Sun and Shade

Turn temperature readings into a graph of change.

FSL.3B.3 "Translate information into a table, graph, or diagram. Determine patterns, trends, and relationships as the values of variables change."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle each time in the table and underline the two readings in its row. These marks will help you compare values taken at the same time.

Two Trays, Twenty Minutes

1. At an outdoor science club, students placed two identical dark metal trays on the same bench. One tray sat in direct sunlight, while the other stayed under a shade cloth. A thermometer rested on each tray's surface. The students recorded surface temperature every five minutes for twenty minutes. They did not move the trays during the test.

2. The table lists surface readings in degrees Celsius. Each row holds readings from the two trays at one moment. Comparing readings taken at the same time keeps the comparison fair. A graph can show how a measured variable changes as another variable changes. A useful graph gives each axis a name and includes units for measured values.

TRAY SURFACE TEMPERATURES

Time (min)	Sunlit tray (°C)	Shaded tray (°C)
0	20	20
5	26	21
10	31	22
15	35	23
20	38	25

3. Sunlight transfers energy to a surface, which can raise its temperature. Shade cloth blocks some direct sunlight but does not seal a tray away from warm air. The readings alone cannot prove that every shaded object would warm in exactly the same way. They can, however, show what happened to these two trays during this short test.

2 ANSWER WITH EVIDENCE

Use the passage

1. How much did the sunlit tray warm from 0 to 10 minutes? How much did it warm from 10 to 20 minutes?

2. Compare the shaded tray's temperature change from 0 to 10 minutes with its change from 10 to 20 minutes.

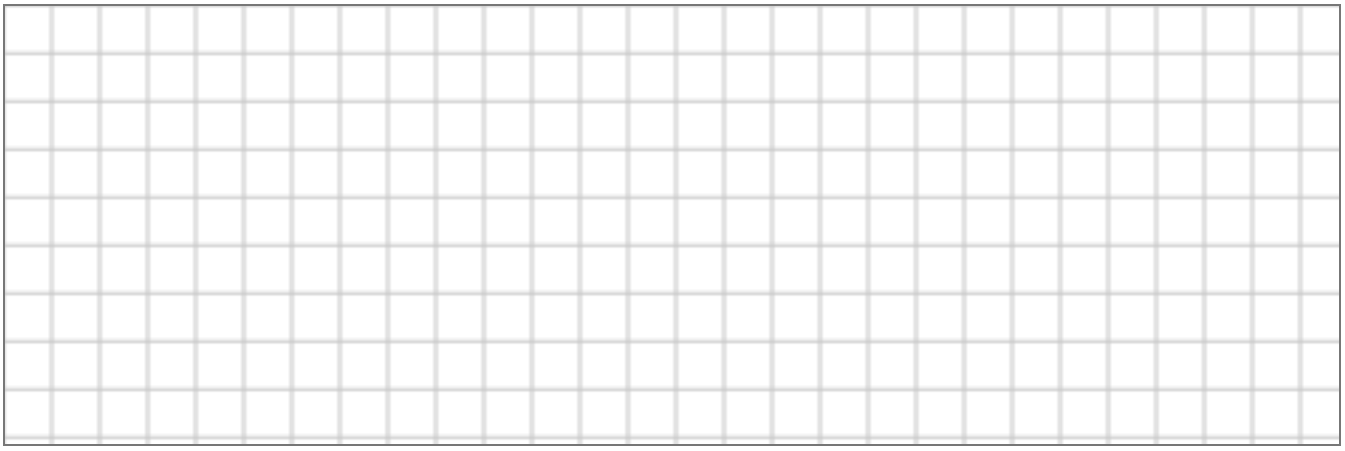
3. During which five-minute interval did the sunlit tray warm the most? How do the readings show this?

4. From 10 to 15 minutes, how did the temperature changes of the two trays compare?

3 YOUR TURN

Your own words

On the grid, graph the temperature difference between the trays at each recorded time. Label both axes, then write one sentence describing how the difference changed.



ANSWER KEY

Sun and Shade

HIGH SCHOOL · FSL.3B.3

PART 1 · READ AND MARK

Circle each time in the table and underline the two readings in its row. These marks will help you compare values taken at the same time. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How much did the sunlit tray warm from 0 to 10 minutes? How much did it warm from 10 to 20 minutes?	**It warmed 11 °C in the first 10 minutes and 7 °C in the last 10 minutes.**
2	Compare the shaded tray's temperature change from 0 to 10 minutes with its change from 10 to 20 minutes.	**It warmed 2 °C in the first 10 minutes and 3 °C in the last 10 minutes.**
3	During which five-minute interval did the sunlit tray warm the most? How do the readings show this?	**From 0 to 5 minutes. Its temperature rose from 20 °C to 26 °C, a 6 °C increase, larger than in any other five-minute interval.**
4	From 10 to 15 minutes, how did the temperature changes of the two trays compare?	**The sunlit tray warmed 4 °C, while the shaded tray warmed 1 °C. The sunlit tray warmed 3 °C more.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Horizontal axis: time (min). Vertical axis: temperature difference (°C). Plot (0, 0), (5, 5), (10, 9), (15, 12), and (20, 13), then connect the points. The difference grew throughout the test, but each increase was smaller than the one before it.

Accept a graph with correctly labeled axes and all five differences plotted at the correct times. The sentence should describe the growing gap; noting that its growth slowed adds detail.