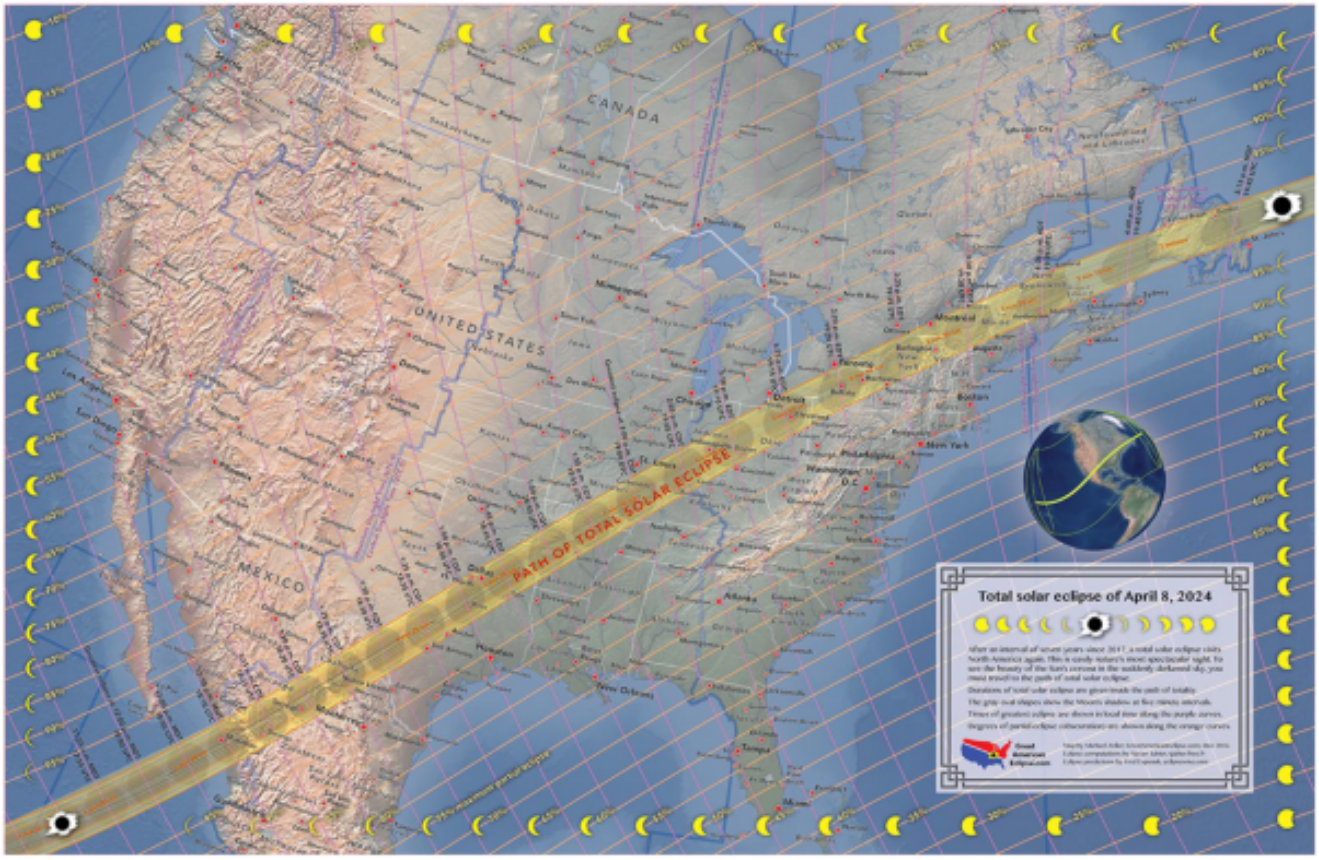
Name: _____ Date: _____ Class: _____

Title: How do Different Locations on Earth Experience a Solar Eclipse?
Student Sheet



The total solar eclipse path crosses from Mexico, through the United States from Texas to Maine, and up through Canada. Image Credit: ©2021 Great American Eclipse, LLC, Used with Permission.

https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/2024%20Eclipse%20Path.png

Map Key:

- The path of totality is in yellow. Durations of totality are listed at key locations in the yellow path.
- The gray oval shapes in the yellow path show the Moon's shadow at five minute intervals.
- Times of maximum totality are shown in local times along the purple curves. Times are written just north of the path of totality.
- Percentages of obscuration of the Sun of the partial eclipse are shown along the orange curves.

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Location	Partial Begins	Totality Begins	Maximum	Totality Ends	Partial Ends
Dallas, Texas	12:23 p.m. CDT	1:40 p.m. CDT	1:42 p.m. CDT	1:44 p.m. CDT	3:02 p.m. CDT
Idabel, Oklahoma	12:28 p.m. CDT	1:45 p.m. CDT	1:47 p.m. MDT	10:49 p.m. MDT	3:06 p.m. CDT
Little Rock, Arkansas	12:33 p.m. CDT	1:51 p.m. CDT	1:52 p.m. CDT	1:54 p.m. CDT	3:11 p.m. CDT
Poplar Bluff, Missouri	12:39 p.m. CDT	1:56 p.m. CDT	1:56 p.m. CDT	2:00 p.m. CDT	3:15 p.m. CDT
Paducah, Kentucky	12:42 p.m. CDT	2:00 p.m. CDT	2:01 p.m. CDT	2:02 p.m. CDT	3:18 p.m. CDT
Evansville, Indiana	12:45 p.m. CDT	2:02 p.m. CDT	2:04 p.m. CDT	2:05 p.m. CDT	3:20 p.m. CDT
Cleveland, Ohio	1:59 p.m. EDT	3:13 p.m. EDT	3:15 p.m. EDT	3:17 p.m. EDT	4:29 p.m. EDT
Erie, Pennsylvania	2:02 p.m. EDT	3:16 p.m. EDT	3:18 p.m. EDT	3:20 p.m. EDT	4:30 p.m. EDT
Buffalo, New York	2:04 p.m. EDT	3:18 p.m. EDT	3:20 p.m. EDT	3:22 p.m. EDT	4:32 p.m. EDT
Burlington, Vermont	2:14 p.m. EDT	3:26 p.m. EDT	3:27 p.m. EDT	3:29 p.m. EDT	4:37 p.m. EDT
Lancaster, New Hampshire	2:16 p.m. EDT	3:27 p.m. EDT	3:29 p.m. EDT	3:30 p.m. EDT	4:38 p.m. EDT
Caribou, Maine	2:22 p.m. EDT	3:32 p.m. EDT	3:33 p.m. EDT	3:34 p.m. EDT	4:40 p.m. EDT

Eclipse Timetable, Credit: NASA Solar System Exploration, Our Galactic Neighborhood, https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/eclipse%20timetable.png

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1. Examine the map of the United States that shows how each location will experience the April 8, 2024 solar eclipse.
2. Examine the data table that accompanies the data from the map.
   For example, if you live in Dallas, TX:
   - The **partial eclipse begins** at **12:23 pm** Central Daylight Time (CDT). The Moon's shadow will start to cover the Sun.
   - The Sun will become more and more obscured until **totality begins** at **1:40 pm** CDT.
   - As you experience totality, the sky gets darker and darker until **1:42 pm** CDT, at the **maximum totality**, which is the moment that you would experience the most darkness.
   - **Totality ends** at **1:44 pm** CDT, when the Moon's shadow moves away from you.
   - You would then experience a partial solar eclipse until the **partial ends at 3:02 pm** CDT.

Safety Reminder! Only viewers in the path of totality will be able to remove their solar eclipse glasses, and only during totality, which only lasts for about 4 minutes in most locations. The rest of the time observers will have to wear their solar eclipse glasses to view the partial eclipse.

3. Answer the following questions on the Google Form.
   a. What location on the path of totality will experience the longest duration of totality?
   b. What location on the path of totality will experience the shortest duration of totality?
   c. Where is your location? What will you see at that location on April 8, 2024? For how long will you be able to see it?
   d. Make a prediction: how does NASA predict the duration of totality in different locations for future solar eclipses?

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4. Watch the video on *Tracing the 2017 Solar Eclipse* to learn more about how NASA uses data from past eclipses to predict the locations and times of future solar eclipses.
5. Answer the following questions about the video..
    a. What features of this visualization are driven by data?
    b. How does Moon topography (mountains and valleys) affect the duration of totality?
    c. What other variables affect the way an observer views a total solar eclipse from different locations on Earth?