Molecules

Use any simple material to explain molecules and how they relate to weather.

Difficulty / Time Commitment:

1 out of 10

Coolness Factor:

4 out of 10

Materials:

- six small identical items of any sort—plastic golf balls work well
- small container or box

Instructions:

1. Shake the plastic golf balls (molecules) within the box, increasing the kinetic energy. Ask students whether the temperature goes up or down in the box (temperature goes up).
2. Take out a few items and shake again. Ask students whether temperature is warmer or colder now (it is colder). You can use the analogy of students running around the room. The more students there are running quickly around the room and bumping against each other, the warmer the students will get and the warmer the room will get.
3. Give a student two of the items and keep four for yourself. Ask students if they think that the items should be shared so that each student has three items (Nature does like to share).
4. Throw one item at the other person. Now both people have three items.

What Happened?

The items (plastic golf balls or whatever) are analogous to air molecules. As air molecules move faster (shaking the box), temperature rises. Also, the more air molecules that are present bumping against each other, the warmer the temperature is. Many fast moving air molecules is also analogous to high pressure. The person with four air molecules was high pressure, while the person with two air molecules was low pressure. When the person with four threw one item to the person with two, this was analogous to the wind blowing from high to low pressure.

Basic Concepts Learned:

- The more air molecules present, the higher the temperature and the higher the pressure.
- The faster the air molecules are moving, the higher the temperature and the higher the pressure.
- Wind is the Nature's method of balancing molecule concentration, with molecules moving from high pressure (many molecules) to low pressure (fewer molecules).
- Temperature is a measure of the average kinetic energy of a fluid.