

STAPLE HERE

Cover Photo: A cloud-to-ground lightning strike during a nighttime thunderstorm.
Taken by C. Clark. Released into the public domain by NOAA.

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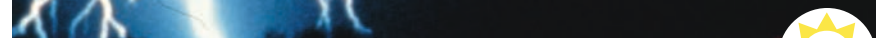
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Getting Ready for Grade 4™

Summer Weather

Thunderstorms

written by Alice Lee Folkins



Summer Reads™ 

Thunderstorms**Table of Contents**

Introduction	3
Hot Air, Cold Air	4
Thunder and Lightning	5
Rain	6
Rate your thinking and reading	7
Comprehension questions	7



Dear Fourth Grader,

I am a teacher who has studied how children learn to read well. What I have learned has been used to write SummerReads and programs like QuickReads® and Ready Readers.

The best way to be ready for fourth-grade is to read every day of the summer. You can choose to read a chapter or a book from SummerReads. But be sure to read it at least three times on the same day. Here's how to use SummerReads:

1. Start by reading it yourself. Mark the words that you don't know.
2. Next, ask someone to read with you. Get that person to help you with any words you don't know. You can even go to the computer to www.textproject.org and hear a recording of the books.
3. Last, you're going to read by yourself to answer the questions at the end of the book. You can go to the computer to find the answers.

Have a reading-filled summer!

Elfrieda (Freddy) Hiebert, Ph.D.

Inventor of the TEXT model

Thunderstorms

Photo: Rain falls on a field in Germany during a storm in 2006.
Released into the public domain by Cremedia at de.wikipedia.

Introduction**Thunderstorms**

For many people around the world, summer brings thunderstorms. Warm wet air and strong winds help to create thunderstorms. But thunderstorms don't happen in every part of the United States. The states along the Pacific Ocean don't get as many thunderstorms as the states along the Gulf of Mexico. Some areas of Florida have thunderstorms once a day for most of the summer!

The best place to be during a thunderstorm is inside a building. Lightning from a thunderstorm can be very dangerous. Just before a thunderstorm, the air may feel like there is electricity in it. When people start feeling electricity in the air, they know a thunderstorm is on the way. People start heading inside buildings so they can be safe during a thunderstorm.

So how are thunderstorms created? You can read about it here without getting wet!

Thunderstorms

Hot Air, Cold Air



Part of what makes summers so hot is also what causes thunderstorms. As heat from the sun beats down on Earth, the heat evaporates some of the water in lakes and oceans. The evaporated water stays in the air. This evaporated water makes the air feel heavy and humid. Humid air is what makes you feel hot and sticky during the summer.

Photo: A rolling thunderstorm cloud arrives over Enschede, The Netherlands, July 2004
© 2004 by John Kerstholt. Some rights reserved (<http://creativecommons.org/licenses/by-sa/3.0>).

Warm humid air usually does not stay in one place. The wind can move it higher in the sky where it will cool off. When warm humid air cools, it forms clouds. As more water is moved from lakes and oceans to the air, the clouds get bigger and bigger.

In summer, the air near the ground is hotter than it is during other seasons of the year. When this hot air mixes with cool air from another area, there will be changes in the weather. Greater differences between the temperatures of the hot and cold air will cause greater changes in the weather. Imagine putting an ice cube in a warm drink. As soon as the ice hits the warm drink, it will crack and pop. But, if you put the ice cube in a cool drink, it will not crack or pop as much. When warmer and cooler clouds get close to one another, there may be some popping and cracking as the weather changes. There may be more clouds or storms. A thunderstorm may be on its way.

Thunderstorms

Thunder and Lightning



Summer thunderstorms can be exciting to watch from inside a building. First, you see dark clouds gathering. Suddenly, you see a bolt of lightning. Then you hear the thunder. Kaboom! Finally, you see a lot of rain coming down. It's a good idea to wait inside than to go out during the storm. The storm will probably be over in about an hour but it's much safer inside than out.

The bright bolt of lightning you saw is really electricity. It is the same electricity that we use to power our lights and TVs.

There is a lot of energy in a lightning bolt, enough to power a light bulb for about 100 days. The Earth receives several hundred millions of lightning bolts each year. This many lightning bolts add up to a vast amount of energy.

People usually hear thunder soon after they see a bolt of lightning. You can use this fact to find out how far you are from the storm. As soon as you see a bolt of lightning, start counting the seconds. When you hear the thunder, stop counting. Every five seconds from the time you see the lightning bolt until you hear thunder equals about one mile. If you counted 10 seconds, then the thunderstorm is about 2 miles away. If you see lightning but don't hear thunder, it means that the thunderstorm is more than 12 miles away. That's too far to hear the thunder.

Thunderstorms

Rain



You already know that the water in lakes and rivers comes from precipitation. Precipitation is any form of water that falls from the sky such as rain and snow. A heavy rainfall can drop as much as two inches of rain per hour. How much water is that? Imagine if someone built walls around a football field and gathered all of the rainwater. If two inches of rain fell in an hour, you would have more than 70,000 gallons of water.

Photo: People wait to be rescued from flooding caused by rain from a tropical storm in Kingfisher, Oklahoma, August 2007. Taken by Marvin Nauman. Released into the public domain by FEMA.

That's enough water for you to fill a bathtub every single day for four years!

That may seem like a lot of water. But people need water for many other reasons than staying clean. We need water to drink and cook. Crops and animals need water too. All of this water comes from precipitation like rain.

Of course, too much rain can cause problems. Floods happen when rain doesn't have enough time to flow into nearby rivers and lakes. One way to think about this is to observe what happens when you let water out of the bathtub. It takes time for all the water to leave the tub because the drain is too small for all the water to leave at once.

Even when there is flooding, rain is not lost. Rain that falls in one state can be stored in the lakes and rivers of another state. Your next glass of water may come from rain that fell hundreds of miles from your home.

Thunderstorms**Rate your thinking and reading**

- ✓ Put a check each time you read one of the chapters of the book.
- ★ Give yourself a star for Sharing if you told someone about something you learned from reading the chapter.
- ✚ Give yourself a + if you can tell that your reading is getting smoother.

	1st Read	2nd Read	3rd Read	Sharing	Smoother
Introduction					
Hot Air, Cold Air					
Thunder and Lightning					
Rain					

Comprehension questions**Hot Air, Cold Air**

1. We described how clouds normally form during warm weather. Can you put these events in the right order?

- _____ As humid air cools, clouds form
- _____ The heated air evaporates water in lakes and oceans
- _____ The sun heats up the air near the ground
- _____ The wind moves the warm humid air into the sky

2. True or false? Great differences in the temperature of hot air and cold air cause small changes in the weather.
- true false

Thunder and Lightning

3. If it takes 5 seconds to hear the thunder after you see a bolt of lightning, how far away was the lightning?

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4. True or false? The electricity in lightning is the same electricity that powers TVs and light bulbs.
- true false

Rain

5. Why is too much rain a bad thing?

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6. True or false? If it rains a lot in one area, the extra water is lost forever.
- true false