

Solar Power

FOCUS QUESTION

Why and how do people use solar power?

About the Lesson

OBJECTIVES

Content Objectives

- Identify and describe a problem-solution structure in a text or part of a text.
- Identify and describe a cause-effect structure in a text or part of a text.
- Understand what solar energy is and how it is used.

Language Objectives

- Use academic vocabulary to describe the structure of part or all of a text.
- Explain in writing how authors use text structure to organize information.
- Justify opinions about solar power in partner discussion, using sentence frames.

ACADEMIC TALK

See **Glossary of Terms** on pp. 478–485.
text structure, problem-solution structure, cause-effect structure, cause, effect

Spanish Cognates

estructura del texto, problema, solución, causa, efecto

Build Knowledge

Lesson texts build knowledge about:

- How creatively designed solar farms in China create power and cause less pollution than some other sources
- How tiny solar cells can use sunlight to charge devices such as phones, cameras, and flashlights
- How a Native American group in Colorado is working toward powering their reservation with 100% renewable energy

Plan Student Scaffolds

- Use **i-Ready data** to guide grouping and choose strategic scaffolds.
- Use this **Teacher Toolbox** resource as needed to address related skills:
— Describe text structures
- Pair EL students with non-EL students so that one may serve as a language model during Sessions 1 and 3. **EL**
- Preview texts and activities to anticipate barriers to engagement, access, and expression. Modify based on needs.

Use Protocols That Meet the Needs of All Students

In order to increase engagement and validate cultural and linguistic behaviors, specific protocols are included in the lesson. To further customize activities for your students, consider optional protocols listed on pp. A46–A51.

PROTOCOL	SESSION	VALIDATES
Take a Poll	1	multiple perspectives
Pick a Stick	1–6	spontaneity
Jump in Reading	2, 4	spontaneity, collective success
Silent Appointment	2, 4	social interaction, nonverbal expression
Shout Out	5	spontaneity, multiple ways to show focus
Vote with Your Feet	6	movement, multiple perspectives

LEARNING PROGRESSION | Describe Text Structure

Students build on this skill:

RI.3.5 Use text features (e.g., key words, sidebars) to locate information relevant to a given topic efficiently.

Students learn this skill:

RI.4.5 Describe the overall structure (e.g., cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

Students prepare for this skill:


RI.5.5 Compare and contrast the overall structure (e.g., cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.

Students review and practice:

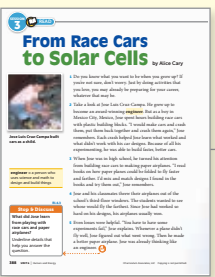
- **RI.4.1** Make inferences
- **RI.4.3** Analyze a scientific text
- **RI.4.4** Determine word meanings

LESSON PLANNING GUIDE

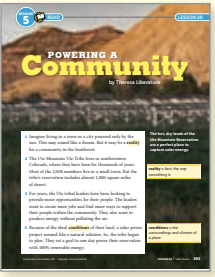
TEXT 1: Panda Power • SCIENCE ARTICLE

SESSION 1	SCAFFOLD READING		TEXT AT-A-GLANCE	ENGLISH LEARNER SUPPORT (EL)
SESSION 2	PRACTICE THE FOCUS STANDARD <ul style="list-style-type: none"> Formative Assessment 		Concepts/Background <ul style="list-style-type: none"> Hong Kong negative effects of burning fossil fuels for energy how solar panels work United Nations Development Programme development of solar farms Language <ul style="list-style-type: none"> Vocabulary: <i>national, global, environmental, generate, pollution, awareness</i> 	Reading <ul style="list-style-type: none"> Leverage cognate knowledge Listening/Reading <ul style="list-style-type: none"> Identify text evidence Speaking/Reading <ul style="list-style-type: none"> Leverage cognate knowledge Writing <ul style="list-style-type: none"> Use sentence frames

TEXT 2: From Race Cars to Solar Cells • SCIENCE ARTICLE

SESSION 3	SCAFFOLD READING		Concepts/Background <ul style="list-style-type: none"> electrical engineer micro-solar cells Language <ul style="list-style-type: none"> Vocabulary: <i>career, designs, experimenting, observes</i> 	Speaking/Reading <ul style="list-style-type: none"> Use sentence frames, Use visual support, Analyze sentences
SESSION 4	PRACTICE THE FOCUS STANDARD <ul style="list-style-type: none"> Formative Assessment 			Speaking <ul style="list-style-type: none"> Reinforce academic vocabulary Speaking/Writing <ul style="list-style-type: none"> Use sentence frames

TEXT 3: Powering a Community • SCIENCE ARTICLE

SESSION 5	INDEPENDENT READING AND PRACTICE		Concepts/Background <ul style="list-style-type: none"> Ute Mountain Ute Tribe reservation how creating jobs helps a community the percent symbol (%) Language <ul style="list-style-type: none"> Vocabulary: <i>Southwest, solar array, megawatt</i> Idioms: <i>cover the costs, stepping stone, think outside of the box</i> 	Reading <ul style="list-style-type: none"> Recognize word forms, Use visual support Listening/Reading <ul style="list-style-type: none"> Read aloud questions and answer choices Speaking/Writing <ul style="list-style-type: none"> Talk before writing
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KNOWLEDGE BUILDING

SESSION 6	RESPOND TO THE FOCUS QUESTION <ul style="list-style-type: none"> Why and how do people use solar power? 	<ul style="list-style-type: none"> Integrate information from the lesson texts Collaborative discussion Short response 	Speaking/Writing <ul style="list-style-type: none"> Talk before writing
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Before Teaching the Lesson

Preview the texts in advance of teaching the lesson. Plan scaffolds to use as needed before reading each text. All three texts focus on using solar power to produce electricity; as an alternate means of representation, consider showing grade-appropriate photographs and diagrams that explain how solar panels work.

- **Panda Power: Fossil Fuels** People burn fossil fuels to generate electricity, but burning them emits gases that pollute the air. Solar power, which converts the sun's energy into electricity, is an alternative energy source that does not emit such gases.
- **From Race Cars to Solar Cells: Electrical Engineer** An electrical engineer uses science and math to design and develop electrical equipment and products.
- **Powering a Community: The Ute Mountain Region** The Ute Mountain Ute Tribe are Native Americans. The reservation, or land they live on, has dry conditions and lots of sunshine, which makes it an excellent place for a solar power project. Show photos to help build background.

Talk About the Topic

BUILD STUDENTS' INTEREST

- 1 • Introduce the lesson topic and the Focus Question. Tell students they will read, talk, and write about why and how people use solar power.
- Invite students to **Raise a Hand** to share something they know about solar power.
- Invite students to use their home language to talk about solar power. **EL**
- 2 • Ask students to think about the Focus Question as they complete Notice and Wonder with a partner.
- Use **Take a Poll** to have students show which text they are most interested in reading.

SESSION

1

TALK ABOUT THE TOPIC

Solar Power

1

FOCUS QUESTION

Why and how do people use solar power?

2

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.

3

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

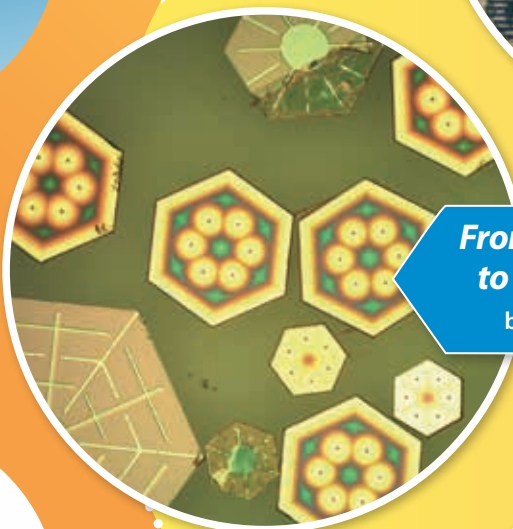
sun

renewable energy

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

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

LESSON 20
Panda Power
by Mary Lindeen

From Race Cars to Solar Cells
by Alice Cary

Powering a Community
by Theresa Liberatore


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LESSON 20 | Solar Power **383**

- Introduce the focus standard. **Say, As you read, you will also learn about problem-solution text structure and cause-effect text structure.**

3 INTRODUCE ESSENTIAL CONCEPTS

- Have students work in pairs to complete What Is Solar Power?
- Guide students to use the sentence frames as needed and make connections between the provided terms and solar power.
- Encourage students to identify cognates in their home language that can help them understand terms in the list: *solar, panel, célula, renovable, energía*. **EL**
- Use **LISTEN FOR** to monitor understanding. Use **Help & Go** scaffolds as needed.
- **LISTEN FOR** Students understand the meaning of *solar power* and have familiarity with the related terms.

HELP & GO: Vocabulary

- Have students look for clues in the titles and pictures to figure out what *solar power* means.
- Have students share what they know about the meaning of the word *power*, clarifying multiple meanings as needed. **EL**
- Have students **Raise a Hand** to share their ideas about solar power and the related terms. Have students add other words and phrases that are related to solar power.
- Have students add new terms to their word journals.
- Record a class definition of *solar power* using the related terms. (Sample definition: Solar power is energy from the sun that is changed into electricity or heat using solar panels or cells. Solar energy is a renewable resource because it does not run out.)

1 Support Reading

- Set a purpose for reading. **Say**, *In this session you will read to learn about what solar power and pandas have in common.*
- Have students read paragraphs 1–4. Have them circle unknown words and mark confusing parts with a question mark.
- Use **CHECK IN** and related **Help & Go** scaffolds as needed to support understanding of the text. Monitor based on annotations, observation, and your knowledge of students.
- **CHECK IN** Students understand the meaning of *national*, *global*, and *environmental*.

HELP & GO: Vocabulary

- In paragraph 2, guide students to look inside the words *national*, *global*, and *environmental* to identify the base words and review the meaning of the suffix *-al* (of; relating to). Discuss how *-al* changes the meaning of the base words *nation*, *globe*, and *environment*.
- Have students identify Spanish cognates for the suffix *-al* (*-al*) and the words *national* (*nacional*), *symbol* (*símbolo*), and *protection* (*proteccion*). **EL**

2 Stop & Discuss

- Have students **Turn and Talk** with a partner to complete **Stop & Discuss**.
- **LISTEN FOR** Ada hopes panda-shaped solar farms will get people interested in solar power.

HELP & GO: Comprehension

- Reread paragraphs 1–3. **Ask**, *What does not interest Ada's friends? using sources of energy other than fossil fuels What other energy source does the text mention? solar panels What do Ada's friends love? pandas What is Ada's idea in paragraph 4? panda-shaped solar farms*

SESSION

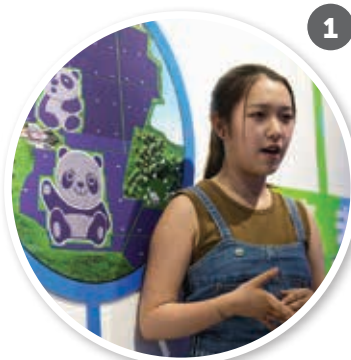
1



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! 🐼

2

RI.4.3

Stop & Discuss


Why did Ada connect pandas and solar power?
Use details from the text to support your answer.



LESSON 20

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

3

- 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.
- 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. 

forum = a meeting where people share ideas

symbolic = a shape or design standing for an idea

4

RI.4.1

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.

3 Support Reading

- Have students read paragraphs 5–7.
- CHECK IN** Students understand the function of the panels discussed in paragraph 6.

HELP & GO: Sentence Comprehension

- In paragraph 6, clarify that *it* in the third sentence refers to energy from sunlight. **Ask**, *What do the panels collect and change into electricity? **energy from sunlight***
- Clarify that *they* in the fourth sentence refers back to panels. **Ask**, *What things generate renewable energy without burning anything? **the panels***

4 Stop & Discuss

- Have students complete **Stop & Discuss**. Then have them **Turn and Talk** with a partner.
- LISTEN FOR** Students explain how they know that people like Ada's idea.

HELP & GO: Comprehension

- Clarify that the text does not directly describe people's feelings. **EL**
- Have students reread paragraph 5. **Ask**, *What happened after Ada shared her idea? **People wanted to build her solar farms. Reread paragraphs 6 and 7. What did China do two years after Ada's presentation? **built its first panda-themed solar farm** What plans does China have? **to build 100 panda solar farms** What do these details tell you about how people feel about Ada's panda-themed solar farms? **People must like her idea.*****

Discuss the Whole Text

- Revisit the Focus Question with the whole class. **Ask**, *Why and how are people using solar power in China?*
- Use **Pick a Stick** to select students to respond. Record students' responses.

Reconnect to the Text

Use **Pick a Stick** to have students recall “Panda Power.” **Ask**, *What idea did Ada have?*

1 Introduce the Standard

- Use **Jump in Reading** to have students read the introduction.
- Explain that identifying a text structure can help you understand how ideas are connected and predict what will come next.
- Note that some texts use just one structure and some use different structures in different sections.
- Encourage students to use cognates in their home language to understand academic terms (*problem/problema, solution/solución*). Discuss related words such as *solve/resolver*. **EL**

2 Reread/Think

MODEL THE STANDARD Display the graphic organizer. Model how to identify a problem and solution while rereading paragraphs 1–6.

- **Ask**, *What signal word tells you about the text structure in paragraph 1? “problem” What’s the problem? Burning fossil fuels for energy hurts the environment.*
- **Say**, *Authors describe problems so they can tell us about solutions. Paragraph 2 is all about pandas, but I don’t yet see how that could be a solution. When I keep reading, paragraph 3 explains that solar farms create electricity. That could be an energy solution. Paragraph 6 explains that solar panels create energy without burning anything. So, solar farms are a solution because they create energy with much less damage to the environment.*

GUIDE STANDARDS PRACTICE Have students add problems and solutions to the chart. **Say**, *This text describes a few connected problems. Look for words that signal problems. Then keep reading to find the solutions. They could be described in more than one paragraph.*

SESSION

2



PRACTICE

RI.4.5 Describe the overall structure (e.g., . . . cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

1 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.

2 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

- **Burning fossil fuels for energy harms the environment. (paragraph 1)**
- **Some people are not interested in using other sources of energy. (paragraph 1)**
- **Some people do not like solar farms because they’re not fun to look at. (paragraph 3)**

Solutions

- **Solar farms supply electricity to homes without burning anything. (paragraphs 3 and 6)**
- **Ada thought people would be more interested in solar farms if the panels made pictures of pandas. (paragraph 4)**
- **Ada is raising awareness about solar energy and has interested many countries in building solar farms. (paragraphs 5 and 7)**



LESSON 20

3 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 ____.

4 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.

Sample response: The author uses a problem-solution text structure in "Panda Power" to show how Ada Li Yan-tung noticed something she didn't like and how she did something to change it. The author describes problems in paragraphs 1–3 and then describes solutions. One problem that worries Ada is that burning fossil fuels hurts the environment. The solution is that solar farms can supply electricity to homes without burning anything. Another problem is that solar farms are not fun to look at, so some people don't support them. Ada thought of a solution: solar panels can be arranged to make pictures of pandas.

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.

3 Talk

- Have students use **Silent Appointment** to find a partner and complete the Talk activity.
- **LISTEN FOR** Students identify connected problems and solutions and use signal words to help them. If needed, use **Help & Go** scaffolds. ✓

HELP & GO: Standards Practice

- Have students reread paragraph 3. Point out the sentence beginning with *However*. **Say**, *The author uses the word however to signal a problem. What problem do some people have with solar farms? Solar farms aren't fun to look at. Because the author has introduced a problem, you know she is likely to tell the solution.*
- Have students read paragraph 4 to find the solution. **Ask**, *What solution does Ada think of? Ada thinks of a way to make solar farms fun to look at: arrange the solar panels to make pictures of pandas.*

- Use **Pick a Stick** to have students share their ideas.

4 Write

- Have students complete the Write activity and use the checklist to check their work.
- Provide sentence frames to help students construct their response: *The author uses ____ to show ____.* *One problem that worries Ada is ____.* *The solution is ____.* *Another problem is ____.* *Ada thinks of a solution: ____.* **EL**
- Use written responses to determine whether students need additional support. ✓
- Use **Pick a Stick** to select a few students to share their written response with the class.

1 Support Reading

- **Say**, *In this session you will read to learn about what inspired one person to work with solar power.*
- Have students read paragraphs 1–5. Have them circle unknown words and mark confusing parts with a question mark.
- Use **CHECK INs** and related **Help & Go** scaffolds as needed.
- **CHECK IN** In paragraph 2, students understand what *his experimenting* refers to.

HELP & GO: Sentence Comprehension

- Have students reread paragraph 2. Help them break down the last sentence. **Ask**, *What experimenting was Jose doing? He made and crashed cars and put them back together.* Point out the phrase *Because of* and explain that it is connected to a *cause*. **Ask**, *What did Jose's experimenting cause to happen?*

2 Stop & Discuss

- Have students pause to complete **Stop & Discuss** independently, then **Turn and Talk**.
- Provide sentence frames for use during discussion: *Jose learned ___ from playing with race cars/paper airplanes.* **EL**
- **LISTEN FOR** Students explain how playing helped Jose learn to test and improve his designs.

HELP & GO: Comprehension

- Have students reread paragraph 2. **Ask**, *How did Jose's experimenting help him?*
- Have students reread paragraph 5. **Ask**, *How were Jose's losses helpful?*



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

2

RI.4.3

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.

3

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. 

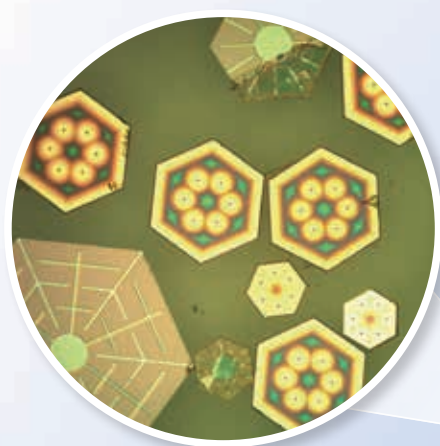
4

RI.4.1

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



3 Support Reading

- Point out the photo and read aloud the caption.
Say, *As you read, pay attention to details that explain what solar cells do.*
- Have students read paragraphs 6 and 7.
- **CHECK IN** Students understand that *just that* in paragraph 7 refers to what Jose said at the end of paragraph 6.

HELP & GO: Sentence Comprehension

- Have students reread paragraphs 6 and 7. **Ask,** *In the first sentence of paragraph 7, what does the word that refer back to in paragraph 6? “create energy from the sun without burning fossil fuels”*
- **Ask,** *How has Jose “done just that”? What does Jose do in the lab? He designs tiny solar cells. What do solar cells do? turn sunlight into electricity*

4 Stop & Discuss

- Have students **Turn and Talk** to complete the **Stop & Discuss**.
- **LISTEN FOR** Students explain that micro solar cells are tiny solar cells that can turn sunlight into electricity.

HELP & GO: Comprehension

- Have students reread paragraph 7. **Ask,** *What can micro solar cells do? turn sunlight into electricity What are they like? size of glitter, thinner than a strand of hair*
- Have students reread paragraph 6. **Ask,** *What does Jose say about solar power? “We need more energy. . . . We can create energy from the sun without burning fossil fuels.”*
- Have students explain in their own words what the photograph shows. **EL**

5 Support Reading

- Have students read paragraphs 8 and 9.
- CHECK IN** Students understand that the text between the dashes in paragraph 9 tells more about what Jose loved to do.

HELP & GO: Sentence Comprehension

- In paragraph 9, help students to unpack the last sentence. **Say**, *The text between the dashes in the middle of the sentence gives additional information.*
- Display the last sentence with and without the text between the dashes to explore what extra information the author provides. **EL**

6 Stop & Discuss

- Have students pause to complete **Stop & Discuss** independently, then **Turn and Talk**.
- LISTEN FOR** Students explain that micro solar cells could be attached to cloth and be used to charge devices.

HELP & GO: Comprehension


- Have students reread paragraph 8. **Ask**, *Where can micro solar cells be attached? to cloth How can people use them? to charge phones, cameras, or flashlights*

Discuss the Whole Text

- Revisit the Focus Question with the whole class.
- Ask**, *Why does Jose work with solar power? How can people use his micro solar cells?*
- Use **Pick a Stick** to select students to respond.
- Record students' responses and display them next to those recorded for "Panda Power."



charge = to add electricity to; to power

- 5** **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. 

RI.4.1

6

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.



SESSION
4

PRACTICE

RI.4.5 Describe the overall structure (e.g., . . . cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

LESSON 20

1 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.

2 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 Sometimes an airplane did not fly well.	Jose figured out what went wrong with his airplanes.
Paragraph 5 Jose figured out what went wrong with his airplanes.	Jose made a better airplane.
Paragraph 9 Playing and problem-solving helped Jose develop design skills.	Now Jose uses skills learned during childhood to make things that help people.

Reconnect to the Text

Have students use **Raise a Hand** to recall "From Race Cars to Solar Cells." **Ask**, *What did Jose love to do as a child? What was he excited about as an adult?*

1 Practice the Standard

- Use **Jump in Reading** to have students read the introduction.
- Share an example of a cause and effect. *Sample: The sidewalk is wet because it rained.* Ask students to identify the cause (rain), the effect (wet), and a word that signals the cause (because). Point out that some sentences mention the effect before the cause.
- Have students **Raise a Hand** to share more examples of cause-and-effect relationships.

2 Reread/Think

MODEL THE STANDARD Model how to identify a cause and effect while reading paragraph 2.

- **Say**, *In the last sentence of paragraph 2, the words because of signal, or introduce, a cause: Jose's experimenting. Because Jose experimented with car designs, the effect, or result, was that Jose built faster, better cars.*
- Have students describe the concept of cause and effect in their own words. **EL**

GUIDE STANDARDS PRACTICE Have students complete the graphic organizer with causes and effects from paragraphs 5 and 9.

- **Say**, *Look for signal words to help you identify causes and effects.*
- Explain that sometimes an effect can cause something else to happen. Point out that paragraph 5 describes an effect ("Jose figured out what went wrong") that is also a cause.

3 Talk

- Have students use **Silent Appointment** to find a partner and complete the Talk activity.
- LISTEN FOR** Students identify examples of cause-effect text structures as they make connections between Jose's childhood and his career. Use **Help & Go** scaffolds as needed. ✓

HELP & GO: Standards Practice

- Have students reread paragraph 5. **Ask**, *What happened when a plane didn't fly well? Jose figured out what went wrong. The cause is that the plane didn't fly well, and the effect is that Jose figured out what went wrong.*
- Say**, *In paragraph 5, the author uses the word then to signal an effect. In this case, "Jose figured out what went wrong" is an effect, but it also causes something else to happen. What happened because Jose figured out what went wrong? Jose made a better airplane. How do these events in Jose's childhood help him as an engineer? They help him because he learns how to solve problems.*

4 Write

- Have students complete the Write activity and use the checklist to check their work.
- LOOK FOR** Students describe how the text structure shows the connection between Jose's childhood and career.

HELP & GO: Writing

- Guide students to identify what Jose learns about design from playing in paragraphs 2–5 and how he uses these skills as an adult in paragraphs 6–9.
- Suggest having students use the Talk sentence frames in their responses. **EL**
- Use **Pick a Stick** to have 2–3 students share their responses.
- Use written responses to determine whether students need additional support. ✓

SESSION
4

PRACTICE

3 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 _____.

4 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.

Sample response: Jose's childhood play taught him how to improve his designs, which helped him as an engineer. For example, as a child, Jose made and crashed cars. Because he experimented with different designs, he built faster, better cars. Jose also made paper airplanes. When an airplane didn't fly well, Jose figured out why and then made a better one. As a result, Jose learned how to experiment and improve his designs, which helped him later as an engineer. Now he uses these skills to make micro solar cells.

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.

SESSION
5 READ

LESSON 20

POWERING A Community

by Theresa Liberatore

1

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.

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

reality = fact; the way something is

conditions = the surroundings and climate of a place

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LESSON 20 | Solar Power 393

Reconnect to the Texts

- Display responses to the Focus Question for "Panda Power" and "From Race Cars to Solar Cells." Have students **Raise a Hand** to make connections between the texts.
- Point out that in the title "Powering a Community," *powering* is a verb. It is used as a noun in "Panda Power." **EL**

1 Independent Reading

- Set a purpose for learning. **Say**, *Today you will work independently to read a text and answer questions about text structure.*
- Remind students to put a question mark next to confusing parts of the text and stop at the end of each page to make sure they understand what they have read.
- If students need more support, work with them in small groups to guide reading. Use **Help & Go** scaffolds as needed.
- **CHECK IN** Students understand that in paragraph 1, *This* and *it* refer to the idea described in the first sentence.

HELP & GO: Sentence Comprehension

- In paragraph 1, guide students to see what *This* and *it* refer to. Point out *This* at the beginning of the second sentence. **Ask**, *What words from the first sentence could you use instead of This? "living in a town or city powered only by the sun"*
- **Say**, *Now reread the third sentence. The word it refers back to the word This. What may be a reality for the community? living in a town or city powered only by the sun*

2 Independent Reading

- **CHECK IN** Students understand what a solar array is.

HELP & GO: Vocabulary

- In paragraph 5, tell students to look around the word for clues to the meaning of *solar array*. (“A solar array is a group of solar panels that work together to collect the sun’s energy.”)
- Point out the picture of the solar array. **EL**
- **CHECK IN** Students understand that a small solar array is expensive and supplies only a small amount of the energy the tribe needs.

HELP & GO: Comprehension

- **Say**, *Paragraph 5 states that the tribe started by building a small solar array. How much of the tribe’s electricity does a small array supply?* **about 10%, a small part**
- As needed, show a 10 x 10 square with one row of 10 shaded to explain that 10 is a small part of 100, so 10% is a small amount.
- **Say**, *Reread paragraph 6. How much money did the tribe spend on the small array?* **1 million dollars from a grant and 1 million of their own money**
- **CHECK IN** Students understand the idioms *think outside of the box* and *stepping stone*.

HELP & GO: Vocabulary

- Read aloud the sentence in paragraph 9 with the expression *think outside of the box*. Explain that the phrase is an idiom: It has a different meaning than what it seems. Guide students to look around the phrase for clues to the meaning.
- Use a similar approach for the idiom *stepping stone* in paragraph 7.

SESSION 5 READ

- 2 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.
- 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.
- 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.
- 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*.

grant = money given to someone to use for a purpose

funding = money



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

SESSION

5



PRACTICE

RI.4.5 Describe the overall structure (e.g., . . . cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

LESSON 20

Respond to Text

3 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

3 Reread/Think

- Have students complete the Reread/Think items independently.
- Consider reading aloud questions and answer choices. **EL**
- Remind students that a text structure can be used to organize a whole text or parts of a text.
- Point out that item 1 has two parts. Students should answer Part A first. Then they should answer Part B.

Answer Analysis

After students complete the independent practice, review each item and have students use **Shout Out** to share their responses. Use the answer analysis below to clarify ideas.

1. PART A The correct choice is **D**. These paragraphs identify challenges and goals the tribe had and the solution to one of them: producing energy without polluting the air. Choices **A**, **B**, and **C** are incorrect because they describe causes and effects and problems and solutions that are not explained in the text.

PART B The correct choice is **C**. This is the only choice that presents a solution to one of the problems stated in the text. Choices **A**, **B**, and **D** are incorrect because they state facts that do not explain a problem or solution. **DOK 2 | RI.4.5**

2. The correct choice is **A**. The text following the word *produces* supports the meaning. The array produces about 1 megawatt of power: enough electricity to power about 1,000 homes. **DOK 2 | RI.4.4**

4 Answer Analysis

3. The correct choice is **D**. This is the best choice because the effect of the small array is described in the paragraph: the amount of power it produces, how many homes it powers, and how much electricity it supplies. Choices **A**, **B**, and **C** are not explained in paragraph 5. **DOK 2 | RI.4.5**

5 Write

- Have students respond independently to the Write prompt. **DOK 3 | RI.4.5**
- If students need more support, work with them in small groups to guide them through writing.
- Consider using **Stronger and Clearer Each Time** before writing. **EL**
- LOOK FOR** Students describe the overall structure of the text with examples to support their thinking.

HELP & GO: Writing

- Guide students to identify the text structures used in different parts of the text:
 - Paragraphs 3 and 4, problem-solution: tribal leaders want to produce energy without polluting; a solar power project is a solution.
 - Paragraphs 5–9, cause-effect: funding affects the size of the solar array that can be built; the size of the array affects the amount of electricity that is produced.

Lesson Wrap-Up

- Revisit the Focus Question with the whole class. **Ask**, *Why and how do people in the Ute Mountain Ute Tribe use solar power?*
- Use **Pick a Stick** to select students to respond. Record responses. Then ask students to make connections between the three texts.

SESSION

5



PRACTICE

4 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.

5 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.

Responses will vary. Students can describe the problem-

solution structure in paragraphs 1–4 or the cause-effect

structure in paragraphs 5 and 6. Sample response: The

author uses a problem-solution structure to introduce the

problem and solution in "Powering a Community." She states

the problem in paragraph 3 (tribal leaders wanted to

produce energy without polluting the air) and the solution in

paragraph 4 (a solar power project).

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.

SESSION

6



PUT IT TOGETHER

LESSON 20

Respond to the Focus Question

Why and how do people use solar power?

1 Reread/Think

Choose one text from the lesson to reread.

TEXT: "Powering a Community"

Sample responses shown.

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: **to produce energy without polluting the air**

2. How: **to provide homes and buildings with electricity**

2 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 ____.

3 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.

Respond to the Focus Question

Read the Focus Question. Tell students that today they will answer the question using information from all three texts.

1 Reread/Think

Have partners reread one text and complete the Reread/Think section.

2 Talk

- Have students use **Vote with Your Feet** to show which idea about solar power they think is the most interesting (panda-shaped solar farms, micro solar cells, or powering an entire community with solar arrays).
- Use **Pick a Stick** to have students explain why they chose the idea. Remind students to use the sentence frames to begin their discussion.
- Encourage students to speak clearly and loudly as they share what they learned.

3 Write

- Have students respond independently to the prompt.
- Have students use **Stronger and Clearer Each Time** before they write. **EL**