SESSION 1 TALK ABOUT THE TOPIC

Solar Power

FOCUS QUESTION

Why and how do people use solar power?

NOTICE AND WONDER

Look at the three texts you will read in this lesson. What do you notice? What do you wonder? Discuss your ideas with a partner.

WHAT IS SOLAR POWER?

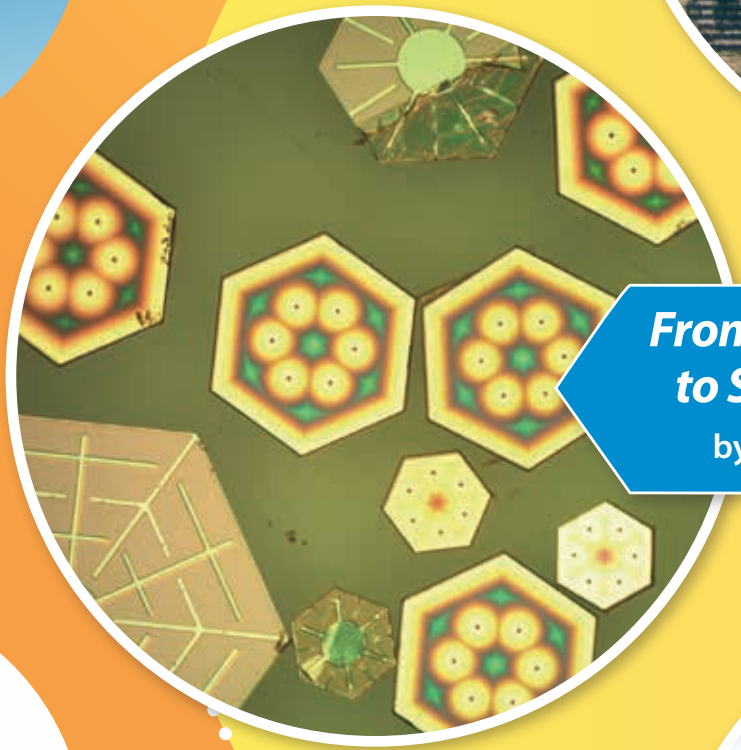
What does *solar power* mean? Circle the terms that are related to *solar power*. Discuss how the terms are connected to *solar power*.

solar panels	fossil fuels	solar cells
pollution	sun	renewable energy

___ said that *solar power* means ___.
I agree/disagree because ___.

I think the term ___ is connected to *solar power* because ___.

Panda Power
by Mary Lindeen



From Race Cars to Solar Cells
by Alice Cary

Powering a Community
by Theresa Liberatore

SESSION 1 READ

PANDA POWER

by Mary Lindeen

Ada Li Yan-tung explains her idea for panda-shaped solar farms.

1 In 2015, Ada Li Yan-tung was a 15-year-old Hong Kong student who noticed a problem. She was worried about how people use energy from burning fossil fuels and how this creates air pollution that hurts the environment. But her friends and other young people were not very interested in using other sources of energy. So, she thought of a creative connection between two very different things: pandas and solar panels.

2 Like millions of other people, Ada and her friends loved watching videos of giant pandas online. Whether eating bamboo or rolling in the snow, these black-and-white bears always seem so cute. They're also a national symbol of China and a global symbol of environmental protection.

3 Solar panels are an alternate energy source. But unlike pandas, they are not cute. And solar farms are big. A solar farm is made up of hundreds or even thousands of solar panels arranged together on open land. The good news is that one 32-acre solar farm can supply electricity to about 1,000 homes. However, these farms take up *a lot* of space. And some people think they're not much fun to look at.

4 Ada wondered if more people would support solar power if solar farms were more meaningful and more interesting to look at. Then she realized that the black and gray solar panels could be arranged to make pictures of pandas!

Stop & Discuss

Why did Ada connect pandas and solar power?

Use details from the text to support your answer.

The first Panda Solar Station was built in Datong, China, in 2017.

5 Ada presented her panda idea at a global **forum**. After the forum, the United Nations Development Programme contacted her and then connected her with a Chinese group interested in building her solar farms.

forum = a meeting where people share ideas

6 Two years later, China built its first panda-themed solar farm. From the sky, the carefully placed panels show pictures of two smiling pandas. The panels collect energy from sunlight and change it into electricity without burning anything. As a result, they generate renewable energy that creates less air pollution.

7 China has plans to build 100 of these panda solar farms. Meanwhile, Ada is helping other countries plan their own **symbolic** solar power farms. In Australia, for example, the panels form both pandas and koalas. Thanks to her creative solution, Ada Li Yan-tung is raising awareness about solar energy. She is showing one way people can reduce the use of fossil fuels and decrease air pollution.

symbolic = a shape or design standing for an idea

Stop & Discuss

Which statement best describes how people feel about Ada's idea?

Underline details in paragraphs 5–7 to support your answer.

- ☐ People like her idea a lot.
- ☐ People wonder if her idea will work.

SESSION 2 PRACTICE

Describe Text Structure

- **Text structure** is the way an author organizes information in a text.
- A text with a **problem-solution structure** describes a problem. Then it describes how the problem is solved. A text may describe more than one problem and solution.
- Words such as *problem, solution, however, but,* and *as a result* may signal a problem-solution structure.

Reread/Think

Complete the chart with problems and solutions from the text.

- Reread paragraphs 1–3 of "Panda Power" to find the problems.
- Then reread paragraphs 3–7 to find the solutions.

Problems	Solutions

Talk

What problems and solutions did you find in "Panda Power"?

- Where did you find them? How did signal words help you?
- Share your ideas with a partner. Listen to your partner's ideas.

One problem is ___.
The solution is ___.

The signal word ___ helped me ___.

Write

How does the author use a problem-solution text structure in "Panda Power"? Support your response with two examples of problems and solutions from the text.

WRITING CHECKLIST

- ☐ I answered the question.
- ☐ I included two examples of problems and solutions.
- ☐ I used complete sentences.
- ☐ I used correct spelling, punctuation, and capitalization.

SESSION 3 READ

From Race Cars to Solar Cells

by Alice Cary

Jose Luis Cruz-Campa built cars as a child.

engineer = a person who uses science and math to design and build things

Stop & Discuss

What did Jose learn from playing with race cars and paper airplanes?

Underline details that help you answer the question.

1 Do you know what you want to be when you grow up? If you're not sure, don't worry. Just by doing activities that you love, you may already be preparing for your career, whatever that may be.

2 Take a look at Jose Luis Cruz-Campa. He grew up to become an award-winning **engineer**. But as a boy in Mexico City, Mexico, Jose spent hours building race cars with plastic building blocks. "I would make cars and crash them, put them back together and crash them again," Jose remembers. Each crash helped Jose learn what worked and what didn't work with his car designs. Because of all his experimenting, he was able to build faster, better cars.

3 When Jose was in high school, he turned his attention from building race cars to making paper airplanes. "I read books on how paper planes could be folded to fly faster and farther. I'd mix and match designs I found in the books and try them out," Jose remembers.

4 Jose and his classmates threw their airplanes out of the school's third-floor windows. The students wanted to see whose would fly the farthest. Since Jose had worked so hard on his designs, his airplanes usually won.

5 Even losses were helpful. "You have to have some experiments fail," Jose explains. Whenever a plane didn't fly well, Jose figured out what went wrong. Then he made a better paper airplane. Jose was already thinking like an engineer.

6 Now, as an adult, Jose is as excited about solar power as he once was about paper airplanes and race cars. "We need more energy for our cars, our houses, and our computers," he says. "We can create energy from the sun without burning fossil fuels."

7 Jose has done just that. An electrical engineer, Jose works at a lab where he makes solar cells, which turn sunlight into electricity. Jose designs tiny solar cells, called micro solar cells. These special solar cells are about the size of a piece of glitter and thinner than a piece of hair. Despite their small size, they work really well. They are also less expensive to make than larger solar cells.

Stop & Discuss

What are micro solar cells? Why are they important?

Explain your ideas using details from the text.

Micro solar cells as seen through a microscope

charge = to add electricity to; to power

8 Because micro solar cells are so small, someday they could be attached to many different things, such as cloth. For example, scientists are researching how to put the solar cells on shirts or tents. Then, as people walk or rest, they could use the solar cells to **charge** things like phones, cameras, or flashlights.

9 Ever since he was a boy, Jose has loved finding new ways to do things. "Once you build something [as a scientist]," Jose observes, "you see that what you did helped people have something nice. You might see millions of people using what you made." Jose didn't realize it at the time, but doing what he loved to do—playing and problem-solving—gave him the skills to continue doing what he loves today.

Stop & Discuss

How could people use Jose's micro solar cells?

Underline two examples of ways people can use micro solar cells.

People could use micro solar cells to ___.

Micro solar cells are so small they could be attached to cloth.

Describe Text Structure

- A **cause** is a reason, event, or action that makes something happen. An **effect** is what happens as the result of a cause.
- A **cause-effect text structure** tells about events, why they happen, and how they cause other events to happen.
- Words such as *because, since,* and *as a result* can signal a cause-effect structure.

Reread/Think

Reread paragraphs 5 and 9 of "From Race Cars to Solar Cells." Complete the chart with causes and effects.

Cause	Effect
Paragraph 5	Jose figured out what went wrong with his airplanes.
Paragraph 5 Jose figured out what went wrong with his airplanes.	
Paragraph 9 Playing and problem-solving helped Jose develop design skills.	

SESSION 4 PRACTICE

Talk

Talk with your partner about causes and effects in "From Race Cars to Solar Cells."

- How does the author use a cause-effect text structure to make a connection between Jose's childhood and his career? Use your chart to help.
- What did Jose learn from his childhood play that helped him as an engineer?
- Use signal words such as *because, since,* and *as a result* to explain cause-and-effect relationships in the text.

As a child, Jose ___. As a result ___.

Because Jose ___, he ___.

Write

What did Jose learn from his childhood play that helped him as an engineer? Use examples from the text and signal words in your response.

WRITING CHECKLIST

- ☐ I answered the question.
- ☐ I included examples of cause-effect text structure.
- ☐ I used signal words.
- ☐ I used complete sentences.
- ☐ I used correct spelling, punctuation, and capitalization.

POWERING A Community

by Theresa Liberatore

The hot, dry lands of the Ute Mountain Reservation are a perfect place to capture solar energy.

1 Imagine living in a town or a city powered only by the sun. This may sound like a dream. But it may be a **reality** for a community in the Southwest.

2 The Ute Mountain Ute Tribe lives in southwestern Colorado, where they have been for thousands of years. Most of the 2,000 members live in a small town. But the tribe's reservation includes almost 1,000 square miles of desert.

3 For years, the Ute tribal leaders have been looking to provide more opportunities for their people. The leaders want to create more jobs and find more ways to support their people within the community. They also want to produce energy without polluting the air.

4 Because of the ideal **conditions** of their land, a solar power project seemed like a natural solution. So, the tribe began to plan. They set a goal to one day power their reservation with 100% renewable energy.

reality = fact; the way something is

conditions = the surroundings and climate of a place

5 But the tribe had to start small. The first step of their plan was to build a small solar array. A solar array is a group of solar panels that work together to collect the sun's energy. The tribe's solar array, made up of about 3,500 solar panels, produces about 1 megawatt of power. This is enough electricity to power about 1,000 homes. The array was completed in September 2019 and is supplying about 10% of the tribe's electricity.

grant = money given to someone to use for a purpose

6 This first array was expensive. The tribe received a $1 million **grant** from the government, but the tribe also had to spend $1 million of its own money to cover the costs of building the array.

funding = money

7 Ute leaders believe this solar array is just the beginning. "We see this as a stepping stone to a much larger project," says Scott Clow, the tribe's environmental director.

Workers and volunteers begin construction of the Ute Mountain solar power project.

8 This larger project would be building a huge solar array that could produce 200 to 300 megawatts of power. All that electricity could power every home and building on the reservation, with a lot left over. However, the cost of building a huge array is a problem. The tribe would need $400–600 million of **funding**, which the tribe doesn't have.

9 Still, the Ute Tribe has hopes for the future. Bernadette Cuthair, a community leader who helped plan the first project, says, "Our tribe likes to think outside of the box and take risks." So, using solar arrays for 100% of their energy needs *is* possible. The only question is *when*.

Respond to Text

Reread/Think

Reread "Powering a Community." Choose the best response to each question.

1. PART A

How does the author use text structure to organize the information in paragraphs 2–4?

A. The author uses a cause-and-effect structure to explain what led to the Ute Tribe living in Colorado.

B. The author uses a cause-and-effect structure to tell what caused tribal leaders to create more jobs.

C. The author uses a problem-solution structure to tell how solar power can reduce air pollution.

D. The author uses a problem-solution structure to tell how the tribe planned to improve people's lives.

PART B

Which sentence from the text **best** supports your answer in Part A?

A. "The Ute Mountain Ute Tribe lives in southwestern Colorado, where they have been for thousands of years." (paragraph 2)

B. "Most of the 2,000 members live in a small town." (paragraph 2)

C. "Because of the ideal conditions of their land, a solar power project seemed like a natural solution." (paragraph 4)

D. "So, the tribe began to plan." (paragraph 4)

2. What does *produces* mean in paragraph 5?

A. makes

B. needs

C. sells

D. wastes

Reread/Think

3. Which of the following **best** describes how the author organizes the information in paragraph 5?

A. The author identifies problems caused by using solar power.

B. The author tells how the tribe solved a problem with their plan.

C. The author explains how a solar array changes light into electricity.

D. The author describes the effect of the solar array on the community.

Write

How does the author use a problem-solution or cause-effect structure in "Powering a Community"? Include examples from the text to support your thinking.

WRITING CHECKLIST

- ☐ I described the overall text structure of the article.
- ☐ I included examples from the text to support my response.
- ☐ I used complete sentences.
- ☐ I used correct spelling, punctuation, and capitalization.

Respond to the Focus Question

Why and how do people use solar power?

Reread/Think

Choose one text from the lesson to reread.

TEXT: _____

What did you learn from your text about why and how people use solar power? Write one example of *why* people use solar power. Then write one example of *how* they use it.

1. Why: _____

_____

_____

2. How: _____

_____

_____

Talk

Which idea about solar power do you think is the most interesting? Why? How else could people use this idea?

I think ___ is the most interesting idea because ___.

People could use ___ to ___.

Write

Which idea about solar power do you think is best? Explain the idea and how people could use it. Use information from the texts in your response.