

**Weather**  
**4<sup>th</sup> or 5<sup>th</sup> Grade**  
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**Benchmark and SLC#:**

SLC# 13: Students will be able to explain and predict weather from maps and observations outside.

**Objectives:**

Students will be able to read a weather map from a newspaper such as the Columbus Dispatch. Students will also understand that air has pressure and that temperature and pressure are inversely related in weather.

**Materials:**

- Fish Tank
- Water
- Red and blue food dye
- Plastic sandwich bags
- 2 Liter plastic bottles (2)
- Balloons
- Maps from local newspapers
- Rulers
- Paper

**Initial Demonstration:**

Place a few sheets of paper on a desk with a ruler under it so that ~1/2 of the ruler hangs over the edge of the desk. Have students push down quickly on the uncovered ruler (but not so quickly it breaks!). Place another ruler similarly underneath the full fish tank. Have students push down on this ruler. How is the behavior of the ruler under the fish tank similar or different to the behavior of the ruler under the paper?

Place the opening of a balloon around the outside lip of a pop bottle. Invert the balloon so that it is inside of the pop bottle. Have students attempt to blow up the balloon.

Prepare a fish tank full of water the night before, and let it sit out in the room so that it reaches room temperature. Mix red food coloring with hot water, and place this carefully inside of a sandwich bag. Mix blue food coloring with cold water, and place this carefully in a different sandwich bag. Place both bags, opened, in the fish tank.

**Target Observations:**

- The ruler under the paper is held down when pushed quickly. It will come up, however, when pushed slowly. The ruler under the fish tank is held down when pushed quickly or slowly.

- The balloon can't be blown up inside of a pop bottle.
- The red (warm) water rose to the surface of the fish tank, and the blue (cold) water sunk to the bottom.

Air has mass and pressure and takes up space  
Hot air rises, cold air sinks

**Target Model:**

*-Air has mass and pressure (which holds the ruler down) and takes up space (which keeps the balloon from blowing up).*

*-Water behaves like air: Hot air rises, cold air sinks.*

Changes in air pressure can change weather

**Procedure:**

Have students make observations of defined fronts on newspaper weather maps from several days (make sure they're in the right chronological order!). What do you notice about the direction of weather?

**Target Model:**

*-Weather moves west to east across the United States.*

**Procedure:**

Create a chart of pressure and temperature measurements that follow the relationship that temperature and pressure are inversely related. Break the class up into groups and give each group a set of data. Have students analyze the data and be able to explain that temperature and pressure are inversely related – what ways are best to do this: graphically, pictorially?

Ask the students what they think the pressure is outside. Use relative/qualitative language, i.e if it is a cold day then the pressure is “high,” etc...

**Target Model:**

*-Air pressure and temperature are inversely related, and one can use air pressure to help predict the temperature.*