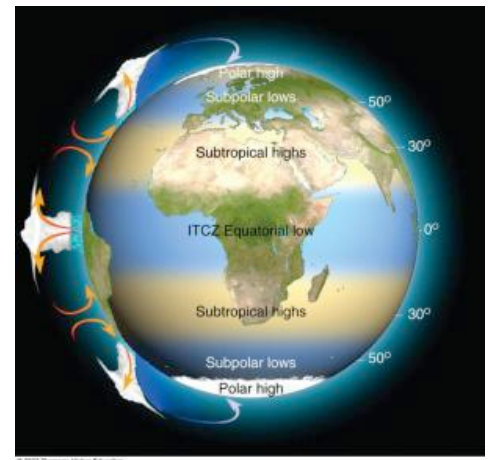
Air Pressure Demonstration

To accompany: <https://serc.carleton.edu/dev/eslabs/weather/3b.html>

Gather the following materials

- 2-4 aluminum pop/soda cans
- Hot plate or Bunsen burner and striker
- Tongs or claw holder (the kind that can be attached to ring stands)
- Bucket of cold water
- Oven mitt (or equivalent) and safety glasses

1. Read the information about semi-permanent air pressure below, or on the Earthlabs, website. As you read, relate the information on the card to the steps in your demonstration.



2. Assemble and practice your demonstration of air pressure.

- a. Put a small amount of water in the bottom of one soda can, just enough to cover the bottom.
- b. Wearing goggles and an oven mitt, place the can on the hot plate, or use the tongs to hold the can over the heat source. Do so until there is a good chimney of steam coming out the opening in the can. This might take a couple of minutes.
- c. Wearing the oven mitt or with the tongs, remove the can from the hot plate, and quickly invert the can into the bucket of cold water and watch the results.

3. Read the information about semi permanent air pressure a second time; practice explaining the information using the demonstration. Explain why you think the pop can collapses when inverted into the cold water.

4. Prepare to share your demonstration with the class. Determine the order in which you will share your information about each semi-permanent pressure system, and its characteristics. Explain how the air pressure in the can changed when it was heated. Be sure everyone in your group has a role in the demonstration.

Semi-permanent pressure systems

Semi-permanent pressure systems are a result of global circulation patterns (especially Hadley Cells). They contribute to the dominating air mass in the region in which they reside. Areas where air is rising, such as around the Equatorial Inter-tropical Convergence Zone (ITCZ), are low-pressure regions, characterized by clouds and stormy, wet weather. On the other hand, regions that are dominated by descending air, resulting in high pressure, are typically dry. In the case of Arizona and New Mexico, the descending air is relatively warm and dry, creating hot desert-type climate conditions. However, there are cold deserts as well. Use the diagram, pictured upper right, to find an example of a cold desert location. Record your notes on your world climate map.

The size and shape of semi-permanent air pressure systems can change slightly from season to season, and year to year. They are influenced by oceanic conditions, such as El Niño and La Niña, as well as land surface types.