Robert Adam Young
Earth Science
Grade: 3
Making A Homemade Tornado

Objective/Purpose:
Teaches students how tornadoes move. The experiment will basically introduce different types of weather, while dealing specifically and going into detail with one type, the tornado. Students get to discuss the hazards of different weather types and what one should do in case he/she is in danger of a tornado.

Strand/OCC: Earth/Space Science/16

Materials:
- 1 Two-Liter Bottle
- Clear Liquid Soap
- Glitter
- Blue Food Coloring
- Aluminum Foil
- Vinegar
- Monopoly Houses (if you have)

Background Information:
I did this lab back when I was in elementary school, and it was a lab that I had always remembered. Before performing the experiment, the students are given certain facts about tornadoes and how they are created and what safety measures can be taken to keep one from harm.

A tornado can be the most horrific and threatening of all natural disasters. It can kill everything and everyone in its path. Houses have been lifted by tornadoes, reeled, and then dumped thousands of feet from the original residence. Buildings and houses can be left sitting in the same location after being shredded, or they can be placed in another location with little damage.

The tornado's pattern is completely unpredictable. Tornadoes develop from thunderstorms when the cold and warm air meets. Rising air within thunderstorms cause an air shift from horizontal to vertical. A twirling rain free wall cloud evolves. Within minutes a tornado develops from the thunderstorm.

When tornadoes develop the air is usually humid and warm prior to a cold front. Frequently these systems form in the Central United States. When tornadoes develop, they normally move from southwest to northeast, yet they are not bound by any rules.

Frequently the southeast and eastern United States receive tornadoes in the fall,
spawned by hurricanes. Waterspouts, too, are spawned by hurricanes. Waterspouts are tornadoes that evolve over warm water, most frequently along the southeastern shores and the Gulf coast.

Tornadoes can occur most anywhere. They are certainly not limited to the United States. Africa has frequent tornadoes, and the United Kingdom experiences tornadoes as well. In fact, many countries in the world are threatened by tornado activity, but these tragic storms tend to be more prevalent in Africa and in the United States.

Tornadoes vary in speed, size, and time limits. There are weak, strong, and violent tornadoes. A weak tornado may break tree branches and damage shutters on a house. It will last from one to ten minutes. A strong tornado has the potential to overturn aircraft and lift roofs from buildings. It may continue its path on ground for fifteen minutes or more.

When the air is set up for thunderstorm activity that can reach limits severe enough to produce a tornado, we then hear about tornado watches and tornado warnings. A "tornado watch" simply means that conditions in the air are favorable for the outbreak of tornadoes. When a "tornado warning" is announced, a tornado has actually been spotted.

If you are in a house with a basement, go immediately to it. Stay away from windows. Perhaps you can go in the bathroom and shut the door. Get in your bathtub and lie down. If you live in a mobile home it is best to seek safety somewhere else during the tornado "watch." However, NEVER get into your car and try to outrun a tornado. If your home does not have a basement, get under a large piece of furniture, and again, remember to cover your head and neck with your arms or hold onto the table above your head.

If you are in a car, get out of it and immediately take shelter in a nearby dwelling. If there is not one near you, lie flat in a ditch, protecting your head. Be sure you are "away" from your car. If there is no ditch, simply lie flat.

Always STAY ALERT at the onset of any thunderstorm and/or tornado watch. You are more likely to survive a tornado when you remain aware of what is going on around you. Stay inside. Flying debris causes most deaths. Some deaths are caused by those who do not take heed of the warnings issued, and other deaths are caused by those persons that ignore them, and think thoughts like, "This is something you read in the newspaper, not something that happens to me."

**Preparation:**

Drop into the bottle 3-4 vary small pieces of aluminum foil rolled into balls. The foil should be folded and pressed so that they will sink. Place small amount of glitter into the bottle and also place 3 monopoly houses into the bottle as well. Add tablespoon of vinegar. Put 1-2 drops of blue food coloring into container and fill with water. Once filled, add about 3-4 tablespoons of liquid soap. Close the container with the top.
Rotate the container and a swirling effect should be produced. It may take some practice. Set the container up on the table and watch. The force of the foil at the bottom should keep the water in motion. The action resembles the motion set up as circular rotations of air in the atmosphere form a tornado. A mini twister can be seen for just a few seconds when the outer fluid slows down and the inner fluids continue to spin rapidly. Try it again!

**Safety Issues:**

There really are not any safety issues with this activity.

**Activity Outline/Teacher Procedures:**

Make sure children understand what activity is representing. Students just have to come into a group and watch the exercise. Starting a small question/answer session would be good to get the children excited. Most kids see a lot of tornadoes on television and on movies, but never get to experience one personally. That being said, let children know that they are real, and they are really dangerous.

**Possible Questions:**

1. Where is the student supposed to go if there is a tornado at the school?
2. Where do tornadoes come from?
3. How long does it last?
4. How fast does it move?

**Assessment/Evaluation:**

I evaluated them on how well they participate in the activity and how well they behaved during the activity. Were the students quiet and attentive when the experiment was going on. I also evaluated them on how well they knew the newly introduced facts about tornadoes and if they remembered the answers to their own questions.