



Hurricane in a Bowl

Target Grade: 2-8. The activity can be adapted as needed depending upon the focus and difficulty of the lesson.

Time Required: 10 minutes

Standards/Topics Covered:

MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and ocean circulation that determine regional climates.

MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Central Focus:

In this lesson, students will observe the characteristics of a hurricane through a mini-model in a clear glass bowl. Students will be able to describe the ways in which the model relates to a rotating storm.

Background Information:

Students should understand that natural hazards have shaped human history. This has had an impact on populations and migrations. They can be local, regional, or global which all can cause a chain impact on each other.

By the end of grade 2 students should know: Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that communities can prepare for and respond to these events.

By the end of grade 5 students should know: A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions, severe weather, floods, coastal erosion). Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

For the activity, teachers should know that in this activity the food coloring will disperse in a spiral formation. [Hurricanes](#) are the most dangerous storms on Earth and start over a body of water. A low pressure and high-pressure wind system mixing together will form the cyclone. It becomes a cyclone when the storm reaches 75 miles per hour. The storm is at least 50,000 feet



high and around 125 miles across. The eye is around 5 to 30 miles wide. See below for hurricane wind speeds.

Information taken from: <https://www.nap.edu/read/13165/chapter/11#194>

Category	Wind Speed (mph)	Damage at Landfall
1	74-95	Minimal
2	96-110	Moderate
3	111-129	Extensive
4	130-156	Extreme
5	157 or higher	Catastrophic

Graphic taken from: <https://scijinks.gov/hurricane/>

Materials

- 1 Large clear glass bowl
- Water
- 1 spoon/stirring rod
- Food coloring

Instructions

1. Fill a large glass bowl about $\frac{3}{4}$ of the way with water.
2. Stir the water with a spoon/stirrer to create a rotation motion.
3. With the water still rotating, add a few drops of food coloring to the center of the bowl.
4. Watch as the food coloring separates out into a rotation-like pattern. Also, note how the color spreads and disperses as the rotation of the water slows down and stops.

Closure

1. Have students describe, either orally or on paper, what they saw. How did the food coloring disperse? How is this similar to how a hurricane or other rotating storm (tornado, cyclone, tropical storm) behaves?

The food coloring disperses in bands that circle around the center of the bowl. It is similar to how a rotating storm behaves because bands of wind, rain, and even debris rotate around the center of a storm, much like the food coloring rotates around the center of the bowl.

2. How is this type of storm created? How does convection relate to hurricanes, storms, and weather in general?

Convection occurs when warm air rises and cool air sinks. Hurricanes form over warm ocean water. Because of convection, the warm moist air near the ocean surface begins to rise. Air from the surrounding areas, pushes in to replace the rising air. That air then becomes warm and also rises, allowing more air to come in and replace it. The constant moving of air creates the spiral movement of the storm.