

# HELLO, SUNSHINE.



## LET'S GET SOLAR!

### LESSON OVERVIEW

Grade Levels: K-8

Learn how the sun can be used to create energy to help us power our homes and libraries with the book *The Toy and the Test Drive* by Gillian King-Cargile. Create your own solar bracelets with UV beads that change colors in the sun; conduct experiments using the bracelets.



### STANDARDS

NGSS 2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
NGSS K-PS3-1	Make observations to determine the effect of sunlight on the Earth's surface.
NGSS 1-PS4-3	Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.
NGSS 2-PS1-1	Plan and conduct an investigation to describe and classify different materials by their observable properties.
NGSS 4-PS3-2	Make observations to provide evidence that energy can be transferred from place by place by sound, light, heat, and electric currents.
NGSS 4-PS3-4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
NGSS 4-ESS3-1	Obtain and combine information to describe the process by which energy and fuels are derived from natural resources and that their uses affect the environment.
CCSS-ELA RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
CCSS-ELA W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
CCSS-ELA RI.5.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

## OBJECTIVES

- Students will learn how the sun creates energy.
- Students will learn how we can harness the power of the sun and other renewable resources.
- Students will understand the importance of saving energy.
- Students will create their own UV ray sensing bracelets.
- Students will conduct experiments using the UV ray sensing bracelets.

## MATERIALS

- UV light sensing beads
- Pony beads
- String
- Computer or mobile device for game
- Camera to take pics and send them to us
- Sunscreen, several types
- Sunglasses, several pairs

## PROCEDURES

- STEP 1: Read the book *The Toy and the Test Drive* by Gillian King-Cargile and ask the following questions:
- What is solar energy?
  - How do people use solar energy?
  - How does solar power reduce our impact on the environment?
- STEP 2: Play the game "Hello, Sunshine :) Let's Get SOLAR! Learn About Types of Energy" at <http://smartspaceni.com/hello-sunshine-lets-get-solar-learn-about-types-of-energy/> and discuss the following topics:
- What are some ways we can 'make' energy?
  - What are some things we can do to save energy?
  - What are the positive and negative aspects of different forms of making electricity?
- STEP 3: Have students create bracelets out of the UV sensitive beads and the pony beads. Do not tell them which beads are which. Ask what they think will happen to the special beads when they are in the sunlight.
- STEP 4: Take students outdoors where they can observe the change in the UV sensitive beads.
- STEP 5: Students can perform experiments on the UV sensitive beads (older students keep data journal):
- Experiment with different kinds of sunscreen on the beads in order to see which sunscreen works most effectively.
  - Place sunglasses over the beads to see if the glasses block UV rays.
- STEP 6: Briefly explain how the UV beads work, then have the students write a short paragraph about their findings with their experiments or what they saw when the beads entered the sun.

## GUIDING INFORMATION

The sun emits a broad spectrum of light. One type of light emitted is called UV. UV light is not visible to the naked eye, but its effects are. The special pony beads used in this activity contain chemicals that change the bead from white to a color when exposed to UV radiation. Sunscreens and many sunglasses are made to protect our skin against UV radiation, which can cause skin cancer. While the sun's light can harm our skin, it can provide us with energy when collected with solar panels.

## RUBRIC

	Target (3)	Meets (2)	Partially Meets (1)	Does Not Meet (0)
WRITING – SCIENTIFIC KNOWLEDGE	Writing indicates a clear and accurate understanding of content.	Writing indicates a relatively accurate understanding of content.	Writing indicates partially accurate understanding of content.	Writing does not illustrate much understanding of content.
WRITING – QUALITY OF INFORMATION	Information clearly relates to the main topic and includes several supporting examples.	Information clearly relates to the main topic and provides 1-2 examples.	Information clearly relates to the main topic, but no examples are given.	Information has little or nothing to do with the main topic.
COLLABORATION	Works well with others and discusses ideas in a fair, respectful, encouraging way and is considerate of the feelings of others.	Works okay with others and discusses ideas in a fair, respectful way, but may not have been encouraging. Considers the feelings of others.	Works with others, but did not contribute a fair share of work OR was discouraging and did not consider the feelings of everyone.	Did not work well with others and/or discusses ideas in an unfair, disrespectful way.
REQUIREMENTS	Meets all of the requirements for the project.	Meets most of the requirements for the project.	Meets some of the requirements for the project.	Does not meet the requirements for the project.
DEMONSTRATION OF KNOWLEDGE OF CONTENT IN DISCUSSIONS AND ACTIVITIES	Does a great job showing an understanding of the content covered in class.	Does an okay job with showing an understanding of the content covered in class.	Tries but has a difficult time showing an understanding of the content covered in class.	Does not show an understanding of the content covered in class.
Total				/15