

Name: \_\_\_\_\_

# Hurricanes: Nature's Wildest Storms

by Erin Ryan

You may already know that hurricanes are major tropical storms that can cause devastating waves, wind, and rain. They happen during "Hurricane Season," which is from June 1<sup>st</sup> until November 30<sup>th</sup> in the Atlantic Ocean and from May 15<sup>th</sup> until November 30<sup>th</sup> in the Pacific Ocean. A hurricane that forms in the Atlantic Ocean begins as tropical disturbance. This is a large area of windy thunderstorms that forms over the warm ocean, near the equator. When the storms grow larger, rains and wind pick up, and the "disturbance" can develop into a full-fledged hurricane.



## Stages of a Hurricane: Simple Storms Grow Into Giants

A storm progresses through four different stages before it is actually considered a hurricane. First is a tropical disturbance, which has thunderstorms and rotating winds, or what scientists call cyclonic circulation. Next is a tropical depression, which is similar to a tropical disturbance, but has winds between 23 and 39 miles per hour. A tropical storm is the next level, which has stronger wind speeds between 40 and 73 miles per hour. Once winds reach 74 miles per hour, the storm is officially classified as a hurricane. The winds pick up energy from the warm surface ocean water.

Hurricanes rotate counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. Hurricanes can vary in size and can grow to have a diameter of up to 600 miles, which is longer than the entire state of Florida!

As a hurricane crosses over land, it begins to dissipate, or break apart and reduce in strength. This is because it is no longer over the warm ocean water that it needs for energy. At this point, a hurricane can still cause a lot of damage because of high winds, rain, and flooding, but unless it makes its way back over the open ocean, it is downgraded from a hurricane back to a tropical storm.

## Hurricane Dangers

When a hurricane makes landfall, it can be very dangerous along coastlines because of a storm surge, where ocean waters rush onto land. When this is combined with heavy rainfall, there can be devastating floods.

The center of a hurricane is called the eye. While most of a hurricane contains dangerously strong winds, the eye is actually a calm area in the storm. When the eye of a hurricane passes over land, people might think that it's over, but before long the wind and rain increase again as the second part of the hurricane moves through.



# Furious Hurricanes

by Erin Ryan

## Predicting Hurricanes and Protecting People!

What's the difference between a hurricane watch and a hurricane warning? During a hurricane watch, there is the possibility that a hurricane will make landfall within 36 hours, and people are advised to prepare for a possible storm ahead. When a hurricane warning is issued, a hurricane is definitely on the way, and will make landfall within 24 hours.



The National Hurricane Center, located in Miami, Florida issues watches and warnings before hurricanes approach the coastline. They use computers with satellite images to figure out where and when a hurricane will come on shore. Sometimes, if a hurricane is strong enough, officials may require citizens to evacuate, or leave their homes, and travel to a safer place.

Can you imagine flying a plane through a hurricane? If you're a hurricane hunter, it's your job! Hurricane Hunters, who work for the Air Force Reserve, fly airplanes called WC-130's on weather missions to help the National Hurricane Center make predictions about hurricanes, and gives them the information needed to issue accurate warnings. Pilots determine how fast the winds are blowing, how big the hurricane is, and which direction it's moving. This helps people to be better prepared for hurricanes as they approach shore.

## Categories of Hurricanes

There are five categories of hurricanes, which are based on wind speeds. The categories help to make people aware of how much damage a hurricane may cause because the greater the wind speed, the more dangerous the storm.

### Category 1 – Winds 74 – 95 mph

Winds snap branches, uproot trees, and overturn mobile homes that aren't secured to the ground.

### Category 2 – Winds 96 -110 mph

Winds are strong enough to destroy weak doors and windows, and create 8-foot ocean waves.

### Category 3 – Winds 111 - 130 mph

Intense winds cause major flooding near the coast, which can destroy homes and businesses.

### Category 4 – Winds 131 - 155 mph

Winds are strong enough to destroy some buildings. Causes heavy damages to building roofs.

### Category 5 – Winds greater than 155 mph

Buildings along the shorelines are washed away. Buildings can be completely destroyed.

# Wild, Wicked Hurricanes

by Erin Ryan

## What's Your Name, Hurricane?

Hurricanes and tropical storms are given names to help people identify them. Scientists refer to hurricanes and storms by name as they track them across the ocean.

Before 1953, hurricanes were not given official names. From 1953 through 1978, hurricanes were only given female names, like Isabel, Camille, Claudette, and Wilma. Beginning in 1979, hurricanes were given the names of both women and men. Today, the names alternate by gender, and they are named alphabetically.

For example, in 2010, storms were named as follows:

Alex (male)  
Bonnie (female)  
Colin (male)  
Danielle (female)  
Earl (male)  
and so on...



There are six different lists of names that change, so the same names are used every six years. The only way that a new name is added is when a hurricane has been particularly deadly or costly and the name is retired, then replaced with a new one.



## Hurricane Katrina: One of the Deadliest Storms in History

Hurricanes can leave behind lots of destruction. In 2005, Hurricane Katrina ripped through Louisiana, Alabama, Mississippi and Texas. This was the sixth windiest hurricane on record, and it was one of the deadliest hurricanes in history.

Many people are surprised to learn that Katrina's wind didn't cause most of the damage. The wind had caused levees in New Orleans to break, (Levees are embankments that hold water away from cities.) When the levees broke, water from the Gulf of Mexico rushed into the low-lying land. Over 80% of the city of New Orleans was buried in flood water.

Hurricane Katrina hurricane took 1,833 lives and caused over 76 billion dollars in damages.

## Tornado versus Hurricane: Which is stronger?



Hurricanes can cover an area hundreds of miles wide, while tornadoes are almost always less than a mile wide. While they are smaller than hurricanes, tornado winds can be stronger and more powerful. Some tornadoes have winds of over 300 miles per hour, while hurricanes rarely exceed 200 miles per hour.



# Wild, Wicked Hurricanes

by Erin Ryan

## Hurricane Safety Tips



There is no way to stop a hurricane or make it change direction, so if you ever find yourself in the path of a hurricane, be sure to follow any emergency procedures that your community has in place. Here are some other hurricane safety tips.

- Be sure you have a battery-powered radio, batteries, fresh drinking water, and a supply of food. Also, if anyone in your family needs special medication, be sure you have a full supply.
- Tell neighbors, friends, and family members your emergency plans. Tell them where you'll go if you need to leave your home.
- If you live near the ocean, in a low-lying area, or in a mobile home, leave your home and travel inland to a safe place. You could stay with a friend or family member, in an inland hotel/motel, or in an emergency shelter area.
- Keep listening to the radio if a hurricane is approaching. If local authorities instruct you to evacuate, do it immediately.
- Before a hurricane arrives, be sure your family's car is filled with fuel. If the electricity goes out, the fuel pumps at gas stations will not work.
- Stay inside during the storm. You could be seriously injured if you go outside.

## But what about my pets?

We should always take good care of our pets and keep them indoors during a storm. If you have to evacuate your home, remember that pets are not allowed in most emergency shelters and hotel rooms. If you leave a pet behind, be sure you set out plenty of food and water for them. Also, be sure they're wearing a collar with your family's name and phone number on it.

## The Five Worst Hurricanes in U.S. History

	Hurricane	Year	State(s) Hit	Category	Death Toll
5.	Sea Islands	1893	South Carolina, Georgia	3	1,000
4.	Cheniere Caminanda	1893	Louisiana	4	1100
3.	Hurricane Katrina	2005	Louisiana, Mississippi, Texas, Alabama	3	1,833
2.	Lake Okeechobee Hurricane	1928	Florida	4	2,500
1.	Great Galveston Hurricane	1900	Texas	4	8,000

# Hurricanes



1. Complete the chart by listing the correct category for each hurricane.

Hurricane Name	Top Wind Speed	Category
Hanna	102 mph	
Arthur	160 mph	
Fey	80 mph	
Cristobal	129 mph	

2. Explain the difference between a hurricane watch and a hurricane warning.

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3. Billy tells his teacher that his grandfather lived in the state of Florida in 1969 and survived Hurricane Michael. His teacher does not believe him. Why not? Use information from the hurricane packet to support your answer.

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# Hurricanes



- Which of these hurricanes had the strongest winds?
  - Sea Islands Hurricane, in 1893
  - Hurricane Katrina, in 2005
  - Lake Okeechobee Hurricane, in 1928
- What does a hurricane hunter do?
  - use computers with satellite images to predict the paths of hurricanes
  - issue official watches and warnings to notify people of danger
  - fly airplanes through hurricanes
- Which sequence of storm stages is in the correct order?
  - tropical depression, tropical disturbance, tropical storm, hurricane
  - tropical disturbance, tropical depression, tropical storm, hurricane
  - tropical storm, tropical depression, tropical disturbance, hurricane
- What would you observe if you were in the eye of a hurricane?
  - strong, spinning winds
  - calm or very little wind
  - heavy rain, thunder, and lightning
- What caused the most destruction during Hurricane Katrina in 2005?
  - floods due to breaking levees
  - houses being blown away
  - people going outdoors during the storm
- In 2011, the first tropical storm will be named Arlene, then Brett, then Cindy, then Don. Which storm name might come next?
  - Eric
  - Emily
  - Olivia
- What happens when a hurricane crosses over land?
  - it breaks apart and forms tornadoes
  - it moves more quickly
  - it loses strength

# Hurricanes



Tell whether each statement is true or false.

- \_\_\_\_\_ 1. When a hurricane warning is issued, a hurricane will definitely hit landfall within 24 hours.
- \_\_\_\_\_ 2. From 1953 through 1978, all tropical storms were given male names.
- \_\_\_\_\_ 3. The Great Galveston Hurricane hit Florida in 1903.
- \_\_\_\_\_ 4. Hurricanes form over warm, ocean water.
- \_\_\_\_\_ 5. Hurricanes begin to lose strength when they hit land.
- \_\_\_\_\_ 6. More people were killed by Hurricane Katrina than by the Great Galveston Hurricane.
- \_\_\_\_\_ 7. Hurricanes in the Northern Hemisphere rotate counterclockwise.
- \_\_\_\_\_ 8. The center of a hurricane is called the eye.
- \_\_\_\_\_ 9. Hurricanes are given names and tropical storms are not.
- \_\_\_\_\_ 10. Category 4 hurricane has winds over 155 miles per hour.
- \_\_\_\_\_ 11. Mobile homes are a safe place to stay during a hurricane.
- \_\_\_\_\_ 12. Hurricanes were not given official names before 1953.
- \_\_\_\_\_ 13. Hurricane Katrina flooded the city of New Orleans in 2005.
- \_\_\_\_\_ 14. Scientists can make hurricanes change direction.
- \_\_\_\_\_ 15. A levee keeps ocean water away from cities.

# Hurricanes



Complete each statement with a word from the box at the bottom of the page. Not all words from the box will be used.

1. In the Atlantic Ocean, hurricane season runs from \_\_\_\_\_ 1<sup>st</sup> through November 30<sup>th</sup>.
2. A tropical \_\_\_\_\_ has winds between 29 and 39 miles per hour.
3. A tropical \_\_\_\_\_ has winds between 40 and 73 miles per hour.
4. In the Southern Hemisphere, hurricanes rotate \_\_\_\_\_.
5. Hurricane names are reused every \_\_\_\_\_ years.
6. Hurricane Katrina flooded the city of \_\_\_\_\_.
7. During a hurricane \_\_\_\_\_, there is a possibility that a hurricane will reach landfall.
8. During a hurricane \_\_\_\_\_, a hurricane will definitely reach landfall.
9. The National Hurricane Center is located in the city of \_\_\_\_\_.
10. If a hurricane is strong enough, citizens might be required to \_\_\_\_\_, or leave their homes.

## Word Box

four	June	Louisiana	Miami	clockwise	disturbance
ten	May	New York	Florida	counterclockwise	depression
six	April	New Orleans	storm	evacuate	tornado
watch	warning	satellite	weather	category	eye



# Hurricanes



Match each vocabulary word on the left, to its definition on the right.

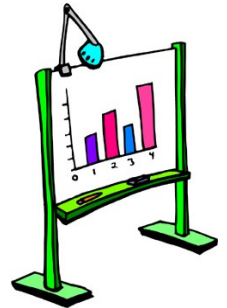
- |                              |   |
|------------------------------|---|
| 1. _____ levee               | a. area where the ocean meets the shore   |
| 2. _____ hurricane hunter    | b. to be forced to leave a home because of danger   |
| 3. _____ equator             | c. a wall or embankment that holds ocean water away from a city   |
| 4. _____ tropical depression | d. a pilot who flies airplanes through hurricanes to measure the wind speed                                     |
| 5. _____ tropical storm      | e. an area of swirling thunderstorms over the ocean with wind speeds between 23 and 39 miles per hour           |
| 6. _____ hurricane           | f. an area of thunderstorms over the ocean with wind speeds between 40 and 73 miles per hour                    |
| 7. _____ dissipate           | g. a giant wind and rain storm that forms over warm water with winds between 74 and 155 miles per hour          |
| 8. _____ coastline           | h. an imaginary line around the center of the Earth   |
| 9. _____ evacuate            | i. a spinning storm that is less than one mile wide, with swirling winds that can reach over 300 miles per hour |
| 10. _____ tornado            | j. to break apart and reduce in strength  |

# Hurricane Projects

1. Make a tri-fold hurricane safety brochure. Your brochure should include information about how to stay safe during a hurricane. Illustrate your brochure with colorful pictures.



2. Use graph paper to make a bar graph that shows the wind strengths of historical hurricanes. Be sure your graph has a title, a scale, and axis labels. Be sure the bars on your graph are drawn neatly and spaced evenly.



3. Interview someone who has survived a hurricane. Ask them 10 or more questions about their experiences. Write down their answers.



4. Make a PowerPoint presentation on hurricane safety. Include at least 5 slides with information about how to stay safe during a hurricane.



5. Write a realistic fiction story about a hurricane. Be sure your story has a happy ending and no people or animals are hurt. Your story should be about 3 pages long. Include an illustration.



## ANSWER KEY - Question Set A

# Hurricanes

1. Complete the chart by listing the correct category for each hurricane.

Hurricane Name	Top Wind Speed	Category
Hanna	102 mph	<u>Category 2</u>
Arthur	160 mph	<u>Category 5</u>
Fey	80 mph	<u>Category 1</u>
Cristobal	129 mph	<u>Category 3</u>

2. Explain the difference between a hurricane watch and a hurricane warning.

A hurricane watch means that there is a possibility of hurricane approaching within 36 hours. A warning means that a hurricane will definitely approach land within 24 hours.

3. Billy tells his teacher that his grandfather lived in the state of Florida in 1969 and survived Hurricane Michael. His teacher does not believe him. Why not? Use information from the hurricane packet to support your answer.

Hurricanes did not have male (boy) names until 1979.

## ANSWER KEY - Question Set B

# Hurricanes

1. Which of these hurricanes had the strongest winds? **c**
  - a. Sea Islands Hurricane, in 1893
  - b. Hurricane Katrina, in 2005
  - c. **Lake Okeechobee Hurricane, in 1928**
2. What does a hurricane hunter do? **c**
  - a. use computers with satellite images to predict the paths of hurricanes
  - b. issue official watches and warnings to notify people of danger
  - c. **fly airplanes through hurricanes**
3. Which sequence of storm stages is in the correct order? **b**
  - a. tropical depression, tropical disturbance, tropical storm, hurricane
  - b. **tropical disturbance, tropical depression, tropical storm, hurricane**
  - c. tropical storm, tropical depression, tropical disturbance, hurricane
4. What would you observe if you were in the eye of a hurricane? **b**
  - a. strong, spinning winds
  - b. calm or very little wind
  - c. heavy rain, thunder, and lightning
5. What caused the most destruction during Hurricane Katrina in 2005? **a**
  - a. **floods due to breaking levees**
  - b. houses being blown away
  - c. people going outdoors during the storm
6. In 2011, the first tropical storm will be named Arlene, then Brett, then Cindy, then Don. Which storm name might come next? **b**
  - a. Eric
  - b. **Emily**
  - c. Olivia
7. What happens when a hurricane crosses over land? **c**
  - a. it breaks apart and forms tornadoes
  - b. it moves more quickly
  - c. **it loses strength**

## ANSWER KEY - Question Set C

# Hurricanes

Tell whether each statement is true or false.

- true** 1. When a hurricane warning is issued, a hurricane will definitely hit landfall within 24 hours.
- false** 2. From 1953 through 1978, all tropical storms were given male names.
- false** 3. The Great Galveston Hurricane hit Florida in 1903.
- true** 4. Hurricanes form over warm, ocean water.
- true** 5. Hurricanes begin to lose strength when they hit land.
- false** 6. More people were killed by Hurricane Katrina than by the Great Galveston Hurricane.
- true** 7. Hurricanes in the Northern Hemisphere rotate counterclockwise.
- true** 8. The center of a hurricane is called the eye.
- false** 9. Hurricanes are given names and tropical storms are not.
- false** 10. Category 4 hurricane has winds over 155 miles per hour.
- false** 11. Mobile homes are a safe place to stay during a hurricane.
- true** 12. Hurricanes were not given official names before 1953.
- true** 13. Hurricane Katrina flooded the city of New Orleans in 2005.
- false** 14. Scientists can make hurricanes change direction.
- true** 15. A levee keeps ocean water away from cities.

# Hurricanes

Complete each statement with a word from the box at the bottom of the page. Not all words from the box will be used.

1. In the Atlantic Ocean, hurricane season runs from **June** 1<sup>st</sup> through November 30<sup>th</sup>.
2. A tropical **depression** has winds between 29 and 39 miles per hour.
3. A tropical **storm** has winds between 40 and 73 miles per hour.
4. In the Southern Hemisphere, hurricanes rotate **clockwise**.
5. Hurricane names are reused every **six** years.
6. Hurricane Katrina flooded the city of **New Orleans**.
7. During a hurricane **watch** there is a possibility that a hurricane will reach landfall.
8. During a hurricane **warning** a hurricane will definitely reach landfall.
9. The National Hurricane Center is located in the city of **Miami**.
10. If a hurricane is strong enough, citizens might be required to **evacuate**, or leave their homes.

## Word Box

four	June	Louisiana	Miami	clockwise	disturbance
ten	May	New York	Florida	counterclockwise	depression
six	April	New Orleans	storm	evacuate	tornado
watch	warning	satellite	weather	category	eye

# Hurricanes

Match each vocabulary word on the left, with its definition on the right.

- |                                 |   |
|---------------------------------|---|
| 1. <b>c</b> levee               | a. area where the ocean meets the shore   |
| 2. <b>d</b> hurricane hunter    | b. to be forced to leave a home because of danger   |
| 3. <b>h</b> equator             | c. a wall or embankment that holds ocean water away from a city   |
| 4. <b>e</b> tropical depression | d. a pilot who flies airplanes through hurricanes to measure the wind speed                                     |
| 5. <b>f</b> tropical storm      | e. an area of swirling thunderstorms over the ocean with wind speeds between 23 and 39 miles per hour           |
| 6. <b>g</b> hurricane           | f. an area of thunderstorms over the ocean with wind speeds between 40 and 73 miles per hour                    |
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| 8. <b>a</b> coastline           | h. an imaginary line around the center of the Earth   |
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