

★ Star Brightness Lab

Name: _____

Date: _____

Class: _____

My level: ☐ 🗡️ Explorer ☐ 🔍 Investigator ☐ 🏆 Legend

Mission: Why does the Sun look so much brighter than every other star? Test lamps and light meters in the dark lab, then use real star data to answer the question.

Big question: Why does the Sun look brighter than other stars?

★ Warm-up: Would you rather?

Choose, then give a reason.

Read by a flashlight 1 meter away or a stadium light 1 kilometer away?

Why does a car's headlight look dim far away but blinding up close?

Key vocabulary	
Apparent brightness	How bright a light looks from where you are.
Actual brightness	How much light a star really gives off.
Light-year	The distance light travels in a year (about 9.5 trillion km).
Light meter	A tool that measures how bright light is.

1 Box 1

Predict

PREDICTION If lamp B moves to 4 m (twice as far as 2 m), the meter will read...

☐ Half of 25 ☐ One-fourth of 25 ☐ The same

Distance data

Record meter B for a normal lamp.

Distance	Meter B (units)
1 m	
2 m	
3 m	
4 m	

2 Box 2

The pattern

You predicted: _____. What happens when the distance doubles?

☐ The light looks 4 times dimmer ☐ The light looks 2 times dimmer ☐ Nothing changes

3 Box 3

A stronger lamp far away

In the simulator: Make lamp B **4× stronger** and find a distance where both meters read the SAME.

A 4× stronger lamp looks the same as lamp A when it is 2 m away. What does this show?

- ☐ A powerful light can look dim if it is far away ☐ Stronger lamps always look brighter
☐ Distance doesn't matter

4 Box 4

Real stars

In the simulator: Switch to **Real stars** and tap Rigel.

Rigel really gives off 120,000 times more light than the Sun. Why does it look like a tiny dot?

- ☐ It is 860 light-years away ☐ It is smaller than the Sun ☐ It is turned off at night

Close vs far

Proxima Centauri is the closest star after the Sun, but we can't see it without a telescope. Use the data table: why?

- ☐ It gives off very little light ($0.0017 \times$ the Sun) ☐ It is the farthest star ☐ It is behind the Moon

5 Box 5

Legend: 3 times as far Legend only

A lamp reads 90 at 1 m. What would it read at 3 m?

Answer: _____ units

Show your thinking:

6 Box 6

Final claim (CER)

Why does the Sun look brighter than other stars?

Claim Start: "The Sun looks brighter because..."

Evidence Start: "In the lamp lab,..."

Reasoning Start: "This shows that..."

Exit ticket: answer the big question in your own words

Why does the Sun look brighter than other stars?

Completion code:

Shown on the last screen of the simulator.