

Sunlight Unmixed

Trace the kinds of radiation that arrive from the Sun.

SC.7.P.10.1 "Illustrate that the sun's energy arrives as radiation with a wide range of wavelengths, including infrared, visible, and ultraviolet, and that white light is made up of a spectrum of many different colors."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline information that tells how infrared, visible light, and ultraviolet differ by wavelength. Number 1, 2, and 3 beside the sentences that explain radiation, the visible spectrum, and white light.

What Arrives in Sunlight?

- ① At noon, sunlight reaches a school garden. The energy has traveled through space from the Sun as radiation, energy that can move without air or another material. Sunlight is not one single kind of radiation. It includes waves with a wide range of wavelengths, or distances from one wave crest to the next. Some wavelengths are too long or too short for human eyes to detect, yet they can still affect matter and living things.
- ② Infrared radiation has wavelengths longer than visible light. You cannot see infrared, but your skin can sense its warming effect when sunlight heats a dark bench. Visible light is the portion of solar radiation that human eyes detect. Ultraviolet radiation has wavelengths shorter than visible light. It is also invisible. Too much ultraviolet can damage skin cells, so sunscreen and shade reduce the ultraviolet radiation that reaches skin during outdoor activities on sunny days at school.
- ③ When a beam of white light passes through a prism, the light spreads into a visible spectrum. The colors blend together in the original white beam, but the prism bends different visible wavelengths by different amounts. A spectrum can show red, orange, yellow, green, blue, and violet in order. These colors are all visible radiation, not separate substances added by the prism. Infrared lies beyond red, and ultraviolet lies beyond violet, where human eyes cannot see them.

2 ANSWER WITH EVIDENCE Use the passage

1 How can energy from the Sun travel through space to Earth, according to the passage?

2 Compare the wavelengths of infrared and ultraviolet radiation with visible light.

3 What happens when white light passes through a prism, and what does this show about white light?

4 Which type of solar radiation can warm a dark bench, and which type can damage skin cells?

3 YOUR TURN Your own words

Use the two panels to show sunlight traveling from the Sun and white light passing through a prism. Label infrared, visible light, and ultraviolet in Panel 1, then show and label the visible spectrum in Panel 2. Write exactly two sentences explaining what your sketch shows.



PART 1 • READ AND MARK

Underline information that tells how infrared, visible light, and ultraviolet differ by wavelength. Number 1, 2, and 3 beside the sentences that explain radiation, the visible spectrum, and white light. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How can energy from the Sun travel through space to Earth, according to the passage?	It travels as radiation, which can move without air or another material.
2	Compare the wavelengths of infrared and ultraviolet radiation with visible light.	Infrared has wavelengths longer than visible light. Ultraviolet has wavelengths shorter than visible light.
3	What happens when white light passes through a prism, and what does this show about white light?	The light spreads into a visible spectrum of colors. This shows that white light is made of many different visible colors.
4	Which type of solar radiation can warm a dark bench, and which type can damage skin cells?	Infrared can warm a dark bench. Ultraviolet can damage skin cells.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1 shows radiation traveling from the Sun through space, labeled infrared, visible, and ultraviolet. Panel 2 shows a white beam entering a prism and spreading into red, orange, yellow, green, blue, and violet, showing that white light contains many visible colors.

Accept labeled sketches that show solar radiation includes infrared, visible light, and ultraviolet, with infrared and ultraviolet identified as invisible. In the prism panel, accept any correct visible-color sequence and an explanation that white light contains many colors.