

**Rising Grade 5**  
**Reading Practice**  
***Develop Your Skills***

# Rare gray orca spotted in Puget Sound waters

By Seattle Times, adapted by Newsela staff on 05.06.20

Word Count **626**

Level **810L**



Image 1. A gray transient orca wowed onlookers all over Puget Sound, Washington, in April 2020. Its nickname, TI'uk, means "moon" in Coast Salish. This is a language spoken by some Native Americans in the region. Photo: Howard Garrett/Orca Network/TNS

All over Puget Sound, Washington, a pale orca has been wowing onlookers. Puget Sound is a stretch of water next to Seattle and other cities in Washington.

The orca is as pale in color as the moon. Social media users have called the orca an albino, which is an animal that usually appears white. However, the orca is not an albino. It is actually gray, rather than the normal deep orca black. It appears bright in the green waters of Puget Sound.

The orca is a male and a member of the transient orca group. You can see transient orcas from Alaska to California and all over Puget Sound. Though they are commonly called killer whales, these orcas are not really whales at all, but they are the world's largest dolphins. They eat meat, rather than fish. They hunt seals, sea lions and other ocean mammals. A mammal is a type of animal. Mammal mothers feed their young with milk from their own bodies. Orcas are mammals, and so are humans.

**TI'uk Appeared In April To Great Interest**

The gray orca is typical in every way but its color, said Howard Garrett. He works with the Orca Network. This is a group that raises awareness of the orcas in the Pacific Northwest.

"He stands right out," said Garrett. He photographed the orca recently. "I don't know that there is anything different about him or his family. He seems to be the right size for his age, and traveling with them, perfectly normal behavior. But he sure glows really bright."

The orca's nickname is Tl'uk, which means "moon" in Coast Salish. This is a language spoken by some Native Americans in the region.

Garrett spotted the gray orca on April 7 in the waters near Whidbey Island in Washington. He and other people were gathered on a dock. The orcas were very close by, which added to the thrill.

"They are powerful, graceful, beautiful beings," Garrett said. He was excited to see them right below his feet.



### **Transient Orcas Healthy, Other Orcas Endangered**

Transient orca populations are healthy. The government has not allowed marine mammal hunting since 1972. Because of this, the orcas are feasting on a good supply of seals and other marine mammals, including some dolphins and even small whales. Transient orcas will team up to take down a big target, such as a sea lion. They often hunt close to shore, where they find their prey lounging on rocks.

Another type of orca is the southern resident orca. They also swim in the waters near the Puget Sound. Unlike the transient orcas, southern resident orcas are in danger of extinction. These orcas face several threats. One major threat is pollution. Other threats include noise and disturbances from ships, which make it harder for orcas to hunt. There's also a lack of salmon, their preferred prey.

People rarely see Tl'uk's family in local waters. They usually see the family north of Washington's San Juan Islands. However, beginning in April, the orcas made their first known trip to the waters around Puget Sound.

The gray orca is less than 2 years old. He is only the second gray orca to appear in these waters. The first gray orca was Chimo. People captured Chimo back when they were still allowed to hunt orcas to supply the aquarium trade.

"It is great to see that guy, just amazing," Garrett said about Tl'uk. The orca appears white in the dark green of the water. He has a mysterious quality, Garrett said.

## Quiz

1 Read the paragraph from the introduction [paragraphs 1-3].

*The orca is as pale in color as the moon. Social media users have called the orca an albino, which is an animal that usually appears white. However, the orca is not an albino. It is actually gray, rather than the normal deep orca black. It appears bright in the green waters of Puget Sound.*

Which of the following is the MOST accurate explanation of what this paragraph means?

- (A) Albino orcas are actually gray instead of the typical white.
- (B) A gray orca is the same color as the moon, which means it is albino.
- (C) Gray orcas appear gray because the Puget Sound has green waters.
- (D) Gray orcas are lighter than black orcas, so they can be mistaken as white.

2 Read the section "Transient Orcas Healthy, Other Orcas Endangered."

Select the paragraph from the section that shows problems that orcas have.

- (A) Transient orca populations are healthy. The government has not allowed marine mammal hunting since 1972. Because of this, the orcas are feasting on a good supply of seals and other marine mammals, including some dolphins and even small whales. Transient orcas will team up to take down a big target, such as a sea lion. They often hunt close to shore, where they find their prey lounging on rocks.
- (B) Another type of orca is the southern resident orca. They also swim in the waters near the Puget Sound. Unlike the transient orcas, southern resident orcas are in danger of extinction. These orcas face several threats. One major threat is pollution. Other threats include noise and disturbances from ships, which make it harder for orcas to hunt. There's also a lack of salmon, their preferred prey.
- (C) People rarely see Tl'uk's family in local waters. They usually see the family north of Washington's San Juan Islands. However, beginning in April, the orcas made their first known trip to the waters around Puget Sound.
- (D) "It is great to see that guy, just amazing," Garrett said about Tl'uk. The orca appears white in the dark green of the water. He has a mysterious quality, Garrett said.

3 Read the selection from the section "Transient Orcas Healthy, Other Orcas Endangered."

*Another type of orca is the southern resident orca. They also swim in the waters near the Puget Sound. Unlike the transient orcas, southern resident orcas are in danger of extinction. These orcas face several threats. One major threat is pollution. Other threats include noise and disturbances from ships, which make it harder for orcas to hunt. There's also a lack of salmon, their preferred prey.*

Which word or phrase from the selection helps the reader understand the meaning of "extinction"?

- (A) threats
- (B) pollution
- (C) noise and disturbances
- (D) preferred prey

Read the sentence from the introduction [paragraphs 1-3].

*Puget Sound is a stretch of water next to Seattle and other cities in Washington.*

Which answer uses the word “stretch” in the SAME way as the sentence above?

- (A) The truck was driving on a long stretch of road.
- (B) Some people like to stretch before running.
- (C) That question on the test was a stretch for me.
- (D) She had to stretch her sweater after it shrank in the dryer.

# The U.S. Government: Does good character make for a successful presidency?

By USHistory.org, adapted by Newsela staff on 02.17.17

Word Count **601**

Level **820L**



A portrait of President Abraham Lincoln from 1863. Lincoln is usually rated as one of the best U.S. presidents. Maybe this is because most people think Lincoln had "good character." Photo from: Wikimedia Commons.

President Harry S. Truman was a man of the people. President John F. Kennedy was a bold, well-spoken leader with a great deal of charisma. President Richard Nixon had a deep interest in dealing with foreign countries.

The United States has had 44 presidents. Each one had a different style, or way of doing things. A president's style tells us something about his or her character. Character is the combination of qualities that make up someone's personality. It can include qualities like honesty and courage. Most people would say that someone who is honest and courageous has "good character."

James Barber was a political scientist, someone who studies government and politics. He published a well-known study of presidential character. He studied presidents' personalities, and then compared their personalities to how well they did in the job.

## **Positive, Active Presidents Most Successful**

Barber believed that presidents can be categorized as having "positive" or "negative" attitudes. Positive presidents are optimistic; they think things will turn out well. Negative presidents are pessimistic; they have a darker view of things.

Barber also labeled presidents as being either "active" or "passive." Active presidents are go-getters, while passive presidents are more laid-back. His findings suggest that positive and active presidents are more successful than passive and negative ones. For example, Theodore and Franklin Roosevelt had "positive/active" personalities. According to Barber, these individuals approach the presidency with enthusiasm. They have a drive to lead and succeed.

### **Ratings Game**

Not everyone agrees with Barber's research, though. It is based on the idea that a president's character helps determine how successful he or she will be, and not everyone thinks this is true.

Most Americans have their own ideas about which presidents deserve to be called great. They also have opinions about which ones were failures. Historians even get into the ratings game. Harvard professor Arthur M. Schlesinger once invited 55 well-known historians to rate the presidents.



In surveys like these, some presidents always rate at the top. Abraham Lincoln, George Washington and Franklin Roosevelt usually take the top three spots in the presidential rankings. Others with high scores are Thomas Jefferson, Andrew Jackson, Theodore Roosevelt, Woodrow Wilson and Harry Truman. Usually near the bottom are James Buchanan, Ulysses Grant and Warren Harding. Historians are hesitant to rank modern presidents. Not enough time has passed to judge their places in history.

### **Good Common Leadership Qualities**

Good presidents appear to have some common leadership qualities. These qualities include: a strong vision for the country's future, good communication and crisis management skills, and the courage to make unpopular decisions. Also important are character and honor, making wise hiring decisions and being able to work with Congress.

Americans have different ideas about what makes a good president. Some people believe character plays an important role, while others do not.

A president has many jobs. Perhaps character is most important to the president's symbolic role. Presidents must somehow stand for what American citizens believe to be the heart of their country. They must represent what is valued now and what was valued in the past. Even more importantly, they must represent the direction of America's future.

## Quiz

1 Read the summary below. Choose the answer that BEST fits into the blank to complete the summary.

Presidents have different personalities that reflect their character. Character can have an effect on how well they do in their job as president.

\_\_\_\_\_

These presidents display common strengths, such as good communication and crisis management.

- (A) Even though some disagree on the importance of character, certain similarities can be found in good presidents.
- (B) Even though some disagree about who is the best president, Thomas Jefferson is usually the highest ranking.
- (C) Even though some disagree with Barber, many people still think that positive and passive presidents are the best.
- (D) Even though some disagree about ranking modern presidents, Ulysses S. Grant will still be on the bottom.

2 What is the connection between the introduction [paragraphs 1-3] and the last section of the article?

- (A) Both provide examples of qualities associated with presidential character.
- (B) Both describe how presidents in the past have exhibited good character.
- (C) Both give examples of specific presidents who demonstrate strong character.
- (D) Both describe the types of research done on presidential character.

3 Read the following sentence from the article.

*Perhaps character is most important to the president's symbolic role.*

Which sentence from the article supports the idea that character is important to the president's symbolic role?

- (A) His findings suggest that positive and active presidents are more successful than passive and negative ones.
- (B) It is based on the idea that a president's character helps determine how successful he or she will be, and not everyone thinks this is true.
- (C) Americans have different ideas about what makes a good president.
- (D) They must represent what is valued now and what was valued in the past.

4 Based on the information in the section "Ratings Game," which of these statements is TRUE?

- (A) Theodore and Franklin Roosevelt are examples of pessimistic presidents.
- (B) Lincoln, Washington and Franklin Roosevelt are top-ranked presidents.
- (C) Jefferson, Lincoln and Truman are ranked the highest in presidential surveys.
- (D) Historians have ranked Jackson, Buchanan and Grant near the bottom.

# Using technology to predict the weather

By National Geographic Society, adapted by Newsela staff on 04.16.20

Word Count **885**

Level **990L**



Image 1. Radar observes the atmosphere from below. It measures data about the atmosphere and weather and helps meteorologists track storms. Photo: Volkmar K. Wentzel/National Geographic

The atmosphere is a blanket of gases that surrounds the planet, reaching up to about 97 kilometers (60 miles) at its upper limits. While that may not sound like it is too far, imagine trying to observe an event from that distance. Watching a baseball game from that far away would be impossible. It's also difficult to study the atmosphere from so far away. Scientists require instruments to see what happens in the atmosphere.



## Thermometers And Barometers

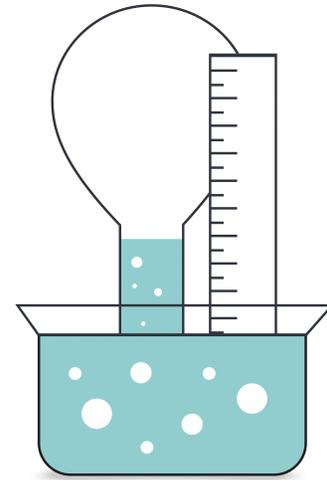
One of the first tools ever used to observe properties of the atmosphere was the thermometer. It was invented in Italy in the 1590s by Galileo Galilei. He designed a device with a hollow glass bulb at one end and a hollow, open tube at the other. Galileo held the bulb end in his hands, allowing it to heat up, then turned the device upside-down into a water-filled basin. The water would then rise into the hollow tube. How high the water moved up or down would depend on the

temperature of the surrounding air. As the air in the bulb cools, there is less pressure because it takes up less space. The water moves higher up the tube toward the bulb because of the lower pressure. Because of this, higher water levels meant cold temperatures and lower water levels meant hot temperatures. In 1612, another Italian scientist improved upon Galileo's thermometer design by adding a number scale so that temperatures could be read.

About 50 years later, one of Galileo's apprentices, Evangelista Torricelli, invented the barometer, an instrument that measures air pressure. Air pressure is caused by the weight of the atmosphere pressing down in a certain location. When the air pressure is high, the atmosphere is stable. When the air pressure is low, the atmosphere is stormy.

### **Weather Balloons And Radiosondes**

Thermometers, barometers and other instruments are used to explore the atmosphere nearby. But what if scientists want to collect measurements where there are no instruments? For this, scientists depend on remote sensing instruments -- tools that obtain information from far away.



High in the atmosphere, the temperatures are below zero and the air is thin. Scientists had to design instruments that can collect observations in these conditions. One of this type of instrument is the weather balloon. It carries a radiosonde into the atmosphere, which measures temperature, pressure, and relative humidity, or how much water vapor is in the air. It also has a radio transmitter that relays this data back to scientists every few seconds. Scientists calculate wind speed and wind directions by tracking the balloon's position. Then they use this data to create weather forecasts and provide input for weather models.

A weather balloon can only travel about 32 kilometers (20 miles) up from the Earth's surface. High in the atmosphere, the low air pressure outside of the balloon causes the air inside the balloon to swell. If it gets too high, it expands and pops. To collect data at higher altitudes, scientists turn to satellites.

### **Weather Satellites**

In the 1960s, NASA launched the nation's first weather satellite called TIROS I. Today, weather satellites continuously circle our planet hundreds of miles above its surface. They are one of the most effective tools for studying Earth. Satellites collect data and images of atmospheric events around the globe. They relay the information from space back to Earth's surface.

Satellites monitor many things. They can track things such as clouds, lightning, snow, ice and hurricanes. But they can also measure other events such as wildfires, volcanoes, ocean temperatures and solar flares. Satellites also help scientists monitor the atmosphere's chemistry. They measure ozone, air pollution and greenhouse gases.

Radar is another form of technology that captures images of the atmosphere. Unlike weather balloons and satellites, which scan the atmosphere from above, radar works by scanning it from

the ground. Radar sends out pulses of energy called radio waves. It then sees how the waves interact with objects in the air. This reveals the location of rain, snow, and other types of precipitation.

### **Doppler Radar, Computer Models**

One kind of radar, called Doppler radar, can detect a storm's location, and its movement too. It can tell whether a storm is approaching or moving out of a specific area. It can also see if a weather system is turning, or rotating, a sign of possible tornadoes.

You have likely heard meteorologists mention a form of technology used to create your weather forecast. These are weather models designed by computer programs. They use mathematical equations that represent how the atmosphere behaves in real life. Data such as temperature and pressure are fed into the program. The programs then predicts what will happen in the atmosphere in the future. The computers solve the equations and make models much faster than any human could. The model estimates what the atmosphere is likely to do before it actually does it.

Today's technologies allow us to explore the atmosphere in extremely fine detail.

## Quiz

1 Which sentence from the article would be MOST important to include in a summary of the article?

- (A) Scientists require instruments to see what happens in the atmosphere.
- (B) When the air pressure is high, the atmosphere is stable.
- (C) If it gets too high, it expands and pops.
- (D) Radar sends out pulses of energy called radio waves.

2 Read the following selection from the article.

*High in the atmosphere, the temperatures are below zero and the air is thin. Scientists had to design instruments that can collect observations in these conditions. One of this type of instrument is the weather balloon.*

How does this detail develop the article's central idea?

- (A) The detail shows that weather balloons are the most reliable way to learn about the atmosphere.
- (B) The detail shows that the upper parts of the atmosphere are too cold for humans to travel to.
- (C) The detail shows that weather balloons are a better way to observe the atmosphere than thermometers.
- (D) The detail shows that technology can get to places in the atmosphere that humans cannot.

3 Read the section "Doppler Radar, Computer Models."

What does this section explain that other sections do not?

- (A) how technology makes it easier to observe the atmosphere
- (B) how technology can predict future weather
- (C) how radar works to help observe the atmosphere
- (D) how satellites work to help observe the atmosphere

4 How effective is the introduction [paragraph 1] at introducing technology and the atmosphere?

- (A) The introduction is effective because it explains why technology is needed to know what the temperature and air pressure are.
- (B) The introduction is effective because it explains why technology is needed to view the atmosphere from a distance.
- (C) The introduction is ineffective because it does not explain how satellites, weather balloons and radar work.
- (D) The introduction is ineffective because it compares watching the atmosphere to watching a baseball game, which are unrelated activities.

**Rising Grade 5**  
**Reading Practice**  
***Review Your Skills***

# Rare gray orca spotted in Puget Sound waters

By Lynda V. Mapes, Seattle Times, adapted by Newsela staff on 05.07.20

Word Count **591**

Level **MAX**



Image 1. A gray transient orca wowed onlookers all over Puget Sound, Washington, in April 2020. Its nickname, Tl'uk, means "moon" in Coast Salish. This is a language spoken by some Native Americans in the region. Photo: Howard Garrett/Orca Network/TNS

An orca pale in color as a winter moon has been wowing onlookers all over Puget Sound, Washington.

Not truly an albino, as social media has dubbed it, the orca is actually gray, rather than the typically deep, dashing orca black. But the whale is a thriller nonetheless, aglow through the green waters of Puget Sound.

The whale is a male and a member of the transient orca ecotype. Transient orcas are meat-eaters, rather than fish eaters. They are not really whales at all, but the world's largest dolphins. Transient orcas are seen from Alaska to California and all over Puget Sound, hunting seals, sea lions and other marine mammals.

The gray whale is typical in every way but its color, said Howard Garrett of Orca Network.

"He stands right out," said Garrett. He photographed the whale recently and added his report to sightings on Orca Network. "I don't know that there is anything different about him or his family.

He seems to be the right size for his age, and traveling with them, perfectly normal behavior. But he sure glows really bright."

The gray transient whale is a member of the T46Bs, a family of transient orcas that includes T46 B1B, the gray whale. He is nicknamed Tl'uk, a Coast Salish word meaning "moon."

Garrett spotted the whale April 7 at Holmes Harbor on Whidbey Island, along with other people gathered on a dock. The whales were very close by which added to the thrill.

"They are powerful, graceful, beautiful beings and to see them right below your feet!" Garrett said.

Transient orca populations are healthy. There has been a federal ban on marine mammal hunting since 1972. Because of this, transients are feasting on seals and other plentiful marine mammals, including Pacific white-sided dolphins and even gray whale calves. Transient orcas will team up to take down a really big target, such as a sea lion. They will often hunt close to shore. That is where their prey is found, lounging on rocks.

Unlike the transient orcas, southern resident orca whales, the salmon-eating whales that frequent Puget Sound, are fighting extinction. Southern resident orcas face a combination of threats, including pollution, boat and ship noise and disturbance that makes it harder for them to hunt, and lack of chinook salmon, their preferred prey.

Tl'uk's family is rarely seen in local waters. Usually, the family is seen north of the San Juan Islands. But beginning in April, the whales made their first documented trip down to Admiralty Inlet. They spent four days in Saratoga Passage between Penn Cove and Holmes Harbor. Then, the family was seen in the deep south of Puget Sound, in Case and Henderson Inlets, Garrett said.

The gray whale is less than 2 years old. He is only the second such whale known to have been seen in the Salish Sea, which is the transboundary body of water between the U.S. and Canada. The Puget Sound is part of the Salish Sea. The first gray whale to be seen was Chimo. Chimo was a whale captured back when hunts were still allowed on orca whales to supply the aquarium trade.

"It is great to see that guy, just amazing," Garrett said of Tl'uk. The whale appears white in the dark green of the water. "There is a certain mystical quality."



## Quiz

1 Read the sentence below.

*Laws have helped keep transient orcas safe.*

Which selection from the article provides the BEST support for the statement above?

- (A) Transient orcas are seen from Alaska to California and all over Puget Sound, hunting seals, sea lions and other marine mammals.
- (B) Transient orca populations are healthy. There has been a federal ban on marine mammal hunting since 1972.
- (C) Unlike the transient orcas, southern resident orca whales, the salmon-eating whales that frequent Puget Sound, are fighting extinction.
- (D) The first gray whale to be seen was Chimo. Chimo was a whale captured back when hunts were still allowed on orca whales to supply the aquarium trade.

2 Which detail in the article BEST supports the conclusion that it is unusual to see gray whales?

- (A) Tl'uk is the second gray whale seen in the Salish Sea.
- (B) Southern resident orca whales are almost extinct.
- (C) Gray whales are just like orca whales except for their color.
- (D) People are excited to see the gray whale.

3 Read the sentence from the article.

*That is where their prey is found, lounging on rocks.*

Which of the following words, if it replaced the word "lounging" in the sentence above, would CHANGE the meaning of the sentence?

- (A) relaxing
- (B) sprawling
- (C) reclining
- (D) mounting

4 What does the word "mystical" suggest as it is used in this selection?

*"It is great to see that guy, just amazing," Garrett said of Tl'uk. The whale appears white in the dark green of the water. "There is a certain mystical quality."*

- (A) that gray whales are powerful
- (B) that gray whales are fascinating
- (C) that gray whales are spiritual
- (D) that gray whales are mysterious

# The U.S. Government: How important is presidential character?

By USHistory.org, adapted by Newsela staff on 02.17.17

Word Count **545**

Level **MAX**



A portrait of President Abraham Lincoln from 1863. Lincoln is usually rated as one of the best U.S. presidents. Maybe this is because most people think Lincoln had "good character." Photo from: Wikimedia Commons.

President Harry S. Truman was a man of the people. President John F. Kennedy was a bold, articulate leader with a great deal of charisma. President Richard Nixon had a deep knowledge of and interest in foreign policy.

The United States has had 44 presidents. Each person who has held the office has brought to it a unique style. Their differing styles reflect each president's unique character. Character is the combination of qualities that make up someone's personality.

## **Barber's Research**

James Barber published a well-known study of presidential character in which he studied personalities in order to predict presidential performance. Barber believes that presidents can be categorized as having "positive" or "negative" attitudes, and as being "active" or "passive." His findings indicate that "positive active" presidents are more successful than passive/negative ones. For example, Theodore and Franklin Roosevelt had positive active personalities. According to

Barber, their personalities caused them to approach the presidency with enthusiasm and a drive to lead and succeed.

This research is controversial. It is based on the assumption that presidential character and personality are extremely important in determining how successful a president is in office.

### **Rating The Presidents**

Most Americans have their own ideas about which presidents deserve to be called great, and which ones were failures. Historians even get into the ratings game. The Harvard professor Arthur M. Schlesinger started the modern game with his invitation to 55 prominent historians to rate the presidents. Although the lists have varied over the years, some presidents consistently rate at the top. Abraham Lincoln, George Washington and Franklin Roosevelt have locked up the top three spots in nearly every ranking survey.

Others with high scores are Thomas Jefferson, Andrew Jackson, Theodore Roosevelt, Woodrow Wilson and Harry Truman. Usually near the bottom are James Buchanan, Ulysses Grant and Warren Harding. Historians are reluctant to rank modern presidents, because not enough time has passed to assess their legacies.

Those who are considered "good" presidents appear to have some common leadership qualities. These include a strong vision for the country's future, an ability to put their own times into the perspective of history, effective communication skills, the courage to make unpopular decisions and crisis management skills. Also important are character and integrity, the ability to make wise appointments to crucial positions and an ability to work with Congress.

All Americans have different ideas about the importance that character plays in the job performance of the president. Considering all of the hats that a president must wear, perhaps the symbolic role that the president plays is most affected by character. Presidents must somehow symbolize what American citizens believe to be the essence of their country. They must represent what is valued now and what was valued in the past. But even more importantly, they embody the direction of America's future.



## Quiz

1 Read the summary below. Choose the answer that BEST fits into the blank to complete the summary.

Presidents have different personalities that reflect their character. Character can have an effect on how well they do in their job as president.

\_\_\_\_\_

Highly ranked, or popular presidents, often possess common leadership qualities, such as communication and crisis management skills.

- (A) Although Barber's research is controversial, there are many who agree with Barber's conclusions about successful negative/passive personalities.
- (B) Although some may disagree on how character affects the role of president, there are similar qualities found in good presidents throughout history.
- (C) Although it is important that the president have leadership skills, people prefer that the president concentrate on a strong vision for the future.
- (D) Although the role of the president is very symbolic, most presidents are not pleased that character plays such an important role in presidential success.

2 Read the paragraph from the section "Rating The Presidents."

*Those who are considered "good" presidents appear to have some common leadership qualities. These include a strong vision for the country's future, an ability to put their own times into the perspective of history, effective communication skills, the courage to make unpopular decisions and crisis management skills. Also important are character and integrity, the ability to make wise appointments to crucial positions and an ability to work with Congress.*

This paragraph:

- (A) describes the types of decisions "good" presidents will make in the future
- (B) explains how "good" presidents demonstrate their individual character
- (C) describes a list of leadership qualities that most "good" presidents have
- (D) explains how leadership qualities of "good" presidents do not affect Congress

3 Which sentence from the section "Barber's Research" supports the idea that certain traits can predict presidential performance?

- (A) James Barber published a well-known study of presidential character in which he studied personalities in order to predict presidential performance.
- (B) Barber believes that presidents can be categorized as having "positive" or "negative" attitudes, and as being "active" or "passive."
- (C) His findings indicate that "positive active" presidents are more successful than passive/negative ones.
- (D) For example, Theodore and Franklin Roosevelt had positive active personalities.

Which piece of evidence from the article BEST supports the idea that the symbolic role of the president is influenced by the character of the president?

- (A) Each person who has held the office has brought to it a unique style. Their differing styles reflect each president's unique character.
- (B) Most Americans have their own ideas about which presidents deserve to be called great and which ones were failures. Historians even get into the ratings game.
- (C) Usually near the bottom are James Buchanan, Ulysses Grant and Warren Harding. Historians are reluctant to rank modern presidents, because not enough time has passed to assess their legacies.
- (D) They must represent what is valued now and what was valued in the past. But even more importantly, they embody the direction of America's future.

# Predicting the weather with technology

By National Geographic Society, adapted by Newsela staff on 04.16.20

Word Count **868**

Level **1110L**



Image 1. Radar observes the atmosphere from below. It measures data about the atmosphere and weather and helps meteorologists track storms. Photo: Volkmar K. Wentzel/National Geographic

The atmosphere is a layer of gasses the surrounds a planet. On Earth, the distance from the surface to the upper levels of the atmosphere is only about 97 kilometers (60 miles). While that may not sound like it is too far, imagine trying to observe a baseball game from that distance. It would be virtually impossible.

That's why scientists need accurate and precise instruments to understand what happens there.

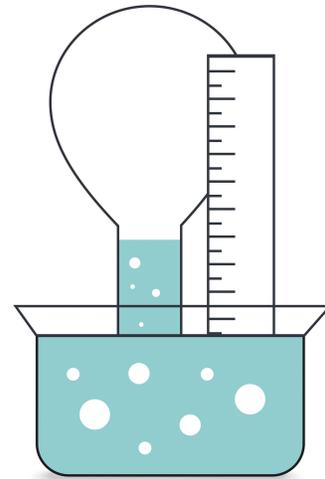


## Thermometers And Barometers

One of the first pieces of technology ever used to observe the atmosphere was the thermometer, invented in Italy in the 1590s by Galileo Galilei. He designed a glass tube with a hollow bulb at one end. Galileo held the bulb end in his hands, allowing it to heat up, and then turned the device upside-down, tube end first, into a basin filled with water. The water would then rise into the tube relative to the temperature of the surrounding air. Colder air made the water rise higher into the

glass. Warm water did the opposite. In 1612, another Italian scientist improved upon Galileo's thermometer design by adding a number scale so that temperatures could be read.

Roughly 50 years later, one of Galileo's apprentices, Evangelista Torricelli, created the barometer -- an instrument that measures the air pressure. Air pressure is the weight of the atmosphere pressing down on a location. Today, many scientists, including meteorologists, use barometers. They use air pressure readings to determine whether the atmosphere is stable (under high air pressure) or stormy (influenced by low air pressure).



### **Remote Sensing Instruments**

We need thermometers, barometers and other instruments to understand the conditions in the part of the where humans live. But what if scientists want to explore how the atmosphere might act hours or days into the future, or in another part of the world? For this, scientists depend on remote sensing instruments. These are tools that obtain information from some distance away.

High in the atmosphere, the temperatures are below zero and the air is thin. Scientists have developed instruments that can collect observations in these conditions. One such instrument is the weather balloon, which floats to lofty heights while a device called a radiosonde follows close behind. As the radiosonde rises, its internal sensors measure temperature, pressure, and humidity. Every two seconds, a radio transmitter within the device relays this data back to scientists. They use this data (along with wind speed and wind direction data, which are calculated by tracking the radiosonde's position) to create weather forecasts.

A weather balloon can only travel about 32 kilometers (20 miles) up from the surface, measuring data for only a third of the atmosphere. Above that height, the atmosphere's decreasing air pressure causes the balloon to rise and expand outward until it pops. To collect data at higher altitudes, scientists turn to satellites.

### **Weather Satellites And Radar**

In the 1960s, NASA launched TIROS I, the nation's first weather satellite. Today, weather satellites continuously circle our planet hundreds of miles above its surface and are one of the most effective tools for studying Earth. From these locations, satellites are able to "see" atmospheric events around the globe. Not only do satellites collect data and relay it from space back to Earth's surface, they also capture images of what they see.

Satellites monitor clouds, lightning, snow, ice and hurricanes. But they can also measure other events such as wildfires, volcanoes, ocean temperatures and solar flares. Satellites also assist scientists in monitoring the atmosphere's chemistry, such as ozone and air pollution levels and greenhouse gas concentrations.

Radar is another form of technology that captures images of the atmosphere, but unlike weather balloons and satellites, which scan the atmosphere from above, radar works by scanning it from

the ground. Radar sends out pulses of energy called radio waves and sees how the waves interact with objects in the air. This reveals the location of rain, snow, and other types of precipitation.

One kind of radar, called Doppler radar, can detect a storm's location and its movement too. It can tell whether a storm is approaching or moving out of a specific area. It can also see rotation, a sign of possible tornadoes.

### **Computer Models**

You have likely heard meteorologists mention weather models when discussing the weather forecast. A weather model is essentially a computer program that use data and math to make estimates and assumptions to predict the weather. As data is fed into the weather models, such as temperature, humidity or pressure, the computer creates a model that predicts what will happen some time in the future. They can do this at speeds of quadrillions of calculations per second, weeks faster than can be done by hand. The model approximates what the atmosphere is likely to do before it actually does it.

Today's technologies allow us to explore the atmosphere in extremely fine detail.

## Quiz

1 Which of these statements would be MOST important to include in an objective summary of the article?

- (A) If a weather balloon goes too high, the atmosphere's pressure causes the balloon to expand and pop.
- (B) Weather satellites can help scientists monitor the atmosphere's ozone, air pollution and greenhouse gases.
- (C) Some technologies that observe the atmosphere are used on the ground, while others are used in the sky.
- (D) The best technology for observing the atmosphere is computer modeling because it is the most accurate.

2 Read the following selection from the section "Weather Satellites And Radar."

*In the 1960s, NASA launched TIROS I, the nation's first weather satellite. Today, weather satellites continuously circle our planet hundreds of miles above its surface. They are one of the most effective tools for studying Earth. From high above the Earth, satellites are able to "see" atmospheric events around the globe. Not only do satellites collect data and relay it from space back to Earth's surface, they also capture images of what they see.*

Which central idea of the article is MOST supported by this selection?

- (A) Technology helps people understand the atmosphere from a perspective that humans alone cannot reach.
- (B) Satellites are the most efficient and accurate technology for observing how the atmosphere works.
- (C) The launch of TIROS I in the '60s was important because it changed how humans were able to predict weather.
- (D) Since the launch of TIROS I, satellites are constantly circling Earth's orbit, taking pictures of the weather.

3 Read the first paragraph of the article.

What is the MOST LIKELY reason for including information about the distance between the Earth and the top of the atmosphere?

- (A) to illustrate the need for technology to observe the atmosphere from beyond Earth's surface
- (B) to illustrate the need for rockets that can leave Earth's orbit in order to view the atmosphere from above
- (C) to highlight how short the distance between Earth's surface and the end of the atmosphere is
- (D) to highlight how long the distance between Earth's surface and the end of the atmosphere is

4 Read the following paragraph from the section "Remote Sensing Instruments."

*Thermometers, barometers and other instruments are essential to exploring the immediate atmosphere where humans exist. But what if scientists want to explore how the atmosphere might act hours or days into the future, or in another part of the world? For this, scientists depend on remote sensing instruments--tools that obtain information from some distance away.*

What is the MAIN reason why the author includes this paragraph in the article?

- (A) to explain how technology works best when it observes the atmosphere from far away
- (B) to explain how technology has become more advanced since the thermometer was invented
- (C) to highlight how remote sensing instruments are more advanced than thermometers and barometers
- (D) to highlight how different technologies are needed to measure different parts of the atmosphere