

Lesson 6: Clouds

☐ Getting Started

Where does the water from humidity go? It creates clouds, fog, and precipitation, all as part of the water cycle. Different kinds of clouds tell you different things about the approaching weather.

Weather Journal: In your weather journal, record today's temperature, air pressure, precipitation, wind speed and direction, relative humidity, and wind chill or heat index information, if applicable. You will fill in other information later in the lesson.

Stuff You Need

- "Weather Words" booklet (kit)
- *Weather and Climate* by Kathleen M. Reilly
- black construction paper (kit)
- colored pencils
- food coloring (kit)
- glass jar (kit)
- glue or gluestick
- matches (kit)
- plastic sandwich bag (kit)
- scissors
- tape
- very warm (not boiling) water

Ideas to Think About

- How are clouds connected to the water cycle?
- How does my local water cycle affect the weather in my area?

Things to Know

- Warm air can hold more water vapor than cooler air can. As air warmed by the Earth rises in a low-pressure area, it cools and cannot hold as much water. This "extra" water condenses to form clouds.
- The ten main cloud types are cirrus, cirrostratus, cirrocumulus, cumulus, altocumulus, stratocumulus, cumulonimbus, stratus, altostratus, and nimbostratus.
- See the "Weather Words" booklet for definitions of the following words: cirrus, stratus, cumulus, nimbus

☐ Reading and Questions

Read pages 52-56 in *Weather and Climate*. Answer the following questions. As you read, fill in the definitions for the "Lesson 6" section of your "Weather Words" booklet. Then watch the "Making of a Cloud" video at the following web link.



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1. What types of messages can clouds carry?

2. What are clouds made of?

3. Why do clouds usually appear white?

Activities

☐ Activity 1: Making Fog

You read that fog is a giant cloud near the surface of the earth. Next time you see fog outside, go out and walk in the clouds! Today, you are going to make fog! You will need adult to help you light the match. Follow the directions on page 60 in the book.

☐ Activity 2: Cloud Chart

Clouds are named according to their shape and how high they form in the atmosphere. Luke Howard was the first person to attempt to classify clouds. He determined that clouds come in three main shapes (cirrus, cumulus, and stratus), but they can combine to form other kinds of shapes.

If you know what the parts of a cloud name mean, it is easier to remember which clouds are which:

- Cirrus: wispy, hair-like
- Cumulus: a pile
- Stratus: a layer or sheet
- Alto: high
- Nimbus: rain

The "Cloud Chart" sheets will help you learn how to identify ten different types of clouds. Use information from the following websites, and from page 52-55 of *Weather and Climate* to find out more about each cloud type and what kind of weather that cloud brings. (As you work through the chart, notice that "alto" clouds are actually middle-altitude clouds. In cloud names, "alto" means that a cloud is higher than its lower-altitude relative. For example, altostratus clouds are higher than stratus clouds.)

Next, cut out the clouds from the first "Clouds in the Sky" page, and then sort each cloud on page 2 according to how high the cloud forms in the atmosphere. Once a parent checks your work, you can paste the clouds on the page.

Weather Journal: When you've finished the activity pages, try to identify one cloud by name and note it in the "Cloud Description" column of your journal. (If there are several kinds of clouds in the sky, look for one that is easy to identify. Don't worry if you have trouble — cloud identification is hard! Just do your best.) Use the clouds you see in the sky and/or today's air pressure reading to predict the weather for later today or tomorrow.



Ten Basic Cloud Types

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These cloud descriptions provide lots of clues you can use to help you identify clouds you see.



What Are the Different Types of Clouds?

www.beyondthepage.com/link/13237/



Cloud Identification Flowchart

www.beyondthepage.com/link/13238/

Use this flowchart to help you identify the clouds you see in the sky when you are filling out your weather journal. You might want to print a copy of it to take outside with you.

Wrapping Up

Did you know that fog can produce precipitation? When it does, the precipitation is typically a light drizzle or light snow. Over the next few days, check your local weather forecast. Is fog expected? Did precipitation occur?

Weather Journal: For the Cloud Description column, look for one cloud in the sky that is easy to identify. On days when the clouds are too hard to identify, describe the day's cloud cover more generally. If you notice early-morning fog or dew (today or in the future), be sure to mention that in the notes section of your weather journal as well. Use today's clouds and/or air pressure reading to forecast the weather for later today or tomorrow.

CLOUD CHART

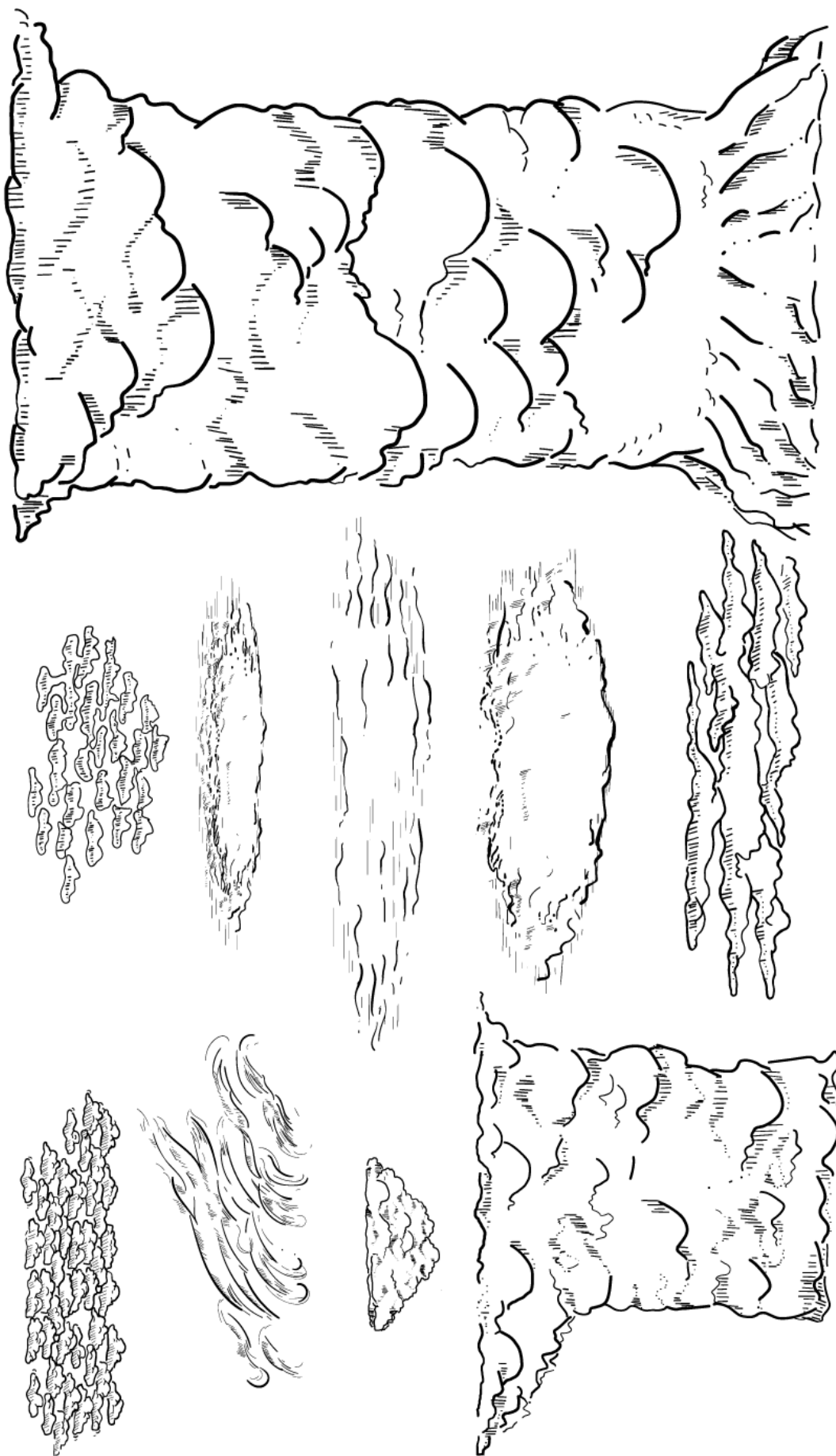
Directions: Describe each cloud type by using the meanings of each part of its name. For example, a cirrostratus cloud looks like a thin, wispy layer. Identify whether each cloud is found at high, middle, or low altitudes, describe the type of weather they usually indicate, and write clues that will help you identify each type of cloud in the future.

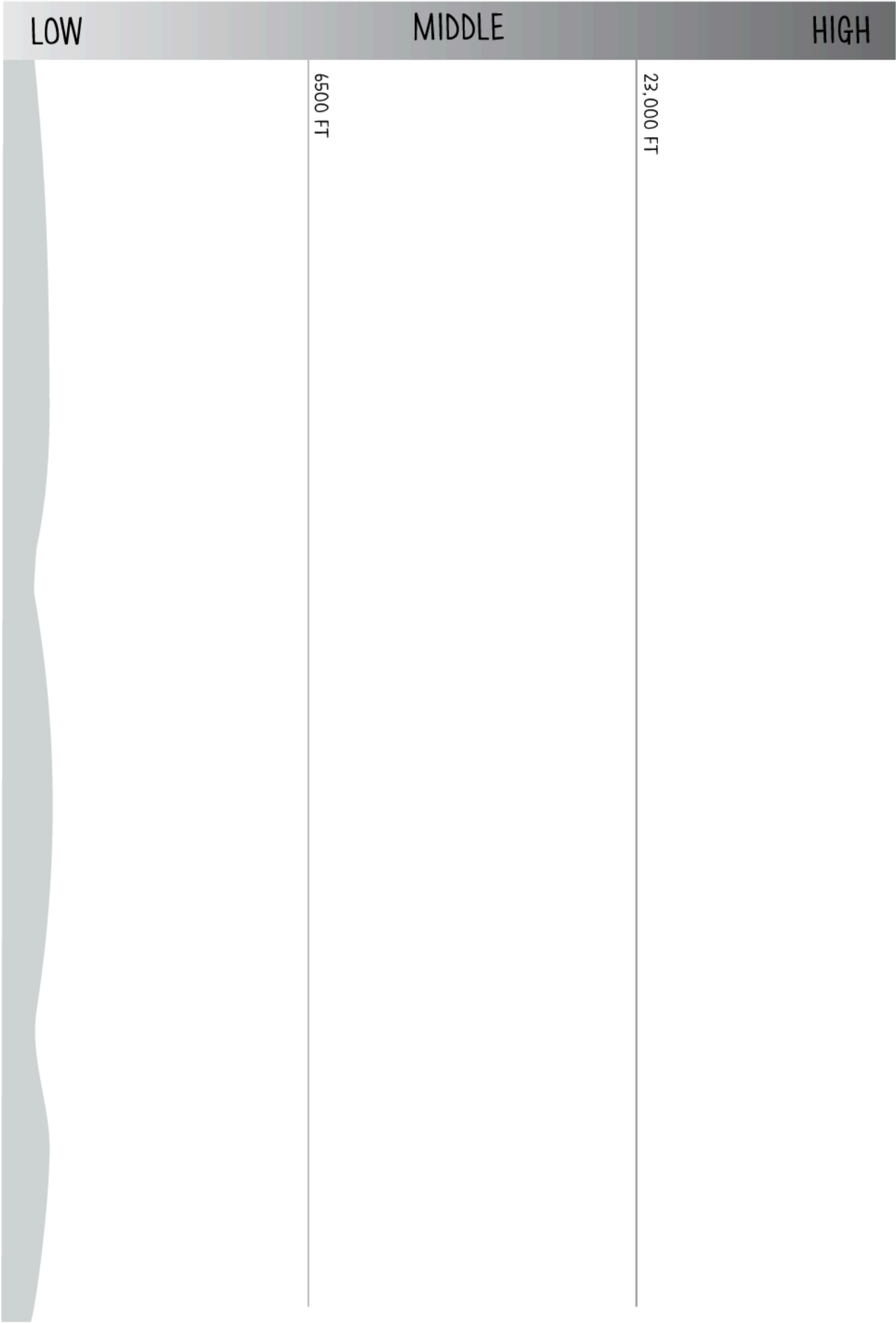
Cloud Name	Description	Altitude	Type of Weather	Clues
Cirrus				
Cirrostratus				
Cirrocumulus				
Altostratus				
Alto cumulus				

Cloud Name	Description	Altitude	Type of Weather	Clues
Stratocumulus				
Cumulus				
Cumulonimbus				
Stratus				
Nimbostratus				

CLOUDS IN THE SKY

Directions: Cut out the clouds below and paste them in the sky on page 2 at the altitude where they form (some clouds span more than one level!). Label each cloud with its name. Lightly shade any clouds that are usually gray. If a cloud produces precipitation or thunderstorms, draw the precipitation and/or lightning beneath those clouds. Use your cloud chart, book, and the websites provided to help you. When you are done, optionally color the sky blue.





Lesson 6: Clouds

Getting Started

✿ Ideas to Think About

- How are clouds connected to the water cycle?
- How does my local water cycle affect the weather in my area?



Things to Know

- Warm air can hold more water vapor than cooler air can. As air warmed by the Earth rises in a low-pressure area, it cools and cannot hold as much water. This "extra" water condenses to form clouds.
- The ten main cloud types are cirrus, cirrostratus, cirrocumulus, cumulus, altocumulus, stratocumulus, cumulonimbus, stratus, altostratus, and nimbostratus.
- See the "Weather Words" booklet for definitions of the following words: cirrus, stratus, cumulus, nimbus

• Skills

- Understand how cloud shapes, types, and elevation predict weather conditions and patterns and associated elevation. (S)

Introducing the Lesson

Today, your child will explore how clouds form and what they can tell us about the weather. She will learn how water vapor in the air condenses to create different types of clouds and how those clouds fit into the water cycle. She will also discover the ten main types of clouds and how their shape, height, and appearance can help predict upcoming weather. She will practice identifying clouds and recording her observations in a weather journal, helping her connect what she learns to the sky above her!

As your child does today's reading, she will fill in the definitions for the "Lesson 6" section in her "Weather Words" booklet. Her definitions should be similar to the following:

- stratus: lowest level of clouds; they are usually layered sheets of clouds
- cumulus: puffy, rounded clouds usually found in the middle cloud layer
- cirrus: highest level of clouds and form in streaks or wisps
- nimbus: clouds that produce rain

Reading and Questions



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1. What types of messages can clouds carry?

Answers might include that they can give us clues to what the weather will be like in the near future or that they can tell us if the day will be clear and sunny or if a storm is coming.

2. What are clouds made of?

Water droplets and ice crystals clinging to tiny dust specks in the sky.

3. Why do clouds usually appear white?

They are reflecting all the colors in the light from the Sun.

Activities

Activity 1: Making Fog

In this experiment, your child learned that fog is essentially a low-lying cloud that forms when water vapor condenses into tiny droplets near the surface of the Earth. By following the steps in the activity, she created her own fog, helping her understand how changes in temperature and moisture can cause fog to appear. Next time she sees fog outside, she can connect it to what she learned and explore it with a new perspective!

Activity 2: Cloud Chart

Starting today, your child will attempt to identify one type of cloud in the sky for her weather journal. Be available to help her as needed. Cloud identification can be difficult, especially when the sky is filled with several different types of clouds. Encourage her to pick a cloud that is easy to identify and to do the best she can to discern what kind it is.

For this activity, your child will use information from the book and from some websites provided to fill in a cloud chart. Encourage her to use the definitions in the activity introduction to describe each cloud. The information in the Clues column will vary.

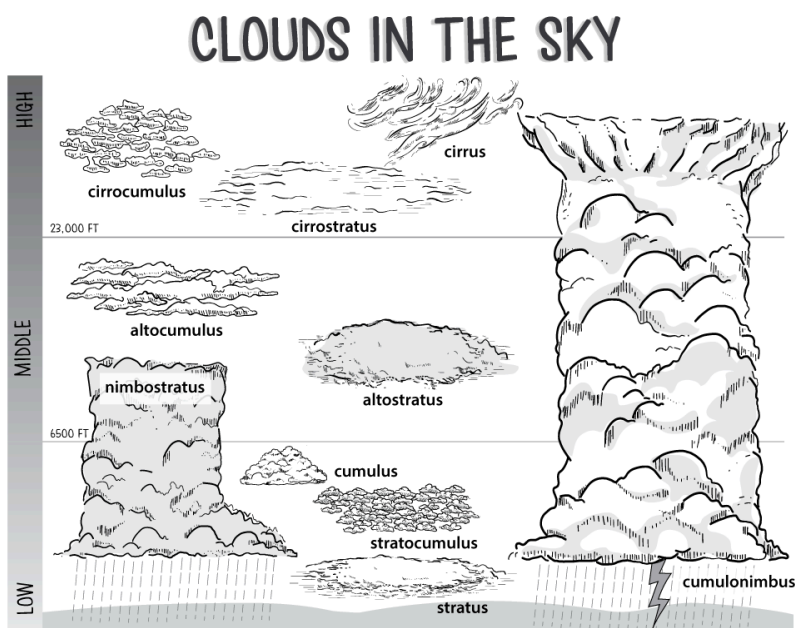
Answer Key:

- **Cirrus:** wispy, hair-like, delicate, feathery; high altitude; indicate a coming change in weather
- **Cirrostratus:** thin, white, hair-like sheets or layers; high altitude; indicate that rain or snow is coming within a day
- **Cirrocumulus:** thin, may look like ripples or small grains; high altitude; indicate cold weather
- **Altostratus:** gray or bluish-gray layer, partly or totally cover the sky; middle altitude; indicate steady rain or snow
- **Alto cumulus:** white or gray piles of clouds, often in rows or ripples; middle altitude; indicate good weather
- **Stratocumulus:** layer of grayish or white piles of clouds that look like a honeycomb; low altitude; indicate good weather now but a storm may be coming
- **Cumulus:** puffy, cotton-like or cauliflower-like; low altitude; good weather
- **Cumulonimbus:** tower-like cloud pile that brings rain, smoother upper portion and darker base; spans from low to high altitude; indicate thunderstorms, rain, hail, and possibly tornadoes
- **Stratus:** white sheet that covers the sky, fog-like; low altitude; indicate gray, gloomy weather
- **Nimbostratus:** thick, dark, and gray layer of clouds that brings rain, may blot out sunlight; spans from low to middle altitude; indicate steady rain or snow

Next, your child will cut out cloud images and paste them at the correct altitude on the "Clouds in the Sky" page. She should label each cloud and use colored pencils to draw precipitation and lightning beneath the correct clouds and shade any clouds that are usually gray.

Use the following answer key to check her work. Distinguishing between the altocumulus and stratocumulus images may be difficult. She can use these images interchangeably. Stratus, altostratus, and cirrostratus clouds can also be hard to distinguish. Again, it's ok if she uses these images interchangeably as long as she understands the differences between these clouds in real life. Many clouds can have a tinge of gray; your child's shading may not match the answer key exactly.

"Clouds in the Sky" Answer Key



Wrapping Up

Questions to Discuss

- Which clouds are associated with steady rain and which with big storms? (Nimbostratus clouds more often create steady rain, while cumulonimbus clouds form large, short storms.)
- Sometimes people say that cirrus or stratus clouds early in the morning will "burn off" and not produce rain. Do you think this is true? Do you think "burn off" is a good way to describe the disappearance of clouds? Why or why not? (Yes, these high clouds often disappear as the air heats up and can hold more moisture.)
- How does cloud cover affect our activities? (Answers will vary. Clouds decrease sunshine and lower the temperature outside. This may make some activities more enjoyable [hiking or playing outside in warm weather], and some less enjoyable [the beach or a water park]. Clouds that produce rain or storms can cause us to cancel our activities altogether.)

Things to Review

Review the different types of clouds with your child.