

Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their "Everything We Know About..." list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised, before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of understanding. A couple of suggestions are listed below:

- Why are wind and clouds so important for life on Earth?
- What would happen if the water cycle stopped and it never rained?

Follow-up Activities

- Have students use disposable or digital cameras to make a collection of photographs of different types and shapes of clouds. Students can then sort and classify the cloud photos into cloud types.
- Students can make daily observations of the clouds in the sky in a cloud journal, noting the type of weather (temperature, precipitation, wind) that accompanied the specific type of clouds. (Weather vanes, wind socks, pinwheels, anemometers and streamers can be used to observe wind strength.) After several weeks of observation, encourage students to look for weather patterns in their data. Students can also make graphs illustrating how many days each type of cloud was observed.
- Share with students the delightful book *It Looked Like Spilt Milk* by Charles G. Shaw. Students can then make "clouds" by placing a small dab of paint on the center of a sheet of construction paper and folding the paper in half. When the students open the paper, they can determine what their cloud looks like, and all shapes can be bound together in a class cloud book.
- Student can design and build kites to fly in the wind. Collect different types of kites to share with your students, and discuss the strengths and weaknesses of these kites. Students can then design and build their own kites to fly on a windy day, using straws and paper of different weights. Fly these kites with your class on several occasions, noting how strong the wind is on each day.

Suggested Internet Resources

Periodically, Internet Resources are updated on our web site at www.LibraryVideo.com

- sln.fi.edu/tfi/units/energy/blustery.html
"Blustery Beginnings" from The Franklin Institute Online site provides students with excellent information about windy weather. Photo and video galleries offer windy images, and links, print resources and activities are provided to extend children's understanding of wind.

(Continued)

• www.wildwildweather.com

"Dan's Wild Wild Weather Page" is an interactive weather site for children presented by a meteorologist in Alabama. This site offers clear information about weather topics like wind, clouds, humidity and pressure. Helpful links and hands-on activities are also provided.

• noaa.kids.us

Owlie Skywarn, the official mascot of the National Weather Service, teaches children about hurricanes, tornadoes and other dangerous weather events. This web site also discusses safety measures that should be followed when severe weather occurs.

Suggested Print Resources

- Cole, Joanna. *The Magic School Bus Inside a Hurricane*. Scholastic, Inc., New York, NY; 1996.
- Simon, Seymour. *Weather*. Harper Collins Publishers, New York, NY; 2006.
- Schaefer, Lola M. *Windy Day*. Capstone Press, Minnetonka, MN; 2000.

TEACHER'S GUIDE CONSULTANT

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K7124
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All About Wind & Clouds

Grades K-4

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

Before Viewing: Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create an "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

After Viewing: After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.



Program Summary

Wind and clouds are important parts of the constant changes in the air that we call weather. The weather changes when sunshine, air and water interact on the ground and in the sky to produce clouds and wind. Even though we cannot see the air that surrounds us, we can tell it is there because we can see clouds, and we can feel the air when the wind blows. Scientists who study weather are called meteorologists. They use special tools to look at the wind and clouds, and tell us whether to expect storms or sunny weather.

What makes the wind blow? Wind is air that moves sideways down near the ground and up high in the sky. Though the air is basically invisible, we can feel it when the wind blows through our hair and see its effect when it lifts our kites and fills parachutes. Air even has weight, but this weight, called air pressure, changes in different areas of the sky. Air always moves from areas of high pressure to areas of low pressure, causing movement we call wind.

What are clouds and how are they made? Clouds are made of tiny water droplets that form during a process called the water cycle. Energy from the sun causes liquid water to turn into a gas called water vapor. The water vapor rises into the atmosphere and cools as it rises, joining with dust or smoke particles along the way. As it cools, the invisible water vapor collects into tiny water droplets that form clouds. The droplets in clouds keep combining, causing clouds to grow. Eventually, the droplets get so large, they can no longer remain up in the air and fall from the sky as rain, snow, sleet or hail. The sun then heats the water on the Earth's surface, starting the cycle all over again.

Clouds come in different types and shapes, and form at different distances from the Earth. Meteorologists have names for different kinds of clouds. These names describe what the cloud looks like and how far above the ground the cloud is. Stratus clouds are low, gray clouds that cover the sky and usually mean rain. Cumulus clouds are piles of white, puffy clouds that generally indicate dry weather. When cumulus clouds grow extremely large, they can become great storm clouds called cumulonimbus clouds, bringing lightning, thunder, heavy wind and rain. The highest clouds are feathery, wispy ones called cirrus clouds. Cirrus clouds are actually made up of ice crystals. These clouds usually mean sunny and dry weather with the possibility of wet weather on the way.

Clouds are important to Earth and to all its living things because they bring moisture needed for life. Wind is helpful because it moves the clouds, carries birds, moves sailboats and even powers windmills, which can generate electricity. Strong winds can be dangerous, though, bringing storms like hurricanes and tornadoes. Knowing all about wind and clouds and what they mean makes weather forecasting possible, and helps us to know how to dress for school and play.

Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

weather — The changes in temperature and precipitation caused by the interaction of air, sunshine and water in Earth's atmosphere. *(Continued)*

atmosphere — The air that surrounds the Earth.

wind — Moving air that blows from high to low pressure areas. Wind moves at different speeds, from a gentle breeze to a hurricane force.

clouds — Tiny droplets of water that collect on small particles in the air. There are different types of clouds, caused by different weather conditions.

water vapor — Water in the form of an invisible gas.

meteorologists — Scientists who study weather.

air pressure — The weight of the air. Air that is heavy has high pressure, and light air has low pressure.

jet stream — A strong, fast-moving river of wind high in the atmosphere that blows from west to east around the world.

anemometer — A tool that measures how fast the wind is moving.

weather vane — A tool that measures in what direction the wind is moving.

compass — A tool that always points to the north, used by people to figure out direction.

condensation — The change of water vapor from a gas to a liquid.

precipitation — The part of the water cycle that involves collecting the tiny water droplets formed by condensation into larger drops before falling back to Earth from clouds. Precipitation can be in the form of rain, snow, sleet or hail.

water cycle — The never-ending process that recycles Earth's water supply by using energy from the sun. The water cycle has three stages: evaporation, condensation and precipitation.

evaporation — The change of liquid water into an invisible gas called water vapor.

stratus — The low, gray clouds that spread out across the sky and block the sun. Stratus clouds usually bring light drizzle or rain.

cumulus — White, puffy clouds that usually mean dry weather.

cumulonimbus — Cumulus clouds that grow very large and dark. These clouds are often called storm clouds or thunder clouds, and they bring storms, heavy wind and lightning.

cirrus — The highest clouds in the sky, which look like feathers or thin wispy curls. Cirrus clouds are made of ice crystals and usually mean sunny and dry weather, but can also signal that precipitation is on the way.

fog — A cloud on the ground.

hurricanes — Huge, dangerous storms with strong winds and many clouds that form over warm oceans.

tornadoes — Small but dangerous storms that can occur on land when the winds in a thunderstorm start to spin very fast, forming a funnel-shaped cloud. Tornadoes are so powerful that they can pick up whole buildings and destroy everything in their path.

Pre-viewing Discussion

Before students generate their list of "Everything We Know About..." this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

- What makes clouds? Are all clouds the same?
- Even though we can't see it, how do we know the air is there?
- What makes the wind blow?

After the class has completed their "Everything We Know About..." list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program:

1. What makes the Earth's weather change?
2. What is the atmosphere?
3. What is the wind? What causes it to blow?
4. What is air made of?
5. What is air pressure?
6. How can you tell that the wind is blowing?
7. What are some of the different names for wind?
8. What is the jet stream? How does the jet stream affect travelers?
9. Two weather instruments are the anemometer and weather vane. What does each one measure? How are they helpful?
10. What can happen when cool wind meets a moist, warm wind?
11. What is the water cycle? Describe the three parts of the water cycle.
12. What are clouds? How are they formed?
13. What can clouds tell us about the weather?
14. What is a stratus cloud?
15. What is a cumulus cloud?
16. What is a cumulonimbus cloud? What types of weather can you expect if cumulonimbus clouds are in the sky?
17. What is a cirrus cloud?
18. What is fog?
19. What causes hurricanes and tornadoes?