

HURRICANE

in the classroom



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Engaging Students in STEM with Flight Simulation

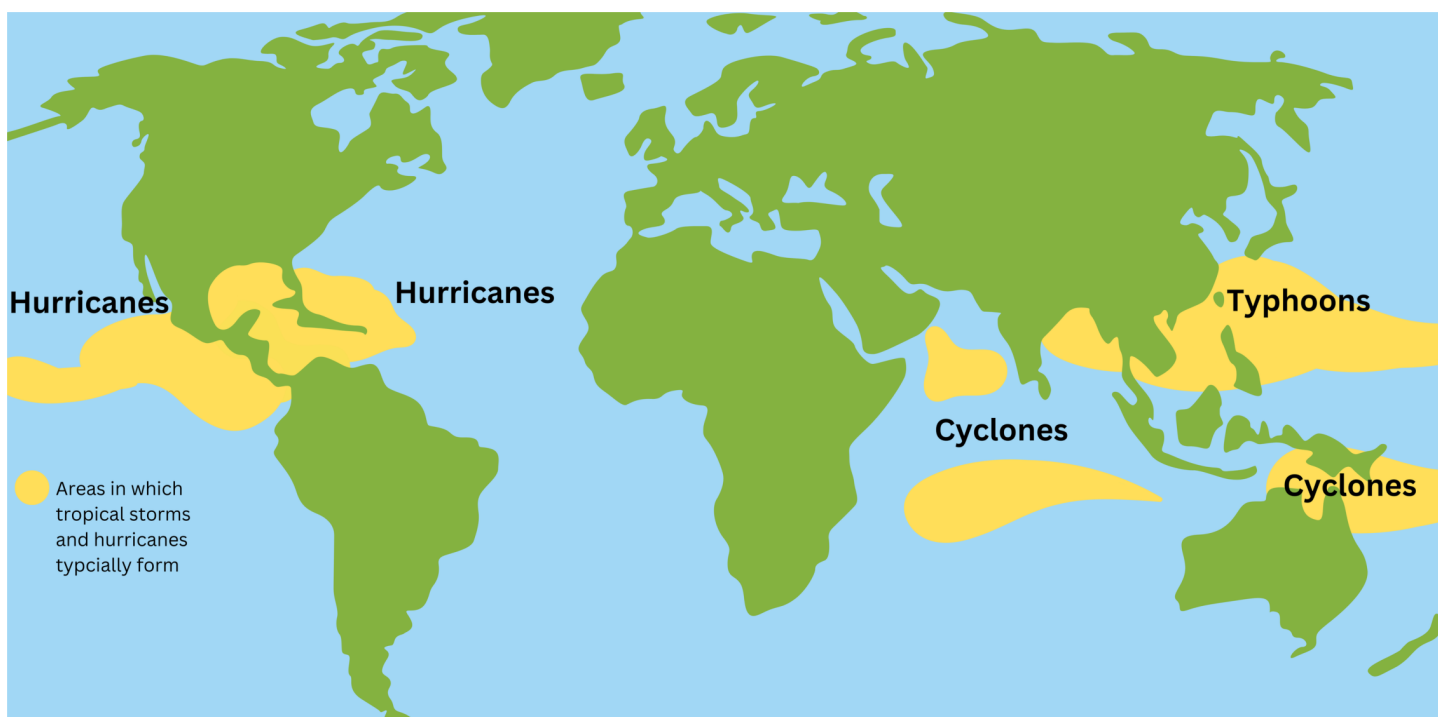
Introduction

It's that time of year again when hurricanes and thunderstorms start stealing the spotlight! But have you ever wondered what really makes a hurricane tick? In this activity, we're going to dive deep into the world of hurricanes, explore their different stages, and even whip up our own mini storm in a jar. So grab your raincoats, because things are about to get stormy as you and your students brew up your very own hurricane!

What is a Hurricane?

You've probably heard of Hurricane Katrina or seen hurricanes making headlines, but do you know what a hurricane actually is? According to the National Ocean Service, a hurricane is a type of tropical cyclone that forms over warm tropical or subtropical waters. These are some of the most powerful storms on Earth.

Hurricanes start forming near the equator over warm ocean water. This warm water evaporates, creating moist air that rises and condenses into tiny water droplets, which then form storm clouds. These clouds are blown into a swirling pattern around the storm's center, creating what we call a tropical cyclone. You're most likely to spot a hurricane in places like Florida, Central America, and the Gulf of Mexico.



Stages of a Hurricane

Just like people, hurricanes go through several stages before becoming full-fledged powerhouses. Let's explore these stages and see how a hurricane comes to life!

Tropical Disturbance

Every hurricane starts as a humble tropical disturbance—a bunch of disorganized thunderstorms. At this stage, those clouds we talked about earlier begin to swirl into a circular pattern.

Tropical Depression

Next, our young storm hits its teenage years, becoming a tropical depression. It starts to get more organized, and the cloud circulation tightens up, with winds beginning to pick up speed.

Tropical Storm

As the storm enters its young adulthood, it matures into a tropical storm. Now, wind speeds can reach up to 73 mph, and the storm's eye begins to take shape. At this stage, our storm finally gets a name!

Hurricane

When the storm reaches its golden years, it becomes a full-fledged hurricane. The eye of the storm can grow 5 to 30 miles wide, with the storm reaching heights of 50,000 feet and a radius of 125 miles. This is when our storm officially earns the title of "Hurricane."

Categories of a Hurricane

Once our hurricane has fully matured, its strength and size can vary widely. Meteorologists have broken hurricanes down into five categories, ranging from mild to monstrous.

Category 1

Category 1 hurricanes are the baby of the bunch, with winds between 74 and 95 mph. They usually cause minimal damage, but you might see some power outages.

Category 2

Category 2 hurricanes are a bit more intense, with winds up to 110 mph. Roofs, doors, and windows can take a hit, and power outages can last several days or longer.

Category 3

Now things start getting serious. Category 3 hurricanes have winds between 111 and 129 mph, causing major structural damage and uprooting large trees. Power outages can stretch on for a week or more.

Category 4

Category 4 hurricanes are downright catastrophic. With winds up to 156 mph, these storms can flood streets and homes, and the sheer force of the wind can send trees flying. Power outages can last for weeks.

Category 5

Finally, we meet the king of hurricanes: Category 5. With winds over 157 mph, these storms can flatten small homes, flood entire streets, and leave areas without power for months.

Now that we've journeyed through the life of a hurricane and soaked up all this knowledge, it's time to get hands-on!

Activity

In this activity, you and your students will put your hurricane know-how to the test by creating your own storm in a jar. Get ready to join forces with Mother Nature as you craft the perfect mini-hurricane!

As discussed, you and your students will be making your own monstrous hurricane. To do this, you will need:

- STEMPilot's Explaining a Hurricane Video
- Projector, smart board, or any visual equipment that can display visuals
- Water
- Glass or plastic containers with lids
- Food coloring (optional)
- Liquid soap that contains Glycol Stearate (Softsoap-preferably the kind that isn't transparent)
- Measuring cups
- Paper towels
- Bins
- Funnels

Before starting this activity, make sure that you have gone over the lesson plan in full detail and gathered all your supplies

- Begin the activity by asking your students to close their eyes and imagine themselves on a beach with their family, listening to the sound of waves clashing against rocks. Feeling that nice hot yellow shinning on their face, when suddenly the heat from the sun disappears and bomb the sky is gray and the wind blowing causing waves to grow. As they imagine this screen, ask them what they think just happened? (This step is very crucial to hooking their attention so it is important to adjust it according to their age range without loosing their attention or scaring them to much, especially if you are teaching this lesson to elementary students)
- After you have hooked their attention, have them watch the short video, STEMPilot's Explaining a Hurricane and open the floor for discussion.
- Once, your students have finished watching the video, tell your students that they will be playing mother nature and creating their own hurricane. They are to work in groups of 2-3 where each person will play a role in creating their hurricane.
- After explaining the activity, have your students get into groups of 2-3. Once they have gotten in their groups, have the groups come up and get their supplies. Make sure they have a visual list of what they need.
- After they have gotten their supplies, have your students, place a series of papr towels on their work station and place their platic bin on top of the paper towels.
- Next, have your student put their plastic container in the bin with the lid off. They will then fill 1/3 of their container with their soap.
- They will then fill the reat of the container with water until bubbles begin to form, overflowing the top.
- Have them screw the lid of their containers on tightly as a way to avoid any spilage from occuring. (Hint: if you are doing this experiment with your elementary school students, make sure that you check their lids before moving onto the next step.)
- Next, have each group shake their bottles and place them on the table.

Extensions

Want to learn more about hurricanes, check out these fun activities you can do with your students.

- Elementary School:

Hurricane Tracking - as a class track hurricanes as they travel

- Middle School:

Create a Disaster Plan - your students are tasked to create a disaster plan for their families in case a hurricane or tropical storm hits

- High School:

Engineering Hurricane Proof Towers

Have your students form groups of 3-5 to design a tower that can withstand strong winds. The design must state what materials they will use and how high it will be.

[Check out our video all about Hurricanes HERE:](https://youtu.be/2iQ-4GBuqMQ)

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