

STEM

Activity Guide Weather in a Bottle

Background:

A vortex is created when the rotating liquid falls through an opening. Gravity is the force that pulls the liquid in to the hole and the rotation causes a continuous vortex to develop. When you swirl the water in the bottle it causes the formation of a vortex that looks like a tornado in a bottle.

Link to video demonstration:

<https://youtu.be/IF2ZByWaUMI>

Materials Needed:

- Drop of dish soap
- Glitter (optional)
- Water
- Smooth sided jar or plastic bottle with tight sealing lid

Rules/Pre-Start Guidelines:

No pre-start guideline or rules.

Instructions:

1. Pour water in a bottle or jar about $\frac{3}{4}$ way to top
2. Add a drop of liquid dish soap
3. Add some glitter (optional)
4. Close the lid tightly
5. Shake the jar to mix glitter if you added glitter
6. Spin the bottle in a circular motion to create the water vortex

Challenge: How to Take this to the next level by creating a Cloud in a Jar

Background:

A cloud is formed when water vapor attaches itself to particles in the air. The water vapor in the jar is coming from the boiling water and the particles attach the hair spray which will form the cloud.

Link to video demonstration:

<https://www.youtube.com/watch?v=oq5yVILTSml>

Materials Needed:

- Jar with lid
- Hair spray
- Hot boiling water
- Ice cubes

Rules/Pre-Start Guidelines:

When boiling the water, younger kids will need help putting the water in the jar, so they do not get burned.

Instructions:

1. Add boiling water to the empty jar, a little less than half
2. Put the top back on upside down and add ice to the top of the lid, let sit for a minute
3. Quick spritz of hair spray and quickly put the lid back on with the ice on it. Let sit for a minute while clouds form
4. Once they have fully formed, you can lift the lid while the cloud escapes, the longer you leave the lid on, the more clouds will form

For an additional challenge, you can add food coloring to the water.