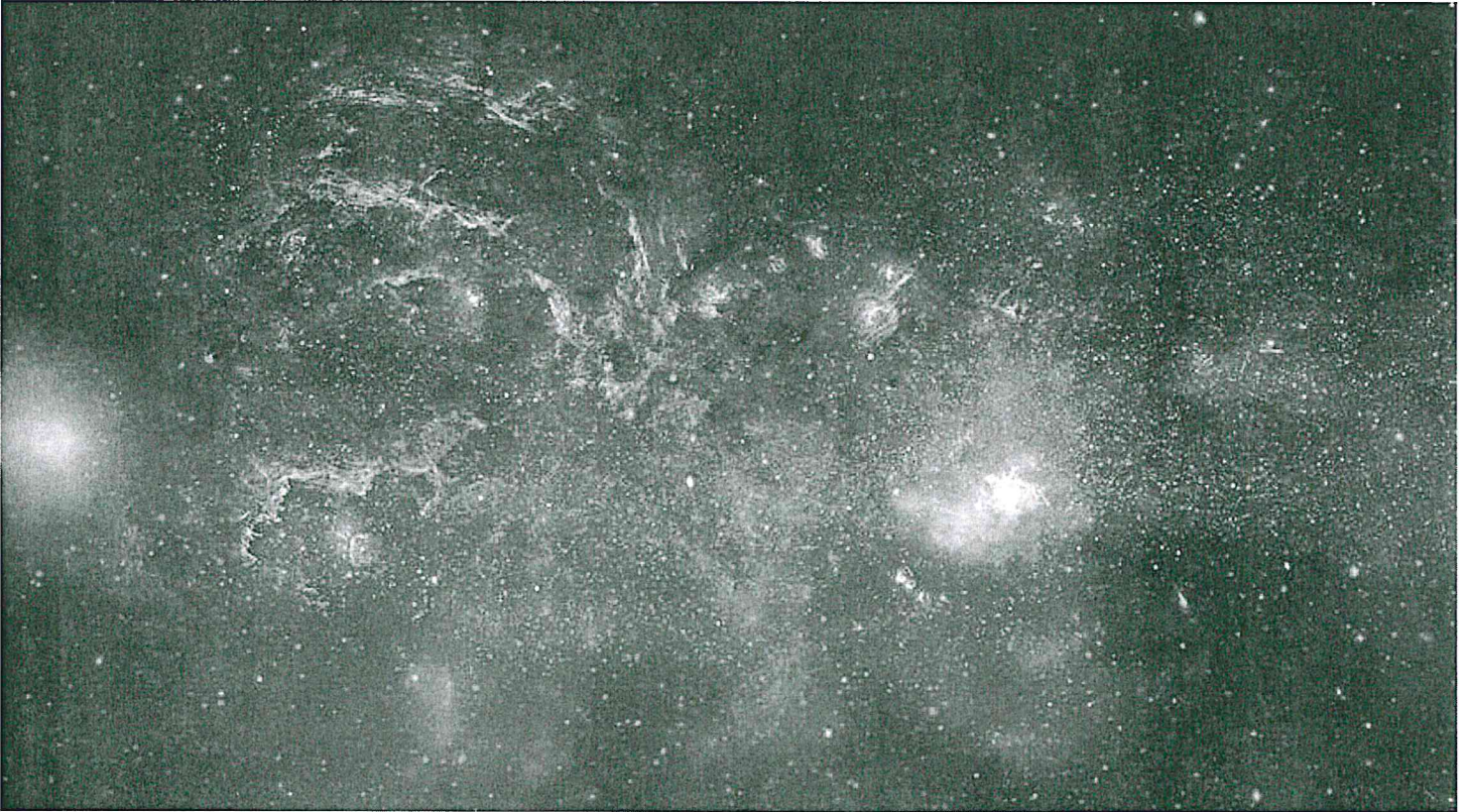


What is the difference between a galaxy and a solar system?

By NASA, adapted by Newsela staff on 09.19.17

Word Count **692**

Level **820L**



An image of the Milky Way galaxy taken in celebration of the International Year of Astronomy in 2009. Infrared and X-ray light were used to see through the obscuring dust and reveal the intense activity near the galactic core. The center of the galaxy is located within the bright white region to the right. Photo by: NASA/JPL-Caltech/ESA/CXC/STScI.

The sun warms us each and every day. But did you know it is also a star? All the stars in the night sky are suns too.

These stars, or suns, can have their own solar systems. A solar system is a group of planets that move around a sun. A single solar system can contain hundreds of planets.

There is a difference between a solar system and a galaxy. A galaxy is a huge collection of gas, dust and billions of stars and their solar systems. Galaxies are held together by gravity, which keeps planets and stars from simply floating away.

Our sun is just one of at least 200 billion stars in our galaxy, which is called the Milky Way. Our solar system is also just one of many solar systems in this galaxy.

Even the Milky Way is just one of many galaxies. Scientists believe there are hundreds of billions of galaxies in the universe.

The Milky Way is part of a group of about 30 galaxies called the Local Group. Our nearest big neighbor is called the Andromeda galaxy.

Spiral Galaxies And Other Shapes

Our galaxy, the Milky Way, is shaped like a spiral. A spiral is a shape that curls around a center point. The Milky Way is a type of spiral that looks a bit like certain kinds of seashells.

About 2 out of 3 galaxies in the universe are also shaped like spirals. Some galaxies are shaped ellipses, or stretched circles. A few look like toothpicks or rings.

How do we know what other galaxies look like if they are so far away? Scientists can see distant galaxies thanks to the Hubble Space Telescope. This is a telescope in outer space that can see outside of our galaxy. It was made by NASA, a lab in the U.S. that builds machines to study space. The Hubble Space Telescope has found many thousands of galaxies, of all sizes, shapes and colors.

Our galaxy, the Milky Way, has hundreds of billions of stars. It also has at least 10 times as much dark matter as all the stars and gas put together.

Dark Matter: We Can't See It

Dark matter is the opposite of bright matter. Bright matter is what we can see with our eyes or with the help of telescopes. It includes bright objects such as planets, stars and galaxies.

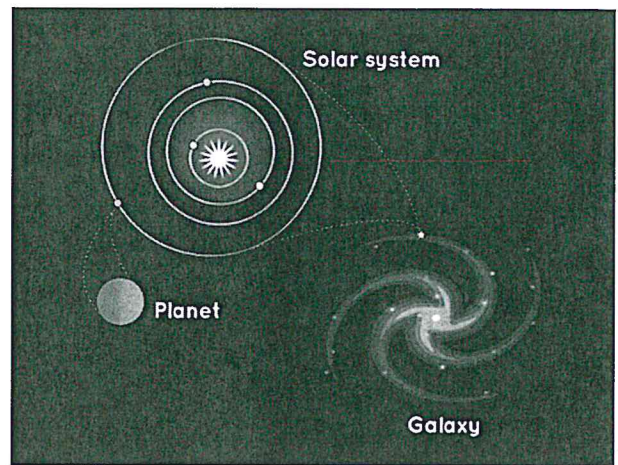
Dark matter is what exists around all those bright objects. We know it exists because we can measure how much it pulls on other objects in the universe. We just can't see it.

Black holes are one kind of dark matter. Objects that are just a little too small to be stars are another kind. They are too small to make any light.

Scientists believe most dark matter is made up of tiny pieces of matter. These pieces have not been seen or studied yet.

The Big Bang: The Universe Forms

The universe was formed by an event known as the Big Bang. This was a large explosion of matter. What happened next is not known. It could be that small pieces of floating matter slowly formed stars, star clusters and then finally galaxies. It could also be that the universe first organized into huge clumps of matter that later broke apart into galaxies.



Galaxies Headed For Collision

Galaxies often crash into each other. The Milky Way itself is on a collision course with our nearest neighbor, the Andromeda galaxy. There's no need to worry, though. The crash won't happen for around another 5 billion years.

Even if it happened tomorrow, you might not notice. Galaxies are very long and stretched out, so usually it's only their ends that bump together. Most planets are nowhere near the ends of their galaxies. When galaxies bump into each other, the planets often don't get close enough to crash.

Quiz

1 Read the paragraph from the introduction [paragraphs 1-6].

The Milky Way is part of a group of about 30 galaxies called the Local Group. Our nearest big neighbor is called the Andromeda galaxy.

What does the "Local Group" refer to?

- (A) all galaxies that have solar systems
- (B) galaxies as big as the Andromeda galaxy
- (C) galaxies that are near the Milky Way
- (D) all the galaxies in our universe

2 Read the sentence from the section "Galaxies Headed For Collision."

The Milky Way itself is on a collision course with our nearest neighbor, the Andromeda galaxy.

Which word from the section BEST helps the reader understand the meaning of "collision"?

- (A) worry
- (B) crash
- (C) stretched
- (D) bump

3 Which selection from the introduction [paragraphs 1-6] is BEST illustrated by the diagram in that section?

- (A) A solar system is a group of planets that move around a sun.
- (B) A single solar system can contain hundreds of planets.
- (C) Our sun is just one of at least 200 billion stars in our galaxy, which is called the Milky Way.
- (D) Scientists believe there are hundreds of billions of galaxies in the universe.

4 Use the two diagrams and the information from the article to select the TRUE statement.

- (A) Earth's solar system is located at the center of the spiral-shaped Milky Way galaxy.
- (B) Spiral galaxies like the Milky Way contain more dark matter than other galaxy shapes.
- (C) Earth's solar system is one of many found within the spiral-shaped Milky Way galaxy.
- (D) Spiral galaxies like the Milky Way contain more solar systems than other galaxy shapes.

The roles of state and federal governments

By National Geographic Society, adapted by Newsela staff on 05.22.19

Word Count **427**

Level **600L**

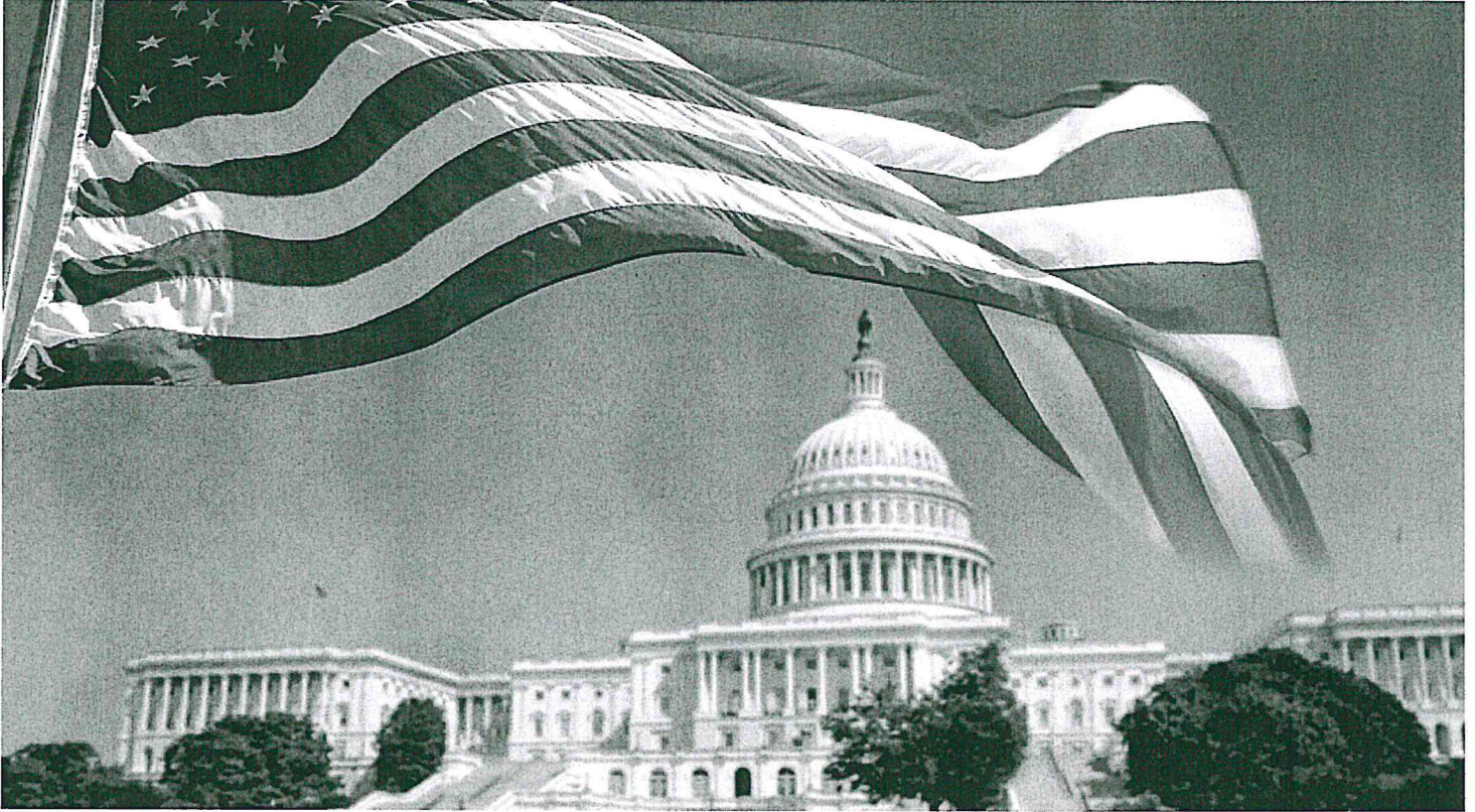


Image 1. The Capitol in Washington, D.C., where federal laws are made.

The United States has a federal system. Federalism is a form of government in which power is divided. Power is shared between a federal, or national, government and state governments. Our federal government is based in Washington, D.C. Congress is the body that makes federal laws.

The U.S. form of federalism is based on the U.S. Constitution. The Constitution declares that federal laws are the "supreme law of the land." Only the Constitution is above federal law. No law can go against the Constitution.

The Federal Government Shares Power With The States

The federal government has many great powers. It can charge taxes. It can create federal courts. It can declare war.



**NATIONAL
GEOGRAPHIC**

However, the Constitution limits the federal government's powers. The federal government's power is shared with the states.

States are given the powers needed to protect public safety and health. Such powers are called "police powers."

Certain powers are called "concurrent powers." These are powers that states and the federal government both have. They both use these powers at the same time. One such power is the power to charge taxes. Another is the power to spend and borrow money.

There Can Be Conflicts

It is not always clear if the power to make certain laws belongs to the federal or state government. As a result, two very different laws covering the same thing can be passed. This can lead to conflict. The two laws can work against each other.

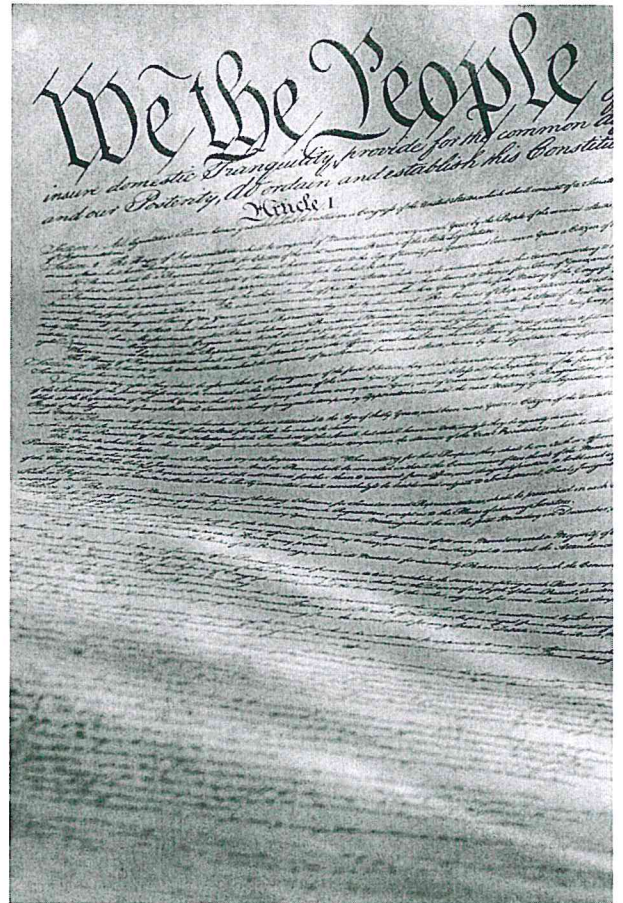
The Constitution provides a way to settle such conflicts. This is known as the doctrine of preemption. A doctrine is a rule. To preempt is to overrule. Under the doctrine, if a state law conflicts with a federal law, the state law must give way. States are not allowed to block federal laws.

State Laws Cannot Go Against Federal Laws

Federal law can preempt state law for various reasons. Sometimes federal and state laws clearly contradict each other. One law says one thing. The other says the opposite.

State laws are also preempted when it is impossible for someone to follow both state and federal laws. Finally, state laws are preempted when they undercut a federal law. These laws go against the goal of a federal law.

The doctrine of preemption does not always apply, however. It does not apply when a federal law goes against the Constitution. In that case, the state law would win out. The Constitution is the final judge.



Quiz

- 1 If readers are looking for information on concurrent powers, which section should they read?
- (A) Introduction [paragraphs 1-2]
 - (B) "The Federal Government Shares Power With The States"
 - (C) "There Can Be Conflicts"
 - (D) "State Laws Cannot Go Against Federal Laws"
- 2 In which section of the article would the author add more information about what happens to a state law if a federal law goes against the Constitution?
- (A) Introduction [paragraphs 1-2]
 - (B) "The Federal Government Shares Power With The States"
 - (C) "There Can Be Conflicts"
 - (D) "State Laws Cannot Go Against Federal Laws"
- 3 Read the section "The Federal Government Shares Power With The States." Select the sentence that describes something only the federal government is allowed to do.
- (A) The federal government has many great powers.
 - (B) It can declare war.
 - (C) One such power is the power to charge taxes.
 - (D) Another is the power to spend and borrow money.
- 4 Read the paragraph from the section "There Can Be Conflicts."

The Constitution provides a way to settle such conflicts. This is known as the doctrine of preemption. A doctrine is a rule. To preempt is to overrule. Under the doctrine, if a state law conflicts with a federal law, the state law must give way. States are not allowed to block federal laws.

Which question is answered in this paragraph?

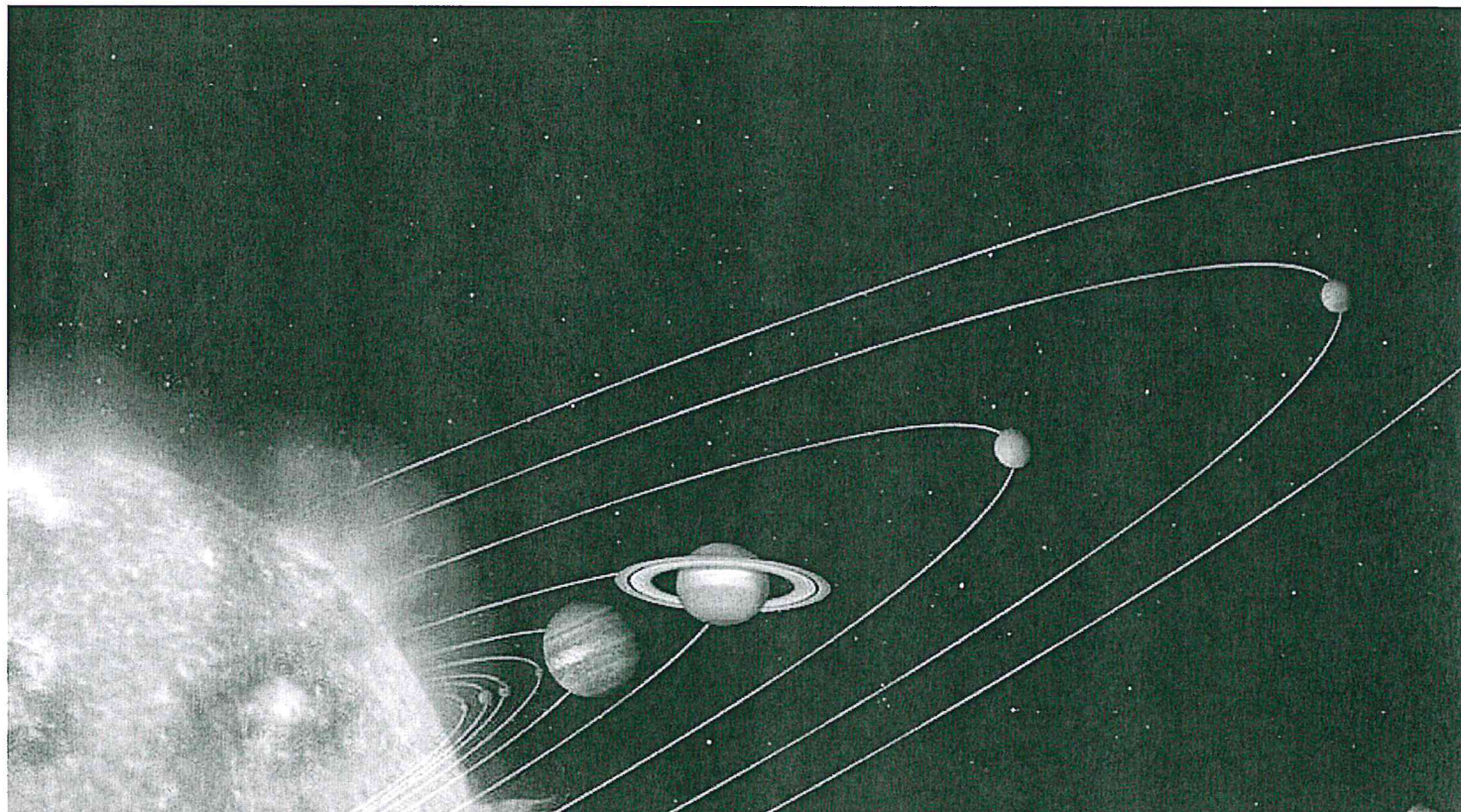
- (A) Why does the United States have a federal system?
- (B) What powers do state governments have?
- (C) What is the doctrine of preemption?
- (D) When was the Constitution created?

Exploring our solar system

By NASA.gov, adapted by Newsela staff on 10.27.16

Word Count **648**

Level **710L**



TOP: Photo of the solar system, June 21, 2016. NASA/JPL-Caltech/T. Pyle (SSC).

A solar system is a star and all of the objects that travel around it, such as planets and moons. Most stars have their own planets. Scientists believe there are many solar systems. Solar systems can also have more than one star. Some have two stars or more.

The solar system that is home to Earth is on the edge of the Milky Way. This is a galaxy, or system of stars, gas and dust. The solar system is made up of the sun and everything that orbits around it. This includes the eight planets and their moons. There are also pieces of rock like asteroids flying around. Comets are also flying through the solar system. They are like dirty snowballs of dust, ice and gas.

Size And Distance

The solar system goes far beyond the eight planets around the sun. It also includes the Kuiper Belt. This lies beyond the planet Neptune. The Kuiper Belt is a ring of icy objects. It includes the dwarf planet Pluto.

Beyond the Kuiper Belt is the Oort Cloud. This giant round shell surrounds the solar system. It has never been seen directly, but scientists believe it exists.

The Oort Cloud is made of icy pieces of space garbage. It is a thick shell of material where the sun's gravity ends. The Oort Cloud is very far away. It would take a space shuttle thousands of years to get there.

Formation

The solar system formed more than 4 billion years ago. It was created from a thick cloud of gas and dust. The cloud collapsed and formed a spinning, swirling disk. At the center of the disk, pressure began to build. Finally it released a huge amount of energy, creating the sun.

Farther out in the disk, material was also clumping together. These clumps smashed into one another, forming larger objects. Some of them turned into spheres, or ball-shaped objects. They became planets, dwarf planets and large moons. In other cases, they did not form planets. These bits and pieces are still flying around the solar system.

Structure

When the solar system formed, it was very hot in the middle. Near the sun, only rocky material could handle the heat. For this reason, the first four planets have solid, rocky surfaces. These planets are Mercury, Venus, Earth and Mars.

The planets farther away from the sun are made of ice and gas. Jupiter and Saturn are gassy planets. Uranus and Neptune are icy planets.

Exploration

About 400 years ago, scientist Galileo Galilei made some important discoveries. He used a new tool called a telescope. It let him see far into space. His discoveries supported the idea that all of the planets circle around the sun. At the time this was a new idea. Most people thought Earth was the center of the universe.

Since then, scientists have learned much more about the solar system. They have also learned more about what lies beyond it.

Significant Dates

1543: Nicolaus Copernicus publishes his theory of heliocentrism. This is the idea that the sun is the center of the universe.

1609, 1619: Johannes Kepler publishes three laws of planetary motion.

QUICK FACTS

Planets

Eight

Dwarf Planets

Five

Moons

Known = 149 | Provisional = 24

Total = 173

Comets

More than 3,400

Asteroids

More than 715,000

1610: Galileo Galilei publishes "The Starry Messenger." It describes the Earth's moon, Venus and four of Jupiter's moons.

1705: Edmond Halley finds similarities between comets seen in 1456, 1531, 1607 and 1682. He successfully predicts the return of the same comet in 1758.

1781: William Herschel discovers a new planet, Uranus.

1801–1808: The first four asteroids were discovered.

1846: Urbain Le Verrier and Johann Galle discover a new planet, Neptune.

1930: Clyde Tombaugh discovers a member of the solar system beyond Neptune, named Pluto. It is now considered a dwarf planet.

1977: Voyagers 1 and 2 launch from Earth. They begin their mission to explore the far reaches of the solar system.

2012: Voyager 1 enters interstellar space.

Quiz

- 1 Which answer choice BEST describes the structure of the article?
- (A) A main topic is introduced; important details about that topic are explained.
 - (B) A problem is presented; several possible solutions are discussed.
 - (C) A question is introduced; some possible answers are explained.
 - (D) A claim is presented; supporting evidence is given to support the claim.

- 2 Which section of the article BEST helps you understand the history of space discoveries?
- (A) "Formation"
 - (B) "Structure"
 - (C) "Exploration"
 - (D) "Significant Dates"

- 3 Read the selection from the article.

When the solar system formed, it was very hot in the middle. Near the sun, only rocky material could handle the heat. For this reason, the first four planets have solid, rocky surfaces. These planets are Mercury, Venus, Earth and Mars.

Based on this selection, which of the following is TRUE?

- (A) The four closest planets to the sun are too hot for life to survive.
 - (B) Planets made of stone and rock can survive hot temperatures.
 - (C) The four closest planets to the sun do not have any gas.
 - (D) The Earth is too close to the sun and humans will not be able to survive.
- 4 Which selection from the article BEST helps you understand how big the solar system is?
- (A) A solar system is a star and all of the objects that travel around it, such as planets and moons.
 - (B) The solar system goes far beyond the eight planets around the sun.
 - (C) Beyond the Kuiper Belt is the Oort Cloud. This giant round shell surrounds the solar system.
 - (D) The Oort Cloud is very far away. It would take a space shuttle thousands of years to get there.

Lewis and Clark Expedition, 1805-1806

By HistoryLink.org, adapted by Newsela staff on 10.31.19

Word Count **760**

Level **860L**



Image 1. Painting titled "Lewis and Clark on the Lower Columbia" by Charles Marion Russell in 1905.

In May 1803, the United States purchased Louisiana from France. Louisiana was then a huge territory. It was far bigger than the present-day state of Louisiana.

The Louisiana Purchase doubled the size of the United States. Soon after the purchase, President Thomas Jefferson asked Meriwether Lewis to explore the nation's vast new lands.

Lewis put together a group of 33 people. The group was led by Captain Lewis and Captain William Clark. It traveled west by foot, horse and watercraft across North America. Its goal was the Pacific Ocean at the mouth of the Columbia River. Along the way, the explorers spent time in what is now Washington state.

Camping Near Salmon Creek

The voyage began in Wood River, Illinois, in May of 1804. By November 3, 1805, the explorers had reached Government Island in what is now Oregon. Continuing down the Columbia River on November 4, they came to a large village on the Oregon side of the river. The villagers were from

the Chinook tribe. They gave Lewis and Clark's party their first taste of wapato roots, a potato-like root the Chinook ate.

Seven miles below the village, the explorers reached Vancouver Lake. The lake lies on the Washington side of the river just west of the present-day city of Vancouver. As the men ate, several canoes from the large village came down the river for a visit that the explorers did not appreciate. Clark claimed that the Chinook stole his pipe and a coat.

On November 4, 1805, the explorers camped along the Columbia River near Salmon Creek in what is now Clark County, Washington. Soon after they set up camp, a group of Chinook arrived. The Chinook sold the explorers some food.

Cultural Differences

The Columbia River Native Americans that Lewis and Clark came across were from tribes that all spoke several related Chinookan languages. They are often called Chinook, or Chinookans, as a group. The Chinookan people were great traders. They had already traded with Europeans and Americans who arrived by boat to buy fur, and were used to bargaining. Unlike some other native peoples Lewis and Clark came across, they did not simply give the explorers food. Instead, they wanted something in exchange. This made the explorers feel the Chinookans were taking advantage of them.

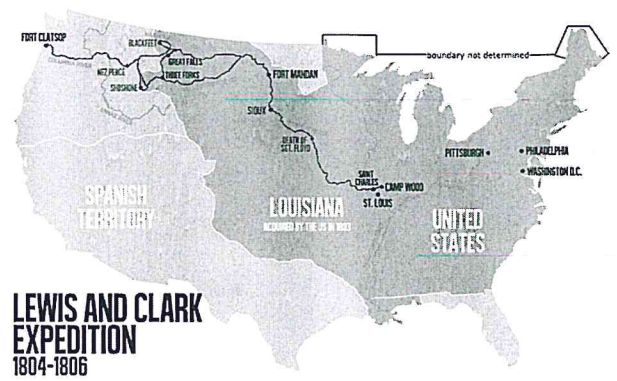
The explorers also didn't understand why the Chinookans stole small things from them. The Chinookans considered the stealing a friendly game. The idea was to see if one person could steal something without the other noticing. It was not really about wanting the thing at all. The Chinookans would never steal anything large or valuable.

Lewis and Clark didn't understand any of this and were angered by the thefts. To get back at the Chinookans, they stole a valuable canoe.

Expedition Leaves The Future State Of Washington

After reaching the Pacific Ocean, the explorers began the return journey on March 23, 1806. The group paddled back up the Columbia River in six boats. They passed from what is now Oregon back into Washington.

Progress was slow because they were paddling against the current. Lewis and Clark decided they would abandon the river if they could buy enough horses.



Lewis & Clark's Journey in Washington



Mixed Relations With Native Americans

Traveling east, Lewis and Clark became increasingly angry at the people who lived along the lower Columbia. The Native Americans demanded what Lewis and Clark thought was too high of prices for their horses.

Relations with the local Native Americans improved after the explorers reached the village of Chief Yellept and his Walla Wallas. The village was located at the mouth of the Walla Walla River, near what is now Wallula, Washington. Lewis and Clark arrived there on April 27, 1806.

The explorers spent three days with the Walla Wallas. The Walla Wallas treated them with great friendliness. One merry night the whole village danced and sang to the music of explorer Pierre Cruzatte's fiddle and the Walla Wallas' drums and rattles.

On May 5, 1806, the explorers left Washington and went on into Idaho. From there, the explorers continued east. Four months later, they ended their 8,000-mile voyage in St. Louis, Missouri.

Quiz

- 1 Select the sentence from the section "Cultural Differences" that BEST shows a cultural difference between Lewis and Clark and the Chinookans.
- (A) The Chinookan people were great traders.
 - (B) They had already traded with Europeans and Americans who arrived by boat to buy fur, and were used to bargaining.
 - (C) The explorers also didn't understand why the Chinookans stole small things from them.
 - (D) The Chinookans would never steal anything large or valuable.

- 2 Read the section "Camping Near Salmon Creek."
- Which selection from the section BEST supports the conclusion that local people introduced the explorers to new things?
- (A) Continuing down the Columbia River on November 4, they came to a large village on the Oregon side of the river.
 - (B) They gave Lewis and Clark's party their first taste of wapato roots, a potato-like root the Chinook ate.
 - (C) As the men ate, several canoes from the large village came down the river for a visit that the explorers did not appreciate.
 - (D) Soon after they set up camp, a group of Chinook arrived. The Chinook sold the explorers some food.

- 3 One MAIN idea of the article is that Lewis and Clark did not understand or appreciate several of the customs of the people they met along the way.
- What is another MAIN idea of the article?
- (A) The Lewis and Clark expedition to the Pacific Ocean covered many miles and took a long time.
 - (B) Lewis and Clark had to travel along many rivers because they could not afford horses.
 - (C) The Walla Wallas were the most friendly and musical tribe Lewis and Clark met.
 - (D) Nobody besides Lewis and Clark could have been successful in the journey across the country.

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

Lewis put together a group of 33 people. The group was led by Captain Lewis and Captain William Clark. It traveled west by foot, horse and watercraft across North America. Its goal was the Pacific Ocean at the mouth of the Columbia River. Along the way, the explorers spent time in what is now Washington state.

How does this paragraph support a MAIN idea of the article?

- (A) by suggesting that the group was just the right size for the trip
- (B) by showing who came up with the idea of the journey
- (C) by detailing who was in Lewis and Clark's traveling party
- (D) by explaining where and how Lewis and Clark traveled

What is beyond our solar system?

By NASA.gov, adapted by Newsela staff on 11.15.16

Word Count **527**

Level **830L**



TOP: Spiral galaxy NGC 7331 looks similar to our Milky Way. NASA. MIDDLE: The arms of the Milky Way. BOTTOM: The first planet discovered beyond our solar system orbits the star 51 Pegasi. NASA.

Our sun looks huge to us, but it is just one of the stars in the Milky Way galaxy. There are 100 billion other stars in our Milky Way galaxy. The Milky Way is a galaxy shaped like a spiral. It is about 100,000 light-years wide. A light-year is not like a human year. A light-year is the distance light travels in one year. Just one light-year is about 6 trillion miles.

The stars of the Milky Way look like a pinwheel with four arms. Earth is on one of the arms. Most of the stars in the Milky Way have their own planets.

All of the stars in the Milky Way orbit a giant black hole at the galaxy's center. This black hole is 4 million times bigger than our sun. It is 168,000 trillion miles away from Earth. The Milky Way orbits the black hole at about 514,000 miles per hour (828,000 kilometers per hour). It takes about 230 million years to make one revolution around it.

Beyond Our Galaxy

Our Milky Way galaxy is part of a neighborhood of 54 other galaxies. It is called the Local Group. Galaxies are all held together by gravity. Without gravity, Earth and everything else in our galaxy would fly off into space. Andromeda is the name of another large galaxy in our neighborhood.

Scientists studying galaxies expect the stars in the outer orbits to move faster since they have farther to travel. They also thought the stars on the inner orbits should move more slowly because they have less distance to travel. However, they found that the stars in the outer and inner orbits are moving at the same speed. They now believe that this might be the result of more gravity coming from some mysterious dark matter.

However, dark matter is invisible, and scientists cannot see it with regular telescopes.

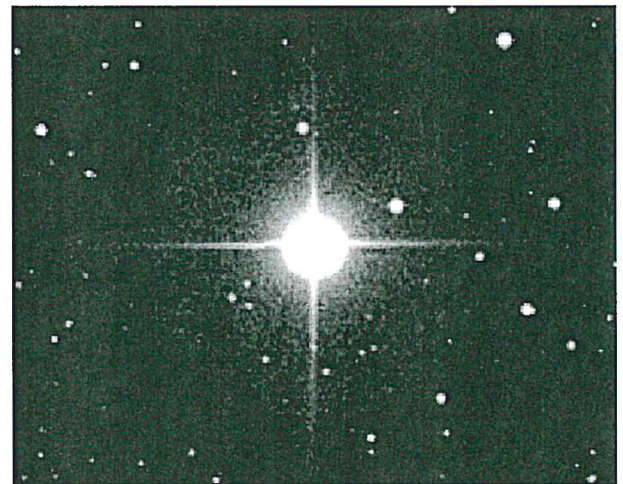
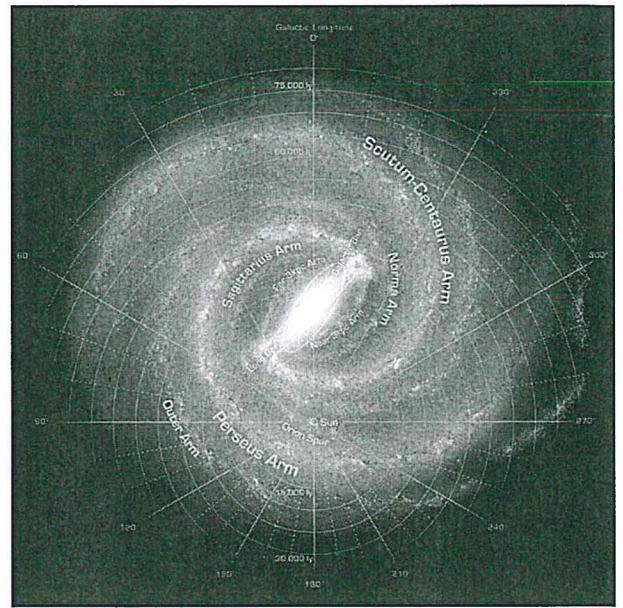
Dark Energy

Our neighborhood of galaxies is only one of many that are moving away from the others. This goes against Isaac Newton's laws of gravity that say every object in the universe moves toward another object. Newton was an English mathematician and scientist in the 1600s. Since objects in space are moving away from each other, there is more space between them. This means the universe itself is getting bigger. That discovery is what led to the theory of the Big Bang origin of the universe.

Scientists thought that gravity would bring things closer to one another. So our universe would not grow very much and maybe even start to shrink. In the 1990s, however, scientists found that our universe is getting bigger. The force causing this is called dark energy. No one is sure what it is. But it is out there in space.

Since matter equals energy in Albert Einstein's famous equation, $E=MC^2$, scientists have been able to measure dark energy. It is about 68 percent of everything out there in the universe. Dark matter makes up another 27 percent. This leaves just 5 percent for everything else we see and understand.

Scientists think there are at least 100 billion galaxies in our universe surrounded by enormous empty places.



Quiz

- 1 Which sentence from the section "Beyond Our Galaxy" BEST supports the idea that space is mysterious?
- (A) Our Milky Way galaxy is part of a neighborhood of 54 other galaxies.
 - (B) Without gravity, Earth and everything else in our galaxy would fly off into space.
 - (C) They also thought the stars on the inner orbits should move more slowly because they have less distance to travel.
 - (D) However, dark matter is invisible, and scientists cannot see it with regular telescopes.
- 2 Select the sentence from the article that uses a cause and effect structure.
- (A) Our sun looks huge to us, but it is just one of the stars in the Milky Way galaxy.
 - (B) Our neighborhood of galaxies is only one of many that are moving away from the others.
 - (C) Since objects in space are moving away from each other, there is more space between them.
 - (D) In the 1990s, however, scientists found that our universe is getting bigger.
- 3 Which sentence from the section "Dark Energy" BEST supports the idea that scientists are constantly learning new things about space?
- (A) Scientists studying galaxies expect the stars in the outer orbits to move faster since they have farther to travel.
 - (B) However, dark matter is invisible, and scientists cannot see it with regular telescopes.
 - (C) In the 1990s, however, scientists found that our universe is getting bigger.
 - (D) It is about 68 percent of everything out there in the universe.
- 4 Overall, the article is organized around:
- (A) a topic and informational facts
 - (B) a mystery and a famous scientist
 - (C) a place and a group of people
 - (D) an event and a discovery

Women Leaders: Sacagawea

By Biography.com Editors and A+E Networks, adapted by Newsela staff on 07.25.16

Word Count 627

Level 860L



Sacagawea Wikimedia Commons

Synopsis: Sacagawea was born around 1788 in Idaho. She was the daughter of a Shoshone Indian chief. When she was about 12 years old, she was captured by an enemy tribe. Sacagawea was then sold to a French-Canadian animal trapper who made her his wife. In November 1804, she was invited to join the Lewis and Clark expedition to explore the West as a Shoshone translator. After leaving the expedition, she died in what is now South Dakota around 1812.

Early Life

Sacagawea is best known as a member of the Lewis and Clark expedition into the American West. She is also famous for being the only woman on the historic journey. Sacagawea served as the group's Shoshone translator, helping the explorers to speak with the Native Americans along the way.

Much of Sacagawea's life is a mystery, though. She was born around 1788 in Lemhi County, Idaho, the daughter of a Shoshone Indian chief.

When she was about 12 years old, Sacagawea was captured by Hidatsa Indians. They were an enemy of the Shoshone. She was then sold to a French-Canadian animal trapper named Toussaint Charbonneau, who made her one of his wives.

Sacagawea and her husband lived among the Hidatsa and Mandan Indians in the upper Missouri River area. This region is now part of North Dakota. In 1804, an expedition led by Meriwether Lewis and William Clark entered the area. The group planned to explore the western lands of the United States and find a route to the Pacific Ocean. Lewis and Clark met Charbonneau and hired him to serve as their translator. Even though she was about to give birth to her first child, Sacagawea was chosen to go with them. Lewis and Clark thought that her knowledge of the Shoshone language would help them during their journey.

Lewis And Clark Expedition

In February 1805, Sacagawea gave birth to a son named Jean Baptiste Charbonneau. Sacagawea was helpful to the explorers in many ways. She was skilled at finding plants they could eat. When her boat tipped over, she saved important documents and supplies. She also served as a symbol of peace. People were less suspicious of a group traveling with a woman and a child than a group of men traveling alone.

Sacagawea also made a wonderful discovery of her own during the trip west. When the explorers came upon a group of Shoshone Indians, she soon realized that its leader was her brother Cameahwait. This personal connection made the Shoshone willing to sell horses to the expedition. With the horses, the explorers were able to cross the Rocky Mountains.

The group reached the Pacific coast in November 1805. Sacagawea voted along with the other members of the expedition on where they would build a fort to stay for the winter. They built Fort Clatsop near what is now Astoria, Oregon. During the journey, Clark had become fond of Sacagawea's son Jean Baptiste, nicknaming him "Pomp" or "Pompey." Clark even offered to help the boy get an education.

Her Life After The Expedition

Once Sacagawea left the expedition, few details of her life are known. Historians think that in 1809 she and her husband traveled with their son to St. Louis, Missouri, to see Clark. Pomp was left in his care. Three years later, Sacagawea gave birth to her second child, a daughter named Lisette. A few months after, Sacagawea died at Fort Manuel in what is now Kenel, South Dakota, around 1812. After her death, Clark adopted her two children.

Over the years, many have honored Sacagawea and her contribution to the Lewis and Clark expedition. There are statues of her and places named after her. The U.S. government has even featured her on a special dollar coin.

Quiz

- 1 Which answer choice would also be a good title for the section "Lewis And Clark Expedition"?
 - (A) "An Unusual Childhood"
 - (B) "An Important Woman"
 - (C) "A Boy Called Pomp"
 - (D) "Sacagawea Is Honored"

- 2 Which answer choice BEST summarizes a central idea of the article?
 - (A) Sacagawea led a very interesting life.
 - (B) William Clark was close to Sacagawea and her children.
 - (C) Little is known about Sacagawea's life.
 - (D) Sacagawea played a valuable role in Lewis and Clark's journey.

- 3 Based on the article, what was the MAIN reason Sacagawea was a symbol of peace?
 - (A) She was honored with many statues and appeared on a special dollar coin.
 - (B) People felt more trusting toward a group traveling with a woman and child.
 - (C) She survived capture by Hidatsa Indians and married a French-Canadian trapper.
 - (D) Her relationship with her brother Cameahwait helped the explorers buy horses from the Shoshone.

- 4 According to the article, what is the relationship between Sacagawea and Clark?
 - (A) Sacagawea helped Clark on his expedition and they stayed friends after the journey.
 - (B) Clark hired Sacagawea to serve as his translator, but he was later interested in marrying her.
 - (C) Clark tutored Sacagawea's son Jean Baptiste and later adopted him.
 - (D) Sacagawea was forced to help Clark during the expedition, but avoided from him afterwards.

Big Questions: Why is Earth rotating?

By NASA SpacePlace, adapted by Newsela staff on 10.17.19

Word Count **586**

Level **720L**



Image 1. A composite time-lapse image of the night sky over Corfe Castle in the United Kingdom. In time-lapse images, the stars appear to trace out circles in the sky. This pattern is a product of Earth's rotation. Photo by: Dan Kitwood/Getty Images

Earth's rotation speed is the speed at which it spins around its axis. Its 24-hour rotation speed is one of the traits that make our planet so friendly to life. It allows most parts of Earth to stay a nice, comfortable temperature. Most places are bathed in sunlight during the day. They are covered in darkness at night.

Each planet has its own particular rotation speed. Mercury is the closest planet to the sun. It takes 59 Earth days to turn just once. Venus is the second planet. It rotates once every 243 Earth days. Venus also rotates backward from the direction it orbits around the sun. So do Uranus and the tiny planet Pluto. Uranus even lies down on the job. It rolls around with its axis of rotation pointed nearly toward the sun.

Rotation Began When Planetary System Formed

Why do Earth and the other planets rotate at all? It will help to understand how our planetary system formed. Almost five billion years ago, our planetary system had its beginnings as a huge cloud of dust and gas. The cloud began to fall in on itself. It flattened into a giant plate shape. This

plate-shaped cloud rotated faster and faster. The sun formed at the center. The spinning gas and dust in the rest of the spinning plate clumped together. It produced the planets and moons. It produced asteroids and comets. Many objects orbit the sun in nearly the same plane, called the ecliptic. They also orbit the sun in the same direction. This is because they all formed from the same plate shape.

While the planets were forming, clumps of matter of all sizes often crashed into one another. Sometimes they stuck together. Sometimes they sideswiped each other. They knocked off pieces. They sent each other spinning.

Gravity is a pulling force that works across space. Objects do not have to touch for gravity to affect them. Sometimes the gravity of big objects would trap smaller ones in orbit. This could be one way the planets picked up their moons.

Hunk Knocked Out Of Earth Became Our Moon

Scientists think a large object hit our young planet. It knocked out a hunk of material. That material one day became our moon. This crash set Earth spinning at a faster speed. Scientists estimate that a day in the life of early Earth was only about 6 hours long.

The moon formed much closer to Earth than where it is today. As Earth rotates, the moon's gravity causes the oceans to rise and fall. The sun also does this, but not as much. There is a little bit of friction between the tides and the turning Earth. Friction is the force that resists objects sliding against each other. This friction causes the Earth's rotation to slow down just a little. As Earth slows, it lets the moon creep away.

An atomic clock measures time using the natural frequencies of vibrating atoms. We can use very accurate atomic clocks to measure how much the Earth's rotation is slowing. One hundred years from now, a day will be about 2 milliseconds longer than today. Two milliseconds is how long it takes a car going 55 miles per hour to travel 2 inches. It is much less than the blink of an eye. So, if you live to be 100, you can't complain that the days are getting shorter! However, you also don't have to worry about the days getting longer enough to change things much.

Quiz

1 Read the section "Rotation Began When Planetary System Formed."

Which selection explains why Earth rotates?

- (A) Almost five billion years ago, our planetary system had its beginnings as a huge cloud of dust and gas.
- (B) This is because they all formed from the same plate shape.
- (C) While the planets were forming, clumps of matter of all sizes often crashed into one another.
- (D) Sometimes the gravity of big objects would trap smaller ones in orbit.

2 Read the paragraph below from the introduction [paragraphs 1-2].

Earth's rotation speed is the speed at which it spins around its axis. Its 24-hour rotation speed is one of the traits that make our planet so friendly to life. It allows most parts of Earth to stay a nice, comfortable temperature. Most places are bathed in sunlight during the day. They are covered in darkness at night.

What conclusion can the reader make based on this paragraph?

- (A) Earth's axis is different from other planets in our solar system.
- (B) The people on Earth are friendly because of the way Earth rotates.
- (C) If Earth did not rotate as it does, our planet would not be able to support life.
- (D) Earth's 24-hour rotation is short compared to the rotation of other planets.

3 Select the sentence that BEST summarizes the article.

- (A) Because of how the solar system was formed many years ago, Earth rotates around the sun.
- (B) Each planet has its own particular rotation speed, and Earth's is rather fast.
- (C) Gravity causes the moon to pull on the ocean, which slows Earth's rotation.
- (D) The speed of Earth's rotation has changed over time from being very fast to being slow.

4 How does the information in the section "Hunk Knocked Out Of Earth Became Our Moon" support the MAIN idea of the article?

- (A) by explaining how Earth's rotation has changed over time
- (B) by explaining how gravity and friction affect Earth's rotation
- (C) by explaining how Earth's rotation is expected to slow over the next few hundred years
- (D) by explaining how part of the Earth became the moon as the solar system was being formed

The War of 1812 in 1814: The rocket's red glare, bombs bursting in air

By Smithsonian.com, adapted by Newsela staff on 08.29.16

Word Count **698**

Level **820L**



TOP: An undated drawing depicts the burning of Washington, D.C., in August of 1814. MIDDLE: Engraving depicting the British capture of Washington during the War of 1812, Library of Congress. BOTTOM: "Maddy in full flight," showing the escape of James Madison from Washington, Library of Congress. FAR BOTTOM: The Battle of North Point, by militiaman Thomas Ruckle, Wikicommons.

The War of 1812 was fought between the United States and Great Britain. In America, the most famous battles were actually fought in 1814. Here's the story of what happened, written by Peter Snow, author of the book "When Britain Burned the White House."

August 24, 1814 – Midday – Bladensburg, Maryland

An army of 4,500 British soldiers suddenly appears at Bladensburg, Maryland. They are led by General Robert Ross. The soldiers have a lot of experience and have recently crushed the armies of the French emperor Napoleon in Europe.

Their target is Washington, the new U.S. capital. They are seeking revenge. The year before, the U.S. burned down the British city of York, which later became known as Toronto, Canada. The Battle of Bladensburg begins. The Americans are easily defeated and the road to Washington is left wide open.

August 24, 1814 – 8 p.m. – Washington, D.C.

The British army walks into an abandoned city. President James Madison's army has disappeared, and the president has escaped to Virginia. His wife, Dolley Madison, refuses to leave the White House until George Washington's portrait is rescued from the dining room. In their hurry to depart, she and the White House servants leave the dinner table set for the president and his guests.

9 p.m.

The British enter Washington. The commanders order the burning of Congress. The Capitol building is soon in flames, and thousands of precious books in the Library of Congress are destroyed.

10 p.m.

The British find the White House empty. They are tempted by the smell of freshly cooked food. They help themselves to James Madison's dinner, along with his favorite wine. After the meal, a British general puts on one of Madison's clean shirts in the bedroom upstairs. The commanders then give the order to set fire to the place. Within minutes, Americans in the area see the painful sight of their President's house going up in flames

August 25 – Morning – Washington, D.C.

The British continue to burn the public buildings of Washington. They destroy the Treasury, the State Department and the Department of War. A huge rainstorm drenches the burning buildings. Most of the walls remain standing, although the insides are destroyed. Later in the day, Ross decides he has done enough damage and pulls his army out.

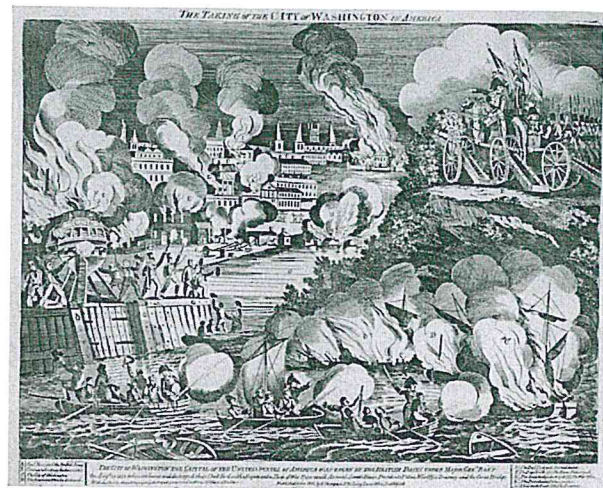
August 29 Through September 2 – Alexandria, Virginia

A group of British ships threaten the nearby town of Alexandria, Virginia. The townspeople are completely unprotected and immediately offer to surrender. The British force them to turn over all their tobacco, cotton and flour.

September 2-11 – The Chesapeake Bay

The British navy threatens Baltimore, Maryland. Baltimore's commander, Major General Sam Smith, organizes the city's defense. Its citizens dig trenches and build walls. A huge flag is made by Baltimore seamstress Mary Pickersgill. It is flown over Fort McHenry. The flag inspires the fort's soldiers to defend the Baltimore harbor.

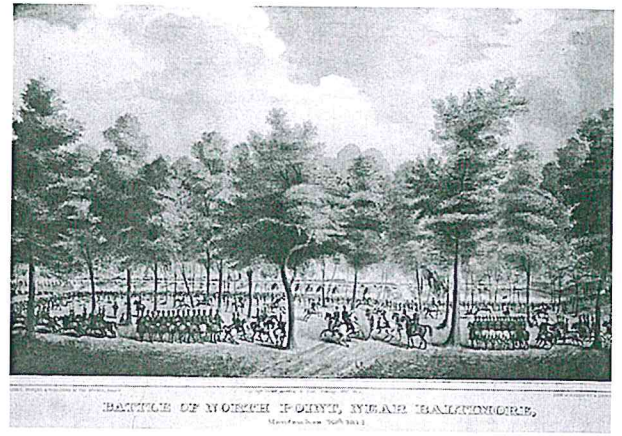
September 12 – The Battle of North Point



The British land and Ross boasts he will eat supper in Baltimore. Within two hours, Ross is shot and killed by an American rifleman. Still, the British force the Americans to retreat.

September 13-14 – Baltimore Harbor

Several British ships fire on Fort McHenry. They fire rockets, mortar shells and cannon balls at the fort. Many townsfolk become scared and abandon their homes.



The British navy does not cause major damage or casualties. The commander sends a message to headquarters that the British should end the battle. He says more fighting will be useless and cost too many British lives.

September 14 - Baltimore

The attack on Baltimore is ended. A young American poet and lawyer, Francis Scott Key, has been watching the attack. He thought the fort would be destroyed, and so he is astonished and delighted to see Mary Pickersgill's flag still flying. He takes a sheet of paper from his pocket and writes a poem. It begins, "O say can you see by the dawn's early light what so proudly we hailed at the twilight's last gleaming?" The poem is later called "The Star-Spangled Banner" and becomes the American anthem.

Quiz

1 Read the following paragraphs from the section "August 24, 1814 – Midday – Bladensburg, Maryland."

An army of 4,500 British soldiers suddenly appears at Bladensburg, Maryland. They are led by General Robert Ross. The soldiers have a lot of experience and have recently crushed the armies of the French emperor Napoleon in Europe.

Their target is Washington, the new U.S. capital. They are seeking revenge. The year before, the U.S. burned down the British city of York, which later became known as Toronto, Canada. The Battle of Bladensburg begins. The Americans are easily defeated and the road to Washington is left wide open.

Which two words from the paragraphs have the same meaning?

- (A) suddenly and recently
- (B) appears and begins
- (C) target and revenge
- (D) crushed and defeated

2 Read the sentence from the section "9 p.m."

The Capitol building is soon in flames, and thousands of precious books in the Library of Congress are destroyed.

Which word MOST closely matches the meaning of "precious" as it used in the sentence?

- (A) valuable
- (B) famous
- (C) pricey
- (D) ancient

3 Read the sections "9 p.m." and "10 p.m."

Which of the following events from these sections is MOST likely to be included in the article's summary?

- (A) The commanders destroyed thousands of books.
- (B) The army was tempted by the smell of fresh warm food.
- (C) One of the British generals put on Madison's clean shirt after dinner.
- (D) The British army burned down the White House.

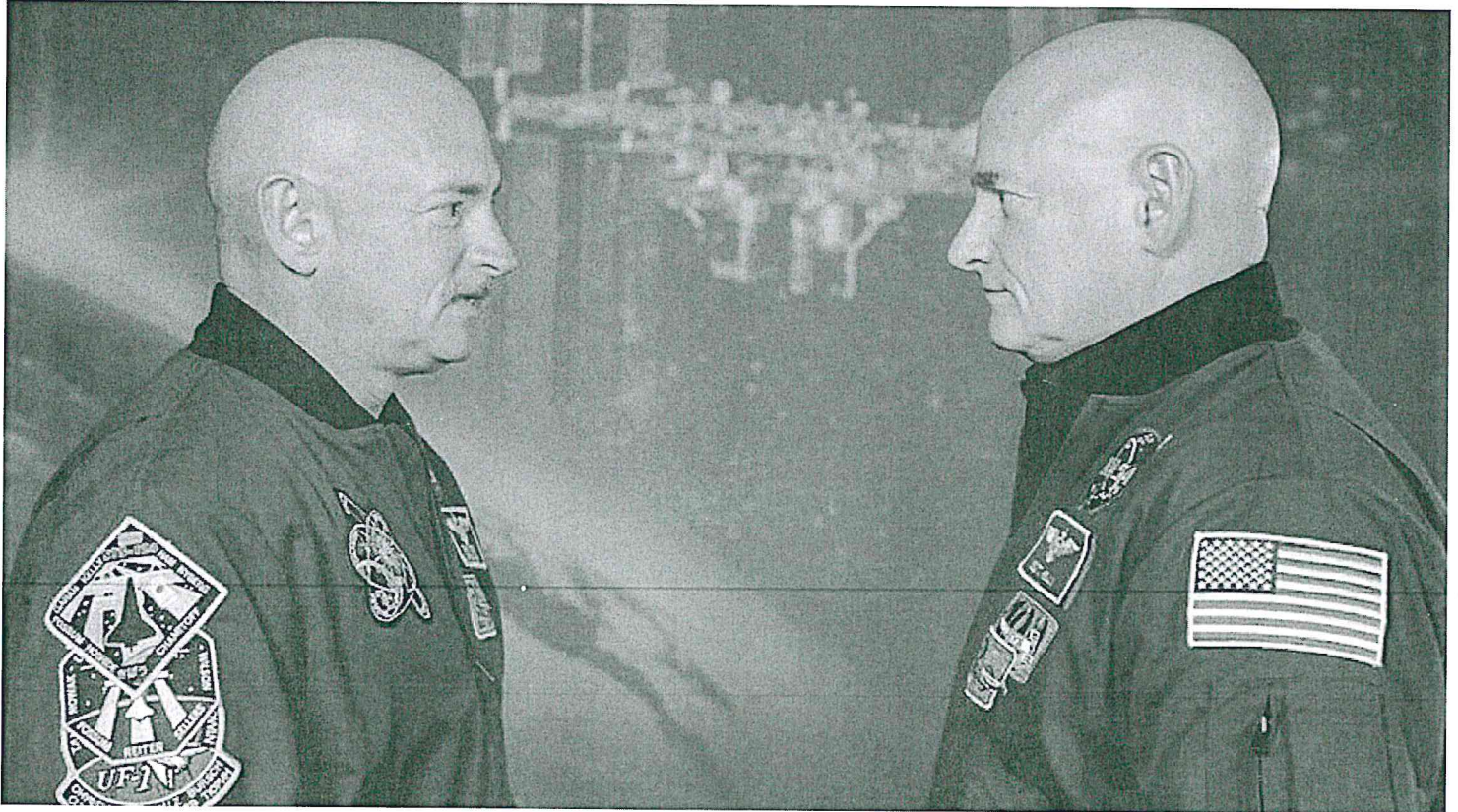
4 Which paragraph from the article is mostly about the origin of a famous patriotic song?

Twins take part in first study to look at effects of space on body

By How Stuff Works, adapted by Newsela staff on 04.17.19

Word Count **685**

Level **810L**



Brothers Mark Kelly and Scott Kelly participated in the landmark NASA twins study. Photo by: NASA

Have you ever wondered what happens to the human body when it's in space for a long time? Based on Hollywood movies, men and women who go to space always seem to be fine when they land back on Earth. Are astronauts so lucky in the real world? NASA made it its mission to find out. NASA is the U.S. space agency.

Scientists published a groundbreaking new DNA study. It was published in the April 12 issue of the journal *Science*. The study compared the epigenomes of two twin brothers.

The genome is one's complete set of genetic material. Genes are made up of DNA, which contains the instructions for how each part of the body works. Genes are passed on from parents to children. The epigenome is the record of chemical changes to DNA.

Changes in a person's epigenome do not change the genome. They simply turn certain genes "on" or "off." Epigenetic changes happen in natural parts of life, like getting older. They also happen

when one has a disease like cancer. When epigenetic changes happen at the wrong time, it can cause problems.

No Major, Long-Term Differences

The new study compared astronaut Scott Kelly and his twin brother Mark Kelly. It revealed that after a year in space, Scott experienced no major, long-term differences to his epigenome compared to his twin. Mark stayed firmly planted on Earth while Scott was in space.

The scientists behind the study say the conclusions are not entirely clear yet. It appears additional study on the genomes of astronauts in space could be helpful, though. It could predict what kinds of health issues each astronaut may be at risk for.

Putting your body in space has many dangers. Astronauts are exposed to many things in space. It means limited food and exercise and different sleep cycles. It could lead to many other problems we do not know about yet. Scientists say it's important to understand the effects space travel has on the human body. It will be even more important for longer missions, like going to Mars.

A major advantage of this new study is the fact that its subjects are twins. They naturally have the same genetic material. The twins offer a rare chance to test whether long-term genetic changes could happen in space.

The scientists are quick to admit the study was too small, though, and more testing is needed. They only studied two people. They will need to study many more astronauts to learn more.

How Did Samples Get To Earth? In A Rocket!

The study involved collecting blood samples and data about the body and mental health. Measurements were taken from each Kelly twin. The data was collected at various points over a 27-month period. It was collected before, during and after Scott's one-year space mission. If you are wondering how in the world Scott's samples reached the scientists from space, they were transported by a rocket. Yes, seriously.

In the future, scientists hope to study and store samples onboard the International Space Station itself. For the purposes of this study, though, samples were rocketed back to Earth and studied within 48 hours. Then the scientists examined the brothers' genomes. They looked for epigenetic changes.

Generally speaking, there were just about as many epigenetic changes in Scott as there were in his twin. The biggest difference was observed nine months into Scott's space mission. There were changes near genes that handle immune system response. The immune system protects the body from diseases. The scientists believe these changes were because Scott had signs of inflammation. This is a normal response when the body is hurt or sick and needs to heal.

Lindsay Rizzardi is a scientist at the HudsonAlpha Institute for Biotechnology in Alabama. She said it was encouraging to see that there were no big changes of the epigenome in either Mark or Scott. The study was too small to draw big conclusions about how space affects the genome, she said. The study was helpful, though. Scientists know what to look at more closely in future studies of astronauts, she said.

Quiz

1

Read the section "How Did Samples Get To Earth? In A Rocket!"

Select the paragraph from the section that shows that the study did find some small changes between the Kelly twins.

- (A) The study involved collecting blood samples and data about the body and mental health. Measurements were taken from each Kelly twin. The data was collected at various points over a 27-month period. It was collected before, during and after Scott's one-year space mission. If you are wondering how in the world Scott's samples reached the scientists from space, they were transported by a rocket. Yes, seriously.
- (B) In the future, scientists hope to study and store samples onboard the International Space Station itself. For the purposes of this study, though, samples were rocketed back to Earth and studied within 48 hours. Then the scientists examined the brothers' genomes. They looked for epigenetic changes.
- (C) Generally speaking, there were just about as many epigenetic changes in Scott as there were in his twin. The biggest difference was observed nine months into Scott's space mission. There were changes near genes that handle immune system response. The immune system protects the body from diseases. The scientists believe these changes were because Scott had signs of inflammation. This is a normal response when the body is hurt or sick and needs to heal.
- (D) Lindsay Rizzardi is a scientist at the HudsonAlpha Institute for Biotechnology in Alabama. She said it was encouraging to see that there were no big changes of the epigenome in either Mark or Scott. The study was too small to draw big conclusions about how space affects the genome, she said. The study was helpful, though. Scientists know what to look at more closely in future studies of astronauts, she said.

2

Read the section "No Major, Long-Term Differences."

Which sentence from the section shows why it is difficult to make conclusions from the twin study?

- (A) It could predict what kinds of health issues each astronaut may be at risk for.
- (B) A major advantage of this new study is the fact that its subjects are twins.
- (C) The twins offer a rare chance to test whether long-term genetic changes could happen in space.
- (D) The scientists are quick to admit the study was too small, though, and more testing is needed.

3

Which sentence from the article expresses a main idea from the article?

- (A) Based on Hollywood movies, men and women who go to space always seem to be fine when they land back on Earth.
- (B) Genes are made up of DNA, which contains the instructions for how each part of the body works.
- (C) It revealed that after a year in space, Scott experienced no major, long-term differences to his epigenome compared to his twin.
- (D) If you are wondering how in the world Scott's samples reached the scientists from space, they were transported by a rocket.

Read the paragraph from the article.

Putting your body in space has many dangers. Astronauts are exposed to many things in space. It means limited food and exercise and different sleep cycles. It could lead to many other problems we do not know about yet. Scientists say it's important to understand the effects space travel has on the human body. It will be even more important for longer missions, like going to Mars.

HOW does this paragraph support the main idea of the article?

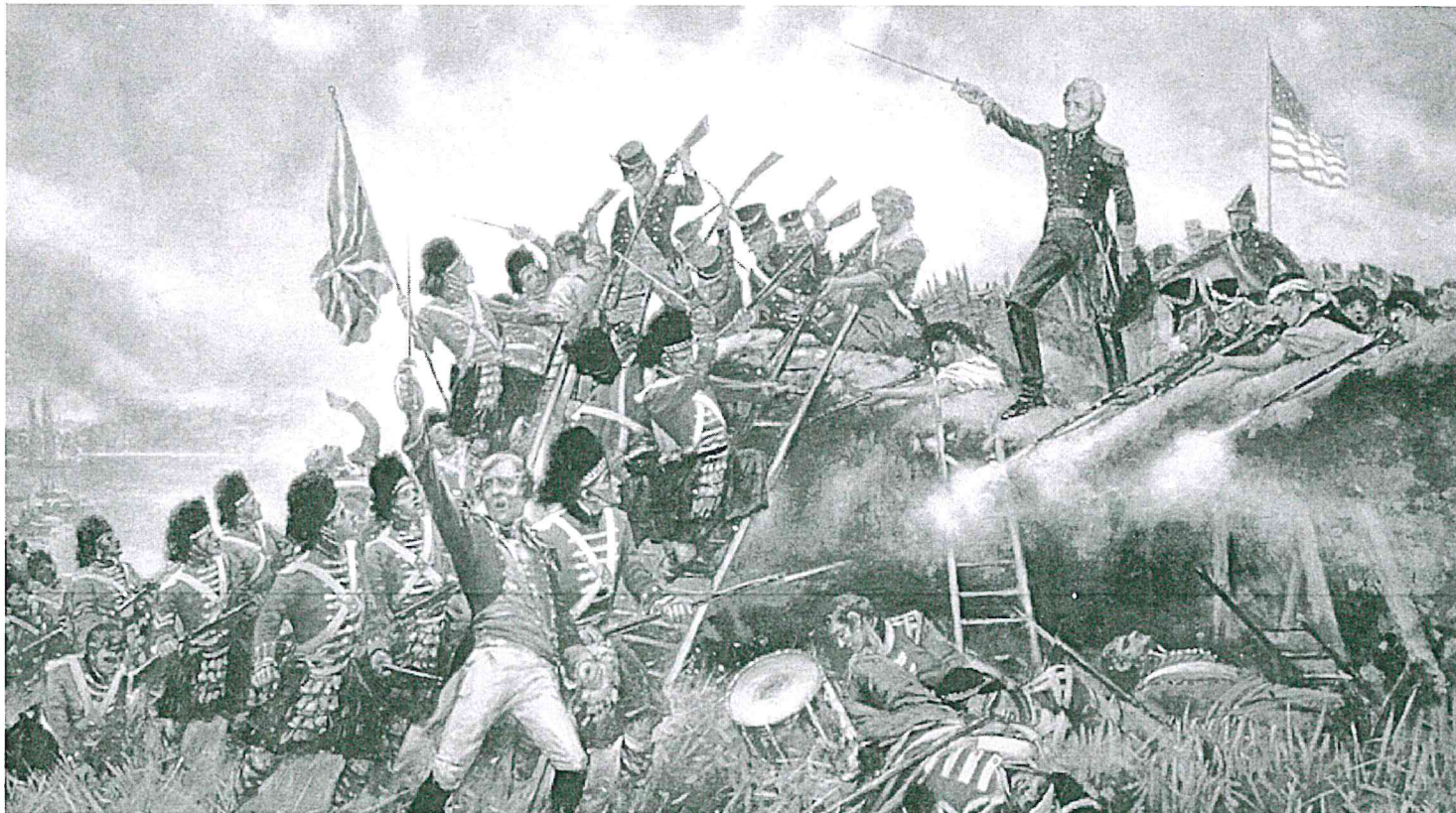
- (A) It helps explain why NASA is studying the effects of space travel on human bodies.
- (B) It helps explain the results from the study that NASA did on Scott and Mark Kelly.
- (C) It shows that space is too dangerous for most humans to experience.
- (D) It shows that astronauts should not travel in space on long missions.

The Expanding American Republic and the War of 1812

By USHistory.org, adapted by Newsela staff on 05.09.17

Word Count **704**

Level **830L**



General Andrew Jackson (right) stands with his sword raised in his army's victory over the British in the Battle of New Orleans during the War of 1812. Photo from Wikimedia Commons

The United States underwent huge changes during the beginning of the 1800s. The country began to expand as settlers moved into new territory west of the Appalachian Mountains. At the same time, the country entered new conflicts with Native Americans and Great Britain. These events all played a part in the coming of the War of 1812.

America quickly expanded to the West

In 1803, the Louisiana Purchase added a huge piece of new territory to the United States. The territory included land west of the Appalachian Mountains, which run from Maine to Georgia. In 1790, only a small number of Americans lived in this area. But by 1820, 1 out of 4 Americans lived west of the Appalachians. During the early 1800s, many Americans moved west into the new territory. This period of settlement was known as western expansion.

Western expansion caused a great deal of conflict. Native Americans in the west were not happy to see Americans moving onto their land. This led to new conflicts along the frontier. Slavery was

expanded, too, and slaves were forced to move west and work on new land. But the majority of white Americans saw western expansion as a big opportunity. It promised independence and success to anyone willing to meet the challenges of frontier life.

Tensions increase with Great Britain

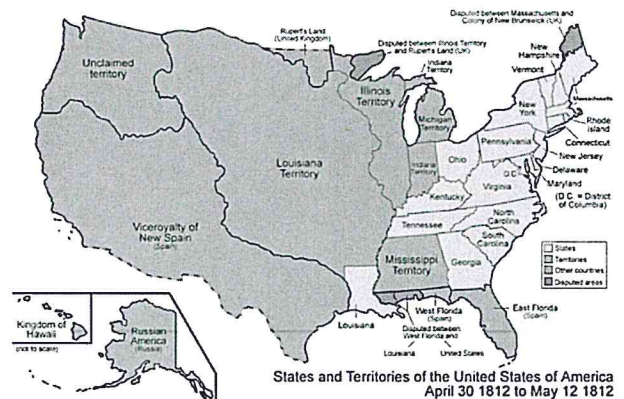
While western movement was reshaping the nation, European wars also presented a challenge to the United States. The Napoleonic Wars were fought between Great Britain and France from 1802 to 1815. The United States did not want to take a side in this conflict. It wanted to keep trading with both countries. But neither Great Britain nor France respected this position. Both tried to prevent U.S. ships from carrying goods to their enemy.

Britain was also assisting Native Americans in the western United States. This created more conflict over land and trade, which finally led to the War of 1812. The United States entered the war hesitantly. There was strong opposition from some Americans in New England. They wanted to preserve friendly relations with Great Britain. When Congress finally declared war, the vote was heavily divided.

The Second War for American Independence

The War of 1812 was similar to the Revolutionary War. Once again, the United States fought against the British and their Native American allies. For this reason, some historians see the conflict as a Second War for American Independence.

During the war, the British launched a failed attack on Fort McHenry in Baltimore. One person who witnessed the attack was Francis Scott Key. He wrote a poem about it called "The Star-Spangled Banner." This became the official national anthem of the United States in 1931.



Claiming victory from several military defeats

The War of 1812 was an important turning point in the history of the United States, but it was mostly a political and military disaster. The war was very expensive and caused great destruction. When the British attacked Washington, D.C., they burned most of the public buildings, including the White House. President James Madison had to flee the city. His wife, Dolley, gathered valuable national objects and escaped with them at the last minute. It was the low point of the war.

The War of 1812 came to an end largely because the British people had grown tired of their long war against France. Now that France was almost defeated, the war against the United States lost support. On December 24, 1814, the United States and Great Britain signed the Treaty of Ghent. This brought the War of 1812 to a close.

At the start of the 1800s, much of North America was not yet part of the United States. After the War of 1812, this began to change. The years of the new nation were a period of enormous change, including big political changes and the rush of western expansion. America was growing up.

Quiz

- 1 What was the relationship between the War of 1812 and westward expansion?
- (A) The War of 1812 prevented the United States from expanding farther west.
 - (B) After the War of 1812, westward expansion increased in the United States.
 - (C) Westward expansion led to conflicts over land between the United States and France in the War of 1812.
 - (D) Westward expansion caused Native Americans living on the land to attack settlers in the War of 1812.
- 2 What effect did the war between Britain and France have on the War of 1812?
- (A) It made the war harder for the U.S. because it was fighting two countries overseas.
 - (B) It made the Native Americans unsure of which country they should side with.
 - (C) It caused Britain to become exhausted and sign a treaty to end fighting in the U.S.
 - (D) It caused the U.S. to declare war on both countries because it was losing trade.
- 3 Look at the picture near the bottom of the article.
- Which selection from the article is BEST illustrated by this picture?
- (A) During the early 1800s, many Americans moved west into the new territory.
 - (B) During the war, the British launched a failed attack on Fort McHenry in Baltimore.
 - (C) The war was very expensive and caused great destruction.
 - (D) This brought the War of 1812 to a close.
- 4 Look at the map.
- What do the different colored sections represent?
- (A) whether that area of North America was a state, a territory or belonged to another country
 - (B) whether that area included states that allowed slavery or states that did not allow slavery
 - (C) whether that area of the United States was fought over during the War of 1812
 - (D) whether that area was available for westward expansion or settled by Native Americans