

Sunlight Design Lab

Read how a test compares structures that change warming.

S3P1.c "Use tools and every day materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each device or structure, then circle each sentence that tells how it changed the warming effect of sunlight.

Testing Covers in Sunlight

- ① Sunlight can warm objects because the objects take in light energy. A third-grade team wanted to keep a chocolate square from getting too warm outdoors. They used a shoebox as a test space and placed the same kind of chocolate square in each box. To make a fair test, the boxes sat side by side in direct sunlight for ten minutes.
- ② For one box, the team made a shade roof from stiff paper. The roof stood above the box on four craft-stick legs, so air could move underneath it. For another box, they covered the top with clear plastic wrap. A third box had no cover. The team used a thermometer to measure the chocolate's temperature before and after the test.
- ③ After ten minutes, the chocolate in the shaded box had warmed by 3 degrees Celsius. The uncovered box warmed by 6 degrees Celsius. The plastic-covered box warmed by 8 degrees Celsius. The shade roof decreased sunlight's warming effect by blocking some direct light. The clear plastic cover increased warming because sunlight entered, while the cover slowed the escape of warm air.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which structure decreased the warming effect of sunlight? How did it work?

2 Which cover increased warming the most? Use the temperature changes as evidence.

3 Name two choices the team made to keep the test fair.

4 What tool did the team use, and why did they measure before and after the test?

3 YOUR TURN _____ Your own words

Plan two devices you could build with everyday materials to change sunlight warming on a cup of water. In the table, plan one device that decreases warming and one that increases warming, and include a fair test for each.

GOAL	DEVICE AND MATERIALS	FAIR TEST	PREDICTION

PART 1 • READ AND MARK

Underline each device or structure, then circle each sentence that tells how it changed the warming effect of sunlight. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which structure decreased the warming effect of sunlight? How did it work?	The stiff-paper shade roof decreased warming by blocking some direct sunlight.
2	Which cover increased warming the most? Use the temperature changes as evidence.	The clear plastic wrap cover increased warming the most. Its chocolate warmed 8 degrees Celsius, compared with 6 degrees Celsius in the uncovered box.
3	Name two choices the team made to keep the test fair.	They used the same kind of chocolate square in each box and placed the boxes side by side in direct sunlight for the same ten minutes.
4	What tool did the team use, and why did they measure before and after the test?	They used a thermometer. Measuring before and after showed how much each chocolate square warmed.

PART 3 • YOUR TURN (SAMPLE ANSWER)

GOAL	DEVICE AND MATERIALS	FAIR TEST	PREDICTION
Decrease warming	Make a white paper roof above the cup with straw legs.	Use equal cups and equal water amounts. Put both cups side by side in sunlight for ten minutes.	The cup under the roof will warm less than an uncovered cup.
Increase warming	Place an upside-down clear glass jar over the cup.	Use equal cups and equal water amounts. Put both cups side by side in sunlight for ten minutes.	The cup under the jar will warm more than an uncovered cup.

Accept the stated structures and explanations when they match the passage. For the open task, accept reasonable everyday-material designs with a clear increase or decrease goal, a fair comparison, and a matching prediction.