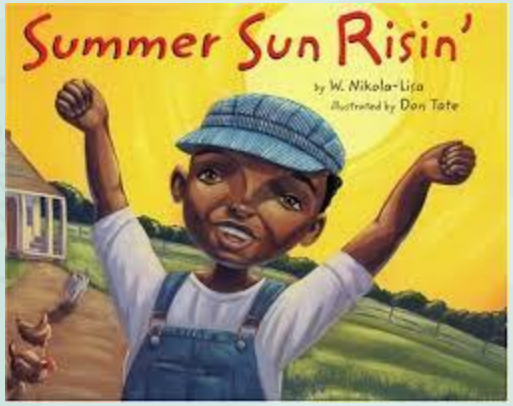
Feel the Heat

PP STEM: K-2



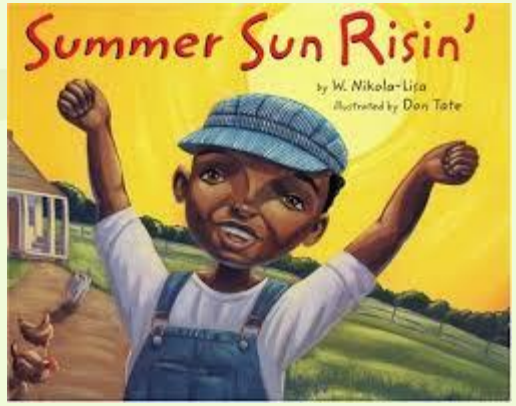
Lesson Objectives

- Science and Engineering Practices
  - Planning and Carrying Out Investigations
  - Using Mathematics and Computational Thinking
  - Constructing Explanations and Designing Solutions
- Disciplinary Core Ideas
  - PS3.B Conservation of Energy and Energy Transfer
  - ETS1.B Developing Possible Solutions
- Crosscutting Concepts
  - Cause and Effect
  - Scale, Proportion, and Quantity

CCSS Connections

- Reading: Literature
  - Key Ideas and Details K-2.1
- Reading: Informational Text
  - Key Ideas and Details K-2.1
- Writing
  - Text Types and Purposes K-2.2
- Mathematics
  - Measurement and Data K.MD.2, 1.MD.4, 2.MD.10

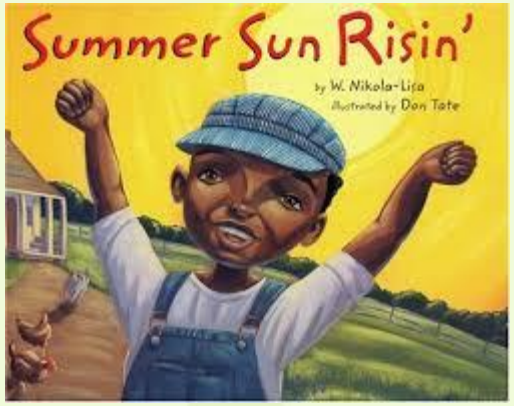
Engage: *Summer Sun Risin'*



- Where do you think this story takes place?
- What clues from the cover make you think that?
- What did you notice about the pictures of the Sun in the book?
- Why do you think the Sun appears again in the very last picture?
- Why do you think the author used words such as *shinin', glarin', blazin',* and *burnin'* to describe the Sun?
- What do you think the author was trying to show about the Sun in his poem?

Engage: *Summer Sun Risin'*

- Have you ever felt the Sun blazin', burnin', and glarin'?
- How do you keep cool on a hot summer day?
- Are some areas of the playground hotter than others?

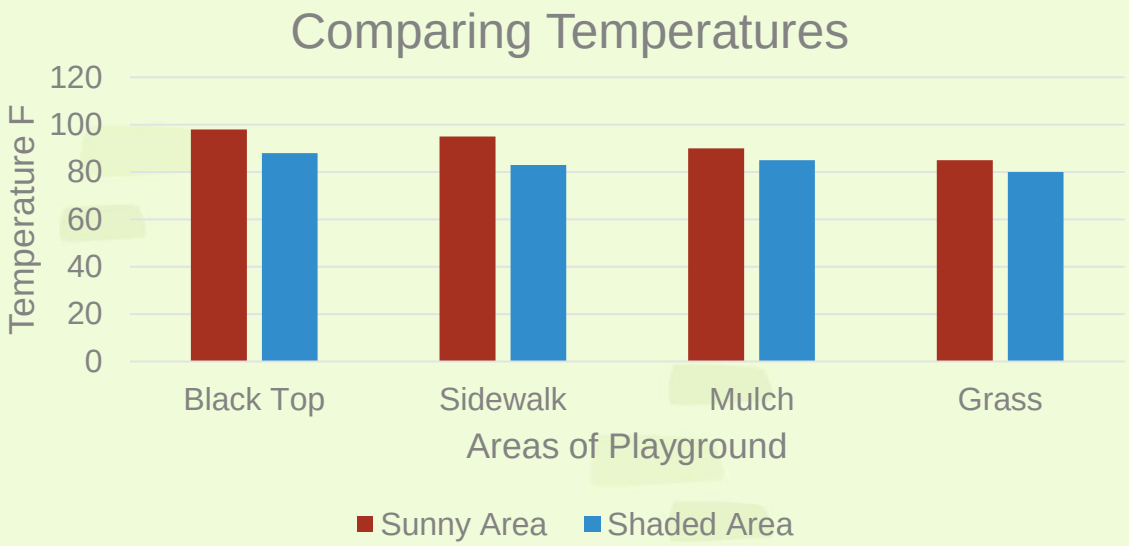


Explore: Comparing Temperatures

- Write these four surfaces on your Comparing Temperatures sheet:
  - Grass, blacktop, cement, shade
- What ways could we measure the temperature of these four surfaces?
- We'll be comparing the temperature by both feeling and measuring temperature with a special type of thermometer.
- Think, Pair, Square: Which surface do you think will be the warmest? Why?

Explain: Comparing Temperatures Graph

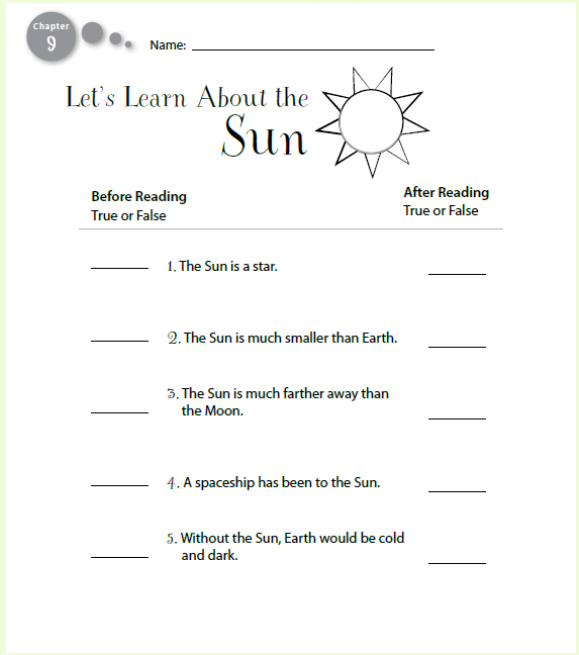
- With a partner, look for patterns in the data.
  - Were sunny surfaces typically warmer than the shaded surfaces?
  - Were lighter surfaces typically cooler than the darker surfaces?



Explain: Comparing Temperatures Graph

- Which surface was the warmest? What is your evidence?
- Why do you think so?
- Which surface was the coolest? What is your evidence?
- Why do you think so?
- What other observations can you make about our graph?
- What is warming the surfaces outside our school?

Explain: *The Sun: Our Nearest Star*



Chapter 9

Name: _____

Let's Learn About the Sun

Before Reading True or False		After Reading True or False
_____	1. The Sun is a star.	_____
_____	2. The Sun is much smaller than Earth.	_____
_____	3. The Sun is much farther away than the Moon.	_____
_____	4. A spaceship has been to the Sun.	_____
_____	5. Without the Sun, Earth would be cold and dark.	_____

During reading, signal if you hear any evidence for or against the statements on our anticipation guide.

Explain: *The Sun: Our Nearest Star*

- Were all the surfaces the same temperature outside our school?
- What was different about the surfaces?

Some surfaces absorb more sunlight than others, and that makes them warmer than the surrounding surfaces. For example, darker colors (like blacktop) absorb, or take in, more sunlight than lighter colors (such as concrete).

- Why do you think the shade was cooler than the other surfaces?
- What was blocking the sunlight in the shady areas?

Elaborate: Keep It Cool Design Challenge

Building Our Models

- Do you ever get hot playing on our school's playground?
- Where do you go to cool off?
- Do you think you could design a structure for the playground that would reduce the warming effect of the Sun on you and your classmates?
- What kind of structure would help you cool on the playground?

Elaborate: Keep It Cool Design Challenge

Building Our Models

- PROBLEM: We need a place to cool off on the playground.
  - Work with a partner to design a structure to cool off when you are on the playground.
  - Create a model (no bigger than a shoebox, but big enough for an ice cube to fit inside) that shows the shape and features of your structure.
  - Test your model by placing one ice cube inside the model and one ice cube outside the model to see which melts first.
    - What shape will your structure be?
    - What materials will you use?
    - What color will you use for the roof of the structure? Why?
    - Where will you place the ice cubes?

Elaborate: Keep It Cool Design Challenge

- Testing Our Models
  - Take your model and two cubes of ice outside with the Keep It Cool Design Challenge sheet.
    - Rotate your model to find the most shade.
  - How will we know if our models solved the problem of providing a place to cool off on the playground?
  - As you wait for your ice cubes to melt, draw a picture of your model on the Keep It Cool Design Challenge sheet.
  - Once your ice cubes have melted, compare the two and answer the questions on your sheet.
  - If you have time, compare designs with another group and discuss what worked best. Brainstorm some ideas to improve your model and test again.

Feel the Heat

- What did you learn today?
- What was your favorite part of the lesson?
- See your STEM at Home sheet for another experiment you can do at home.

Source

- Picture Perfect STEM K-2. (2017). National Science Teachers Association.