

Calendar History

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. Julius Caesar was a Roman ruler who _____.
Ⓐ ordered changes in the calendar
Ⓑ lived about 1,600 years after Pope Gregory
Ⓒ lived in ancient Egypt
2. _____ is a word that refers to the moon.
Ⓐ Solar
Ⓑ Lunar
Ⓒ Holiday
3. In what way were the calendars of ancient Babylon and Rome alike?

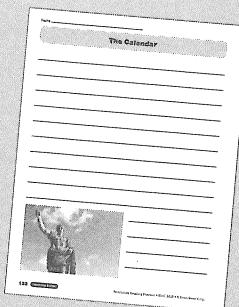
4. Do you think Pope Gregory was right to change the Roman calendar? Support your answer.

5. Why did some ancient people base their calendar on the moon instead of the sun?

Write About the Topic

Use the Writing Form to write about what you read.

Imagine if your favorite holiday fell in the wrong season. What would change? Describe it in detail.



Weather Satellites

Level 1 ■

Words to Know list, Reading Selection, and Reading Comprehension questions

Weather Ahead

Fill in the circle to complete the sentence.

Weather Ahead

Satellites alone can't keep us safe from the day and night. The United States put the first weather satellite into orbit in 1960. Since then, many more have gone into space since then. Now there are about 120 of them.

What do weather satellites do in space? Satellites take pictures of cloud systems. They send the pictures back to weather stations on Earth. The pictures show how storms are growing and where. By looking at the pictures, meteorologists can make forecasts. They can tell people when severe weather is coming. Weather satellites can save lives. Floods, hurricanes, thunderstorms, and tornadoes are dangerous. Forecasts help them to be ready.

Satellites gather huge amounts of data about weather conditions. They measure temperature, air pressure, air temperature, air pressure, and lightning strikes. They even measure bursts of energy from the sun during solar flares. Data from weather satellites help meteorologists create mathematical models with speed and accuracy.

Weather forecasts help ships go through bad weather. Forecasters help airplane pilots, too. They can change their routes if severe weather storms from the west threaten to interrupt their flight.

Weather satellites are also part of a system to rescue systems. In one year, the system saved 126 lives. A satellite picks up a signal from a ship or a plane in danger. A rescue team can be sent to right the situation.

The **Weather Satellite** is now in its second year of service. It was launched April 1, 1983. Called **GOES-2**, it is the second of three geostationary weather satellites.

Weather Satellites **1**

Weather Satellites **2**

Weather Satellites **3**

and S.

Words to Review

Weather Ahead

satellites
meteorologists
forecasts
severe
approaching
conditions
date
pollution
bursts
supercomputers
mathematical
models
magnetic
routes
rescue
signal

Level 2 ■ ■

Words to Know list, Reading Selection, and Reading Comprehension questions

Level 3 ■ ■ ■

Words to Know list, Reading Selection, and Reading Comprehension questions

Weather Watching

Fill in the circle to complete the sentence.

Weather Watching

What will the weather be? People want to know about the weather so they can plan their daily activities. You would want to know if you should wear your rain gear or not. Weather is even more important for farmers. They want to know when severe weather approaches so they can protect their crops. Floods, tornadoes, thunderstorms, and hurricanes put people in danger. Severe weather conditions can serve lots of people well if they know the weather so they can guard against dangerous storms.

Meteorologists are scientists who forecast the weather. They are always working to be better forecasters. These scientists keep records of what has happened over time. They study the weather to predict what will happen next. Satellites will be used to make predictions. Satellites can see more than a hundred weather stations all over the world. They also use supercomputers to process the satellite data.

The United States has been using weather satellites since the 1960s. Satellites collect data about cloud systems. They can also smoke from volcanic eruptions to see the movement of ocean currents and dust particles.

Today's weather forecasters help scientists forecast the weather. They will take your pictures to send to earth, where experts need them to work. The pictures help to forecast the weather for the next few hours. The pictures can also show where weather conditions such as the subtropical ridge, the jet stream, and lightning strikes. Supercomputers use this huge amount of data to make forecasts. The models can sometimes make mistakes. The meteorologists make sure the models are correct.

The most accurate forecasts are short, and when the weather will change in a few hours or in a few days.

Weather Watchers

Home
Fill in the circle to complete the sentence.
and 5.

Weather Watchers

Weather to Know
Weather Watchers

severe
approaches
conditions
dangerous
meteorologists
forecast
predictions
supercomputers
data
rapidly
observe
currents
temperature
pollution

Weather Satellites

This chart shows typical weather systems in the Northern Hemisphere.

Hadley circulation in the Northern Hemisphere

Weather Satellites © 2012

Assemble the Unit

Reproduce and distribute one copy for each student:

- Visual Literacy page: Take a Closer Look: Weather Satellite, page 141
 - Level 1, 2, or 3 Reading Selection and Reading Comprehension page and the corresponding Words to Know list
 - Graphic Organizer of your choosing, provided on pages 180–186
 - Writing Form: Thinking About Weather Satellites, page 142

Introduce the Topic

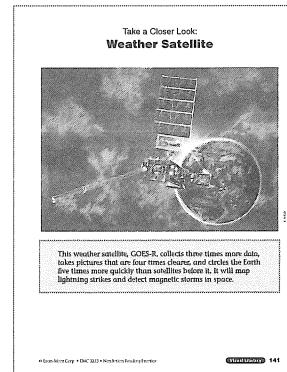
Review the image and text with students. Explain that the image shows a weather satellite that launched in 2016. The spring-like part extending from it is a magnetometer. Ask students to infer what it does. (It measures magnetic forces.)

Read and Respond

Form leveled groups and review the Words to Know lists with each group of students. Instruct each group to read their selection individually, in pairs, or as a group. Have students complete the Reading Comprehension page for their selection.

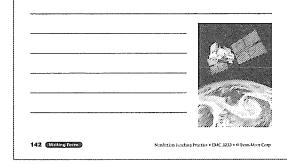
Write About the Topic

Read aloud the leveled writing prompt for each group. Tell students to use the Graphic Organizer to plan their writing. Direct students to use their Writing Form to respond to their prompt.



Visual Literacy

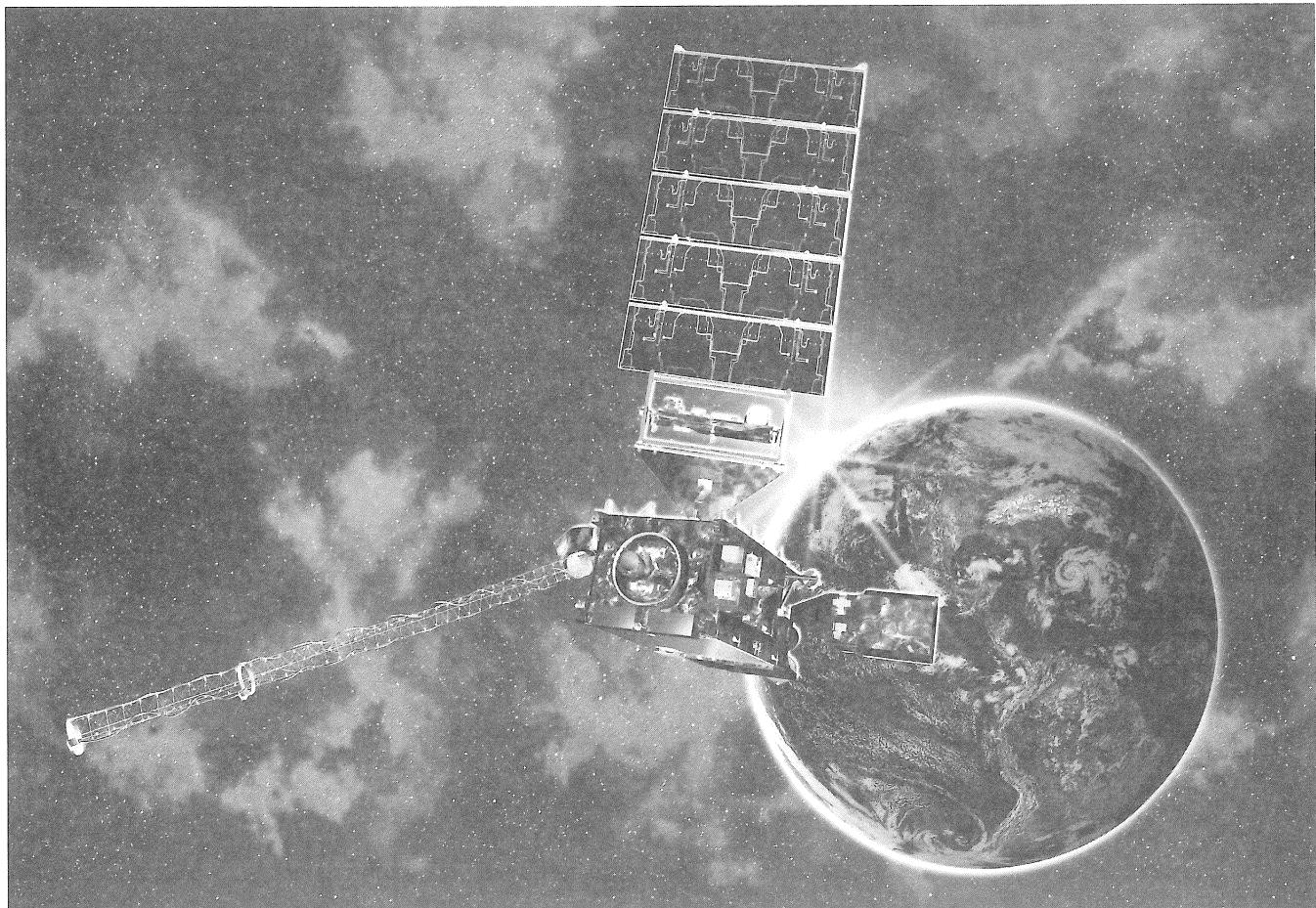
Visual Literacy



-2 Writing Test

Writing Form

Take a Closer Look: **Weather Satellite**

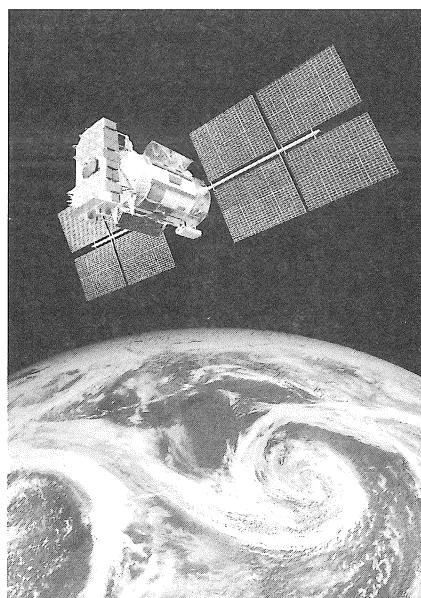


© NASA

This weather satellite, GOES-R, collects three times more data, takes pictures that are four times clearer, and circles the Earth five times more quickly than satellites before it. It will map lightning strikes and detect magnetic storms in space.

Name _____

Thinking About Weather Satellites



Words to Know

Weather Ahead

satellites
meteorologists
forecasts
severe
approaching
conditions
data
pollution
bursts
supercomputers
mathematical
models
magnetic
routes
rescue
signal

Weather Satellites ■



Words to Know

A Bird's-Eye View

satellites
measurements
conditions
meteorologists
mathematical
models
forecast
severe
approaching
data
bird's-eye
currents
observe
supercomputers
dangerous
rescue

Weather Satellites ■ ■

Words to Know

Weather Watching

severe
approaches
conditions
dangerous
meteorologists
forecast
predictions
supercomputers
data
rapidly
observe
currents
temperature
pollution

Weather Satellites ■ ■ ■

Weather Ahead

Satellites above Earth are keeping an eye on the weather day and night. The United States put the first weather satellite into orbit in 1960. Many more satellites have gone into space since then. Now there are at least 120 of them.

What do weather satellites do in space? Satellites take pictures of cloud systems. They send the pictures to weather scientists on Earth. The pictures show how storms are growing and where. By tracking storms, meteorologists can make forecasts. They can tell people when severe weather is approaching. Knowing weather conditions can save lives. Floods, tornadoes, thunderstorms, and hurricanes put people in danger. Forecasts help them to be storm ready.

Satellites gather huge amounts of data about weather conditions. They measure things such as air temperature, air pollution, and lightning strikes. They even measure bursts of energy from the sun. Data from weather satellites is sent to supercomputers. These computers are huge. They create mathematical models with speed.

Weather forecasts help ships go around dangerous storms. Forecasts help airplane pilots, too. They need to be aware of magnetic energy storms from the sun. They can change their routes so their radios will not lose contact with air traffic control.

Weather satellites are also part of a search and rescue system. In one year, the system saved 240 lives. A satellite picks up a signal from a ship or a hiker in danger. A rescue team can be sent to the right location.



© NASA

The first weather satellite was sent into space on April 1, 1960. Called TIROS-1, this satellite changed weather forecasting.

Weather Ahead

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. The job of a meteorologist is to _____.
Ⓐ search and rescue
Ⓑ control air traffic
Ⓒ predict weather
2. A hurricane is an example of _____.
Ⓐ magnetic energy
Ⓑ severe weather
Ⓒ a forecast
3. What is the connection between forecasting severe weather quickly and saving lives? Explain your thinking.

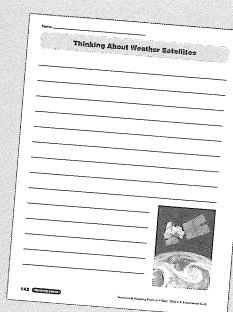
4. Based on what you read, could an airplane pilot lose radio contact with the ground? How?

5. In what ways would weather forecasting be different without supercomputers? Explain your thinking.

Write About the Topic

Use the Writing Form to write about what you read.

Use information from the text to support the view that weather satellites are important to people's safety.



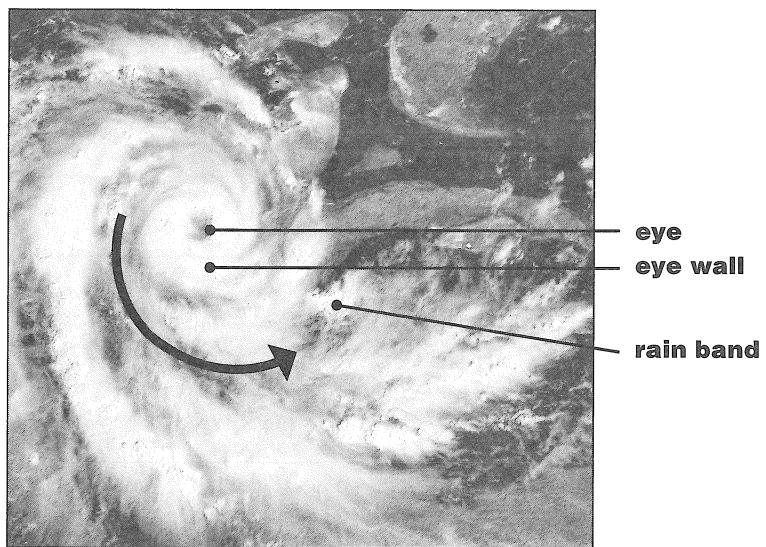
A Bird's-Eye View

High above Earth, more than a hundred weather satellites are collecting information. They send pictures of cloud patterns to scientists on Earth. They also take measurements of weather conditions. The meteorologists study the pictures. They make mathematical models using the measurements. They might forecast rain in your area tomorrow. If so, you might decide to take your umbrella to school.

More important, weather forecasts tell when severe weather is approaching. Floods, tornadoes, thunderstorms, and hurricanes put people in danger. Weather forecasts can save lives. For example, satellite pictures taken over time show how fast a hurricane is growing and the path it is taking. People can be ready for the storm. Meteorologists are always working to make better forecasts.

The United States began using weather satellites in 1960. Today's satellites take clearer pictures and collect more data. Satellites collect data about cloud systems. They have a bird's-eye view of smoke from wildfires and of ash clouds from volcanoes. Weather satellites can also track an oil spill on the ocean's currents. They can observe a cloud of sand blowing from a desert in Africa. Data from weather satellites is sent to supercomputers. These computers are huge, and they make mathematical models quickly.

Planes and ships need to know the weather so they can go around dangerous storms. A weather satellite can also help a ship in trouble. The satellite is part of a search and rescue tracking system. The satellite can send a signal from the ship in danger to the U.S. Coast Guard. The Coast Guard can send out a rescue team.



A view of a hurricane, taken by a weather satellite, shows that the storm spins in a counterclockwise direction.

A Bird's-Eye View

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. A meteorologist is a weather _____.
Ⓐ measurement
Ⓑ satellite
Ⓒ scientist

2. Another word for *prediction* is _____.
Ⓐ pattern
Ⓑ forecast
Ⓒ data

3. Describe how a weather satellite might be helpful to wildland firefighters.
-
-

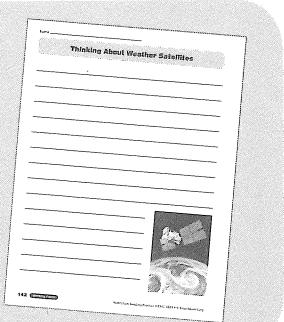
4. How do you suppose weather forecasting would be different without computers or supercomputers? Explain your idea.
-
-

5. In your opinion, what is the most important reason that meteorologists should make the best forecasts possible?
-
-

Write About the Topic

Use the Writing Form to write about what you read.

Write to support the view that weather satellites are important for more than just predicting a rainy day.



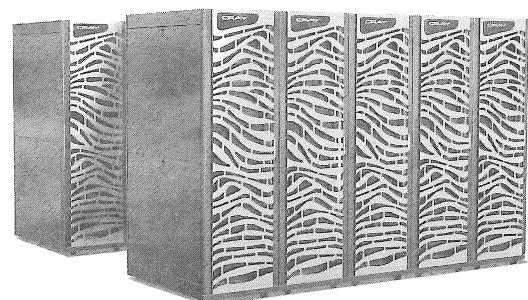
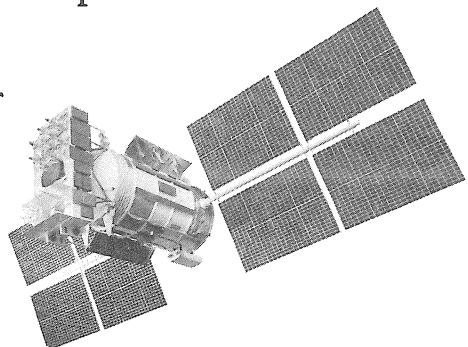
Weather Watching

What will the weather be? People want to know about the weather in order to plan their daily activities. You want to know if you should wear your rain gear to school tomorrow. It is even more important for people to know when severe weather approaches, so they can be storm ready. Floods, tornadoes, thunderstorms, and hurricanes put people in danger. Knowing weather conditions can save lives. Planes and ships need to know the weather so they can go around dangerous storms.

Meteorologists are scientists who forecast the weather. They are always working to make better forecasts. These scientists keep records of weather patterns over time. They study the weather in different areas. They look for patterns of change that can be used to make predictions. Their tools include more than a hundred weather satellites above the Earth. They also use supercomputers to process the satellite data rapidly.

The United States has been using weather satellites since the 1960s. Satellites collect data about cloud systems. They observe smoke from wildfires and ash clouds from volcanoes. Satellites can see the movements of ocean currents and dust storms.

Today's weather satellites help scientists forecast the weather in two ways. One, they send pictures to earth, where experts read them. The pictures help to forecast the weather for the next few hours. Two, the satellites collect measurements of weather conditions such as air temperature, air pollution, and lightning strikes. Supercomputers use this huge amount of data to quickly make mathematical models. The models can help meteorologists make predictions. The models predict how, when, and where the weather will change in a few hours or in several days.



This giant supercomputer works at record speed to help meteorologists make faster and better weather predictions.