

Tornadoes



Droughts



Earthquakes



Flooding



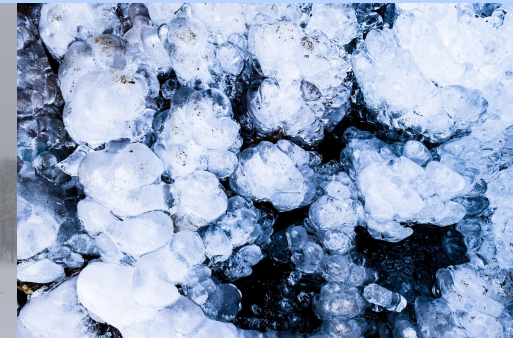
# **STORM GUIDE:**

## **EIGHT BOOKS IN ONE!**

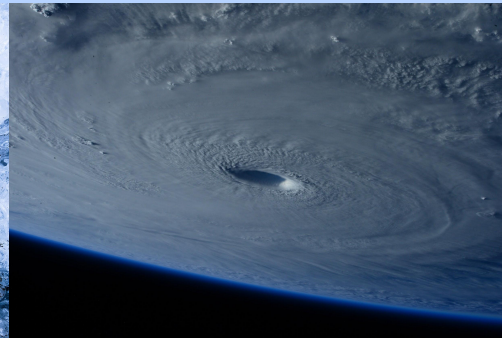
By the Third Graders of New Covenant School  
2018-2019



Blizzards



Hail



Hurricanes



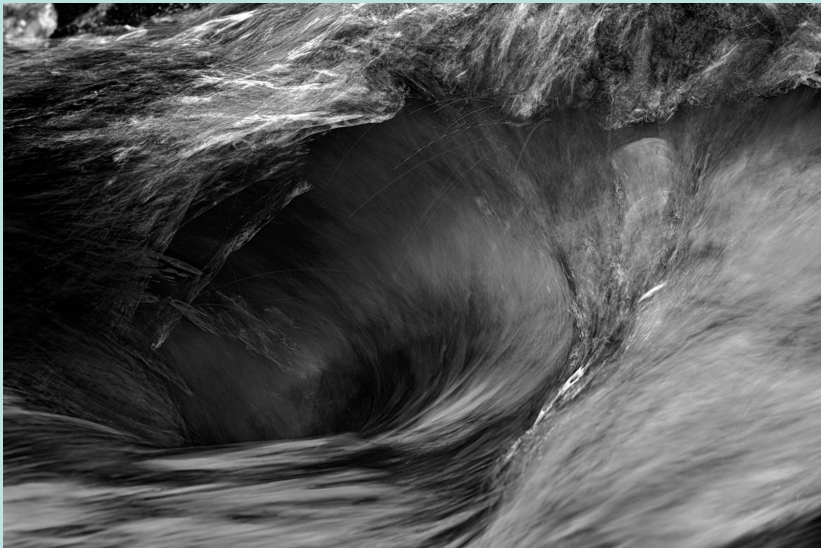
Thunderstorms

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# AMAZING STORMS

Be ready for dangerous, harsh, terrorizing storms like lightning, earthquakes, blizzards hail, hurricanes, floods, droughts, and tornadoes too! So be ready for bad storms!





# THUNDERSTORM

## What is a Thunderstorm and How it Forms



A thunderstorm does not have many steps for how it forms. First thousands of wet droplets rise, called **vapor** or gas. After the water vapor cools it changes into liquid, then clouds come together. Next they become heavy with water until the clouds are ready to rain. Water and ice hit each other many times in the cloud to produce electricity. Then electricity leaves the cloud as lightning. Usually a thunderstorm is really dark. A thunderstorm usually ends in about less than 30 minutes.



# Different Types of Lightning

There are many different types of lightning but there are three main kinds. The first kind of lightning is **intracloud**. It's the most common. It occurs in the same cloud. **Cloud to ground lightning** hits the ground. It is the most dangerous kind of lightning. Next is **intercloud** lightning, which leaps across to another cloud.

Ribbon lightning streams down to the ground. Heat lightning is when you don't hear the thunder but you see the lightning. Ball lightning is very fast like a **meteorite**.



# Staying Safe in a Thunderstorm



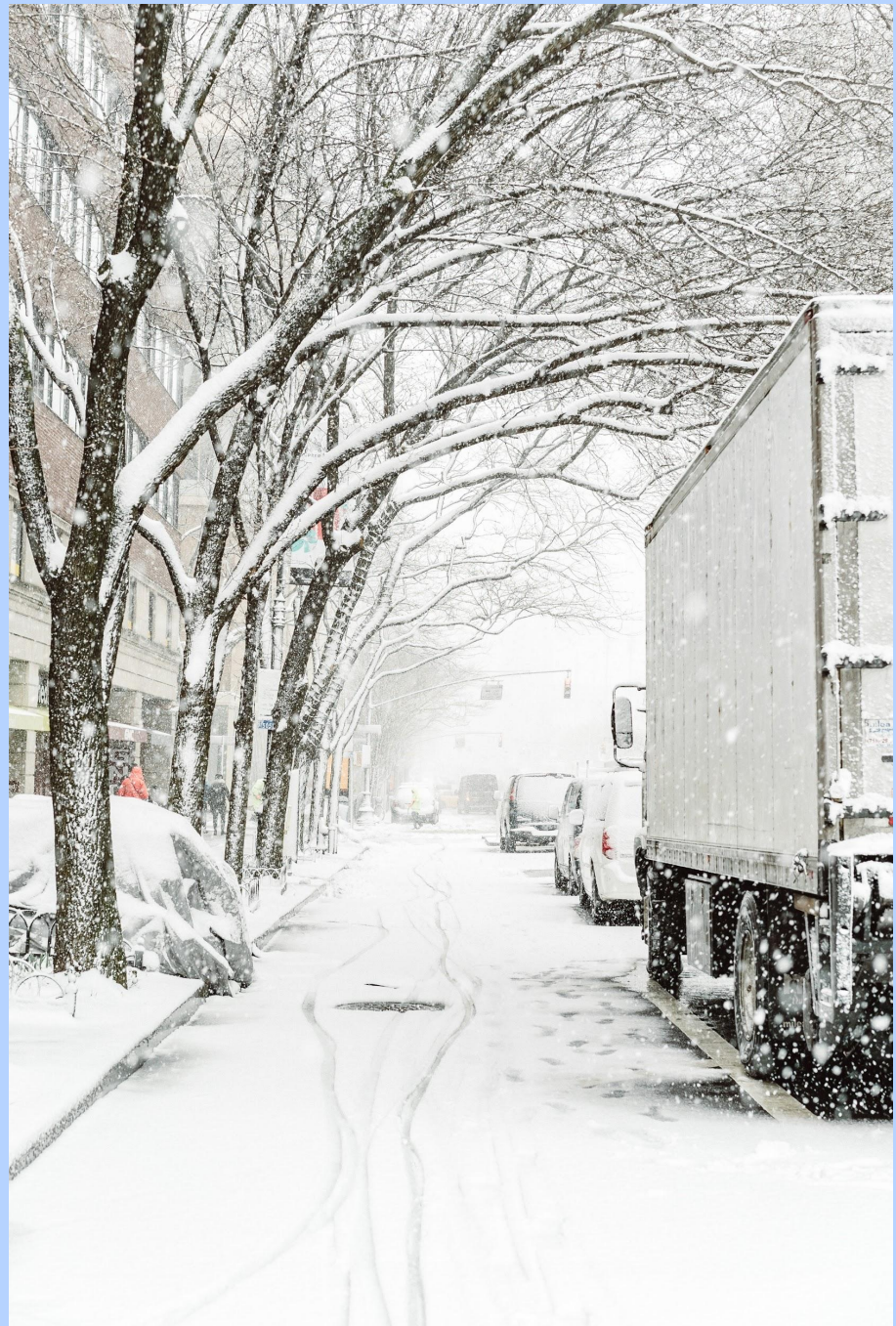
There are many different ways to stay safe. First you should not stay outside. Stay inside because you could get hurt and lightning could strike a tree and the tree could fall over. Second stay away from high places, wet branches, single trees. Get out of the pool if lightning is near you because the **electricity** can travel through the water and shock you.



# BLIZZARD

## What is a Blizzard?

A blizzard is when tons of snow falls and the winds get strong, which makes it hard to see and you can get lost very easily. If the snow storm is cold enough it can feel like a knife, especially when you get hit by a snowball.





# Where Blizzards Happen



Blizzards can happen in tons of places. For example, they happen in mountains and cold high places. Also during winter in North America, northern Europe, China and the **North and South poles**.

# How to Stay Safe in a Blizzard



There are many ways to stay safe in a blizzard. One way to stay safe is to stay inside. One reason why you should stay inside is because the roads are very slippery and snowy, so you can hurt yourself. The snow makes it hard to see and it can also make it hard to see the ground because the snow will be falling fast. The last reason why you should stay inside is because you can get frostbite. Frostbite is when one part of your body gets really, really cold and all the blood moves out of that spot. Usually it happens on your toes and your fingers. Now that's a reason why you should stay inside and have a first aid kit in reach!

# HAIL

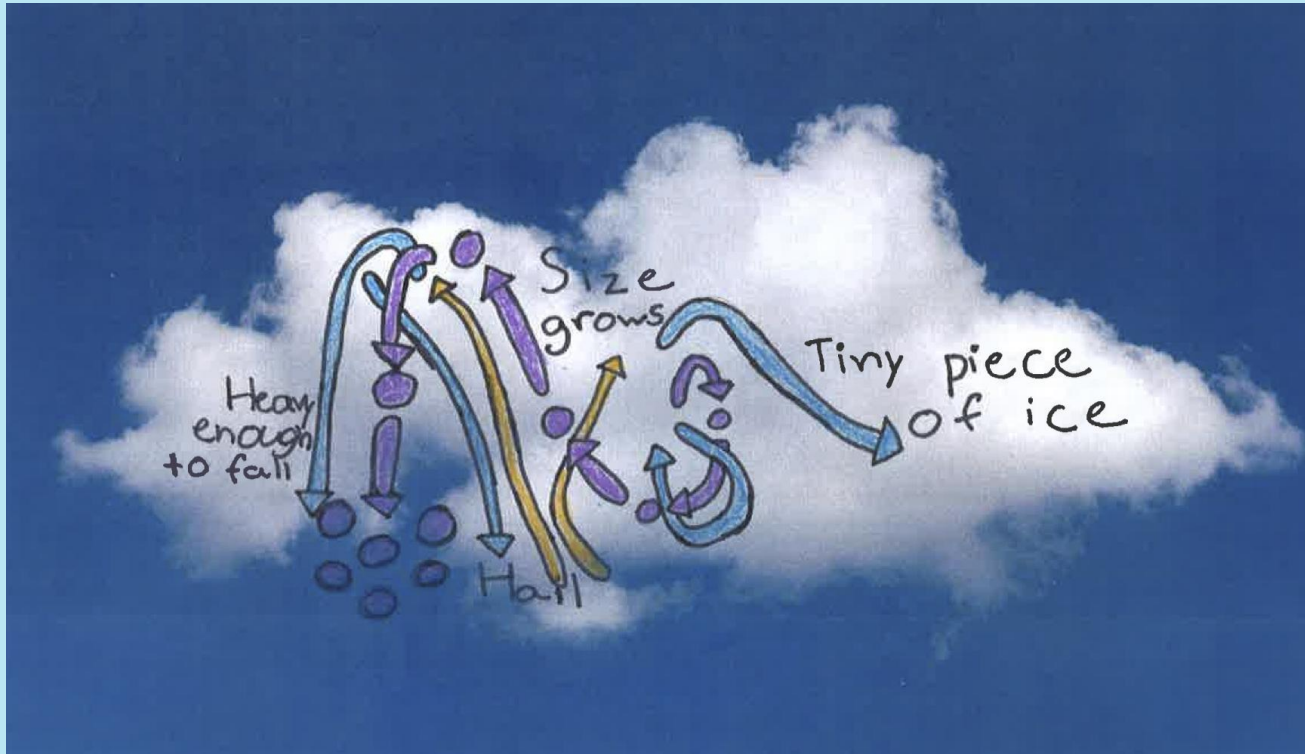
## What is Hail?

Hail is a big chunk of ice falling from the sky. It can sound like an audience clapping! Also hail can make a lot of noise. Since hail can make a lot of noise, it can cause a lot of **damage**.



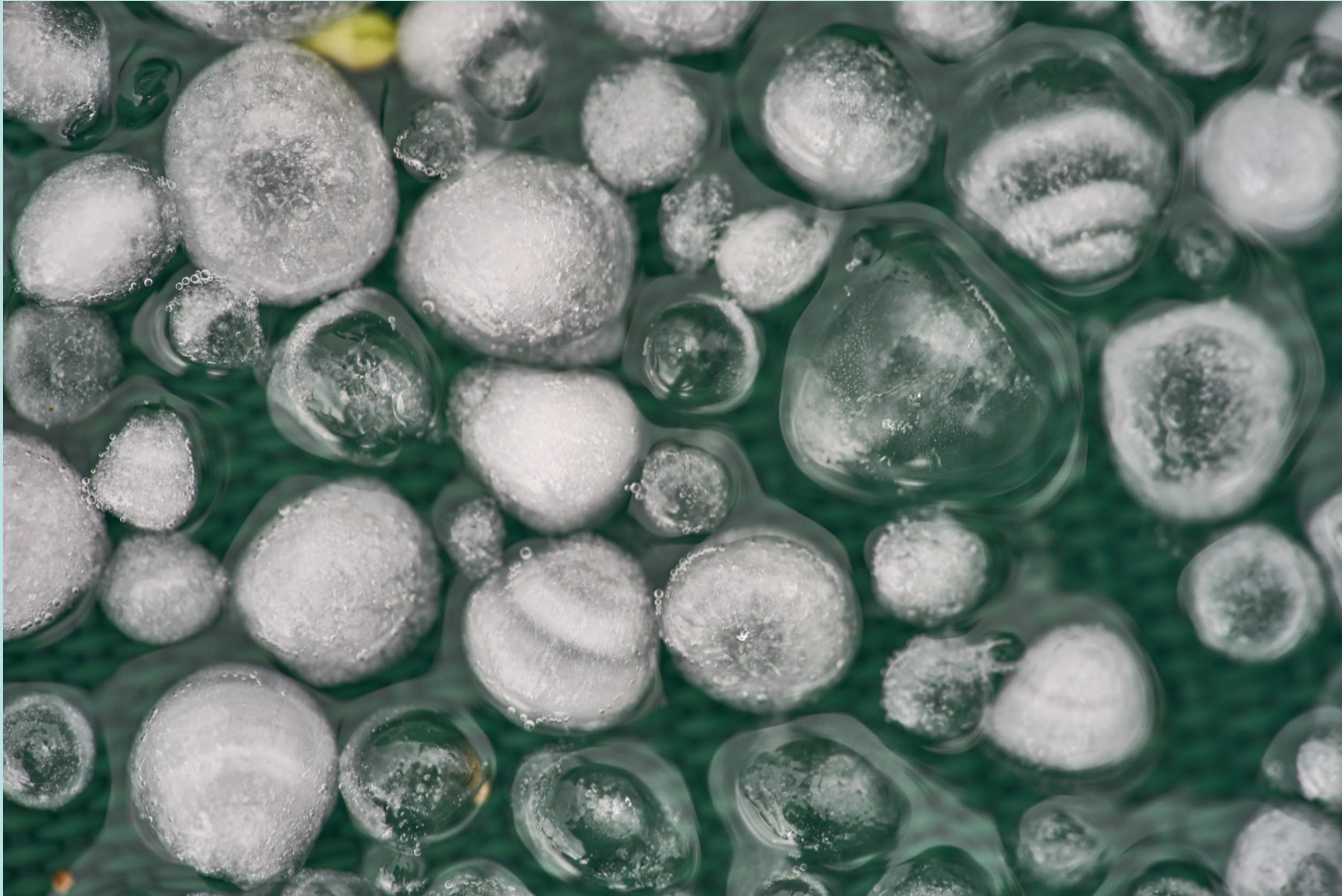


# How Hailstones Form



Hailstones go through a long process to form. Hailstones start very small. Hail comes in many sizes, for example the size of a pea, a baseball, or even a grapefruit! Then hailstones start to form into tiny ice particles of dust and ice. Then ice collides with cold water droplets that freeze to it. Then the powerful winds and thunder toss the ice pellets up and down, then they grow as they collect more and more water. When the chunks of ice grow too heavy, they fall on the ground.

# Hail Damage



Hailstones can ruin a lot of things such as crops, homes, and car. When there are big pieces of hard freezing hail, the hail can make dents in your cars! So you might want to cover your car with something, or even put it in your garage. If you don't have a garage, there are still many ways you can protect your car, like an inflatable hail protector.



# How to Stay Safe

Here are a couple of ways to stay safe. If you're in the middle of a hailstorm, get your supplies right now because it can make the power go out! Here is what you need: a flashlight, batteries, food in a cooler, and a big blanket. The most important thing that you need is a first aid kit and a backpack to hold all of these things.





# DROUGHT

## What is a Drought?



What is a drought? A drought is a long time with no rain or **snow melt**. A drought also dries up your lawn and crops. Droughts can be so dangerous because they affect crops, food, and water. If you live in a cold place you most likely will not get a drought. Most happen in dry areas but they happen anywhere in the WORLD!



# Preparing for a Drought!



The most important thing about a drought is you should always save up water. To live through a drought, use tanks to save up water. You should put the tanks in your yard when it rains so you can collect rainwater. Some people save up water even when there is not a drought. Also take fewer showers and baths.



# Extreme Heat and Keeping Cool



**Heat stroke** can happen anytime when it's hot, including during a drought. Clothing is a BIG part of droughts, it helps protect your body. You need to stay in the shade. If not you will get heat stroke. If someone gets heat stroke get them into the shade right away. Next place a cold towel around their forehead and fan the cold air around him or her.





# TORNADO

## What is a Tornado and How Does it Form

What is a tornado? A tornado is a tube of spinning air and also has lots of dust in it. It can be wide or narrow. A tornado is a very powerful twist and can blow you away in seconds. It's also very windy and technically a dangerous dust cloud. It's not safe to be near it.

There are a few steps to form a tornado. First a humongous thunderstorm with lots of lightning, called a **supercell** happens. Then once the supercell dies down, a dusty dark cloud starts to form. It gets bigger and bigger and it forms a funnel cloud. It's like a tornado but it didn't reach the ground yet, but once it does, you should go inside.



# Tornado Alley!



*Image by KRCU (krcu.org)*

Tornado Alley is an area near the midwest, southeast, and southwest side of the U.S. It is called tornado alley because tornadoes happen in a lot of places but tornadoes are most common in this area. If you're not in these places that's good, but if you have relatives near or even in these places warn them to be safe.



# What You Need and Where To Go

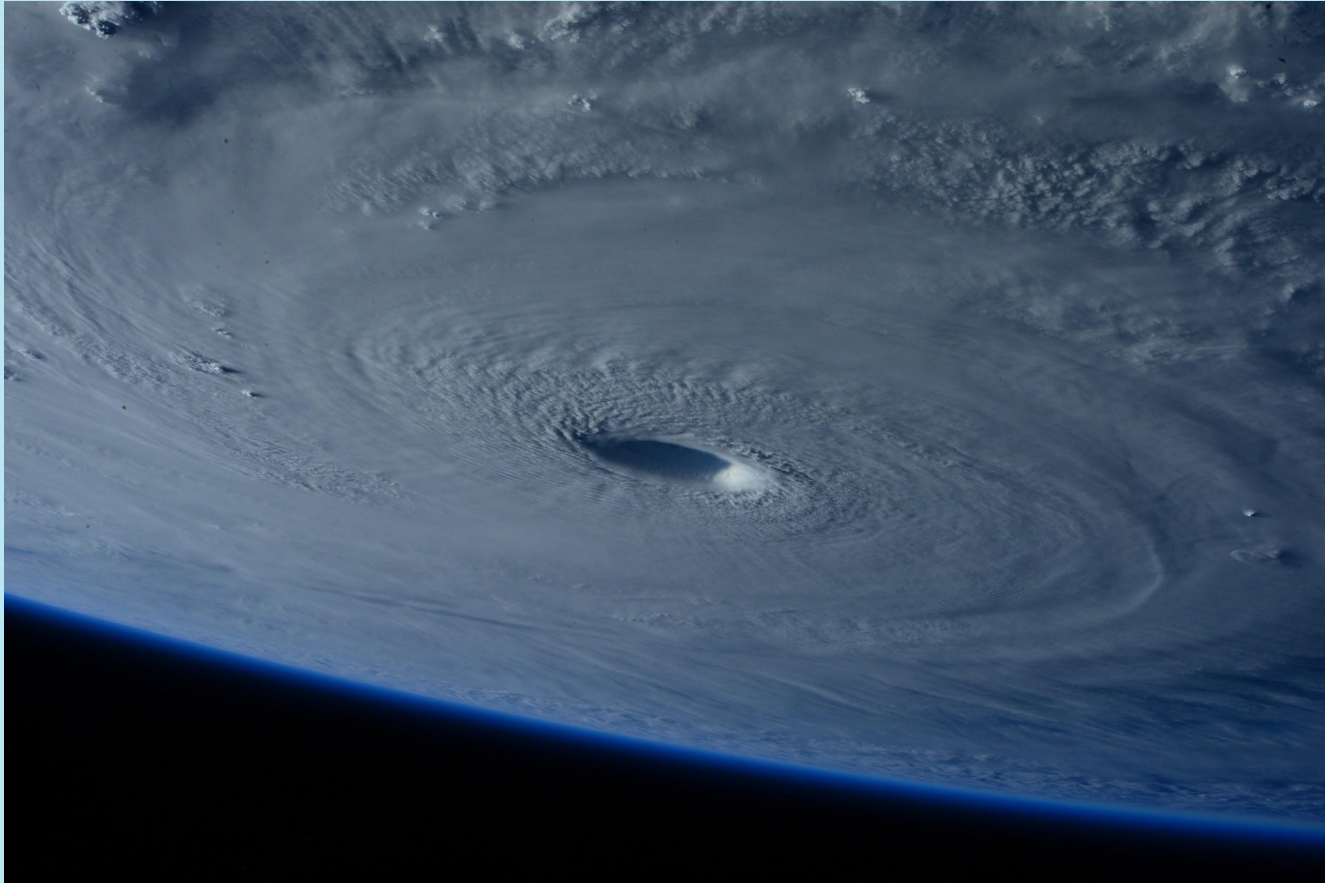


There are a lot of things you need for a tornado. First you need food and water. Mainly canned food because if the power goes out your food won't be spoiled. Next you need a flashlight or candle if the lights go out. Also you should carry some first aid supplies and a blanket. Also get a weather radio and some batteries.

Always go in a basement where there are no windows. You should stay away from windows so you won't be badly hurt. Another thing is you should crouch down, put your hands on your head so your head is protected.

# HURRICANE

It's a Hurricane!

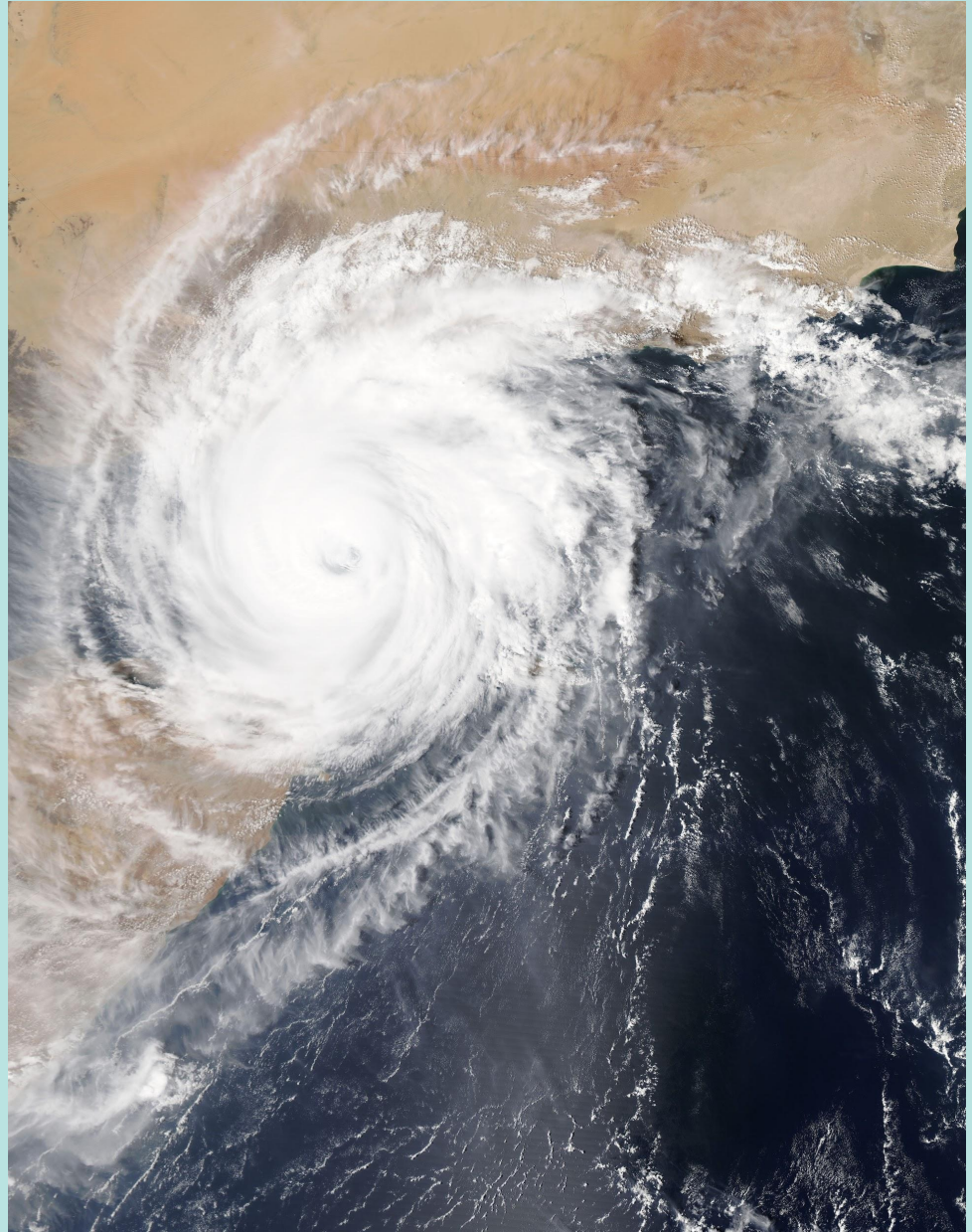


A hurricane is a big, fast, spiraling wind formed in warm oceans and can cause extreme damage. This storm can cause heavy rain, that creates floods. Whoa, that's a big storm!



# How Hurricanes Form

You may not notice a hurricane forming, but it's ready when you see it. First warm water rises which forms large clouds. Next large clouds create wind. Warm water acts like fuel, making the wind go faster and faster. The wind circles around and around moving the clouds with it. Finally when the wind reaches 74 mph it is a hurricane! A hurricane looks like a giant grey cloud floating on the sea. There are large waves pounding down on the sand and the sand slips right under your feet. It's pouring down rain, the wind is ripping against your face. It's a deadly storm!



# Run for Your Lives!

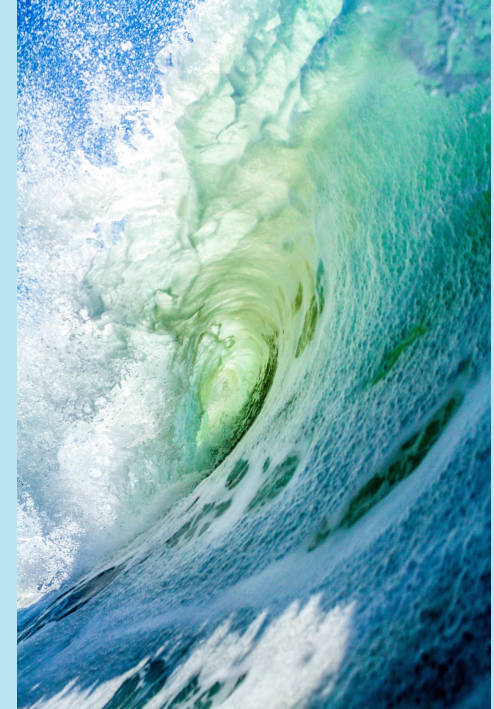


The most important thing to do to stay safe is to watch the news to see if you need to evacuate. One way to evacuate is to pack all the supplies you need to survive and get in your car and GO! Another way to stay safe is to stock up canned food and water. Then get in your attic. One more way to stay safe is to go to an emergency evacuation bus stop. A tip is if you have a **seawall** near you, you're going to have more time to evacuate. Also stay away from windows or board them up. Do this because you can get hit in the face by flying **debris** and get hurt badly or get cut with glass if the windows break.



# FLOOD

## Every Flood



Powerful storms cause a sudden and dangerous **storm surge**! **Coastal** flooding has a sign, high **tides** and high winds! Flooding is most likely in swampy coastal areas. River floods are the most common flood. River floods are caused by rain and **snow melt**. Drains can be blocked and flood the streets. **Ice jams** are another way floods happen. When the ice doesn't melt, it blocks the flow and it floods. When it melts, the river banks can't hold it and it floods again!

# Living In Water



There are many ways of flood protection. Did you know piling sandbags works like a wall? Dams protect **reservoirs** and rivers from flooding. A **seawall** is a wall that protects the city from floods and **tsunamis**. A seawall is made of concrete and metal to make it strong. If you have an attic or floors above you, go there fast. Before a flood, you need to get canned food stored to survive.



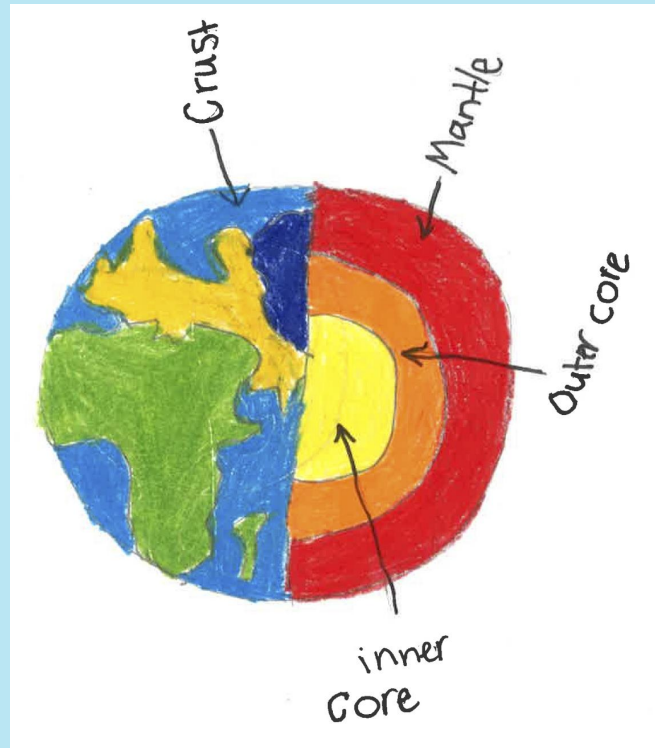
# EARTHQUAKE

## Look Out!

What is an earthquake?  
An earthquake is when two **tectonic plates** rub together and make the earth's crust move. One scary thing about earthquakes is that a building can fall on you! Did you know that about 300 earthquakes happen in Iceland a week!



# Layers of the Earth



The earth has 3 layers, the crust, mantle, and the core. CRUST: A thin layer of the earth. The crust stretches 70 kilometers (44 miles) from your feet to the end of the crust. Under the ocean it is only 6 kilometers (3 miles). MANTLE: After the crust comes the mantle! Finally things get hot here, the heat makes the rock melt. CORE: This is made up of 2 parts, the inner core and outer core. The outer core is hot liquid, the inner core is of solid iron and nickel, it is very strong.



# Getting Ready



To get ready for an earthquake you have to do a lot of things. For example you have to evacuate the building if it's not too bad. If it's worse stay inside and go under a desk, table, or chair. People in China and other places prepare by having earthquake drills.

Some things to have in a safety kit are a flashlight or lantern incase the power goes out. Another thing is a wallet, clothes, canned food, blankets, first aid kit, and an activity book.



# Tools

**Geologists** need to predict earthquakes faster and better. Usually they use the **Richter scale** but that only measures how harmful the earthquake is. Maybe you will try to practice the safety rules, and maybe even give money to people who got hurt from earthquakes.



*Photo by Stefan Hinman / Matanuska-Susitna Borough, Anchorage Daily News*



# CONCLUSION



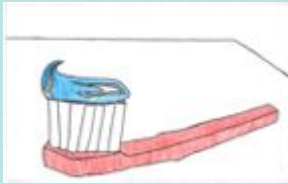
*Photos from the American Red Cross*

Storms are important because people can be badly hurt. You should be prepared even before a storm is coming! Make sure to have all the tools ready and in your house to keep safe. You can also help others by donating money to people who have been in severe storms!

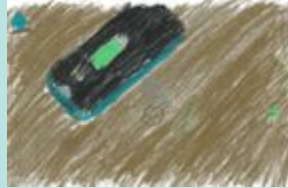


# PREPAREDNESS KIT

With your family pack then check off these things so you can keep safe in a storm or disaster!

☐

Toothbrush and  
Toothpaste

☐

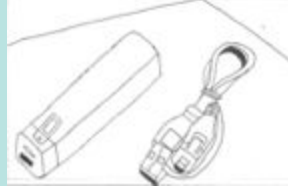
Cellphone

☐

Clothes

☐

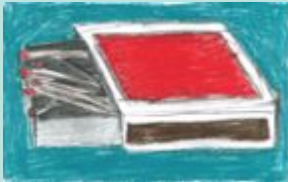
Flashlight

☐

Battery Pack  
and Charger

☐

Blankets

☐

Matches

☐

First Aid Kit

☐

Canned Food

☐

Candle

☐

Bucket

☐

Dry Food

# GLOSSARY

Word	Definition	Page
cloud to ground lightning	Lightning that goes from a cloud to the ground.	5
coastal*	The land near water; seashore.	23
damage	When a person or property is hurt or broken.	20
debris	A flying object that has been torn off of a tree, wall, or building by the wind.	22
electricity*	A form of energy that is found in nature. For example, electricity is used to power phones and computers.	6
funnel cloud*	A funnel cloud is shaped like a cone, pillar, or tube.	17
geologists*	Geology is the study of the physical features and history of Earth. Scientists who work in geology are called geologists.	28
heat stroke	When your body gets too hot and you faint.	16
intracloud lightning	Lightning that stays in one cloud.	5
intercloud lightning	Lightning that leaps across from one cloud to another cloud.	5
ice jams	Ice that blocks the streams.	23

*\*Definition from Britannica Kids/Merriam-Webster*



# GLOSSARY CONTINUED...

Word	Definition	Page
meteorite**	A meteor that reaches the surface of the earth. These streaks of light are sometimes called “shooting stars.” But they are really just bits of rock! (A meteor is a piece of rock in space that burns and glows.)	5
north and south poles*	The northern and southern most point of the earth.	8
Richter scale	A scale that measures how bad an earthquake is.	28
storm surge***	A storm surge is a rise in sea level that occurs during a hurricane. (National Geographic)	23
supercell	A supercell is a thunderstorm filled with tons of lightning.	17
seawall	A wall that is made out of concrete and metal that protects people from floods.	22, 24
snowmelt	Snow melting.	14, 23
tsunamis	A BIG wave that covers land, destroys property, and causes a flood. It starts with two tectonic plates that move under water (an underwater earthquake) and cause the water to move. (“Tsunami” is a Japanese word meaning “big wave.”)	24
tectonic plates	A part of the earth’s top layer (called crust) that moves and rubs together. The tectonic plates fit together like a big puzzle that goes around the whole earth.	25
vapor	When water is a gas. An example is steam.	4

*\*Definition from Britannica Kids/Merriam-Webster*

*\*\*Definition from NASA*

*\*\*\*Definition from National Geographic*

# THUNDERSTORMS BLIZZARDS

These are the most common storms that happen in Massachusetts, but there are more storms to discover!

