

Student Activity Guide for NAEP Interactive Science Task: Here Comes the Sun

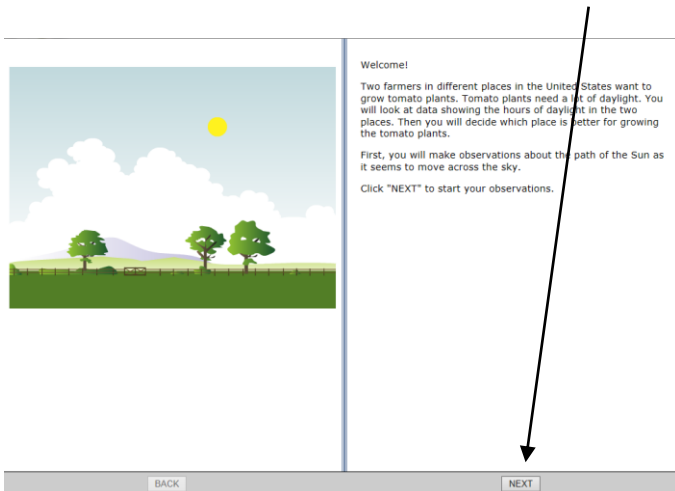
http://www.nationsreportcard.gov/science_2009/ict_tasks.asp

Select "Take this task" under Here Comes the Sun.

 <p>GRADE 4 Cracking Concrete Predict the effect of the freeze/thaw cycle on a concrete sidewalk. Duration: 20 minutes Take this task > Scoring information ></p>	 <p>GRADE 4 Here Comes the Sun Predict path of the sun and number of daylight hours to determine best planting location. Duration: 20 minutes Take this task > Scoring information ></p>	 <p>GRADE 4 Mystery Plants Determine optimum amount of light and nutrients for plant growth. Duration: 40 minutes Take this task > Scoring information ></p>
 <p>GRADE 8 Bottling Honey Investigate flow rates of four liquids to determine best temperature for bottling honey. Duration: 20 minutes Take this task > Scoring information ></p>	 <p>GRADE 8 Playground Soil Investigate attributes of two soil samples to determine the best site for building a playground. Duration: 20 minutes Take this task > Scoring information ></p>	 <p>GRADE 8 Planning a Park Evaluate the impact of a planned recreation park on specific organisms. Duration: 40 minutes Take this task > Scoring information ></p>
 <p>GRADE 12 Energy Transfer Investigate energy transfer between substances to determine the best metal for a cooking pot. Duration: 20 minutes Take this task > Scoring information ></p>	 <p>GRADE 12 Starlight Investigate relationships between the luminosity and temperature of different stars. Duration: 20 minutes Take this task > Scoring information ></p>	 <p>GRADE 12 Phytoplankton Factor Investigate ocean conditions that support phytoplankton growth. Duration: 40 minutes Take this task > Scoring information ></p>

In this task, you will use a time lapse simulation to make observations about the path of the Sun as it relates to the amount of daylight. You will use this knowledge to determine the better of two locations for growing tomatoes.

Read the information on each screen. Select "NEXT" when you have finished reading the information on the screen.



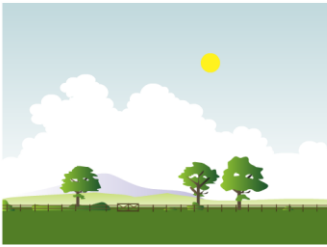
Welcome!

Two farmers in different places in the United States want to grow tomato plants. Tomato plants need a lot of daylight. You will look at data showing the hours of daylight in the two places. Then you will decide which place is better for growing the tomato plants.

First, you will make observations about the path of the Sun as it seems to move across the sky.

Click "NEXT" to start your observations.

BACK NEXT



Welcome!

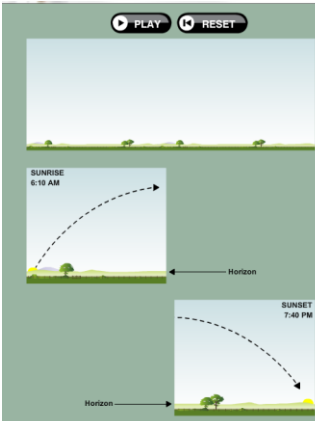
Two farmers in different places in the United States want to grow tomato plants. Tomato plants need a lot of daylight. You will look at data showing the hours of daylight in the two places. Then you will decide which place is better for growing the tomato plants.

First, you will make observations about the path of the Sun as it seems to move across the sky.

Click "NEXT" to start your observations.

BACK

NEXT



The Sun seems to move in a curved path across the sky.

Click "PLAY" to view the path of the Sun on a day.

You can click "PAUSE" to stop.

You can click "RESET" to go back to the beginning of the day.

The path changes depending on the season.

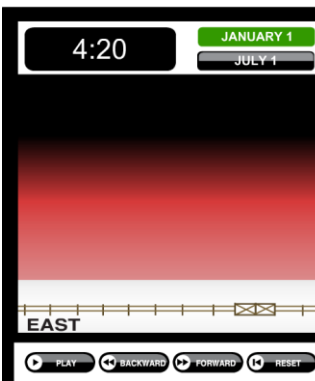
Sunrise is the time in the morning when the first part of the Sun appears above the horizon.

Sunset is the time in the evening when the last part of the Sun disappears below the horizon.

Click "NEXT" to continue.

BACK

NEXT



You will now carefully observe the path of the Sun as it seems to move across the sky on January 1 and July 1.

You will record the time of sunrise and sunset for each of the days.

Then, you will compare your observations for the two days.

Click "NEXT" to continue.

BACK

NEXT

When there is a question, write your answer on this worksheet, not on the computer screen. If you answer directly on the computer, your answer will not be saved. You do not need to answer anything directly on the computer. After answering, select "NEXT" to continue.

Question 1

Look at the clock and record the time of sunrise on January 1 below. Be sure to include AM or PM in your answer (EXAMPLE: 7:20 AM).

Record the time of sunset on January 1 below. Be sure to include AM or PM in your answer.

Now click on "JULY 1."

Use the buttons as you did earlier to observe the path of the Sun.

Record the sunrise and sunset times for July 1 below. Remember to include AM or PM in your answers (EXAMPLE: 7:20 AM).

July 1 sunrise:

July 1 sunset:

Date	Time of Sunrise	Time of Sunset
January 1	8:38 AM	5:22 PM
July 1	5:34 AM	8:26 PM

Another student made the observations you did and recorded the data shown on the left.

Based on the data in the table, which statement is true?

- A January 1 has more hours of daylight.
- B July 1 has more hours of daylight.
- C Both days have the same amount of daylight.
- D You cannot tell the amount of daylight.

Click "NEXT" to continue. You will not be able to return to this screen once you click on the "NEXT" button.

Question 2

Another student made the observations you did and recorded the data shown on the left. Based on the data in the table, which statement is true?

- A. January 1 has more hours of daylight.
- B. July 1 has more hours of daylight.
- C. Both days have the same amount of daylight
- D. You cannot tell the amount of daylight.

9:00 AM

JANUARY 1

JULY 1

PLAY BACKWARD FORWARD RESET

Now you will compare the paths of the Sun across the sky on January 1 and July 1.

Grid lines have been added to the screen to help you measure the height of the Sun above the horizon.

On which day do you think the Sun will be lowest in the sky at 12:00 noon?

- A January 1
- B July 1
- C Sometimes it is January 1 and sometimes July 1.
- D It will rise to the same height on both days.

Click "NEXT" to continue. You will not be able to return to this screen once you click on the "NEXT" button.

Question 3

On which day do you think the Sun will be lowest in the sky at 12:00 noon?

- A. January 1
- B. July 1
- C. Sometimes it is January 1 and sometimes July 1
- D. It will rise to the same height on both days.

4:20 JANUARY 1 JULY 1

Use the buttons on the left to observe the paths of the Sun on January 1 and July 1.

Use the grid lines to help you measure the height the Sun reaches in the sky.

Describe two differences you observe about the paths of the Sun on January 1 and July 1.

Difference 1

Difference 2

Click "NEXT" to continue. You will not be able to return to this screen once you click on the "NEXT" button.

BACK NEXT

Question 4

Describe two differences you observe about the paths of the Sun on January 1 and July 1.

Difference 1

Difference 2

DATA TABLE AND GRAPH OF AMOUNT OF DAYLIGHT

Date	Amount of Daylight
January 1	9 h 15 min
February 1	10 h 15 min
March 1	11 h 15 min
April 1	12 h 30 min
May 1	14 h 0 min
June 1	14 h 45 min
July 1	15 h 0 min
August 1	14 h 30 min
September 1	13 h 15 min
October 1	10 h 15 min
November 1	9 h 15 min
December 1	9 h 30 min

Time (h)

Last year a student observed the amount of daylight where she lives.

On the first day of each month, she determined the amount of daylight in hours (h) and minutes (min).

Her results, data table and graph of the amount of daylight, are shown on the left.

Based on the results, about how many hours of daylight do you think there were on October 1?

Explain how you used the results to get your answer.

Click "NEXT" to continue.

BACK NEXT

Question 5

Based on the results, about how many hours of daylight do you think there were on October 1?

Explain how you used the results to get your answer.

Growing Season for Place X

Date	Time of Sunrise	Time of Sunset	Amount of Daylight
April 1	6:45 AM	7:30 PM	12 h 45 min
May 1	5:50 AM	8:00 PM	14 h 10 min
June 1	5:15 AM	8:30 PM	15 h 15 min

Growing Season for Place Y

Date	Time of Sunrise	Time of Sunset	Amount of Daylight
April 1	6:50 AM	7:20 PM	12 h 30 min
May 1	6:15 AM	7:45 PM	13 h 30 min
June 1	6:00 AM	8:00 PM	14 h 0 min

Two farmers grow tomato plants in two places, X and Y, shown on the maps on the left. You are now ready to decide which of the two places is better for growing tomato plants. The two tables on the left show sunrise times, sunset times, and the amount of daylight during the growing season in each place.

Tomato plants that need a lot of sunlight are grown in both places. They are planted in the same type of soil. The tomato plants are grown in greenhouses that are kept at the same temperature in both places.

Based on the data in the tables, in which place would you expect the tomato plants to grow the most in the growing season?

A Place X
 B Place Y
 C The tomato plants would grow the same amount in both places.

Explain how you know. Use the data to support your explanation.

Question 6

Based on the data in the tables, in which place would you expect the tomato plants to grow the most in the growing season?

- A. Place X
- B. Place Y
- C. The tomato plants would grow the same amount in both places.

Explain how you know. Use the data to support your explanation.
