

CLOUDS

WEATHER UNIT

Cycle 3 Science

Name _____

Teacher: Mr. D. Strina



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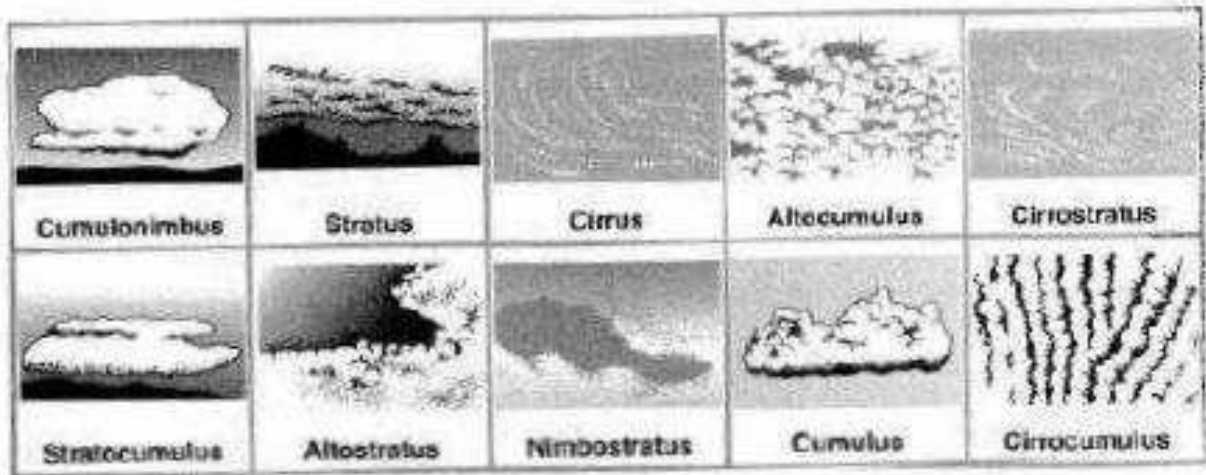
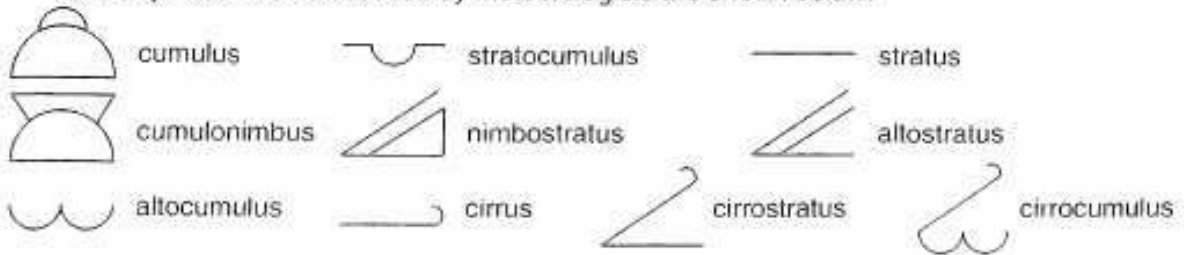
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NOTES---

Clouds are collections of tiny water and/or ice particles in the air. Clouds close to the earth are called fog.

Clouds are created when water vapor in the air cools below the dew point and forms droplets on tiny particles in the air. This occurs when warm air is pushed upwards into the atmosphere and cools.

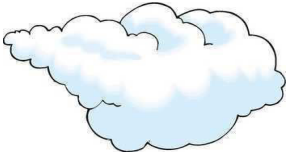
Some symbols for clouds used by meteorologists are shown below:



CLOUD TYPE	DESCRIPTION
High Clouds	<p>Cirrus - Generally made up of ice crystals, appear as feathery "horse tails"</p> <p>Cirrostratus - a thin white layer of clouds.</p> <p>Cirrocumulus - Fluffier high white clouds.</p>
Intermediate Clouds	<p>Altocumulus are thick, flattened layers of clouds</p> <p>Altostratus - A thick gray layer of sometimes don't allow the sun or moon to appear.</p>
Low Clouds	<p>Stratocumulus - quite large fluffy cloud layers</p> <p>Stratus - A continuous cloud layer.</p> <p>Nimbo stratus - A continuous cloud layer that is dark and is seen on days of constant rain or snow.</p>
Vertical Clouds	<p>Cumulus - Huge fluffy clouds with a flat base bottom and piled up into the sky.</p> <p>Nimbocumulus - Dark cumulus clouds seen during thunderstorms.</p>

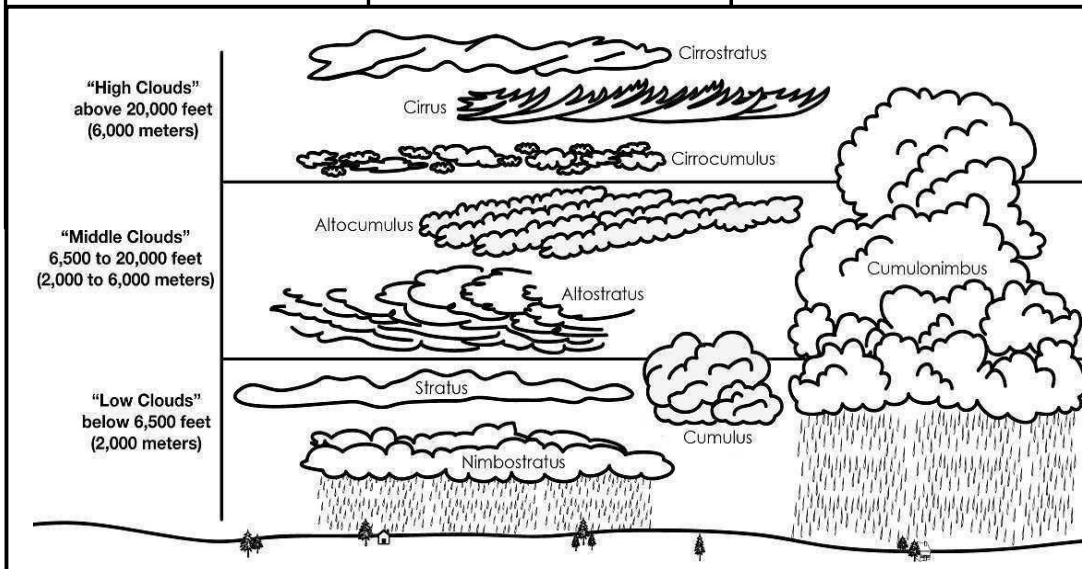
NOTES--

TYPES OF CLOUDS



When you look up in the sky, you realize that no two clouds look exactly alike. Clouds are formed from water vapor that condenses then clusters together in droplets. There are many different types of clouds that can be seen. The types of clouds are determined based on what they look like and how high they are in the atmosphere.

High-Level Clouds	Mid-Level Clouds	Low-Level Clouds	Vertical Clouds
<p>High-level clouds are formed in altitudes above 20,000 feet. Because the temperatures are so cold at this elevation, these clouds are formed from ice crystals.</p> <p><u>Cirrus</u> clouds are thin and wispy clouds that are blown by high winds. They usually mean the day will have fair or pleasant weather, and follow the direction that the air moves at the altitude they are found at.</p> <p><u>Cirrostratus</u> clouds are like very thin sheets of clouds that cover large parts of the sky.</p> <p><u>Cirrocumulus</u> clouds look like small round puffs in the sky. Sometimes they are called mackerel clouds because they look similar to fish scales.</p>	<p>Mid-level clouds are found in altitudes between 6,500 to 20,000 feet. They are formed mainly of water droplets, but can also be made up of ice crystals when the temperature is cold enough.</p> <p><u>Altostratus</u> clouds are composed of water droplets and are gray and puffy. These clouds are usually seen on warm and humid summer mornings and are usually a sign that thunderstorms will follow later in the day.</p> <p><u>Altostratus</u> clouds are made up of ice crystals and water droplets. They can cover the entire sky and form before rain storms.</p>	<p>Low-level clouds are found below 6,500 feet and although they are mostly made up of water droplets. They can also be composed of ice particles and snow in very cold temperatures.</p> <p><u>Stratus</u> clouds are among the low-lying clouds. They are gray clouds that cover the entire sky and can be the result of very thick fog lifting in the morning.</p> <p><u>Nimbostratus</u> clouds are dark gray clouds that produce falling rain or snow.</p>	<p><u>Cumulus</u> and <u>cumulonimbus</u> clouds are both known as vertical clouds.</p> <p><u>Cumulus</u> clouds are also called fair weather clouds and look like floating cotton. They have very flat bases and are not very tall clouds. When <u>cumulus</u> clouds are first formed from droplets, they have very distinct edges, but as they move through the sky, air causes the edges to appear more ragged and broken apart.</p> <p><u>Cumulonimbus</u> clouds can take up several miles across the sky and can reach elevations of 39,000 feet or higher because of very strong updrafts in the atmosphere. Low level <u>cumulonimbus</u> clouds are made up of water droplets, but at higher elevations, they consist of ice crystals. <u>Cumulonimbus</u> clouds are they type of clouds that bring lightning, thunder, violent tornadoes and other intense weather situations.</p>



A. Draw lines to match the clouds with their descriptions.

- | | |
|------------|--|
| 1. cirrus | white and feathery |
| 2. cumulus | layers of gray clouds that cover most of the sky |
| 3. stratus | piles of cotton |

B. Fill in the missing words.

1. Cirrus clouds form _____ in the sky. (high, low)
2. You can often see cumulus clouds on a _____ summer day. (sunny, rainy)
3. Cirrus clouds usually mean that _____ is coming within a day. (rain or snow, a thunderstorm)
4. A stratus cloud that forms on the ground is called _____ (cirrus, fog)
5. _____ means that a cloud is heavy and dark and will bring rain. (Nimbus, Cumulus)
6. Cumulonimbus clouds produce summer _____ (sunny days, thunderstorms)
7. You can study clouds to find out how the _____ will change. (weather, moon)

C. Write the names of each type of cloud on the lines below.

D. Answer the questions.

1. What is a cloud?

2. What are cirrus clouds made of?

Cloud Types

Complete the diagram with the correct

“High Clouds”
above 20,000 feet
(6,000 meters)

1- _____
2- _____
3- _____

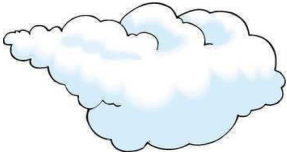
4- _____
5- _____
6- _____

7- _____
8- _____
9- _____

“Middle Clouds”
6,500 to 20,000 feet
(2,000 to 6,000 meters)

“Low Clouds”
below 6,500 feet
(2,000 meters)

TYPES OF CLOUDS



1. Name the two types of low-level clouds.

2. What type of clouds are called "fair weather clouds" and look like floating cotton?

3. Name two types of clouds that are between 20,000 and 65,000 feet in the air.

4. Which type of clouds brings lightning, thunder, and tornadoes?






5. Are stratus clouds or cirrus clouds found closer to the ground?






6. What are cirrus, cirrostratus, and cirrocumulus clouds made of?

7. What type of cloud is often formed by fog lifting in the morning?

8. Why are cirrocumulus clouds sometimes called mackerel clouds?

DRAW THE CLOUD SYMBOL UNDER EACH PICTURE.

				
Cumulonimbus	Stratus	Cirrus	Alto cumulus	Cirrostratus
1	2	3	4	5

				
Stratocumulus	Altostratus	Nimbostratus	Cumulus	Cirrocumulus
6	7	8	9	10

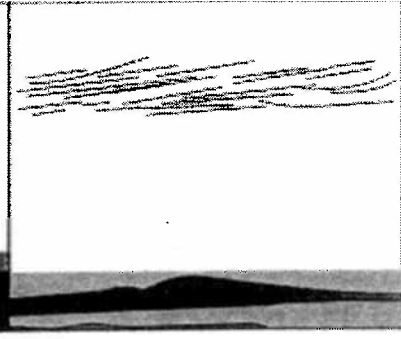
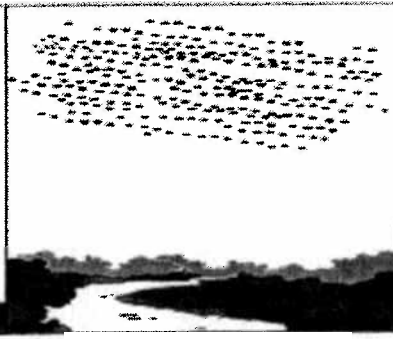
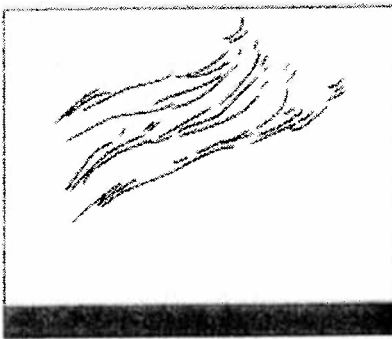
MULTIPLE CHOICE.

1. The word that means rain, snow, hail, sleet, and freezing rain is _____. <input type="radio"/> A Prediction <input type="radio"/> B Precipitation <input type="radio"/> C Clouds <input type="radio"/> D Cumulonimbus	2. The type of cloud that produces thunderstorms is _____. <input type="radio"/> A Nimbostratus <input type="radio"/> B Cirrostratus <input type="radio"/> C Cumulonimbus <input type="radio"/> D Alto cumulus
3. Layers of curly clouds are called _____. <input type="radio"/> A Cumulonimbus <input type="radio"/> B Nimbostratus <input type="radio"/> C Cirrostratus <input type="radio"/> D Alto cumulus	4. Layers of rain clouds are called _____. <input type="radio"/> A Cumulonimbus <input type="radio"/> B Cirrostratus <input type="radio"/> C Alto cumulus <input type="radio"/> D Nimbostratus
5. Heaps of rain clouds are called _____. <input type="radio"/> A Cumulonimbus <input type="radio"/> B Alto cumulus <input type="radio"/> C Nimbostratus <input type="radio"/> D Cirrostratus	6. Clouds are made of _____. <input type="radio"/> A Water <input type="radio"/> B Ice <input type="radio"/> C Oxygen <input type="radio"/> D Either (a) or (b)
7. The same storm can produce both rain and snow. <input type="radio"/> A True <input type="radio"/> B False	8. Precipitation falls when clouds get too heavy with water and ice. <input type="radio"/> A True <input type="radio"/> B False

Complete the page with the correct cloud names.

Cloud Types

High Clouds

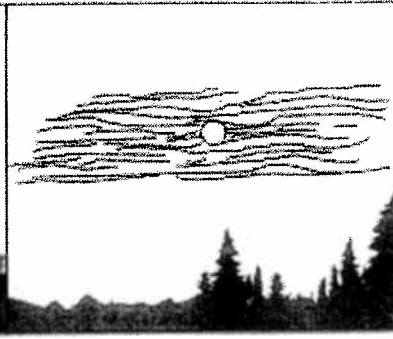


1- _____

2- _____

3- _____

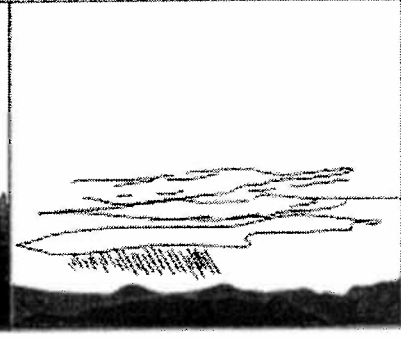
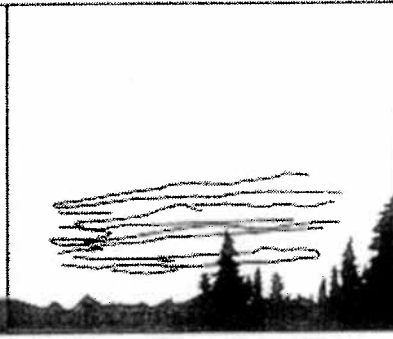
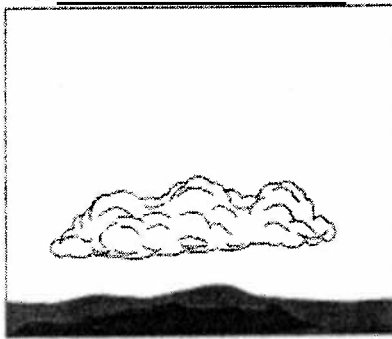
Middle Clouds



4- _____

5- _____

Low Clouds

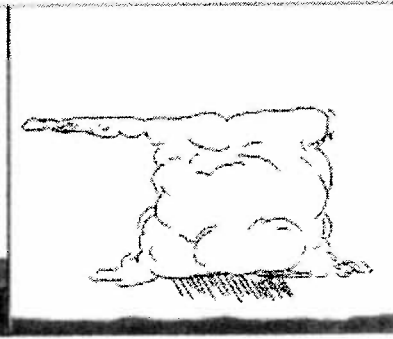
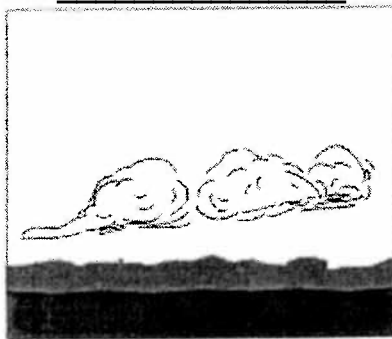


6- _____

7- _____

8- _____

clouds of Vertical Development



9- _____

10- _____

COMPLETE WITH THE CORRECT CLOUD.

- 1 _____ Middle-level, medium-sized puffy clouds.
- Middle-level, layered clouds. 2 _____
- 3 _____ - High-altitude, small, wispy, patchy, puffy clouds.
- 4 _____ - High-altitude, thin, wispy clouds in layers.
- High-altitude, thin, wispy clouds. 5 _____
- 6 _____ - Large, dense, towering clouds that cause thunderstorms.
- Low, puffy clouds. 7 _____
- Ground-hugging clouds. 8 _____
- Low, dark, rain cloud. 9 _____
- 10 _____ - Low, layered, horizontal, wispy clouds with a flat base.
- 11 _____ - Low clouds, broad and flat on the bottom, puffy on top
(higher than cumulus and lower than altocumulus).

MULTIPLE CHOICE.

1. These are collections of tiny water and/or ice particles in the air.
 clouds lightning winds
2. Clouds close to the earth are called
 sleet snow fog
3. Clouds high in the sky that are made of ice crystals are
 cirrus stratus cumulus
4. Clouds that appear fluffy and can stretch up high vertically and frequently have a flat base are
 cirrus stratus cumulus
5. Clouds that are in layers are called
 cirrus stratus cumulus
6. Thunderclouds are also called
 cumulostatus cirrostratus cumulonimbus

CLOUDS

-Fill in the missing words.

A cloud is a mass of water droplets or ice crystals that floats in the air. When warm air rises and cools, the water vapor in air condenses and forms water droplets. These droplets form _____

2,3 There are three main types of clouds. They are _____, _____ and
4 _____. These types of clouds may combine to form many other kinds of clouds. You can study clouds to find out how the weather will change.

Cirrus clouds are white and feathery. They form high in the sky. It is so cold in this part of the atmosphere that cirrus clouds are made entirely of _____. Cirrus clouds usually mean that rain or snow is coming within a day.

5 Cumulus clouds are thick, white, and _____. They look like piles of cotton. You can often see cumulus clouds on a sunny summer day. They mean fair weather. Cumulus clouds form much lower in the atmosphere than cirrus clouds and are made only of water droplets.

6 Stratus clouds are _____ of gray clouds that cover most of the sky. They often mean that rain or snow is coming. Stratus clouds form low in the atmosphere. A stratus cloud that forms on the ground is called fog. Fog forms when air that is holding a lot of water cools off quickly at night.

Sometimes the term nimbus is added to the name of a cloud.

7 Nimbus means that a cloud is heavy and dark and will bring _____.
8 _____ clouds, for example, produce summer
thunderstorms.

DRAW THE CLOUDS BELOW IN THE BOX.

cirrus clouds	cumulus clouds	stratus clouds	cumulonimbus clouds

Common Types of Clouds

Cloud Name	Appearance	Composition	What It Produces	Usual Forecast
Cirrus	Wispy, feathery—sometimes called “mare’s tails”	Ice Crystals	Nothing	Fair
Cirrostratus	Thin, gauzy sheets—Sun appears to have a halo	Ice Crystals	Nothing	Fair
Cirrocumulus	Thin, patchy, wave-like—“mackerel sky”	Ice Crystals	Nothing	Fair
Alto cumulus	Puffy or roll-like—Sun may appear to have a yellow or blue ring	Water	Drizzle, Snow Flurries	Rain
Altostratus	Dense, gray-blue sheets	Ice and Water	Light Rain or Snow	Storms
Stratocumulus	Irregular masses of gray clouds—rippled like cardboard	Water	Drizzle or Snow Flurries	Changing weather
Stratus	Low, uniform, gray sheets	Water	Drizzle or Snow Flurries	Fair
Nimbostratus	Dark, rain clouds—rain often visible	Ice and Water	Steady Rain or Snow	Long spell of precipitation
Cumulus	White, puffy—“balls of cotton”	Water	Nothing	Fair
Cumulonimbus	Thunderheads—flat on top like an anvil; the point indicates the direction the cloud is moving	Ice and Water	Heavy Rain, Snow, Hail	Thunderstorms
Fog	Stratus clouds that touch the ground	Water	Drizzle or Snow Flurries	Fair

Partly Cloudy

Matching: Write the letter for the correct word in each blank.

- _____ 1. Clouds that usually cover the whole sky with a blue-gray appearance and form ahead of storms.
- _____ 2. Thin, wispy clouds that usually point in the direction of air movement at their height.
- _____ 3. Clouds in this layer are primarily composed of ice crystals.
- _____ 4. Large groups of tiny water droplets or ice particles that are visible.
- _____ 5. Clouds that form vertically.
- _____ 6. Clouds from the low-level cloud layer that touch the ground.
- _____ 7. Clouds in this layer are primarily composed of water droplets, but can also be composed of ice crystals.
- _____ 8. When this word part is added to a cloud name, it indicates precipitation.
- _____ 9. These clouds are formed when fog lifts off the ground.
- _____ 10. Clouds form when this occurs.

A. high-level clouds

E. clouds

I. cirrus clouds

B. middle-level clouds

F. stratus clouds

J. altostratus clouds

C. fog


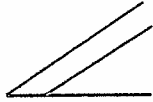

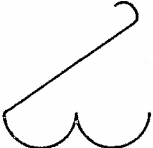


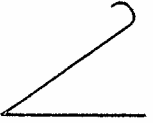


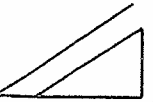
G. cumulus clouds

D. nimbus

H. condensation

Identifying Clouds

For each symbol below, tell which type of cloud it stands for and give some of the characteristics of that cloud type.

Symbol	Cloud Type	Characteristics
1. 	_____	_____ _____ _____
2. 	_____	_____ _____ _____
3. 	_____	_____ _____ _____
4. 	_____	_____ _____ _____
5. 	_____	_____ _____ _____
6. 	_____	_____ _____ _____
7. 	_____	_____ _____ _____
8. 	_____	_____ _____ _____
9. 	_____	_____ _____ _____
10. 	_____	_____ _____ _____



Cloud Project



Observe the types of clouds that appear outside each day for a week.

Each day, photograph or draw the types of clouds you see in the sky.

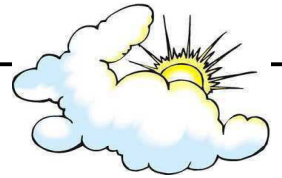
- If you choose to photograph the clouds, print out your photos. Then, write the dates to show when each picture was taken. Also, write the types of clouds shown in each photo. Attach your pictures to a sheet of poster board.
- If you choose to draw the clouds, be sure your pictures are clear and detailed. You should accurately show the color and shape of the clouds. Also include part of the landscape such as trees, hills, or buildings that you see. Label each type of cloud shown in your pictures. Also, write the date on each picture you draw. Attach your illustrations to a sheet of poster board.

Your cloud project is due on _____.

Your cloud project may be on display at school, so do your very best work!



Cloud Project - Grading Sheet



_____ /1

The project has been brought to school on-time.

_____ /1

Poster includes five or more photographs or hand-drawn pictures of clouds.

_____ /1

The pictures are clear and detailed so cloud types can be identified.

_____ /1

Each cloud picture is clearly and accurately dated.

_____ /1

The type of cloud is correctly identified for each picture.

_____ /1

The poster has a title written in large letters at the top.

_____ /1

Handwriting is neat and easy-to-read.

_____ /1

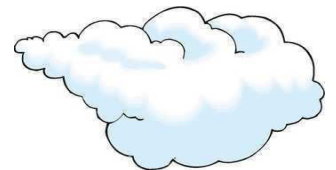
Words are spelled correctly, including cloud types.

_____ /1

The project is neat and presentable.

_____ /1

The student's first and last name has been written on the front of the poster.



Total - _____ /10

Cloud Study

Directions




This activity needs to be done on a day with clouds of varying types.

1. Take this page outside with a clipboard or pad to write on.
2. Sit on the playground or blacktop facing north.
3. Sketch all of the clouds visible in the north.
4. Use as many descriptive words as possible to describe the height, shape, color, texture, and appearance of these clouds.
5. Turn toward the east and do the same thing.
6. Complete the sections for south and west.

North	Cloud Sketches	Description _____ _____ _____ _____
East	Cloud Sketches	Description _____ _____ _____ _____
West	Cloud Sketches	Description _____ _____ _____ _____
South	Cloud Sketches	Description _____ _____ _____ _____

National Weather Service



-  **High Clouds**
16,000 - 50,000 feet
-  **Middle Clouds**
6,500 - 23,000 feet
-  **Low Clouds**
Up to 6,500 feet

Cutout



CloudSpotter

National Weather Service

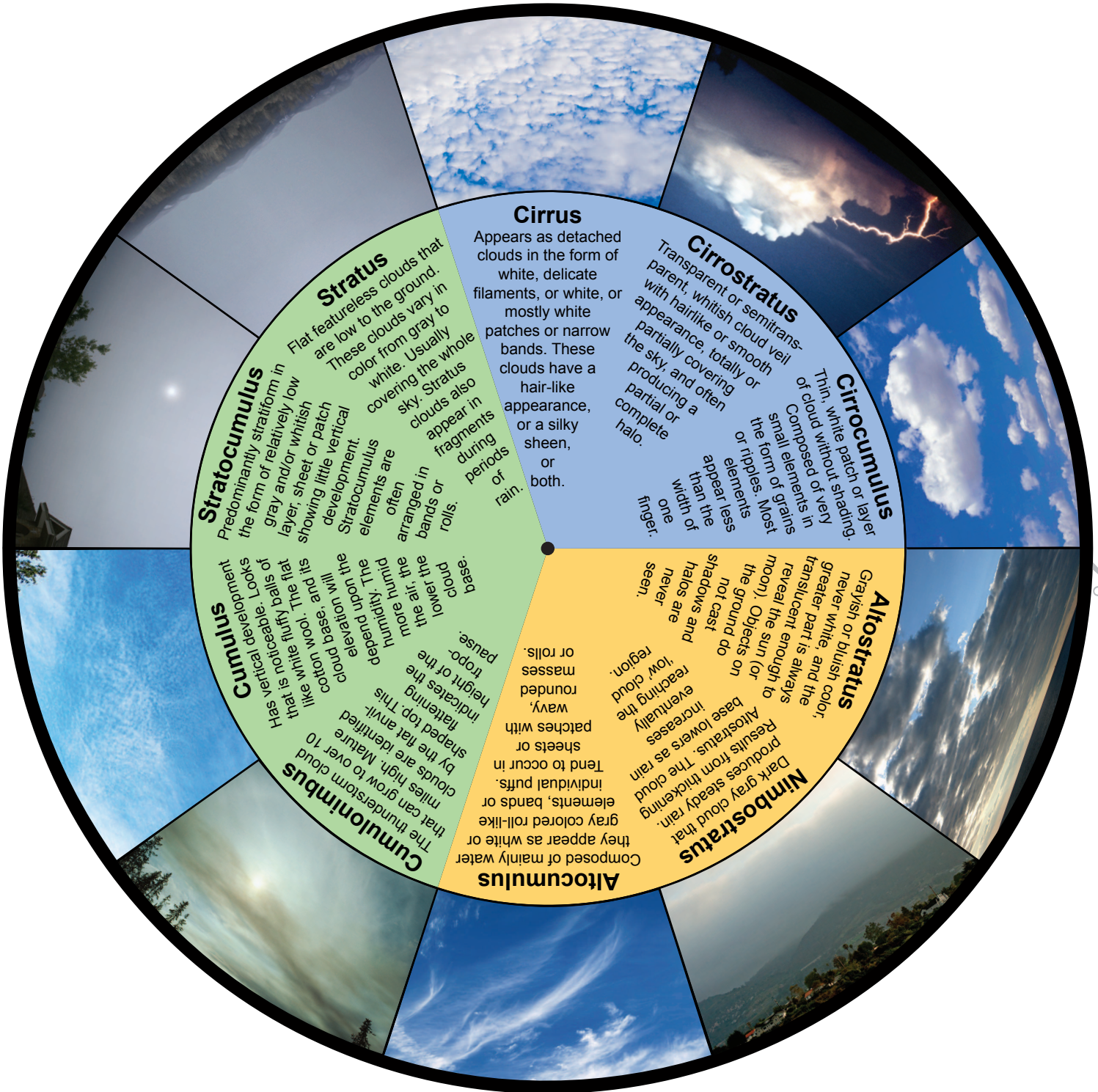
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Cutout





Cirrus

Appears as detached clouds in the form of white, delicate filaments, or white, or mostly white patches or narrow bands. These clouds have a hair-like appearance, or a silky sheen, or both.

Cirrostratus

Transparent or semitransparent, whitish cloud veil with hairlike or smooth appearance, totally or partially covering the sky, and often producing a partial or complete halo.

Cirrocumulus

Thin, white patch or layer of cloud without shading. Composed of very small elements in the form of grains or ripples. Most appear less than the width of one finger.

Altostratus

Grayish or bluish color, never white, and the greater part is always translucent enough to reveal the sun (or moon). Objects on the ground do not cast shadows and halos are never seen.

Nimbostratus

Dark gray cloud that produces steady rain. Results from thickening Altostratus. The cloud base lowers as rain increases eventually reaching the low cloud region. Tends to occur in sheets or rounded masses or rolls.

Alto cumulus

Composed of mainly water they appear as white or gray colored roll-like elements, bands or sheets or rounded masses or rolls. Tend to occur in individual puffs.

Stratus

Flat featureless clouds that are low to the ground. These clouds vary in color from gray to white. Usually covering the whole sky. Stratus clouds also appear in fragments during periods of rain.

Stratocumulus

Predominantly stratiform in the form of relatively low layer, sheet or patch showing little vertical development. Stratocumulus elements are often arranged in bands or rolls.

Cumulus

Has vertical development that is noticeable. Look like white fluffy balls of cotton wool. The flat top will be at the cloud base, and the elevation on the more humid air, the cloud base will depend on the humidity. The cloud base will be at the flat anvil-shaped top. This flattening indicates the height of the tropopause.

Cumulonimbus

The thunderstorm cloud that can grow to over 10 miles high. Mature clouds are identified by the flat anvil-shaped top. This flattening indicates the height of the tropopause.

Cloud Key

C L O U D S

Identifying clouds is a terrific way for students to put their skills of observation and classification to work, as well as to launch them into weather prediction. Clouds are only one of the many factors—including fronts, winds, pressure systems, etc.—that contribute to predicting weather, but they are one that students can easily observe. Note: Identifying clouds can be difficult at first. Encourage students to make their best guesses based on the dominant kind of clouds they see, or to list more than one type.

Directions

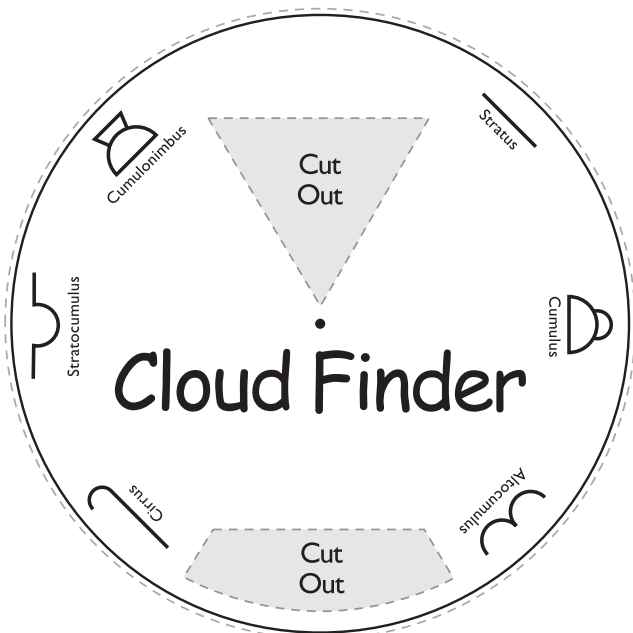
- 1 Make a copy of the reproducible for each student. Show students how to make the Cloud Key by cutting out both circles on pages 45 and 46, cutting out and discarding the two shaded areas on page 45, and fastening the wheels together. Page 45 goes on top.
- 2 Show students how to use the key. Move the wheel until the cloud you want appears, then read the name and weather information in the box.
- 3 Have students make a chart with these five headings: “Date/Time,” “Cloud Type,” “A.M. Weather,” “P.M. Predicted Weather,” “Actual P.M. Weather/Time.” (See the sample shown here.) Invite students to fill in the chart every morning for a week, comparing their predictions to the actual weather in the afternoon.

Materials

(for each student)

reproducible pages
45 and 46

brass paper fastener
scissors



Date/ Time	Cloud Type	AM Weather	Predicted Weather PM	Weather/ Time

Cloud Finder



Cumulus

Fluffy lower clouds that often "grow" during sunny days. Usually mean fair weather unless they grow tall late in the day.



Altocumulus

Thick blue-gray blanket-like clouds made of ice and water at middle heights. Rain or snow likely, or at least cloudy skies.



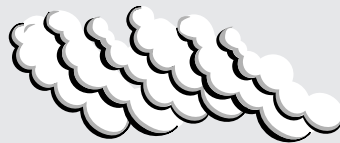
Cirrus

High wispy ice clouds. Often seen in clear skies and mean good weather, but can mean a change in the weather!



Stratus

Flat layer of low clouds. Light rain, drizzle, or flurries likely. Overcast skies at best.



Cumulonimbus

Giant thunderhead clouds that tower to high heights. Thunderstorms with heavy rain, hail, winds, and lightning are on the way.

Dark, heavy water-droplet clouds at low or lower-middle heights. Rain or snow very likely.

Stratocumulus



Cloud Key

Cut out the wheel.
Cut out the two shaded areas inside the wheel.
This is the top wheel of your cloud key.

