PRINCIPAL CREDITS

Producer, Writer & Director: Peter Matulavich

Consultants: Ronald L. Holle Research Meteorologist National Severe Storms Laboratory NOAA

Videography & Animation: Peter Matulavich

Production Manager: Roxanne Hall

Special Thanks to: National Severe Storms Laboratory NOAA National Weather Service National Hurricane Center United States Geological Survey Tornado Project R. James Vavrek

Video and Teacher's Guide produced for Rainbow Educational Media by Peter Matulavich Productions
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Objectives</td>
<td>3</td>
</tr>
<tr>
<td>Summary</td>
<td>4</td>
</tr>
<tr>
<td>Review Questions</td>
<td>7</td>
</tr>
<tr>
<td>Discussion Questions</td>
<td>9</td>
</tr>
<tr>
<td>Activities</td>
<td>12</td>
</tr>
<tr>
<td>Glossary</td>
<td>14</td>
</tr>
<tr>
<td>Bibliography</td>
<td>16</td>
</tr>
<tr>
<td>Script</td>
<td>18</td>
</tr>
</tbody>
</table>
INTRODUCTION

This video is designed to introduce students to the subject of storms, including hurricanes, tornadoes and thunderstorms. Exciting "eyewitness" video and full-motion animation show how these storms are among nature's most powerful and awesome forces and can cause considerable devastation and loss of life.

Thunderstorms are introduced first, and students will see how the formation of these storms is linked to air's ability to rise and its capacity to hold moisture. While thunderstorms can occur just about anywhere, severe thunderstorm outbreaks occur each summer along cold fronts in the central states where cold dry air from Canada meets warm moist air from the Gulf of Mexico.

Tornadoes occur when air starts to circulate near a thunderstorm. As it does, a spinning funnel-shaped form may drop from the storm cloud. It is called a tornado when it touches the ground. Tornadoes have the most powerful winds on earth.

Hurricanes are formed in tropical waters where warm moist air comes together, feeding groups of thunderstorms. The earth's rotation causes the cloud mass to spin, leading to the formation of tropical storms and hurricanes. While hurricane winds are not as powerful as those of tornadoes, hurricanes cause greater devastation because they last much longer and have wider paths of destruction.

In the video's conclusion, students will learn that scientists continually study these storms in the hope of learning more about them.
OBJECTIVES
After viewing this video, students should know:

• how our earth is surrounded by an atmosphere
• the concept of air pressure
• how air pressure is measured
• how high and low air pressure affects our weather
• what cold and warm fronts are
• how thunderstorms form
• how lightning and thunder are created
• how hailstorms are caused
• how tornadoes form
• how hurricanes form
• how hurricanes are classified
• the most destructive part of a hurricane
• the devastation caused by these storms
• how scientists study these storms
SUMMARY

The video opens with dramatic scenes showing the fury of hurricanes, tornadoes and thunderstorms. The narrator poses these questions: How are these storms related? How do they occur? How destructive are they?

Next, we see a shot of the earth's atmosphere as seen from space. We learn that the earth's atmosphere is like a thick blanket of air that surrounds our planet. It is dozens of kilometers thick. We live at the bottom of the atmosphere and the amount of air that's above us presses down on us.

Several students are shown examining a barometer and we learn that this instrument measures the weight of air in much the same way that a bathroom scale measures your weight. The weight of air is measured in millibars.

An animated sequence then shows how air pressure changes due to changes in air temperature. When air is heated, its molecules spread out. There are then fewer of them in the same amount of space and the air weighs less. When air is chilled, its molecules come closer together. There are now more of them in the same amount of space and the air is heavier.

Students then learn that changes in air pressure help determine the weather because they are often associated with fronts. A warm front is a place where warm air is moving into and replacing cold air. A cold front is an area where cold air is moving into and replacing warm air. Cold fronts are often associated with the formation of severe thunderstorms.
Next, students learn about two important properties of air: its ability to rise and its capacity to hold moisture. It is these two properties that contribute directly to the formation of thunderstorms. While thunderstorms can occur just about anywhere, some of the most severe outbreaks occur each summer in the central states along cold fronts, where cold dry air from Canada meets warm moist air from the Gulf of Mexico.

The cold air mass plows its way beneath the warm air mass causing it to rise quickly. As it rises, the water vapor within the warm air mass condenses into the formation of cumulus and sometimes cumulonimbus clouds. Cumulonimbus clouds are thunder clouds, and they are marked by an anvil shape and dark bottoms.

Through the use of animation, we learn that thunderstorms can produce rain, hail, wind, lightning and thunder.

The video then moves on to the discussion of tornadoes and we learn that they are formed when circulating movement near a thunderstorm causes a spinning funnel-shaped form to drop from the clouds. When a funnel reaches the ground, it is referred to as a tornado. When a funnel touches down over water, it is called a waterspout.

With speeds reaching 500 kilometers an hour, the winds produced by tornadoes are the most powerful on earth and can cause considerable devastation and loss of life.

Tornadoes come in a variety of forms. Some are long and snakelike while others are much wider. Tornadoes move along at speeds that vary between 25 and 100 kilometers an hour.
The video then features dramatic footage from the tornado that devastated Andover, Kansas on April 26, 1991. The tornado killed more than 20 people, left thousands homeless, and caused millions of dollars of damage.

The video explains that as devastating as tornadoes can be, hurricanes are much more destructive. Hurricanes have wider paths of destruction and they can last for days.

Animation shows how hurricanes form in tropical waters where warm moist air comes together, feeding groups of thunderstorms. The earth's rotation caused the cloud mass to spin, and as it spins, it can suck up more air behind it, leading to the formation of tropical storms. When the speed of rotation within a tropical storm exceeds 73 miles an hour, it is officially classified as a hurricane.

By the time hurricanes reach land, they can be monsters, with wind speeds in excess of 200 kilometers an hour. As devastating as hurricane winds are, a hurricane's most destructive force is usually the storm surge, a piling up of water driven by the wind. The storm surge can be over 100 kilometers wide and can flood vast stretches of coastline.

Next, we follow a research plane as it flies directly into a hurricane so that scientists can record important measurements.

The video concludes with a review of the key points.
REVIEW QUESTIONS

1. What do we call the blanket of air that surrounds our planet?
   The atmosphere

2. What name is used to refer to the weight of air?
   Air pressure

3. What instrument is used to measure the weight of air?
   A barometer

4. What do you call a place where cold air moves into and replaces warm air?
   A cold front

5. What two properties of air contribute to the formation of thunderstorms?
   Its capacity to rise and its ability to hold moisture

6. How do clouds form along a cold front?
   As warm air rises, it causes water vapor within it to condense into tiny drops of water.

7. What is the name of the thunder clouds that can form along cold fronts?
   Cumulonimbus clouds
8. **Where do most tornadoes originate?**
   Near thunderstorms

9. **Which storm has the most powerful winds on earth?**
   The tornado

10. **Why are hurricanes more destructive than tornadoes?**
    They have wider paths of destruction and they last longer.

11. **Where do hurricanes originate?**
    In tropical waters

12. **At what wind speed do tropical storms become classified as hurricanes?**
    In excess of 73 miles an hour

13. **What is the name of the opening near the center of a hurricane?**
    The hurricane's eye

14. **What is a hurricane's most destructive force?**
    The storm surge
DISCUSSION QUESTIONS

These questions are designed to encourage classroom discussion

1. **The video discusses how hurricanes, tornadoes, and thunderstorms occur in some parts of the world.**

   *What is the likelihood of any of these storms' occurring in the area in which you live?*

   Answers, of course, vary with each locality. Hurricanes mostly threaten states along the Gulf Coast and Eastern Seaboard. They can also strike Hawaii. Tornadoes and thunderstorms can occur just about anywhere but they are especially prevalent in the Plains states during the spring and summer.

2. **The video discusses the devastation and loss of life caused by these storms.**

   *What safety precautions can people take to minimize injuries and death?*

   While not discussed in the video, a few include:
   - evacuating hurricane-threatened areas
   - seeking protection in a storm cellar during tornado alerts
   - remaining in cars, homes and buildings during lightning storms
3. The video discusses how tornadoes have the highest winds on earth, yet hurricanes are considered more destructive.

*Why is this so?*

Hurricanes have wider paths of destruction and they last much longer - days as opposed to minutes. Further, the most devastating part of a hurricane is the storm surge, a piling up of ocean water, that is driven by the wind, which can flood coastal areas.

4. The video discusses how hurricanes are the world's deadliest storms, yet relatively few deaths are attributed to hurricanes in the U.S.

*Why do hurricanes cause more deaths in other countries than they do in the US?*

While not discussed in the video, most hurricane deaths occur in poor countries where millions of people live in coastal areas and flood plains subject to hurricane devastation. Further, these countries often have ineffective emergency notification and evacuation procedures. Many victims die later due to slow emergency medical response.
5. The video shows satellite sequences that mark the paths of hurricanes as they approach the United States.

*Is it possible for the same hurricane to strike the U.S. more than once?*

Yes, and Hurricane Andrew in 1991 is a good example. It first swept across southern Florida and then struck Louisiana.

6. While there is usually plenty of advance warning of an impending hurricane, there is little advance warning of a tornado.

*What benefit would a more advanced tornado warning provide people?*

It would allow people more time to seek shelter.
ACTIVITIES

These activities are designed to encourage students to learn more about some of the things covered in the video.

1. **The video discusses how air moves from an area of high air pressure to an area of low air pressure.**

   **Activity:** Students can demonstrate this by blowing up a balloon and then allowing the air to escape. The escaping air can be directed at strips of colored paper to help dramatize the effect.

2. **The video features a barometer which is used to measure air pressure as it changes over time.**

   **Activity:** Students can make their own simple barometer by taping a thin stick to an inflated balloon. The stick is to be used as a pointer. As the barometric pressure changes from day to day, the balloon will contract or expand, causing the pointer to move.

3. **The video discusses symbols used on weather maps.**

   **Activity:** Have students draw a weather map with symbols that would represent those conditions that might give rise to the development of thunderstorms and tornadoes.
The video features several devastating tornadoes and hurricanes.

Activity: Have students research and report on a devastating hurricane or tornado.

The video discusses how hurricanes occur in certain parts of the world.

Activity: Have students draw a map of the world, marking hurricane breeding grounds.
GLOSSARY

**air pressure:** weight of air  
**anvil:** shape of a classic  
**cumulonimbus cloud**  
**atmosphere:** blanket of air  
**surrounding our planet**  
**barometer:** instrument used  
**to measure air pressure**  
**cold front:** area where a cold air mass is moving into  
**and replacing a warm air mass**  
**counterclockwise:** direction of movement that is  
**opposite to the rotating hands of a clock**  
**cumulonimbus cloud:** large dark cloud charged  
**with electricity capable of producing heavy rain,**  
**thunderstorms or hailstorms; thundercloud**  
**cumulus cloud:** white, fluffy cloud with multiple  
**rounded tops**  
**cyclone:** cyclonic storm that originates in the Indian  
**Ocean; hurricane**  
**destructive:** able to cause great damage  
**devastating:** causing great destruction  
**downdraft:** strong downward current of air  
**eye:** center of a hurricane marked by relatively calm  
**winds**  
**front:** line between two different air masses  
**hail:**  
**precipitation in the form of ice pellets**
humidity: moisture content of air

hurricane: tropical storm with a wind speed greater than 73 miles an hour

hygrometer: instrument used to measure the moisture content of air

lightning: electric discharge in the atmosphere

millibars: units of measurement associated with the measuring of air pressure

molecules: groups of similar atoms

seaboard: seacoast; land near the sea

storm surge: piling up of ocean water driven by the winds of a hurricane

thunder: loud sound caused by the sudden expansion of air during an electrical discharge

thunderstorm: violent storm accompanied by thunder, lightning and sometimes hail

tornado: rotating, funnel-shaped column of air

tropical: relating to the tropics; hot and humid

tropical storm: a cyclonic storm with a wind speed 73 miles an hour or less

typhoon: cyclonic storm that originates in the Far East; hurricane

vapor: gaseous state of a liquid

warm front: area where a warm mass moves into and replaces a cold air mass
BIBLIOGRAPHY


April 26, 1991. Kansas. A fear-stricken family rushes from its car to take shelter beneath a highway overpass. These people are about to experience firsthand one of nature's most powerful forces -- a tornado. Few have experienced a tornado so close, and lived to tell about it.

Tornadoes have the most powerful winds on earth, but as devastating as they are, another type of storm is even more destructive.

A hurricane covers a much greater area and can leave a path of destruction many kilometers wide. Winds can rip buildings apart, and ocean waves, 10 meters high and even higher, can lash broad stretches of coastline.

Hurricanes... tornadoes... and a third type of storm, a thunderstorm, are among nature's most powerful and awesome forces.

How are these storms related?

How do they occur? How destructive are they?

To find out more about nature's great storms, we have to learn more about the air around us. In this shot from space, you can see the moon and the thick blanket of air that surrounds our planet. It's called the atmosphere. It is an ocean of air dozens of kilometers deep.

We live at the bottom of the atmosphere and the amount of air that's above us presses down on us. We're so used to the air pressing down on us, that we can't really feel it...
...but we can measure it, with a device called a barometer. A barometer measures the weight of air in much the same way that a bathroom scale can measure your weight.

The weight of air is referred to as air pressure, and air pressure is measured in units called millibars. This barometer shows that the air pressure is just under one thousand and ten millibars. That's how much air is pressing on the barometer and everybody and everything around it... but air pressure doesn't remain the same all the time.

If you were to watch the barometer over a period of days, you would find that the amount of air pressure changes. That's because air pressure is influenced by a number of factors, including temperature.

Here's why. In this demonstration, two blocks of air have been placed on a balance scale. Air, like everything else on earth is composed of molecules, shown here as tiny balls. Molecules are so small they are invisible to the naked eye and they are shown much larger than they really are. These two blocks of air have an equal number of molecules and that's why they weigh the same... but watch what happens when the block on the left is heated up. Its molecules spread out. There are now fewer of them in the same amount of space. The air rises because it weighs less, but when air is chilled, its molecules come closer together. There are now more of them in the same amount of space. The air sinks because it is now heavier.

That's why a hot air balloon rises. The air within the balloon is hotter and therefore lighter than the surrounding air.
Air pressure helps determine the weather. That's why most weather maps show areas of high and low air pressure, but weather maps have so many lines they can be confusing, so let's simplify one by removing all the lines except the ones that mark high and low air pressure. These lines shown in white.

The areas with "H"s are high pressure areas. The area with an "L" is a low pressure area.

Some of the boundaries between low and high pressure areas, here, for example, can be windy.

The wind is caused by the movement of air from an area of high air pressure to an area of low air pressure.

You can simulate this yourself. When you blow up a balloon, you are actually increasing the air pressure within the balloon. The balloon now has higher air pressure than the air surrounding it. When you allow the air to escape, it creates wind, caused by the movement of air from a high to a low pressure area.

Highs and lows are often associated with fronts. The red symbol represents a warm front. It's called that because it is a place where warm air is moving into and replacing cold air.

The blue symbol represents a cold front. This is an area where cold air is moving into and replacing warm air.

Cold fronts are often associated with the formation of severe thunderstorms. To find out why, we have to learn more about air.

We've already seen that air's ability to rise is just one of its important properties.
Another important property is its capacity to hold moisture.

Just as a barometer measures the weight of air, an instrument called a hygrometer measures its moisture content.

Air can be either dry or moist. You can't always see the moisture.

It becomes visible only when conditions are just right, for example during the formation of clouds or fog. Clouds and fog consist of water vapor that has condensed into tiny drops.

It is air's capacity to hold moisture and its ability to rise that contribute to the formation of thunderstorms.

Thunderstorms can occur just about anywhere, but some of the most severe outbreaks occur each summer in the central United States. It is in this region during the summer months when cold dry air from Canada meets warm moist air from the Gulf of Mexico. The place where they meet is along a cold front.

In this example, the cold air mass is shown in blue on the right, and the warm air mass is shown in red on the left. Because the cold air has a higher air pressure, it bulldozes its way beneath the lower air pressure found in the warm air mass. This causes the warm air mass to rise quickly. As it rises, it becomes colder. It becomes colder because air temperature decreases the higher it goes. As it becomes colder, it causes water vapor in the air mass to change into tiny drops of water, drops so tiny, they float. An air mass filled with tiny drops of water is called a cloud.
And that is how clouds form at a cold front. As the warm air mass rises, the water vapor within it cools to form clouds, cumulus clouds.

As long as there is moisture in the air, clouds can get larger and larger. They can join other cumulus clouds to form a super cloud that is thousands of meters across. These super clouds are called cumulonimbus or thunderclouds. A cumulonimbus cloud is marked by a flat top called an anvil, which is formed when a cloud can rise no higher, and fans out along the top.

Thunder clouds are also marked by dark bottoms. They appear dark because the clouds reach so high into the atmosphere that little sunlight can reach the bottoms.

This beautiful cumulonimbus cloud has a classic anvil shape.

As a cumulonimbus cloud continues to grow, water droplets within it collide with one another, growing larger. When the drops become large enough...they fall as rain. Cumulonimbus clouds are known for the great amount of rain they produce.

Rain can fall with such force that it can create its own downward wind. Wind that blows directly down from a storm cloud is called a downdraft. Downdrafts can be so strong that they can create hazards for aircraft.

Some storms also produce hail. Hail is formed in clouds when water freezes to tiny ice particles as they fall to earth. One theory suggests that hailstones may be sent on a roller coaster ride through the cloud, rising and falling with updrafts and downdrafts of air.
As they travel, the hailstones become larger and larger as more water freezes to their surfaces. When they become heavy enough they fall to earth.

While other types of storms are more destructive, no others put on quite the same show as a thunderstorm. Lightning can be very exciting, but it's also deadly. In the United States, lightning kills more people than do hurricanes and tornadoes. Here's how lightning is created.

When updrafts and downdrafts send rain and hail on a roller coaster ride through a cumulonimbus cloud, their motion creates both positive and negative charges.

Lightning occurs when electricity discharges and leaps across the air from one charge to another. Lightning can occur from cloud to cloud and from cloud to ground.

As lightning discharges, it causes the air to heat up and expand. The vibrations caused by this sudden expansion of air is what we call thunder.

Sometimes a thunderstorm gives birth to another type of storm, a tornado.

For reasons not entirely understood, air will start to circulate near a thunderstorm. As it does, a spinning funnel-shaped form may drop from the storm cloud. When, and if, it touches the ground, it is called a tornado.

When a funnel touches down over water, it is called a waterspout. Waterspouts are not nearly as powerful as tornadoes.
With speeds reaching 500 kilometers an hour, the winds produced by tornadoes are the most powerful on earth; powerful enough to destroy nearly everything in a tornado's path.

The dark color of many tornadoes is caused by the dirt they have sucked up.

Many powerful tornadoes are also accompanied by flying debris, debris that was once barns, buildings and homes.

Some tornadoes create paths of destruction not much wider than 20 or 30 meters. These tornadoes can appear long and snakelike.

Other tornadoes are hundreds of meters wide, creating much wider paths of destruction.

Tornadoes move along at speeds that vary between 25 and 100 kilometers an hour. Some can even exceed that speed. This tornado is catching up to a car that is moving along at nearly 140 kilometers an hour.

The tornado is moving so fast that the occupants of the car, two members of a television news crew, must abandon their vehicle to take cover under a highway overpass.

Here they encounter a family. All of them seek protection under the iron girders supporting the overpass.

As the tornado approaches you can see a car being blown across the highway, first in one direction, then the other, there in the upper left corner of the screen.

Fortunately, the news crew and family are unharmed, but the tornado continues.
It would be among a series of tornadoes that would devastate several towns in central Kansas that day, leaving 20 people dead, thousands homeless, and millions of dollars of damage.

As destructive as tornadoes are, the damage they cause could be far worse. Their paths of destruction, though, are relatively narrow, and they only remain on the ground for short periods, usually minutes, seldom more than an hour.

One type of storm is much more destructive. It can last for days and leave a path of destruction hundreds of kilometers wide and thousands of kilometers long. It's called a hurricane.

Hurricanes that strike the United States usually originate thousands of miles away over the Atlantic Ocean.

These are not yet hurricanes. Their winds aren't moving fast enough. They're called tropical storms. Here's how tropical storms and hurricanes are created.

Here in the tropical waters of the Atlantic, warm moist air comes together, feeding groups of thunderstorms. The growing cloud mass begins to spin, triggered by the earth's rotation. As the cloud mass spins, it sucks up more air behind it, creating a storm hundreds of kilometers across.

In the northern hemisphere, the spin is always counterclockwise. That is, the clouds spin in a direction that is opposite to that of the movement of a clock.

Storms that form over the Atlantic Ocean almost always move toward the west and northwest. They're being pushed in those directions by the prevailing winds that exist on our planet.
This satellite sequence has been sped up and shows how Atlantic storms move in a generally northwest direction, being driven by the prevailing winds.

As tropical storms move northwest, they usually gain size and strength by drawing in more and more moist air.

The speed of rotation of the storm can increase. When it exceeds 73 miles an hour, the storm is officially classified as a hurricane.

In this photograph from space, you see a massive hurricane, hundreds of kilometers across. Near the center of the storm you can see an opening.

The opening is called the hurricane's eye.

The eye is an area of extremely low air pressure and can be 7 to 70 kilometers across. It is surrounded by a cylindrical band of the storm's highest winds, called the eye wall.

The air within the eye is relatively calm, leading some people to believe the storm has passed, when in many cases, the worst is yet to come.

That's because in the northern hemisphere, the winds in the right half of a hurricane are the highest as the circulating winds are combined with the forward motion of the storm.

Most Atlantic hurricanes turn north before they strike the United States. This one, Hurricane Bob, barely scraped the Eastern Seaboard. Once a hurricane leaves warm water, it loses the fuel that kept it going, and soon dies out...
...but a few hurricanes hit the United States head on. Here, Hurricane Andrew sweeps across southern Florida... then moves into Louisiana, causing widespread devastation.

By the time they get here, the storms can be monsters, with wind speeds in excess of 200 kilometers an hour.

As devastating as hurricane winds are, they are not the deadliest part of a hurricane.

A hurricane's most destructive force is usually the storm surge... a piling up of water driven by the wind.

The storm surge is created when the high winds found in the hurricane cause the level of the ocean to bulge by as much as 10 meters or more.

The area of this surge can be over 100 kilometers wide and can flood vast stretches of coastline.

The storm surge can be topped by waves 5 to 10 meters high which have the power to destroy buildings and homes.

Hurricanes occur throughout the world. The areas marked in red are hurricane breeding grounds. These are the areas where hurricanes are most likely to occur. They go by different names depending on where they occur.

Storms that develop in the Atlantic or eastern Pacific Ocean are called hurricanes.

Storms that originate in the Far East are called typhoons.
Storms that begin in the Indian Ocean are called cyclones.

They are all caused in the same way and are equally destructive.

Hurricanes are classified by wind speed. They range from a Category 1 with winds between 74 and 95 miles per hour to a Category 5 with winds greater than 155 miles per hour.

No type of storm is studied more than hurricanes.

Satellite images like this not only track hurricanes, but also tell us something about the size, speed and power of these great storms.

As important as satellite images are, there is a lot they can't tell us.

That's why some researchers fly specially equipped aircraft directly into the center of hurricanes.

In this flight, scientists will eject instruments from the plane that will, as they fall, measure wind speed, air temperature, humidity and air pressure.

Only by flying into and around these storms can scientists obtain the precise measurements to learn even more about hurricanes.

In this program, we have seen that air's ability to rise and its capacity to hold moisture is what contributes to the formation of thunderstorms.

Severe thunderstorm outbreaks can occur when cold dry air meets warm moist air along cold fronts.
As the cold air mass bulldozes its way beneath a warm air mass, it causes the warm air mass to rise.

As it rises, it cools, and as it cools, it causes water vapor inside the warm air to condense into cumulus clouds.

As this process continues, cumulus clouds can grow into a super cloud, called a cumulonimbus cloud, which is marked by a top that resembles an anvil.

When the water droplets inside a cumulonimbus cloud become big enough, they fall as rain... or as hail.

The motion of water and ice within a cloud can produce electrical charges which are released as lightning and thunder.

When thunderstorms are violent enough, spinning air in the form of funnels may drop from clouds. If they reach the ground, they are called tornadoes.

The winds produced by a tornado are the most powerful on earth and can cause considerable damage and loss of life.

The wind speeds of hurricanes are not as high, but these storms last longer and leave much wider paths of destruction. They are the world's deadliest storms.

Most of the hurricanes that strike the United States are formed in the warm tropical waters of the Atlantic Ocean.

Spinning in a counterclockwise direction, a few hurricanes will eventually reach land where they can cause considerable devastation.

The deadliest part of a hurricane is the storm surge, a piling up of water that follows a hurricane to shore.
Hurricanes are called typhoons and cyclones in other parts of the world.

... but no matter what they're called, they are formed in the same way and they are equally destructive.

As devastating as hurricanes, tornadoes and thunderstorms are, we must remember they also have beneficial effects.

They bring needed rain to some areas and they help cleanse the atmosphere of pollution.

They also act as giant air conditioners, bringing cooling relief to the hottest parts of our planet.

While all these storms can be frightening, we should remember that they are, after all, part of nature's great plan.