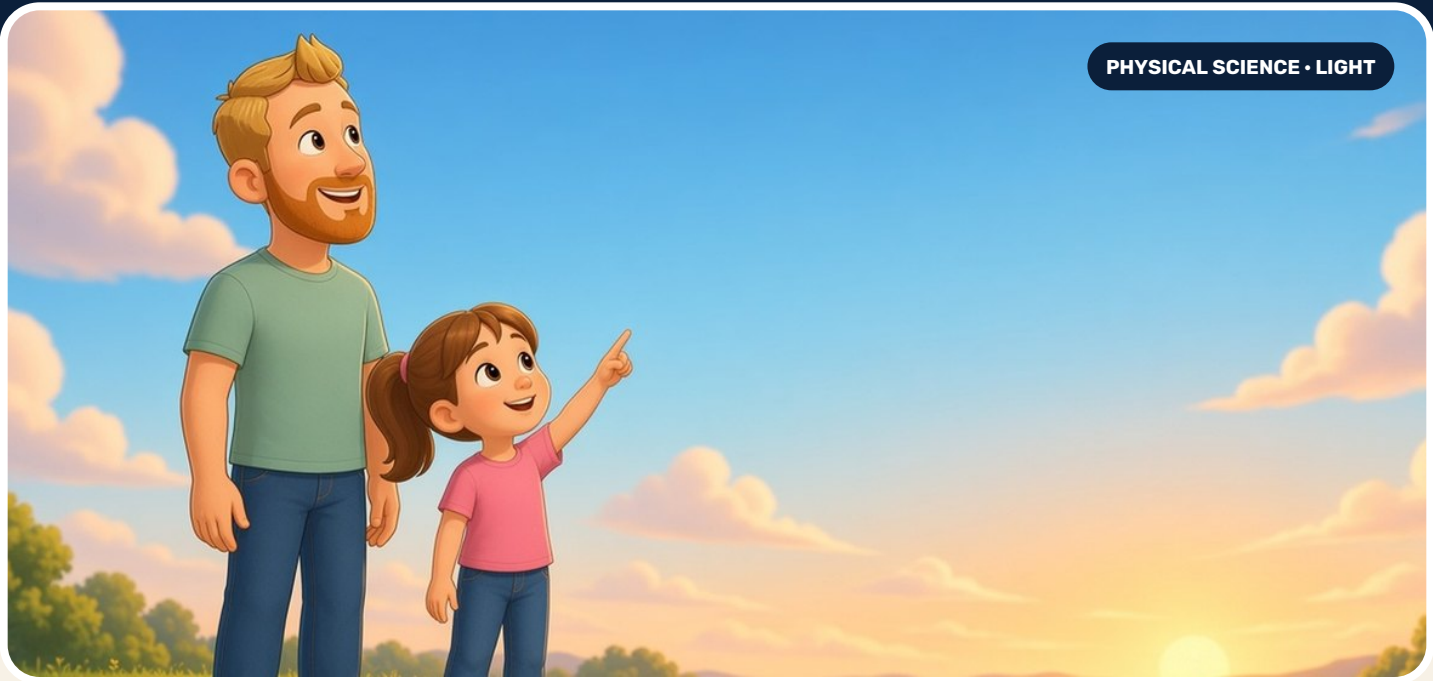
LISTEN & DISCUSS • TEACHER GUIDE

Why Is the Sky Blue?

Air has no color of its own. So why does the daytime sky look so blue?



GRADES	TIME	FORMAT	STANDARDS
K–4	**~45 min**	**Listen + do**	**NGSS**
Ages 5–10	incl. 12-min episode	Talk · activity · exit ticket	1-PS4-3, 4-PS4-2

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4 **Student page** printable exit ticket

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Scan to listen
Free transcript on the episode page

BEFORE YOU TEACH

Lesson overview

Learning objectives

Students will be able to…

1. Explain that sunlight looks white but is a mix of all the colors of the rainbow.
2. Describe how air scatters blue light much more than red light, so the whole sky glows blue.
3. Use the Moon (almost no air, black sky) and sunsets as evidence that air makes the color.

The science in 60 seconds

Background for the teacher, drawn from the episode.

- Sunlight looks white, but it holds every rainbow color. A rainbow "unzips" white light so we can see the colors that were there all along.
- Air is packed with molecules far too small to see. When sunlight hits them, some light bounces off in new directions. Scientists call this **scattering** (Rayleigh scattering).
- Blue light has shorter waves than red light, and short waves scatter much more. Scattered blue light reaches our eyes from every part of the sky.
- Violet scatters even more, but sunlight has less violet and our eyes are much more sensitive to blue, so we see blue.
- At sunset, light crosses much more air, so most blue is scattered away and reds and oranges are left. On the Moon, with almost no air, the daytime sky is black.
- **Analogy note:** the episode compares red light to a bowling ball and blue light to a ping-pong ball. Helpful picture, but light has no weight; the real difference is the length of the waves.

BEFORE CLASS: PREP CHECKLIST

- ☐ Test the episode audio (QR code on the cover).
- ☐ Gather the activity materials (page 3).
- ☐ Print the student page (page 4), one per student.

THE BIG IDEA

Sunlight is a mix of all the colors. Tiny bits of air bounce (scatter) blue light all over the sky, so blue reaches our eyes from every direction.

Key vocabulary

Sunlight
Light from the Sun. It looks white but holds all the rainbow colors.

Atmosphere
The blanket of air around Earth.

Scatter
To bounce off in many different directions.

Rainbow
Sunlight spread out so we can see each of its colors.

Sunset
When the Sun sinks low and its light passes through lots of air.

WATCH FOR THIS MISCONCEPTION

Students may think: "The sky is blue because it reflects the ocean."

Actually: The sky is blue over deserts and forests too, far from any ocean. Air scatters blue sunlight everywhere.

NGSS CONNECTIONS (PERFORMANCE EXPECTATIONS)

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.** How this lesson connects: The milky-water demo puts a cloudy material in a light beam and observes what changes.

4-PS4-2 **Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.** How this lesson connects: We see a blue sky because scattered light enters our eyes from every direction.

This short lesson builds toward these expectations; it does not fully assess them on its own.

STEP BY STEP · ABOUT 45 MINUTES

Lesson plan

ENGAGE 5 min

Spark curiosity

Ask: "What color is the air between you and me?" (Clear!) "So why does the sky look blue?" Write guesses on the board and revisit them after listening.

LISTEN 12 min

Play the episode

Play the episode from the QR code on the cover or the episode page. Give students two things to listen for:

- What two "ingredients" does the sky need to look blue?
- What would the daytime sky look like on the Moon?

DISCUSS 8 min

Talk about it

Use think-pair-share: 30 seconds to think, a minute with a partner, then share. Model answers are on page 5.

1. What two "ingredients" does the sky need to look blue?
2. In the episode, red light is like a bowling ball and blue light is like a ping-pong ball. Which one bounces all over the sky, and why does that make the sky blue?
3. If you stood on the Moon in the daytime, what color would the sky be? Why?

EXPLORE 15 min

Hands-on: Sunset in a glass

1. Darken the room. Shine the flashlight through the side of the plain water. What color is the beam?
2. Stir in a few drops of milk and shine the light again. Look at the cup from the side: the cloudy water can look slightly bluish.
3. Hold white paper on the far side of the cup, opposite the flashlight. The light that made it through looks more yellow-orange, like a sunset.
4. Add a little more milk and repeat. Now the light must get past more "bits," like sunlight at sunset. Does the far side look more orange?

MATERIALS

- Clear glass or plastic cup of water
- Milk (a few drops, then a little more)
- Spoon for stirring
- Flashlight (a phone light works)
- White paper or card
- A darkened room

Safety: An adult handles the flashlight. Never shine lights into anyone's eyes, and never look straight at the Sun.

WRAP UP 5 min

Exit ticket

Hand out the student page (page 4). For K–1, read each item aloud and let students circle, point, or draw. Return to the guesses from the start: what changed?

Name _____ Date _____

Why Is the Sky Blue?

Show what you learned! Circle, write, or draw.

1 **Sunlight is really...** Circle one.

a) only yellow | b) a mix of all the colors | c) only blue

2 **True or false? Circle T or F.**

The sky is blue because it reflects the ocean. T F

At sunset, sunlight travels through more air. T F

3 **Fill in the blanks. Use the word bank.**

Word bank: air | blue | colors

Sunlight is a mix of many _____. Tiny bits of _____ bounce the _____ light all over the sky.

4 **Draw the Sun, the air, and arrows showing blue light bouncing into your eyes.**

Label your drawing!

FOR THE TEACHER

Answer key & extensions

Talk about it: model answers

1. What two "ingredients" does the sky need to look blue?

> Sunlight (a mix of all the colors) and air (lots of tiny molecules for the light to bump into).

2. In the episode, red light is like a bowling ball and blue light is like a ping-pong ball. Which one bounces all over the sky, and why does that make the sky blue?

> The ping-pong ball (blue light). It bounces all over, so blue light reaches our eyes from every part of the sky. (Really, blue scatters more because its waves are shorter.)

3. If you stood on the Moon in the daytime, what color would the sky be? Why?

> Black, even in the daytime. The Moon has almost no air, so nothing scatters the blue light around.

Exit ticket answers

1. b) a mix of all the colors

2. F: The sky is blue because it reflects the ocean. · T: At sunset, sunlight travels through more air.

3. colors, air, blue

4. Look for: the Sun, air, and blue light bouncing toward the eye.

Differentiation

Grades K–1: Act it out: "red" students walk straight across the room, "blue" students bounce off classmates who are the air. Do the demo as a class.

Grades 2–4: Record predictions and observations in a table: plain water, a few drops, more milk. Side view vs. far side.

Keep wondering

- Why are clouds white, not blue? (Cloud droplets are much bigger than air molecules and scatter all colors about equally.)
- Use a prism or a glass of water in sunlight to make a small rainbow on paper.

Quick-check rubric

Got it	Getting there	Not yet
Explains the big idea in their own words and uses 2+ vocabulary words correctly.	Explains part of the idea, or needs a prompt or the word bank.	Can't yet explain it. Revisit the activity, then retry the exit ticket orally.



TRY IT AT HOME

Look up together

On a sunny day, compare the sky high overhead with the sky near the horizon (never look at the Sun). At sunset, watch the colors change and ask: "Where did the blue go?" Car-ride question: would the sky be blue over a desert?

Listen together