Unit 22: Partner Resource

Using Our Resources Wisely
Additional Teacher Resources

**MINI PD VIDEOS**
*(Password: MySci1)*

- Lesson 2 Mini PD: https://vimeo.com/138241331
- Lesson 3 Mini PD: https://vimeo.com/138241529

**BOOKS**
- Recycle, by Gail Gibbons
- Energy Island, by Allan Drummond
- Look Closely in the Rain Forest, by Frank Serafini
- Paddle to the Sea, by H. Clancy Holling
- John Muir; America’s Naturalist, by Thomas Locker
- Leopard and Silkie; One Boy’s Quest to Save the Seal Pups, by Brenda Peterson
- A Refreshing Look at Renewable Energy with Max Axiom, by Katherine Krohn (graphic novel)
- Spaceship Earth, by Gina Dal Fuocco
- Renewable Energy, by Nigel Saunders
- The Water Cycle: Evaporation, Condensation, and Erosion, by Rebecca Harman
- Make A Splash! A Kid’s Guide to Protecting, by Cathryn Berger Kaye
- Using Water, by Sally Hewitt

**ONLINE RESOURCES**
- “Dead Zone” http://www.readworks.org/passages/dead-zone-0
- “Energy for Life” http://www.readworks.org/passages/energy-life
- “Catch The Breeze” http://www.readworks.org/passages/catch-breeze
- “Hot For Hybrids” http://www.readworks.org/passages/hot-hybrids
- “Houston Affects The Earth” http://www.readworks.org/passages/houston-affects-earth
- “High and Dry” http://www.readworks.org/passages/high-and-dry
- http://video.about.com/geography/The-Four-Spheres-of-Earth.htm

**LOANER ITEMS**

**DISCOVERY ED (Subscription Required)**
- Environment Tackle Box: video segment: http://bit.ly/1KZLqBx, Tips: Use this video segment for Lesson 3
- The Language of Science: Weather(water cycle): http://bit.ly/1BX06t2, Tips: Use this video segment with Lesson 4
PART ONE: MULTIPLE CHOICE

1. Which of the following is NOT an example of a renewable energy source?
   a. Sunlight is collected via solar panels to produce electricity.
   b. Coal is burned to generate electricity.
   c. Hydropower is used in dams to generate electricity.
   d. Wind rotates turbines to make electricity.

2. Which of the following explains how the geosphere and biosphere interact?
   a. The ocean absorbs carbon dioxide and heat
   b. The rocks on Earth break and form valleys that fill with water
   c. Organisms help break up larger rocks to form soil so that plants can grow
   d. Clouds form in the sky

3. Where is most of Earth’s water located? Use the graph below and your knowledge of science to answer the question.
   a. glaciers
   b. oceans
   c. rivers and lakes
   d. groundwater

Look at the diagram below to answer questions 4 and 5.

4. In which location on the diagram is precipitation occurring?
   a. A
   b. B
   c. C
   d. D

5. What is the role of evaporation in the water cycle?
   a. It creates clouds.
   b. It changes water into water vapor.
   c. It creates rain.
   d. It gives the water a place to collect.
6. Mark TRUE or FALSE for the following statements about human impact on Earth's systems:

- Cleaning up rivers positively impacts water in the hydrosphere.  
- Burning gasoline positively impacts air in the atmosphere.  
- Deforestation negatively impacts the biosphere.  
- Recycling negatively impacts the soil in the geosphere.  
- Reducing air pollution positively affects the air in the atmosphere.

**PART TWO: CONSTRUCTED RESPONSE**

7. Identify one human activity and explain how it affects the quantity and quality of fresh water on Earth.

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8. Using the graph from question number 3 and your knowledge of science explain why it is important to protect fresh water resources on Earth.

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9. Using this model explain how the hydrosphere, geosphere, biosphere, and atmosphere interact in the water cycle.

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You are in the fifth grade in Conservationville, Missouri. Your fifth grade class is learning about using resources wisely and these lessons got you thinking. Conservationville has a large landfill that borders a community park. The debris from this landfill is slowly leaking into a stream that flows through the park. You decide to use science ideas from class to explain how the community of Conservationville, Missouri can protect the Earth’s resources and environment and solve a potential problem.

10. How does the landfill debris in Conservationville affect the hydrosphere?

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11. Freshwater makes up only 3% of the water on Earth (Refer to question 3). Complete a bar graph to show the percentages of the types of freshwater on Earth. Be sure to label the axes, graph the data accurately and give the graph a title.

Division of freshwater on Earth:
- Glaciers and Ice Caps: 69%
- Groundwater: 30%
- Surface water such as lakes, rivers, streams, and swamps: 1%

**TITLE:**

**DEPENDENT VARIABLE:**

**INDEPENDENT VARIABLE:**

12. Explain how to use the above graph to convince the Mayor that controlling the landfill and protecting the stream is important.
You know that most of Earth’s water is in the ocean and that desalination is one way to make ocean water drinkable. You think that this model can be used to clean water in the stream contaminated by the landfill. You propose the model below to the mayor as a way to get more drinkable water for the citizens of Conservationville, MO.

13. You realize that your desalination design was not collecting enough clean water. You decide to redesign your device. You change the cover from plastic wrap to aluminum foil and change the plastic bowl to a metal pot. Would this be a fair test?

14. Explain your reasoning.

15. What is one way you could improve the design of this investigation?
Name:  **SCORING GUIDE:** 25 points total  
Date:  

**Unit 22: Using Our Resources Wisely**

**PART ONE: MULTIPLE CHOICE**

1. Which of the following is NOT an example of a renewable energy source? (NGSS 4-ESS3-1) **1 POINT**  
   a. Sunlight is collected via solar panels to produce electricity.  
   b. Coal is burned to generate electricity.  
   c. Hydropower is used in dams to generate electricity.  
   d. Wind rotates turbines to make electricity.

2. Which of the following explains how the geosphere and biosphere interact? (NGSS 5-ESS2-1) **1 POINT**  
   a. The ocean absorbs carbon dioxide and heat  
   b. The rocks on Earth break and form valleys that fill with water  
   c. Organisms help break up larger rocks to form soil so that plants can grow  
   d. Clouds form in the sky  

3. Where is most of Earth’s water located? Use the graph below and your knowledge of science to answer the question. (NGSS 5-ESS2-2 & GLE ES 1 B 5 a) **1 POINT**  
   a. glaciers,  
   b. oceans  
   c. rivers and lakes  
   d. groundwater

![Graph showing water distribution](image)

Look at the diagram below to answer questions 4 and 5. (GLE ES 2 E 5 a, GLE ME 1 D 3 c & GLE ES 2 E 5 b)

4. In which location on the diagram is precipitation occurring? **1 POINT**  
   a. A  
   b. B  
   c. C  
   d. D

5. What is the role of evaporation in the water cycle? **1 POINT**  
   a. It creates clouds.  
   b. It changes water into water vapor.  
   c. It creates rain.  
   d. It gives the water a place to collect.
6. Mark TRUE or FALSE for the following statements about human impact on Earth’s systems: (GLE ES 3 A 5 b)  
**TOTAL: 5 POINTS**, Give 1 point for each of the statements identified correctly as true or false:

- **True**  Cleaning up rivers positively impacts water in the hydrosphere.
- **False**  Burning gasoline positively impacts air in the atmosphere.
- **False**  Deforestation negatively impacts the biosphere.
- **False**  Recycling negatively impacts the soil in the geosphere.
- **True**  Reducing air pollution positively affects the air in the atmosphere.

**PART TWO: CONSTRUCTED RESPONSE**

7. Identify one human activity and explain how it affects the quantity and quality of fresh water on Earth.  
(GLE ES 3 A 5 b) **1 POINT**

Students identify a positive or negative human activity and share that it conserves water (positive) or decreases access to clean water (negative) such as:

Positive- Fixing a leaky toilet, Limiting baths

Negative- Farming with pesticides and fertilizers that contaminate water, Long showers, Sewage

8. Using the graph from question number 3 and your knowledge of science explain why it is important to protect fresh water resources on Earth.  
(GLE ES 3 A 5 b) **1 POINT**

Students state that most of the water on Earth is not freshwater (less than 3%) so it is important that we keep this water clean in order to continue to provide the water resources humans need (for drinking especially since we cannot drink salt water).
The diagram below represents the water cycle on Earth.

9. Using this model explain how the hydrosphere, geosphere, biosphere, and atmosphere interact in the water cycle. (NGSS 5-ESS2-1 & GLE ES 2 E 5 a) **4 POINTS**

   Students explain how each sphere is involved in the water cycle (1 point for each sphere explained correctly)
   
   **Hydrosphere** – Water precipitates into oceans, lakes and streams that are part of the hydrosphere,
   
   **Geosphere** – Groundwater infiltrates into the geosphere, **Biosphere** – The transpiration of water from plants demonstrates involvement of the biosphere, **Atmosphere** – Condensation occurs in the atmosphere

You are in the fifth grade in Conservationville, Missouri. Your fifth grade class is learning about using resources wisely and these lessons got you thinking. Conservationville has a large landfill that borders a community park. The debris from this landfill is slowly leaking into a stream that flows through the park. You decide to use science ideas from class to explain how the community of Conservationville, Missouri can protect the Earth’s resources and environment and solve a potential problem.

10. How does the landfill debris in Conservationville affect the hydrosphere? (GLE ES 3 A 5 b) **1 POINT**

   **Give 1 point for students explaining how the landfill can affect the hydrosphere**

   Examples: Water can runoff the landfill and bring pollutants into groundwater, lakes, and streams
11. Freshwater makes up only 3% of the water on Earth (Refer to question 3). Complete a bar graph to show the percentages of the types of freshwater on Earth. Be sure to label the axes, graph the data accurately and give the graph a title.

**Division of freshwater on Earth:**
- Glaciers and Ice Caps: 69%
- Groundwater: 30%
- Surface water such as lakes, rivers, streams, and swamps: 1% *(NGSS 5-ESS2-2)*  

**TITLE:** Division of Freshwater on Earth (1 POINT)

**DEPENDENT VARIABLE:** Percentage of Fresh Water (Y-Axis labels, 1 POINT)

**INDEPENDENT VARIABLE:** Location of Freshwater on Earth (X-Axis labels, 1 POINT)

Accurate plotting of the bars (1 POINT)

12. Explain how to use the above graph to convince the Mayor that controlling the landfill and protecting the stream is important. *(NGSS 5-ESS2-2)* 1 POINT

Give one point for students explaining that there is limited freshwater on Earth and of the freshwater, most of it is trapped in glaciers. Therefore it is extremely important to conserve freshwater resources such as the stream which represents an extremely limited resource.
You know that most of Earth’s water is in the ocean and that desalination is one way to make ocean water drinkable. You think that this model can be used to clean water in the stream contaminated by the landfill. You propose the model below to the mayor as a way to get more drinkable water for the citizens of Conservationville, MO.

13. You realize that your desalination design was not collecting enough clean water. You decide to redesign your device. You change the cover from plastic wrap to aluminum foil and change the plastic bowl to a metal pot. Would this be a fair test? (NGSS 3-5-ETS1-3, GLE IN 1 A 5 b & GLE IN 1 A 5 d) **1 POINT**

   Give one point for saying no.

14. Explain your reasoning. (NGSS 3-5-ETS1-3) **1 POINT**

   Give 1 point for explaining that in order for this to be a fair test you can only change on variable and in this case two variables were being changed so there is no way to tell which one caused the effect seen.

15. What is one way you could improve the design of this investigation? (GLE IN 1 A 5 d) **1 POINT**

   Give one point for a suggestion for a reasonable improvement of extension of a fair test Examples: change only the cover but keep the bowl the same, change only the bowl but keep the cover the same.