



ARM

CLIMATE RESEARCH FACILITY

Education and Outreach Lesson Plan

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Grade levels K–2
Common Covering Clouds

Common Covering Clouds

Approximate Time

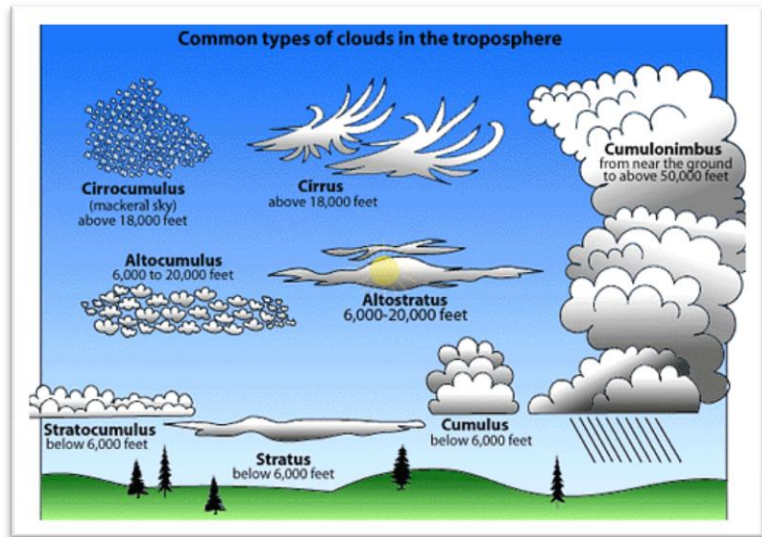
One and a half hours, or two 45-minute segments

Objective

The student will investigate and demonstrate understanding of common clouds as evidenced by completion of activity.

Key Points to Understand

- There are many types of clouds, including cirrus, cumulus, stratus, cirrocumulus, altocumulus, stratocumulus, cumulonimbus, and altostratus.
- Clouds influence weather.
- Weather is what you see outside currently.
- Climate covers a longer period of time—years, months, or decades.



Background Information

A cloud is a visible collection of a large number of tiny water droplets or ice particles being carried by a current of air. Clouds are formed when water vapor condenses. Condensation occurs on aerosols, which are water-absorbing. There is an abundance of naturally occurring aerosols in the Earth's atmosphere, i.e., dust and salt from sea spray. Pollution also contributes aerosols for cloud formation. Clouds are produced when the air cools, such as when air rises or when air is forced to rise over mountains.

Clouds are an indicator of approaching weather. Some clouds indicate calm weather, and others tell of approaching storms. If the cloud is raining then the term “nimbus” is used, as in “cumulonimbus” and “nimbostratus.” Furthermore, the name of each cloud is based on appearance and altitude.

The following Latin words were used to come up with the cloud names:

- Alto: “middle”
- Cirrus: “wispy or curly”
- Cumulus: “lump or heap”
- Nimbus: “rainy or stormy”
- Stratus: “layer”

Key Vocabulary

- **Aerosol:** A system of particles dispersed in a gas, such as smoke or fog.
- **Altostratus:** A cloud with globular masses or rolls in layers or patches, larger and darker than cirrostratus and smaller than stratocumulus. These clouds are of medium altitude, about 8000–20,000 feet.
- **Altostratus:** A cloud that is generally a uniform gray sheet or layer, lighter in color than nimbostratus and darker than cirrostratus. These clouds are of medium altitude, about 8000–20,000 feet.
- **Atmosphere:** The air surrounding and bound to the Earth.
- **Cirrus:** High-level clouds (16,000 feet or higher), composed of ice crystals and appearing white. Cirrus clouds typically have a fibrous or hair-like appearance and often are semi-transparent.
- **Cirrocumulus:** A cloud with thin, white patches, each of which are composed of very small granules or ripples. These clouds are of high altitude at about 20,000–40,000 feet.
- **Climate:** The weather conditions of a region throughout the year, averaged over a series of years.
- **Condensation:** The physical process by which a vapor becomes a liquid or solid.
- **Cloud:** A visible aggregate of tiny water droplets or ice particles in the atmosphere above the Earth's surface.
- **Cumulus:** A cloud that is generally dense and with sharp outlines, showing vertical development in the form of domes, mounds, or towers. Tops are normally rounded while bases are more horizontal.
- **Cumulonimbus:** A cloud that is extremely dense. It is a vertically developed cloud with a low, dark base and fluffy masses that tower to great heights. Cumulonimbus clouds usually produce heavy rains, thunderstorms, or hailstorms. Also called a thundercloud.
- **Stratus:** A low, generally gray cloud layer with a fairly uniform base. Stratus may appear in the form of ragged patches.
- **Stratocumulus:** Low-level clouds, existing in a relatively flat layer but having individual elements. Elements often are arranged in rows, bands, or waves.
- **Troposphere:** The lowest layer of Earth's atmosphere, ranging from 7–20 kilometers above the Earth's surface.
- **Weather:** The state of the atmosphere with respect to wind, temperature, cloudiness, moisture, pressure, etc. **Weather** refers to these conditions at a given point in time (e.g., today's high temperature).

Materials

- 5x7 pictures of each of the eight clouds
- One piece of butcher paper or poster board
- 15–20 cotton balls per student
- One gray marker per student (or gray tempera paint and paint brush)
- One 11x17 piece of construction paper per student (blue or white)
- Glue (one bottle per student)
- Crayons or colored pencils
- Student Record Sheet

Preparation

Before the lesson, gather materials. Each student should have 15–20 cotton balls, glue, marker or paint, and a piece of construction paper on their desk. On the board, tape up a large piece of butcher paper or poster board.

Management Tip

Students may need to fill in Student Record Sheets as directed by the teacher dependent upon student needs. The Student Record Sheet can be modeled under a document camera or can be enlarged to poster size to be completed as a whole class activity.

Procedure

1. Before beginning the lesson, ask students the following questions and have a class discussion.
 - What are clouds?
 - What does it mean when we see different types of clouds outside?
 - How would you describe the clouds you have seen outside?
2. Bring students to the floor by the poster board. On the poster board, tape up pictures of each cloud one at a time. Ask students to describe each cloud as you show them the pictures. Then, below each cloud, write the name of the cloud and a description (see description below). Leave this poster up throughout the lesson.

Cirrus: Thin, wispy, and white. They are located high in the sky and are almost entirely made up of ice particles. These types of clouds often are seen before rain or snow.

Cumulus: Low and white, puffy clouds with flat bottoms. They are seen on nice days.

Cumulonimbus: Tall, vertical clouds. Often called thunderheads. They usually produce lightning and storms.

Stratus: Low-hanging clouds that are in layers that look like a gray blanket. They look like haze in the sky. These types of clouds can become fog if they get low enough in the air.

Stratocumulus: Low, broad, and flat on the bottom, puffy on top.

Alto cumulus: A middle-level, medium-sized puffy cloud that often precedes a cold front.

Alto stratus: Thin, middle-level clouds composed of ice crystals and water droplets.

Cirrocumulus: Wispy, high-altitude clouds that include some amount of very cold precipitation.

3. Each student should now have a piece of construction paper, glue, cotton balls, gray marker or paint and paint brush at their desk. Depending on the level of the students, guide them, or allow them to independently make their own representation of each cloud on the construction paper. Students take the cotton balls, spread them apart to make thin wispy clouds or clump them together to make thick clouds and glue them on their paper to represent the different clouds. Use a marker or paint to lightly color the cotton balls to look like gray or hazy weather. Underneath each cloud, have the students write the name of the cloud and a description of the cloud. The end result should look like the image on the first page.
4. Using the student record sheet "Common Covering Clouds," take the students outside to look at the weather and complete the student record sheet together.

Closure/Evaluation

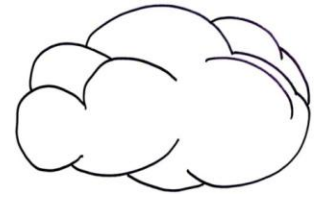
Ask students:

- How would you know if a storm was approaching by looking up at the clouds in the sky?
- How do clouds affect our weather?
- What type of clouds would you expect on a nice day? A rainy day? An overcast day?

Suggested Follow-Up Activities

- ARM "Covering Clouds" worksheet (attached)
- Take the students outside to look at the clouds in the sky. Have them come back inside and make that cloud on a new sheet of paper, or have students write a few sentences about the clouds they see.
- Choose books that discuss weather and clouds for students to read.
- Research poems about clouds on the internet. Discuss and/or write up a paragraph analyzing the poem.
- Using old magazines, have students cut out pictures of clouds and glue them onto a piece of paper. Write a description of each cloud, the weather, and name the cloud.
- Interview adults about different kinds of extreme weather they have experienced in their lifetime.
- Collect current newspaper articles related to weather, clouds, or global warming.
- Write a report about clouds, weather, global warming, or extreme weather.

Name _____
Date _____



Common Covering Clouds

Research Question: What kinds of clouds are influencing our weather today?

Hypothesis

Materials

- Activity Sheet
- Pencil
- Crayons or Colored Pencils

Data

Today's Cloud Cover

	_____ Time	_____ Time	_____ Time	_____ Time
Sketch clouds you see				
Weather-write about what you see				

Conclusion

Based on what I observed outside today, I can conclude...
