

Level
E

Exploring

**Content
Area
READING**

- Science • Social Studies
- Language Arts • Mathematics

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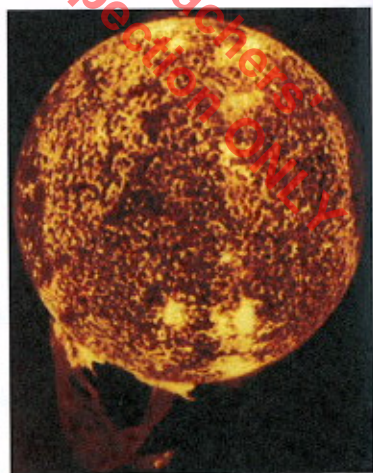
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OUR SUN

The Sun is the nearest star to Earth. Not only is the Sun the center of the solar system, it is also central to our lives. This huge ball of gas is so big, more than a million Earths could fit inside it. The Sun holds about 99% of all the mass of the solar system. A medium-sized yellow star, the Sun is incredibly hot, giving off huge amounts of energy. It does this by changing 5 million tons of matter into energy each second. This energy comes from the Sun's core, where the temperature is about 27,000,000° F (15,000,000° C). The process that produces this incredible heat and energy is called nuclear fusion. At the core, the Sun's enormous gravity makes hydrogen atoms fuse into helium atoms. When this happens, great amounts of energy are produced.

The energy, in the form of radiation, travels from the core to the Sun's surface. From the surface it travels outward into our solar system. It takes 8.13 minutes for the energy to reach our planet. But it's worth the wait: The Sun's energy provides us with light and heat. Without this energy, no life could exist on Earth.



This photo of the Sun, taken with a special filter, shows a huge solar flare.

PHOTOSPHERE The surface of the Sun that we see.

CONVECTIVE ZONE The energy from below is carried to the surface by currents of gas that rise (and eventually fall back).

RADIATIVE ZONE Energy moves out of the core and through this area.

CORE The center of the Sun, where nuclear fusion takes place. More than half the Sun's mass is located in this region, even though it takes up only 2% of its volume.

CHROMOSPHERE

CORONA

SUNSPOTS

PROMINENCE

The Surface and Above

The Sun's surface is called the *photosphere*. This word is Greek for "sphere of light." The photosphere looks like a solid yellow surface, but it is really a swirling ocean of blazing gases 300 miles thick. The temperature here is about 10,000° F (5500° C).

Above its surface are the gases forming the Sun's atmosphere. The middle region of these gases is called the *chromosphere*. Above the chromosphere is the *corona*, which is visible around the Sun during a solar eclipse.

Photosphere Activity

Sunspots: Dark spots often appear on the surface of the Sun. These sunspots range in size from less than 600 miles across to about 60,000 miles across. They sometimes last weeks before disappearing. What makes these dark blotches? Scientists believe they are cool spots, caused by magnetic fields holding gases from reaching the surface. They aren't really black, just a little darker than the surrounding area.

Prominences: Giant clouds of gas often rise above the Sun's atmosphere. They look like loops, which arch down onto the surface, or sometimes flare out into space.

Flares: Solar flares are bursts of hot gases that shoot deep into the solar system. When they reach Earth, they can disrupt radio communications.

Comprehension Connection



Before Reading

1. Scan the card. What kinds of information do you expect to learn by reading this page from a nonfiction book?
2. Look at the diagram. What is it designed to show?
3. What makes the Sun so important to Earth?

During Reading

1. You could say the core of the Sun is its most important part. What happens there? Why is this important?
2. What two activities of the photosphere are opposite? What makes them opposite?
3. How does energy travel from the core to the surface of the Sun? Describe two ways.

After Reading

1. The author mentions radiation from the Sun's core and from the Sun to Earth. What do you think radiation is? Why?
2. How do you think scientists figured out what each layer of the Sun is like?
3. What would you say is the main idea of this page?

Skill Focus

The Big Picture

A picture or fact book offers lots of information about its topic. If you just glance at this card, you see that it gives you many facts. It has numbers, terms, and explanations. It may be hard to remember all those details!

Don't be discouraged. Keep in mind that the many details are given to support an overall main idea. It is this "big picture" that you should try to understand and remember.

After a while, you may not remember that the Sun holds 99% of the solar system's mass, or that the temperature at the Sun's core is 27,000,000° F. Most people cannot recall that it takes energy 8.13 minutes to travel from the Sun to Earth. Nor do they remember that giant looping clouds of gas on the Sun's surface are called prominences. However, these details do make an impression on you. They help you remember the main idea: The Sun generates vast amounts of energy that make life on Earth possible.

Writer's World

1. What are the layers of Earth? What is each one like? Research this topic and make a diagram with labels to show and explain these layers.
2. Learn more about the Sun, our star. Use your notes and information from this card to create a Most Amazing Facts poster about the Sun.
3. Pretend you are a science teacher. Write a plan for teaching a lesson on the Sun. Summarize the main ideas you will teach. Explain what words, pictures, and activities you will use to teach them.



Making Their Goals

By Arthur Burke

The 2002 World Cup was a success for Korea—in every way. The world championship of soccer, or football, is held every four years. In 2002, the World Cup took place in Korea and Japan. It was the first time any Asian nation held the event. Thirty-two games were held in each country. In Korea, the matches took place in 10 different cities.

Korea worked hard to make the World Cup a success. New stadiums were built. Extra roads, railroads, and airports had to be built. That's because millions of people were coming to Korea to see the games. All the work was completed on time. Visitors from many nations enjoyed the event. They also enjoyed the friendliness and warmth of the Korean people.

Great Games

Korea did a great job as host of the World Cup. The nation's team did an even better job on the playing fields. Korea had taken part in five World Cups before this one. But the team had never even won a game. At this World Cup, the Korean team reached the semi-finals. To do that, they beat the Italian team—one of the best in the world.

Korea did better than any Asian team in the history of the World Cup.



They were well coached by Guss Hiddink. Under Hiddink, the players showed great teamwork. They were also in better shape than many other players.

A Loss to Germany

The team finally lost to Germany in the semi-finals. Still, Koreans celebrated the success of the team. The crowd at the Seoul stadium chanted and cheered for their team. The players saluted the fans. The Korean government declared July 1 a national holiday. It was a day to celebrate the success of the team.

The World Cup proved something to Koreans. It showed that Korea can hold its own on and off the field.

THE BIG TEN

At the 2002 World Cup, soccer matches were held throughout Korea. The games were played at these 10 cities:

Seoul
Incheon
Suwon
Busan
Daegu
Daejeon
Ulsan
Cheongju
Gwangju
Seogwipo

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Comprehension Connection



Before Reading

1. What is the World Cup?
2. What does a city have to do to get ready to host an international championship?
3. What sports are most popular worldwide?

During Reading

1. Why did Korea have to build stadiums, roads, railroads, and airports?
2. How did the Korean soccer team do compared to past years at the World Cup?
3. How did Koreans show their pride in the team's success?

After Reading

1. Why do you think the World Cup had never been held in Asia before?
2. What factors do you think played a role in the Korean team's success?
3. What might be some long-term results of Korea hosting the World Cup?

Skill Focus

Finding the Main Idea

A well-written paragraph should contain details that support one main idea. Sometimes a paragraph has a topic sentence that states the paragraph's main idea. Often the topic sentence is the first sentence in the paragraph. Then the rest of the sentences in the paragraph give details that support the main idea.

Look at the second paragraph in "Making Their Goals." It begins by saying, "Korea worked hard to make the World Cup a success." The other sentences in the paragraph tell about how Korea built stadiums, roads, railroads, and airports. They tell about how millions of visitors came to the games and were treated warmly by Koreans. Do you see that all these sentences support the first sentence? They all explain ways Koreans worked to make sure the World Cup was successful.

Some paragraphs do not state the main idea directly. For these paragraphs, you can "add up" the details. Then you can make up your own main idea sentence. For the third paragraph, it might be this: "The 2002 Korean soccer team succeeded, where previous teams had failed."

Writer's World

1. Write a brochure about Korea. Convince travelers that they should visit Korea, home of the 2002 World Cup games.
2. Imagine you are watching the game in which Korea lost to Italy. Write a journal entry explaining your feelings on this day and describing the crowd's reactions.
3. Research the history of the World Cup. Find out where the next World Cup will be held. Make a chart showing the winners and the locations of the games over a period of years.



This award-winning program helps students develop
Nonfiction reading skills and strategies in the content areas:
Science ■ Social Studies ■ Language Arts ■ Mathematics

The program cover 12 nonfiction reading skills and strategies

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