WEEK 1 pages 1-5

Read the passage. Use the ask and answer questions strategy to check for understanding as you read.

Harnessing the Sun's Energy

For as long as people have lived on Earth, they have depended on the sun for the energy they need. Energy from the sun is called solar energy. In ancient times, people were warmed directly by the sun and indirectly by the solar energy stored in wood when they burned it. They used stored solar energy whenever they ate plants or animals that got their energy from plants. Today we use the solar energy stored in oil, coal, and natural gas. All of these are formed over very long periods of time.

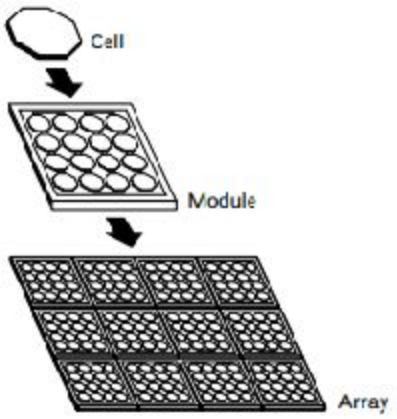
Because coal, oil, and gas take a long time to form, using them as energy sources has a disadvantage. They cannot be replaced as we use them. Today people are looking for ways to use solar energy directly from sunlight. Solar energy used in this way is called solar power. Because Earth receives light from the sun constantly, direct solar energy is a renewable source of energy.

Many ancient people found ways to harness solar power by converting, or turning, sunlight into thermal energy (heat). Greeks and Romans used the sun's reflection on mirrors to light torches. Romans found that using glass windows would capture the sun's warmth. Native Americans built houses into the sides of cliffs. They used the sun's heat from the day for warmth at night. Solar technology is not new. However, we continue to learn ways to harness the sun's power.

From Light to Electricity

Today we also have the technology to turn solar energy into electrical energy (electricity). In 1839 a French scientist by the name of Edmund Becquerel made a breakthrough discovery. He observed that certain materials made electrical current when they absorbed light. In 1905 Albert Einstein described the details of this process. Einstein's work was the basis for much progress in solar technology.

Convert, Collect, and Store



In the 1950s, American scientists developed a solar cell that could convert the sun's energy into current. One cell did not produce much electricity. Soon the cells were placed into larger units called modules. Then NASA decided to invest in solar energy for space travel. By combining solar modules, they made a more powerful electrical source called an array. NASA first used this technology on their satellite called Vanguard I in 1958.

The sun's energy can produce heat and power, but it must somehow be stored for later use. Some electrical power can be stored in batteries. Solar heat can also be captured by collectors and then stored. In 1767 a Swiss scientist developed the first solar collector. A flat plate collector uses black metal plates covered with pieces of glass. The glass heats up as the sun strikes. The heat is then carried by water or air to storage. Collectors are often used for heating homes or water. A focusing collector is used to capture greater heat. In these, a layout of carefully placed mirrors focuses the sunlight. The light goes from a wide area and is concentrated into a small black receiver. These solar furnaces can reach temperatures of up to 2,000 degrees Celsius.

An Available Renewable Energy

Solar power has many advantages. It does not pollute. This resource is free and widely available. The challenge is collecting and storing energy from this source cheaply. Today, more people use solar power in their homes and businesses. Water heaters and collection panels are cutting energy costs. New designs in windows, skylights, and even roof shingles help homeowners use the sun's energy directly. From ancient people to today, humans have looked for ways to harness our amazing sun. With awareness of the need for renewable, clean energy, looking to the sun just makes sense. The potential for solar power is enormous.

Reread the passage and answer the questions. Use complete sentences.

1. Look at the first paragraph. Write two details that support the main idea that people have always depended on the sun for energy.

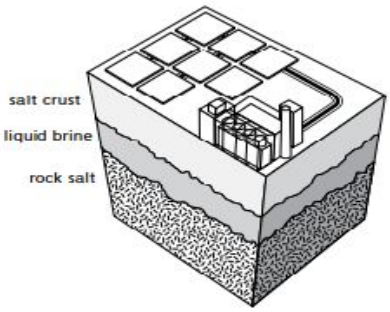
2. What is the main idea of the third paragraph?

3. Look at the second paragraph under the heading “Convert, Collect, and Store.” What is the main idea of that paragraph? Name one detail that supports this idea.

Genre: Narrative Nonfiction

Lithium: The World's Newest Commodity

Like oil and natural gas that fuel our cars and homes, lithium has become a valuable commodity or product. It is a light silvery-white metal with high electrical conductivity. Therefore, electronics that require a long battery life, such as laptops and mobile phones, run on lithium. The world's largest supply lies within the salt flats of Chile and Bolivia in South America. Although lithium is a clean energy source, mining for it is dirty work. The precious metal is pumped out of the ground and left to bake in the hot desert sun. It then becomes a yellow greasy liquid that can be used as energy. For some people, the question remains: How much environmental damage will lithium mining cause?



Lithium from the liquid brine layer is pumped up to the earth's surface.

Answer the questions about the text.

1. What process does the text explain?

2. How do the diagram and caption help you understand this process?

3. Why are some people concerned about lithium mining?

Vocabulary Strategy: Latin Roots

Read each sentence. Use the chart below to help you figure out the meaning of each word in bold. Then write the root of each word and a new sentence using that word.

Latin Root	Meaning
flec, flex	bend, break
ology	study or science of
scrib, scrip	write
vert, vers	turn
sign	sign

1. Many ancient people found ways to harness solar power by **converting**, or turning, sunlight into thermal energy (heat).

root:

sentence:

2. Greeks and Romans used the sun's **reflection** on mirrors to light torches.

root:

sentence:

3. Solar **technology** is not new.

root:

sentence:

4. In 1905, Albert Einstein **described** the details of this process.

root:

sentence:

5. New **designs** in windows, skylights, and even roof shingles help homeowners use the sun's energy directly.

root:

sentence:

Word Study: Suffixes -ible and -able

A. Read each word in bold. Then circle the related word with the suffix -ible or -able.

1. **value**	valuable	valued	remarkable
2. **profit**	professional	profitable	profits
3. **consider**	changeable	considerable	considerate
4. **love**	lovely	adorable	lovable
5. **horror**	horrible	honorable	horrifying

B. Read each clue. Then choose a word from the box that matches it. Write the word on the line and circle the suffix.

reversible	impossible	admirable	predictable	believable
terrible	acceptable	reliable	noticeable	considerable

6. worthy of admiration _____

7. able to be reversed _____

8. capable of being noticed _____

9. able to be believed _____

10. causing terror _____

WEEK 2 pages 6-10
Read the passage. Use the ask and answer questions strategy to check your understanding as you read.

The Triangle Shirtwaist Fire

New York City was a booming industrial center in 1911. The garment industry was one of the largest employers in the city at that time. Immigrant women and girls were often the ones who worked in these factories, cutting and sewing fabric for clothing. The garment factories were in great competition. As a result, workers' pay and factory conditions often suffered. It was common for immigrant workers to work in unclean, overcrowded factories.

The Triangle Shirtwaist Factory specialized in making a popular women's blouse called the shirtwaist. The Triangle Factory was on the top three floors of the ten-story Asch Building. Nearly 500 of the 600 employees were young women and girls. Sewing machines were crowded together with hardly an aisle to walk between them. Cloth scraps littered the floors. Webs of thread and cloth draped over chairs and tables. There was no time for cleanup.

At 4:45 P.M. on March 25, 1911, the Triangle Shirtwaist Factory erupted into an uncontrollable blaze. It was the close of a workday. Many were ready to walk out with their coats in hand. It was a cruel fate for the 146 people who died, trapped in flames within minutes of their freedom!

A tailor on the eighth floor heard the first cry of fire. He and the manager grabbed buckets and began dousing the flames with water. A feast for the hungry fire, long rope lines of shirtwaist garments hung above sewing tables. While the men tossed water on the fire, the rope burned in two. As a result, the flaming blouses fell onto electric sewing machines and wooden tables below. Soon the cloth-filled room was an uncontrolled wildfire.

A Picture Is Worth a Thousand Words

As clouds gather before a storm, the first sparks of flame foreshadowed an unthinkable disaster in New York City. Chaos reigned inside the factory. The workers found exit doors locked. There was only one fire escape. One elevator worked, but for only a short time. Stairwells soon filled with fire. Because they had nowhere to go, the employees faced unwelcome choices.

Library of Congress, Prints & Photographs Division [LC-USZ62-34985]

Horse-drawn fire engine, on its way to the Triangle Shirtwaist Company fire

Sarah Friedman Dworetz worked on the ninth floor that dreadful day. She said in an interview, "There was screaming and shoving and many girls tried to climb over the machine tables." As Sarah waited for the elevator, she saw the flames coming from all sides. "Suddenly I was holding to the sides of the door looking down the elevator shaft with girls screaming and pushing behind me." She reached for the elevator cable and grabbed hold. Sarah slid down the shaft, landing on top of the elevator, unconscious. Other girls followed Sarah, many falling on top of her broken body.

Many other girls tried to escape through the windows. Unfortunately, they were unable to do so. The murderous fire was over in thirty minutes. In this factory, advice when most needed was least heeded. There had been other fires at the Triangle Factory. Experts had called for more safety measures.

In 1909 union workers protested the conditions in a strike. Their suggestions were ignored. The owners were not convicted of a crime, but public outrage did lead to reform. Workers organized, and political leaders

took action. Many would say that the reforms were better late than never. For the women who lost their lives, however, it was too little too late.

Reread the passage and answer the questions. Use complete sentences.

1. What caused the low workers' pay and poor working conditions in garment factories in the early 1900s?

2. Once the fire began, what was the effect of having cloth, thread, and blouses all over the factory?

3. What caused so many workers to become trapped in the factory?

4. What was the effect of people's outrage about the fire?

Baltimore in Flames

For firefighters at Engine 15 in Baltimore, Maryland, February 7, 1904, seemed like an ordinary Sunday morning. Everything changed at 10:48 A.M. when they received a fire alarm from John Hurst and Company. Soon after the fire engine arrived at the building, a basement fire caused an explosion in the elevator shaft. From there, the fire spread rapidly. For two days, firefighters worked frantically to put out the blaze that swallowed the city. The New York Times reported on February 9, 1904, “A territory twelve full city blocks by nine, and extending beyond over a mile and more of waterfront, is left in smoking, hideous ruins.” As destructive as the fire was, the city of Baltimore quickly began to rebuild and recover.

Smoke and ruins from the great Baltimore fire of 1904

Answer the questions about the text.

1. List two features of narrative nonfiction that this text contains.

2. What information does the primary source quotation add to the text?

3. How did the photograph impact your understanding of the fire?

Vocabulary Strategy: Adages and Proverbs

Read each passage below. Use context clues to figure out the meaning of each adage or proverb in bold. Write the meaning of each one. Underline the context clues that helped you understand the adage or proverb.

1. **As clouds gather before a storm**, the first sparks of flame foreshadowed an unthinkable disaster in New York City.

2. In this factory, **advice when most needed was least heeded**. There had been other fires at the Triangle Factory. Experts had called for more safety measures. In 1909 union workers protested the conditions in a strike. Their suggestions were ignored.

3. The owners were not convicted of a crime, but public outrage did lead to reform. Workers organized, and political leaders took action. Many would say that the reforms were **better late than never.**

4. For the women who lost their lives, however, it was **too little too late.**

Word Study: Suffixes -ance, -ence, -ant, and -ent

A. Read each adjective in bold. Then circle the word with the suffix that changes the adjective to a noun. Underline the suffix.

1. important importance import

2. evident evidential evidence

3. defiant definitely defiance

4. excellent excellence excelled

B. Read each pair of sentences and identify the word in bold. Then complete the second sentence by writing the word in the box that is related to the word in bold.

importance	persistent	violence	fragrance
observant	conference	disappearance	occurrence

5. The programmers persisted until they found a solution. They were very _____**.**

6. City leaders proudly reported there were fewer violent incidents this year. The amount of _____ has decreased.

7. The noisy crows disappeared from the trees last week. The neighborhood is much quieter since their _____ .

8. The food baking in the oven was deliciously fragrant. The _____ made my mouth water!

9. Experts on the topic conferred for days to find a solution. In the end, their _____ was quite successful.

WEEK 3 pages 11-15
Read the passage. Use the summarize strategy to check your understanding of key ideas.

Researching the Ocean's Secrets

Scientists didn't know much about deep-sea life until Jacques Cousteau's inventions changed everything. Cousteau, a Frenchman, wanted to dive deep below the surface of the sea. Skin divers had to swim near the surface. They had no way to carry air with them. Cousteau invented a portable breathing apparatus and an underwater camera. Those inventions made it possible to explore the ocean and film the wonders of the sea.

Goggles, Cameras, and Scuba Diving

Goggles were not common diving gear in the 1930s. Free-swimming divers usually swam without anything to cover their eyes. Cousteau tried some goggles and was amazed at what he saw. His love for diving grew even more. Cousteau was excited to share his discovery with the world, but his camera would not work in water. So he figured out how to make it waterproof. With goggles and an underwater camera, Cousteau was set to make history.

Still, Cousteau wanted to dive deeper than was possible without an air supply. He envied the freedom of the fish. However, there was no equipment that allowed divers to breathe without hoses or tubes attached to an air supply above the surface. Those lines fastened divers to a vessel that carried their bulky air-supply equipment. In 1943 Cousteau and Emile Gagnan invented a self-contained underwater breathing system. They called the device the Aqua-Lung. This gear ushered in a new era in underwater exploration. The equipment offered a way for divers to get air underwater without being connected to an air source above.

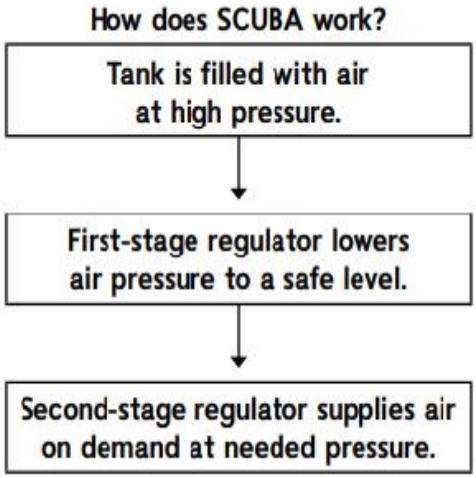
The new gear became known as Self-Contained Underwater Breathing Apparatus or SCUBA. The breathing apparatus fed air to divers at the same pressure as the water around them. It allowed divers to spend more time below. Scuba gear changed the way Cousteau and others explored the oceans.

From the Sea to TV

Cousteau's breathing machine and goggles allowed him to explore the depths of the sea. He needed a vessel, a boat of just the right size from which he could dive. In 1950 Cousteau acquired a small ship named Calypso. She was sturdy and built so she could go in and out of shallow coral reefs. Calypso was perfect for both exploring and filming Cousteau's underwater adventures.

Cousteau outfitted Calypso as a laboratory from which he could make dives. Calypso's workspace carried underwater cameras and diving gear. A shark cage was lashed to the deck. An underwater observation room known as "Calypso's false nose" was added to the vessel. The nose chamber was a large enough space for two of the crew to film underwater. Cousteau wanted to share what he and his crew saw below.

Cousteau began recording his explorations. First, he used black-and-white film and later, color. National Geographic magazine noticed Cousteau's color pictures and invited him to work with them. They started filming his underwater adventures for television. Cousteau's films soon played on televisions across America on a weekly basis. His program became so popular that it ran for nine years. Cousteau narrated the shows himself, describing his discoveries with his engaging French accent.



Cousteau thought of his films as nature adventures. He was a scientist who had a sense of wonder about everything he did. He loved to explore unknown waters. Cousteau explored sea life with a sense of awe and shared that with his TV viewers.

Cousteau also brought attention to marine conservation, so that ocean life would be preserved instead of harmed. He founded the Cousteau Society in 1974. Cousteau brought the beauty and marvel of underwater life into people's homes. He inspired the world by sharing his love of the sea.

Reread the passage and answer the questions.

1. What is the main idea of the first paragraph? Which two details in the paragraph support the main idea?

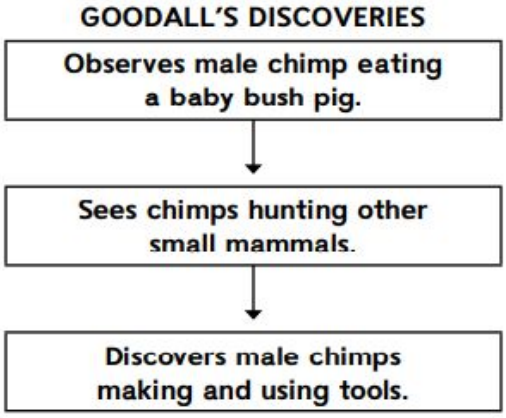
2. Give two key details in the second paragraph.

3. What is the main idea of the second paragraph?

4. Look at the second paragraph under the heading “From the Sea to TV.” Write one key detail and the main idea of that paragraph.

Jane Goodall: Chimpanzee Expert

Interested in animals from a young age, Jane Goodall left England in 1960 and went to Gombe, Tanzania, in Africa. There, she began her lifelong study of chimpanzees. Unlike other scientists, Goodall took a very personal approach to her research. She gave the chimpanzees names instead of numbers. Goodall made many new discoveries about chimpanzees, including the fact that they are omnivores. In other words, they eat other animals as well as plants. In 1986 Goodall published her book Chimpanzees of Gombe: Patterns of Behavior. Today, Goodall travels 300 days a year. She educates others worldwide about wildlife conservation.



Answer the questions about the text.

1. What technical term is included in this expository text? What does it mean?

2. Which step in the flow chart provides information that is different from the other two steps?

3. What can you conclude about Goodall's commitment to wildlife?

Vocabulary Strategy: Context Clues

Read each passage. Underline the context clues that help you figure out the meaning of each word in bold. Then answer the question below the passage.

1. **Goggles** were not common diving gear in the 1930s. Free-swimming divers usually swam without anything to cover their eyes.

On what part of your body would you wear **goggles**?

2. In 1943 Cousteau and Emile Gagnan invented a self-contained underwater breathing system. They called the **device** the AquaLung. This gear ushered in a new era in underwater exploration.

What is an example of a **device** you might find in a kitchen?

3. He needed a **vessel**, a boat of just the right size from which he could dive. In 1950 Cousteau acquired a small ship named Calypso.

What kind of **vessel** might you use on a small lake?

4. Cousteau outfitted Calypso as a **laboratory** from which he could make dives. Calypso's workspace carried underwater cameras and diving gear.

What happens in a **laboratory**?

5. An underwater observation room known as "Calypso's false nose" was added to the vessel. The nose **chamber** was a large enough space for two of the crew to film underwater.

Instead of in a big theater, where do you think **chamber** music is usually played?

6. Cousteau also brought attention to marine **conservation**, so that ocean life would be preserved instead of harmed.

What could help the **conservation** of the oceans?

Word Study: Greek Suffixes

A. Read the words in the box. Sort the words by their Greek suffixes. Write each word in the correct column below.

technology	physician	heroism	geologist	politician
ecologist	apology	mythology	specialist	feminism
novelist	biologist	technician	patriotism	tourist

-ician	-logy	-ologist	-ist	-ism
1.	1.	1.	1.	1.
2.	2.	2.	2.	2.
3.	3.	3.	3.	3.

Greek Suffixes

- *-ician* means "a specialist in"
- *-crat* and *-cracy* mean "rule"
- *-logy* and *-ologist* mean "science of" and "scientist"
- *-phobia* means "an abnormal fear"
- *-ist* means "one who practices"

B. Find the word in each row that matches the clue in bold. Write the word on the line and underline its suffix. Use the meanings of the Greek suffixes to help you.

1. fear of water	aquaphobia	anthropology	_____
2. ruled by the people	chemist	democracy	_____
3. a specialist in music	musical	musician	_____
4. science of the heart	cardiologist	cardiology	_____