What am I?
I am a stone ring that marks the summer and winter solstices.
I am a stone wall, so long and wide that I can be seen from space.
I am the place where the Zambezi River spills over high stone cliffs.
Can you match us with our pictures?

Topics to explore:
- natural wonders of the world
- ancient and modern human-made wonders of the world
Imagine it!

A school bus weighs more than twelve tons, or 24,000 pounds. School buses are very heavy, but they are easy to move because they have wheels. Imagine a school bus without wheels. It would be very difficult to move that bus. You would need heavy machines and the help of many people to do it.

Now imagine that you must move a school bus without wheels or machines to help you. Could you and your classmates lift a school bus off the ground? If you had enough people, could you move it across a parking lot? How could you do it?
Who Built Stonehenge?

Archaeologists and historians developed theories about the builders. One is that Merlin, the court wizard for the legendary King Arthur, built Stonehenge. Another is that the ancient Romans built the structure. A third is that a group of ancient people called the Druids built it.

These experts now know when Stonehenge was built. This has helped them eliminate some theories. They know that Stonehenge was built around 2600 BC, during the Neolithic era. Sometimes this period in history is called the Stone Age. This was certainly long before the time of King Arthur, the Romans, and the Druids.

The Mystery of Stonehenge

Thousands of years ago, people moved something even bigger and heavier than a school bus. They moved rocks. They made a circle of enormous rocks in a large field in southern England. The circle is called Stonehenge. Some of these rocks weighed as much as forty tons, or 80,000 pounds. That is the weight of three buses. The rocks are almost thirty feet tall, as tall as a three-story house! The ground slopes in places, but the tops of the rocks form a straight line. So the people who placed them were able to align the tops of all of the rocks. Large holes in the ground keep the rocks in place. Many of the rocks stand perfectly upright. A few rocks were placed sideways on top of the other rocks.

Stonehenge is one of the world’s greatest mysteries. Archaeologists believe that ancient people moved the rocks there almost 5,000 years ago. It is clear that plenty of work went into building Stonehenge. Who were these workers? Why did they build this incredible structure? How did they move the rocks without using machines? These questions are still unanswered.
It is hard to know what the people were like in those times. There are no written records from that period. The houses where the people lived disappeared long ago. Their farms are now modern buildings and roads. All that is left are relics, such as pieces of pottery, human bones, and some tools.

Among the relics are deer antlers. Archaeologists think that the people who built Stonehenge may have used the antlers to dig holes in the ground for the stones. They can never be certain. Archaeologists now know that most of the rocks in Stonehenge came from an area about twenty-five miles away.

**How Was Stonehenge Built?**

There are two major theories to explain how the rocks were brought to Stonehenge. One is that people rolled the rocks on tree trunks. They lined up tree trunks along the ground and rolled the rocks over them. Some scientists disagree with this theory. They believe that the rocks were too heavy for the roller system to work.

Another idea is that the people moved the rocks on a kind of track. They could have placed tree trunks parallel to each other on the ground. This might have created a sort of railroad track. The builders could have put animal fat on the track to grease it and make it slippery. Then, they could have slid the rocks along the track.
Why Was Stonehenge Built?

Another great mystery is why Stonehenge was built. Among the relics that archaeologists have found at Stonehenge are human bones and skulls. Some people think that Stonehenge was a tomb or a giant cemetery. Perhaps Stonehenge was built to honor the dead.

Stonehenge might have been a kind of calendar. The sun rises directly over the top of one of the rocks on the summer solstice. This is the longest day of the year. The sun sets on the opposite side of the rocks on the winter solstice. This is the shortest day of the year. Maybe Stonehenge was used to keep track of the time of year. The structure may have helped farmers know when to plant and harvest crops.

Other people believe that Stonehenge was a place of worship. The people who built Stonehenge might have worshiped the sun. This may explain why the rocks are aligned with the sun on the solstices. Archaeologists have recently found some animal bones. They now think that the Neolithic people may have held ceremonies and celebrations at Stonehenge at special times of the year.

These theories explain how the builders got the rocks to Stonehenge. They don’t explain how the builders lifted the rocks into position. Some of the rocks rest on top of others, high in the air. How was it possible to lift those rocks? That would be like lifting six school buses thirty feet above the ground!

Some scientists believe that hundreds of people used a pulley system to lift the rocks. They also believe Stonehenge was built in stages. It may have taken many years to complete the final structure. It is impossible to tell exactly how the builders moved and placed the rocks. This is part of the mystery of Stonehenge.
**Stonehenge Today**

Stonehenge is thousands of years old, but it is not well preserved. Some rocks have fallen over. They have all been weathered by thousands of years of wind and rain. Modern life is also to blame. Many people have traveled to Stonehenge to admire it. Some local businesses have taken advantage of the tourist trade. There is an ice cream store and a gift shop nearby. A large parking lot and a highway lie a few hundred feet from the stones. The area is not at all what it was when Stonehenge was built.

English Heritage is an organization working to preserve Stonehenge. Workers will move the road away from the historic area so that cars and trucks will not speed by the rocks. There are efforts to turn the surrounding area into grasslands.

English Heritage is also building a visitors center a few miles away from the rocks. The roof will be planted with grass to blend in with the fields. People can learn about Stonehenge without damaging the ancient structure. Scientists are constantly searching for more information about Stonehenge. They want to know how ancient people could accomplish such an incredible task. They may never fully understand Stonehenge, however. It may always remain one of the world’s great mysteries.
Facts | What I Know | What I Infer
--- | --- | ---
Scientists have found deer antlers at Stonehenge. | Deer antlers are long, hard, and pointed. | The Neolithic people may have used the antlers as digging tools.

Reflecting
You just read some theories about Stonehenge. Write your own theory about Stonehenge.

Why do you think Stonehenge was built?

How did the Neolithic people move the rocks to Stonehenge? Use what you wrote in your graphic organizer to help you develop your theory.

B. Answer the Critical Thinking questions in complete sentences.

1. Why will Stonehenge always remain a mystery?

2. How has the modern age put Stonehenge in danger?
Connecting

Listen to the story about a wonder of the world.

A. Long ago, King Nebuchadnezzar ruled Babylon.
B. Babylon existed by the banks of the Euphrates River.
C. People called these gardens the Hanging Gardens of Babylon.
D. The king married Princess Amytis, who lived in a mountain kingdom.
E. Princess Amytis came to live at the royal palace in Babylon.
F. Although the palace was beautiful, the land around Babylon had no hills or mountains, and it rarely rained.
G. Amytis missed the mountains of her home.
H. Workers built terraces that rose high in the air.
I. They created an irrigation system that pumped water up to the terraces.
J. These gardens amazed the people who saw them.

Applying

Describe a garden that you have seen. The garden can be one that you have visited or one that you have seen in a photograph or on TV. Write about where the garden is, what makes the garden special, and any unusual plants or other features.

The National Garden is a very big garden.
Connecting

A Listen and read about a natural wonder.

An Amazing Waterfall

Victoria Falls is a spectacular waterfall in southern Africa, between Zambia and Zimbabwe. The Zambezi River moves peacefully over the plains of Africa. It does not speed up as it approaches the high cliffs that are the falls. The water drops 355 feet over the cliffs into the gorge below. The power of the falling water created this gorge over many thousands of years.

The water falls very fast. It looks almost like a solid when it falls. It breaks into ribbons on its way down. The crashing water creates a loud noise that sounds like thunder when it hits the rocks below. It also creates a fine mist. The mist is white near the bottom of the falls. It looks darker, almost like smoke, higher up on the falls. For these reasons, the local people call the falls “The Smoke That Thunders.” The mist causes rainbows day and night. The mist can be seen many miles away from the falls.

Dr. David Livingstone was the first European to see the falls. He was a Scottish explorer in Africa. He had heard the local people talk about “The Smoke That Thunders.” When he saw the falls, he called them “the most wonderful sight I had witnessed in Africa.” He named them for Queen Victoria of England.

B Answer the questions in complete sentences.

1. Why should people be very careful when walking near cliffs?
2. What would make a glass come crashing to the floor?
3. What is the weather like when there is a mist in the air?

Focusing

Look at the underlined word or words in each sentence. Note that some additional letters appear at the end of each word. Take those letters off the word and write the word that remains.

1. Victoria Falls is located between Zambia and Zimbabwe in southern Africa.
2. The Zambezi River moves peacefully over the plains of Africa.
3. The powerfully falling water created the gorge over many thousands of years.
4. The crashing water creates a sound like thunder.
5. The mist looks darker, almost like smoke, higher up on the falls.
6. Dr. David Livingstone was a Scottish explorer in Africa.
7. He was the first European to see the falls.
8. When he saw the falls, he called them “the most wonderful sight I had witnessed in Africa.”

Applying

You have just returned from visiting Victoria Falls. Write a journal entry describing what you saw, heard, smelled, tasted, and felt. Be sure to use the underlined words from the activity above in your journal entry.

Today I heard the thunder of Victoria Falls.
The Great Wall of China is the world’s longest structure made by people. It is more than 4,000 miles long! The wall runs from west to east along the northern border of China.

The Great Wall was made of many walls. Rulers of small kingdoms in ancient China built these walls. Emperor Qin Shi Huang unified China in the third century BC, and he had the smaller walls connected. This protected the country from people to the north, and it was also a sign of the power of the Chinese empire. The emperor forced more than one million people to build the wall.

Chinese emperors continued to add to the wall. They maintained it for thousands of years, but most of what remains of the wall was built during the Ming Dynasty (1368-1644). Many different materials were used to build it, from dirt to wood to stone. Some parts of the wall were built with granite stones weighing two tons or more. People and animals had to move these heavy stones.

The Great Wall crossed desert and grasslands. It ran up, down, and along mountains. Twenty-five thousand watchtowers were built along the 4,000 miles as posts for guards. The soldiers stayed in the watchtowers, and they sent messages or signaled attacks from them. During the day, the soldiers used smoke signals, but at night they used fire to send signals.

The Great Wall of China is one of the greatest human-made wonders of the world.

1. The wall is more than 4,000 miles long. (and) It runs from west to east along the northern border of China.
2. The wall protected the country from people to the north. (but) It was also a sign of the power of the Chinese empire.
3. Emperor Qin Shi Huang unified China in the third century BC. (and) He had the smaller walls connected.
4. The Chinese maintained it for thousands of years. (but) Most of what remains of the wall was built during the Ming Dynasty.
5. The soldiers stayed in the watchtowers. (and) They sent messages or signaled attacks from them.
6. During the day, the soldiers used smoke signals. (but) At night they used fire to send signals.

Imagine that you are a television reporter during the Ming Dynasty. Invaders have just attacked. Write a broadcast describing how soldiers are protecting China against the attack.
People have always built amazing buildings and monuments. These are great feats of engineering and hard work. Such structures make us wonder how people were able to build them. The Great Pyramids of Giza and the Colosseum of Rome are two of the world’s ancient wonders made by people.

A Spectacular Tribute

When you see pictures of the Great Pyramids, then you understand why they are a wonder. They soar 450 feet in the air, and each side is 750 feet long. They are so big that they can be seen from miles away. More than two million stone blocks were used to build the Great Pyramids. Each block weighs as much as a large car. They are possibly the world’s largest tombs. Experts believe that the Great Pyramids are more than 4,500 years old.

One of the First Sports Arenas

The Colosseum in Rome was first named the Flavian Amphitheater. The Colosseum is nearly 2,000 years old. It was a huge arena with an elliptical shape, and it could hold more than 50,000 people. It had four levels and more than eighty entrances. It had an underground level with cages for wild animals. It also had a covering to protect the people from the sun. It took 240,000 cartloads of stone just to build the outside of the Colosseum.

The purpose of informational writing is to tell the reader about a topic. Informational writing can be about people, places, or things. An informational essay will often have these elements:

- A heading, or title, which gives you a general idea about the topic of the essay.
- Subheadings appear at the beginning of each section in an essay. These will give you a general idea about the information in that section.
- Photographs and illustrations are images of something described in the essay. There are often captions that describe the photograph or illustration. These elements help you know what information is most important in the essay.

Research more information about either the Pyramids at Giza or the Colosseum in Rome. Use the graphic organizer to order details from your research.

Use details in your organizer to write an informational essay. Include a major heading. Remember to use subheadings to separate sections. If you can, include pictures or drawings. Write captions for the photographs or illustrations.

Answer the questions in complete sentences.

1. What is the title of this essay?
2. What information do the pictures provide?
3. Under which subheading will you read about the Pyramids of Giza?
Compound and Complex Sentences

A **simple sentence** has a **subject** and a **predicate** and expresses a complete thought.

*My mother went to the park with me.*

*My mother is the subject and went to the park with me is the predicate.*

B **compound sentence** is made up of two or more simple sentences joined together. They are joined by a comma and one of these words: and, but, or, so, yet, nor, for.

*We will visit the Parthenon, and we will visit the National Museum.*

A **complex sentence** has an **independent clause** and a **dependent clause.** Both clauses have a subject and a predicate, but only an independent clause expresses a complete thought.

*We want to visit Africa because the animals are so beautiful there.*

*We want to visit Africa is the independent clause because it expresses a complete thought. Because the animals are so beautiful there is the dependent clause because it does not express a complete thought; we need more information to complete the idea.*

C **A complex sentence begins with a dependent clause, use a comma at the end of the dependent clause.**

*When we went to India, we saw the Taj Mahal.*

**Revising**

C **Revise your essay. Follow these steps to make any changes that you think will improve your essay.**

1. Check that your essay has a title and subheadings.
2. Include photographs or illustrations with captions.
3. Look for simple sentences that can be combined.
4. Use complex sentences when telling about the order of events.

**A Explain whether each sentence is compound or complex.**

1. Although the lighthouse was amazing, it crumbled to the ground.
2. The crater is an amazing sight, but it is not what I would call pretty.
3. You will freeze at the top of Mount Everest because it is so cold.

**B Combine each set of simple sentences to make a compound sentence.**

1. The temple was large. It was not the largest one.
2. I have read about the wonders of the world. Now I want to see them.
3. I may go see the Great Wall of China. I may see the Grand Canyon.

**C Combine each set of clauses to make a complex sentence.**

1. because experts know little about the Neolithic people Stonehenge remains a mystery
2. although I am tired I am ready to walk into the Grand Canyon
3. when you hear a strange roar we will be close to Victoria Falls

**Key Words**

- complex sentence
- compound sentence
- dependent clause
- independent clause
- predicate
- simple sentence
- subject
Operations with Decimals

When you carry out operations with decimals, you have to pay attention to the decimal point.

When you add or subtract decimals, you must be sure to line up the decimal points in each number.

\[
\begin{array}{c}
  4.160 \\
  \underline{- 2.635} \\
  1.525
\end{array}
\]

When you multiply decimals, you find the product and then count up the decimal places in the factors. Count over the same number of places in the product.

\[
\begin{array}{c}
  3.362 \\
  \times \quad 4.5 \\
  \hline
  16810 \\
  133480 \\
  \hline
  15.0290
\end{array}
\]

Before you can divide decimals and find a quotient, the divisor must be a whole number. Multiply the divisor by a multiple of 10 to make a whole number. Multiply the dividend by the same value.

\[
\begin{array}{c}
  4.5 \times 26.35 = 118.625
\end{array}
\]

The table shows the lengths in thousands of miles of the longest rivers on each of the major continents.

<table>
<thead>
<tr>
<th>River</th>
<th>Continent</th>
<th>Length (in thousands of miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nile</td>
<td>Africa</td>
<td>4.16</td>
</tr>
<tr>
<td>Amazon</td>
<td>South America</td>
<td>4.0</td>
</tr>
<tr>
<td>Yangtze</td>
<td>Asia</td>
<td>3.964</td>
</tr>
<tr>
<td>Ob-Irtysh</td>
<td>Europe</td>
<td>3.362</td>
</tr>
<tr>
<td>Mackenzie</td>
<td>North America</td>
<td>2.635</td>
</tr>
</tbody>
</table>

A Place the decimal point in the product. Be sure to explain your answers.

\[
\begin{array}{c|c|c|c}
  & 1 & 9.6 & 2.03 & 3.165 \\
  \times & 8.4 & \times 4.1 & \times 0.375 & \hline
  8064 & 8323 & 474375
\end{array}
\]

B Answer the questions in complete sentences.

1. You want to find the difference between the length of the Nile River and the Yangtze River. How would you set up the problem?

2. Imagine you divided the Yangtze River into four equal sections. Your solution was 991. Where does the decimal point go? Explain your reasoning.

C Answer the questions in complete sentences.

1. Explain how and why the dividend would be changed if the divisor was converted from a decimal to a whole number.

2. How do operations with decimals differ from operations with whole numbers?

3. How are operations with decimals the same as operations with whole numbers?
Mount Rushmore, an American Wonder

Mount Rushmore is an important United States landmark. It is located in Black Hills National Forest in South Dakota. The faces of Presidents George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln are carved into the side of a mountain.

A sculptor named Gutzon Borglum carved the faces of these famous Americans into the mountain. He used dynamite to remove granite from the mountain. Each face is around sixty feet tall. It took six and a half years of carving, hammering, and drilling to complete the project. The completed images were finally unveiled in 1941.

Each of the four U.S. presidents carved into Mount Rushmore played an important role in the history of this country.

George Washington was the Commander in Chief of the Continental Army during the Revolutionary War. He was the nation’s first president and is considered the Father of Our Country.

Thomas Jefferson, the third president of the United States, was the main author of the Declaration of Independence. He purchased the Louisiana Territory from France and doubled the size of the United States.

Abraham Lincoln was the sixteenth president of the United States. He held the nation together during the American Civil War. He was president when slavery was abolished.

Theodore Roosevelt, the twenty-sixth president, was a conservationist. He created five national parks and reserved millions of acres of national forest for Americans to enjoy. He also worked for fairness in the workplace and in the economy.

A Answer the questions in complete sentences.
1. Why were Washington, Jefferson, Lincoln, and Roosevelt carved into Mount Rushmore?
2. Why might sculptors create statues or other historical monuments?
3. How can we remember important people or events in history besides creating a statue?

B These American landmarks were built to honor people who played an important role in American history. Choose one of them to find out more about the person or people honored. Write about what you learned.

abolished granite landmark sculptor unveil

Key Words
abolished granite landmark sculptor unveil
The Grand Canyon is an enormous canyon in northwestern Arizona. It is a geologist’s ideal field site. It helps geologists understand how the land has changed during the past hundreds of millions of years.

The Canyon’s many colors represent different kinds of rock. Most of the rocks in the Canyon are different kinds of sedimentary rock formed during different geological ages. The different colorful layers of the Canyon represent the different kinds of sedimentary rock, such as limestone, sandstone, and shale. The oldest rock, found at the bottom of the Canyon, is metamorphic rock. This rock has been formed by heat and pressure. There are also some kinds of igneous rock, such as granite. This type of rock is found mostly in the western part of the Canyon.

Key Words
- fossil
- igneous
- magma
- metamorphic
- sedimentary

### Kinds of Rocks

There are three major kinds of rocks:

- **Sedimentary**: These are often found in dried-up rivers, lakes, or oceans. They are formed by layers of sediment hardened by the earth’s pressure. They often contain plant or animal fossils.

- **Igneous**: These are products of magma, which can be formed inside or outside the earth’s crust.

- **Metamorphic**: These are rocks changed because of heat or pressure.

### A Match each of the terms with the correct description.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>igneous rocks</td>
<td>a. rocks formed from magma</td>
</tr>
<tr>
<td>sedimentary</td>
<td>b. rocks that have been changed by great heat or pressure</td>
</tr>
<tr>
<td>metamorphic</td>
<td>c. rocks found in dried-up rivers, lakes, or oceans</td>
</tr>
</tbody>
</table>

### B Identify the rock described as sedimentary, igneous, or metamorphic.

1. Sandstone is a rock made of layers of sand.
2. Granite is a rock made from granitic magma.
3. Vishnu schist is a rock made from volcanic ash and sandstone, heated and pressurized.
4. Limestone is a rock made from layers of marine organisms.
5. Shale is a rock made from layers of mud.

### C You are a rock in the Grand Canyon. Decide if you are a sedimentary, an igneous, or a metamorphic rock. Then, write a paragraph describing the changes you go through as hundreds of years pass. Include descriptive words and details.
Sing Along

A Listen to the song.

Row, row, row your barge,
Row it down the Nile.
Visiting, visiting, visiting, visiting
The Pyramids in style.

Strolling down the garden paths
You see the Taj Mahal.
Shining, shimmering, gleaming, glimmering,
So bright and white and tall.

Hiking, through the jungle
You reach an awesome spot:
Beautiful statues, gates, and towers.
The temple Angkor Wat.

Climb, climb, climb the trail,
Almost reach the sky.
Look beyond the Mountains’ path,
At Machu Picchu up high.

Rising on the Acropolis,
The Parthenon is pretty.
Its marble columns look strong and grand,
Over Athens city.

B Sing the song.

C Answer the questions in complete sentences.
1. What are two words that mean walk?
2. What is a barge?
3. What words mean the same as shine?
4. What words could we use to talk about kinds of roads?

Perspective

Three-dimensional shapes, such as buildings and cubes, have length, width, and depth. When artists paint or draw an image, they try to make shapes look three-dimensional on a flat surface that has only two dimensions: length and width.

To make a shape look three-dimensional on a flat sheet of paper, artists often use perspective. In perspective drawing, an imaginary horizon is placed at some point on the page. The artist then chooses a point on the horizon as a vanishing point. The vanishing point is the place where the artist will draw parallel lines that begin at the bottom of the page and move to the horizon. At the vanishing point, all of the lines meet, making it look as though the objects on the page are getting farther away.

The ancient Roman aqueduct pictured here provides a good example of how to use perspective to draw basic three-dimensional objects. Based on the point of view in this photograph of the Roman aqueduct, there is one vanishing point. It is found where the five lines in the drawing connect at one point in the sand.

A Draw a picture of the aqueduct.
1. Place a vanishing point on the horizon.
   Situate it as it is in the photograph.
2. Draw the five lines shown in the picture.
   Each should end at the vanishing point.
3. Draw an outline of the aqueduct and the beach. Use perspective to have objects disappear at the vanishing point. Draw the objects without the sand around the bottom of the structure.
4. Fill in details of the aqueduct, such as bricks and archways.
5. Erase unnecessary lines and add any finishing touches, such as coloring the drawing or drawing swirls in the sand.

B Describe the perspective of a picture. Choose a photograph or draw a picture of a world wonder or monument. Explain the perspective of the picture. Be sure to include where the vanishing point is found.

Supplies
- white art paper
- pencils
- colored pencils
In this unit, you read about wonders of the world. Some of them are ancient wonders, like the Hanging Gardens of Babylon. Others are natural wonders, such as the Grand Canyon. Still others have only recently been added to the list of Wonders of the World.

Write an informational essay about a modern wonder of the world or other important landmark. Use your graphic organizer to help you plan your essay. In your essay, give the location of the wonder and a brief history, as well as reasons why your topic is a modern wonder or landmark. Remember to include a title and subheadings. Add photographs or illustrations if you can.

The Writing Process

Remember, the writing process includes a series of steps:

- **Developing Ideas** Use the Internet, visual elements, or other references to help you gather and develop ideas.
- **Organizing** Choose the ideas you want to use. Put them in order, connect them, or discard the least important ones.
- **Drafting** Use the ideas you organized to write paragraphs.
- **Revising** Read your paragraphs again and correct your writing, keeping in mind what you learned in this unit.
- **Rewriting** Produce a clean copy of your piece, applying all the corrections, to display in class.

Remember, you can always repeat a step if you need to.