



Preparing for Thunderstorms and Lightning

PLEASE NOTE:

Students must complete the "Initiation" section of the **Monster Guard** app before they begin this activity, in order to gain access to the Thunderstorm & Lightning training mission.



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Opening

Inform students that they are going to learn about thunderstorms and lightning, and how to stay safe when a thunderstorm happens. Ask students to raise their hands if they know what a thunderstorm is. Then ask them if they have ever seen a thunderstorm (even on TV). Assess for prior knowledge by asking students to share what they know about thunderstorms. Explain that thunderstorms always bring lightning, which is very dangerous. That's why it is important to remember the safety rule, **When the Thunder Roars, Go Indoors!**

Monster Guard

Tell students that they will be learning more about thunderstorms and lightning with a cool app called **Monster Guard**. Explain that **Monster Guard** was created by the American Red Cross as a way for students to have fun learning, practicing, and sharing how to stay safe during different types of emergencies.

Adapt your teaching instructions to the various methods of playing **Monster Guard** – whether you are using a smart board to play as a class or having students play in small groups or individually using mobile devices.

Before they begin playing, remind students that they need to watch the videos before and after the training mission for information that will help them complete the classroom activities.

Pass out the activity sheet, read the introduction together, and have students go through the Thunderstorm & Lightning section with Hugo. Remind them to write their score in the space provided on the activity sheet. As a class, have students suggest ways they think they could raise their scores the next time.

Grades 1-3

PART 1. Read and discuss the paragraphs explaining how thunderstorms form and how lightning produces thunder. Use these paragraphs to reinforce the safety rule, **When the Thunder Roars, Go Indoors!**

Have students complete this part of the activity individually or in a class discussion, drawing on what they learned from the video portion of their Thunderstorms & Lightning training mission.

Answers: (1) If you hear thunder while walking to your car after soccer practice, get into the car for safety. A metal-topped car can protect you from lightning if you don't touch anything metal inside the car. (2) If you hear thunder while standing near a window inside your home, move away from the window to avoid being hurt if the storm should break the window. (3) If you hear thunder while you and your family are driving to a movie, stay in the car. A metal-topped car can protect you from lightning if you don't touch anything metal inside the car. If the rain makes it difficult to see, pull off the road and wait for the storm to pass. (4) If you hear thunder while you and your friends are swimming in a lake, get out of the water immediately and go indoors for safety.

PART 2. Have students work individually to complete Part 2 of the activity. Remind them that they can replay the **Monster Guard** Thunder & Lightning training mission if they need help. Review the answers in a class discussion.

Answers:

B	A	T	H	T	U	B	S
A	B	C	D	S	E	P	H
F	G	H	V	I	J	H	O
K	L	W	I	N	D	O	W
M	N	O	P	K	Q	N	E
C	O	M	P	U	T	E	R

Grades 4-6

PART 1. Read and discuss the paragraphs explaining how thunderstorms and lightning form, and how lightning produces thunder. Then have students work individually to complete this part of the activity.

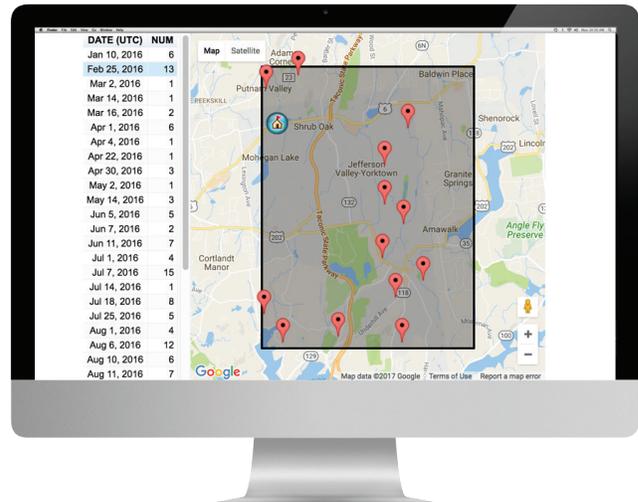
Remind students that the sound of thunder travels about one mile in 5 seconds, so if you see a flash of lightning and hear thunder 5 seconds later, you know that the lightning was approximately one mile away. After students calculate how far away the lightning is in each of the situations described on the activity sheet, use these examples to reinforce the safety rule, **When the Thunder Roars, Go Indoors!**

Answers: (1) 9 miles; (2) 3 miles; (3) 6 miles.

PART 2. Have students work individually to complete Part 2 of the activity. Remind them that they can replay the **Monster Guard** Thunder & Lightning training mission if they need help. Review the answers in a class discussion.

Answers: bathtub, sink, shower, phone, computer; other answers acceptable.

PART 3. Read the introduction to Part 3 and have students work in small groups to complete this part of the activity by accessing the NOAA Severe Weather Data Inventory at <https://www.ncdc.noaa.gov/swdi/#TileSearch>. Help students use the data they obtain to determine when they should be most on the lookout for thunderstorms and lightning.



Teachers:

Please provide feedback on this activity using our online feedback form at www.ymiclassroom.com/mgfeedback-thunderstorm.



Preparing for Thunderstorms & Lightning

Grades 1-3 • Reproducible Master

Hi! I'm Hugo. There are more than 100,000 thunderstorms in the U.S. every year. Want to learn more? Download **Monster Guard**. It's a free app from the American Red Cross that teaches kids how to be prepared for emergencies. Choose "Thunderstorm & Lightning" on the main menu. Then join me on a training mission to learn how to stay safe when you hear thunder. **Note:** You must have completed the **Monster Guard** Initiation section before you can access the Thunderstorm & Lightning training mission.

My Thunderstorm & Lightning Safety Score: _____



Part 1

Thunderstorms begin as warm, moist air that rises into the sky. The air forms a white, puffy cloud, called a *cumulus* cloud. When the cloud piles up high enough, it crashes into cold air high in the atmosphere. The cold air causes the moisture in the warm air to condense into raindrops, and before long, a thunderstorm is on the way.

Lightning is the most dangerous part of a thunderstorm. Lightning is a gigantic spark of electricity that connects the thunderstorm to the ground. It heats the air around it to very high temperatures. This causes the air to expand very quickly, like a balloon popping. That's the sound we call thunder. So whenever you hear thunder, you know that lightning is nearby. And that's why the safety rule for thunderstorms is, **When the Thunder Roars, Go Indoors!**



Now read about the situations below. Tell what you would do to stay safe if you heard thunder.

1. You are walking to your car after soccer practice.

2. You are standing near a window inside your home.

3. You and your family are driving to a movie.

4. You and your friends are swimming in a lake.

Preparing for Thunderstorms & Lightning

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Part 2

Do you remember your thunderstorm and lightning safety training? Show what you learned with this wordfind puzzle. Circle the things in a home that might be dangerous when you are indoors during a thunderstorm. Use the word bank if you need help.



B	A	T	H	T	U	B	S
A	B	C	D	S	E	P	H
F	G	H	V	I	J	H	O
K	L	W	I	N	D	O	W
M	N	O	P	K	Q	N	E
C	O	M	P	U	T	E	R

Word Bank:

bathtub
computer
phone
shower
sink
window

Replay the
Monster Guard
Thunderstorm &
Lightning training
mission. See if you can
score higher!



Preparing for Thunderstorms & Lightning

Grades 4-6 • Reproducible Master

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My Thunderstorm & Lightning Safety Score: _____



Part 1

Thunderstorms begin as warm, moist air that rises into the sky to become a white, puffy *cumulus* cloud. If the cloud keeps piling up, it will eventually crash into cold air high in the atmosphere. The cold air causes the moisture in the warm air to condense into raindrops, and before long, a thunderstorm is on the way.

As the rain falls, it pulls air from the cloud down with it, creating a wind that drives the rain toward the ground. The rain and wind also create electrical charges inside the cloud. The positive charges stay at the top, while the negative charges fall to the bottom. Meanwhile, positive charges are building up on the ground under the cloud. And because opposites attract, sparks of electricity can begin to race from the top of the cloud to the bottom, and from the bottom of the cloud to the ground. That's lightning.



Lightning heats the air around it, causing the air to expand suddenly, like an explosion. That's the sound we call thunder. So whenever you hear thunder, you know that lightning is nearby.

As you've learned, the light from lightning travels much faster than the sound of thunder. If you hear thunder 5 seconds after you see a flash of lightning, you can estimate that the lightning is about one mile away. Use your math skills to estimate how far away the lightning is in these situations.

1. You hear thunder 45 seconds after the lightning flash: _____ miles

2. You hear thunder 15 seconds after the lightning flash: _____ miles

3. You hear thunder 30 seconds after the lightning flash: _____ miles

Remember, you should always go indoors when you hear thunder, especially if it comes less than 30 seconds after you see a flash of lightning. **When the Thunder Roars, Go Indoors!**

Preparing for Thunderstorms & Lightning

Grades 4-6 • Reproducible Master

Part 2

Do you remember your thunderstorm and lightning safety training? Show what you learned by listing some things in your home that you should avoid touching when you are indoors during a thunderstorm.

_____	_____
_____	_____
_____	_____
_____	_____

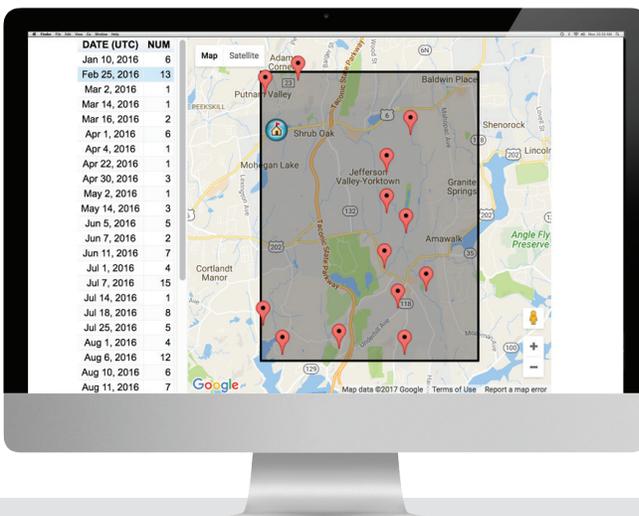


Part 3

Thunderstorms can happen anywhere in the United State, any time conditions are right. How many thunderstorms happen in your area?

Visit www.ncdc.noaa.gov/swdi/#TileSearch to find out.

Enter your zip code, select a year, and choose the “Lightning Strikes” dataset to see a list of days when lightning struck in your area and how many strikes were recorded each day. Use this data to determine when you and your family should be most on the lookout for thunderstorms and lightning.



Replay the Monster Guard Thunderstorm & Lightning training mission. See if you can score higher!

