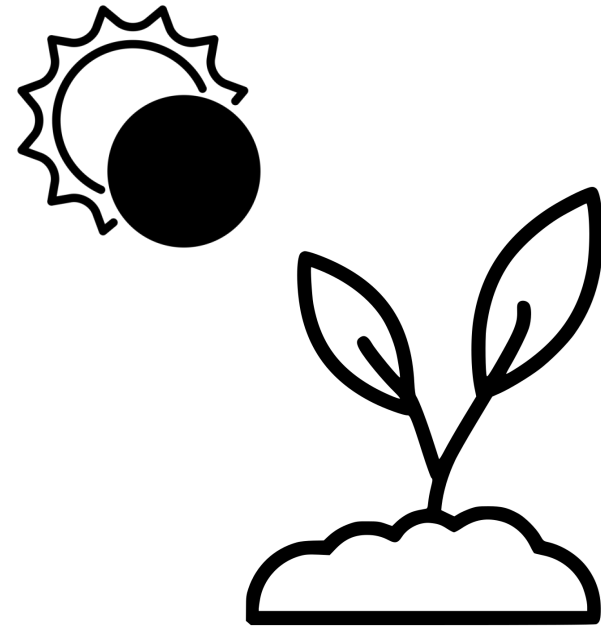




# Solar Eclipse Biology



This student data book was created to support classrooms participating in the GLOBE Observer Eclipse project by Civil Air Patrol Solar Eclipse Mission volunteers.

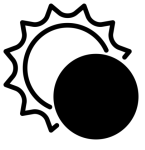
To learn more about the GLOBE Observer go to: <https://www.globe.gov>

To learn more about Civil Air Patrol go to: <https://www.gocivilairpatrol.com>

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_





## Additional Solar Eclipse Activities



Have extra time between observations? Try one of these additional activities.

- **Play With Shadows** - Solar eclipses have unique effects on shadows. Play with the shadows and see what shapes and patterns you can produce. Try using different household items like a kitchen colander to see what types of shadows they will create.
- **Make Your Own Eclipse** - Using a ball, cast a shadow on the ground. Explore how the shadow changes based on the distance the ball is from the ground.
- **Create Eclipse Art** - Bring a little STEAM to your eclipse by creating art or poetry to capture your experience.
- **Make Additional Observations** - Grab a piece of paper and collect more data!

Welcome **Solar Eclipse Citizen Scientist**. Today you will be making observations of a very special astronomical event...a solar eclipse! Over the next 4 hours you will be able to collect both quantitative and qualitative data that will help us learn more about the effects that solar eclipses have on Earth.

Throughout the eclipse you will be collecting different types of observations. Look for these symbols in the corners of your data book to help you flip to the correct page write down your data.



Air Temperature Observations



Animal Observations

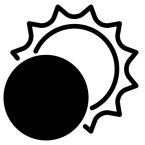


Plant Observations



Other Eclipse Info/Activities





## Solar Eclipse Science

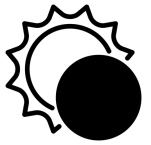
Solar eclipses happen when the Moon passes between the Sun and the Earth. This causes the Moon to cast a shadow on the Earth. During the solar eclipse on April 8, 2024, this shadow will cover most of North America.

Many scientists have been preparing for years so that they could be ready to collect science during this eclipse, but the path of the Moon's shadow is so large they can't collect the data they need alone.

That is where your class comes in! Today your class will join thousands of other students across North America collecting air temperature data as part of the GLOBE Eclipse project. You will collect your data using this data book and your teacher will be uploading data the class collects to NASA in real time using the GLOBE Observer App.



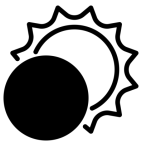
## Eclipse Biology Word Search



This word search contains 15 terms and words related to the solar eclipse project. See how many you and your friends can find!

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | C | I | C | C | A | E | L | U | U | O | U | O | C |
| O | A | S | O | R | A | L | E | U | D | E | L | P | I |
| U | R | O | H | N | E | W | O | C | R | E | T | L | S |
| U | B | B | A | A | O | P | P | S | L | D | U | A | E |
| E | M | S | N | U | D | O | U | I | U | I | N | N | X |
| B | U | E | I | A | M | O | R | C | M | N | P | T | C |
| E | N | R | M | D | I | A | W | A | U | N | N | S | C |
| H | E | V | A | M | I | N | L | N | D | L | I | H | E |
| A | P | A | L | U | L | U | I | O | H | E | A | A | W |
| V | P | T | A | M | I | E | R | U | A | A | R | R | A |
| I | O | I | R | I | S | O | U | N | D | S | D | R | U |
| O | U | O | E | X | N | U | T | C | A | T | N | O | C |
| R | A | N | M | A | A | P | L | I | R | L | R | M | A |
| R | P | R | O | M | M | O | O | N | N | M | N | D | N |





## Eclipse Vocabulary

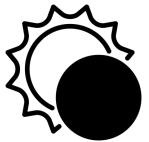
We have learned a lot of new scientific terms as part of this activity. This is a references sheet for your new vocabulary.

- **Citizen Scientist** - A member of the public who volunteers to collect scientific data for a project.
- **Crepuscular** - Animals that are active around twilight at dusk and/or dawn.
- **Diurnal** - Animals that are active during the day.
- **Eclipse Maximum** - The phase of an eclipse when the Moon covers the greatest percentage of the Sun.
- **First Contact** - When the Moon first starts to block the Sun and the solar eclipse begins.
- **Fourth Contact** - When the Moon stops blocking the Sun and the solar eclipse ends.
- **Nocturnal** - Animals that are active at night.
- **Penumbra** - A shadow caused by the Moon blocking some of the light from the Sun.
- **Umbra** - The darkest part of the Moon’s shadow where the Sun is completely blocked.

Explore more solar eclipse vocabulary using

NASA’s Solar Eclipse Glossary:

<https://eclipse.gsfc.nasa.gov/SEhelp/SEglossary.html>



## Eclipse Meta Data

In order to be analyzed, data needs context. This information is called **Meta Data** and it helps scientists know who, how, and where the data was collected. Meta data is particularly important for this experiment, because we expect to see different effects based on where in the solar eclipse path the data is collected.

**Members of your data collection team:**

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**Location of your data collection site:**

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**Latitude and longitude of your data collection site:**

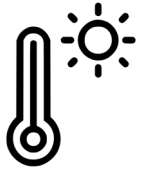
Latitude: 

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Longitude: 

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A lot of the Sun's energy arrives to the Earth in the form of visible light. When the light reaches the Earth, some of it is absorbed and readmitted as heat. By tracking changes in air temperature during an eclipse we can 'see' changes in the amount of solar energy reaching our planet.

## Tracking Air Temperature

|                             |                             |                              |                              |                              |                              |                              |                              |
|-----------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| <b>1.</b><br>Time:<br>Temp: | <b>5.</b><br>Time:<br>Temp: | <b>9.</b><br>Time:<br>Temp:  | <b>13.</b><br>Time:<br>Temp: | <b>17.</b><br>Time:<br>Temp: | <b>21.</b><br>Time:<br>Temp: | <b>25.</b><br>Time:<br>Temp: | <b>29.</b><br>Time:<br>Temp: |
| <b>2.</b><br>Time:<br>Temp: | <b>6.</b><br>Time:<br>Temp: | <b>10.</b><br>Time:<br>Temp: | <b>14.</b><br>Time:<br>Temp: | <b>18.</b><br>Time:<br>Temp: | <b>22.</b><br>Time:<br>Temp: | <b>26.</b><br>Time:<br>Temp: | <b>30.</b><br>Time:<br>Temp: |
| <b>3.</b><br>Time:<br>Temp: | <b>7.</b><br>Time:<br>Temp: | <b>11.</b><br>Time:<br>Temp: | <b>15.</b><br>Time:<br>Temp: | <b>19.</b><br>Time:<br>Temp: | <b>23.</b><br>Time:<br>Temp: | <b>27.</b><br>Time:<br>Temp: | <b>31.</b><br>Time:<br>Temp: |
| <b>4.</b><br>Time:<br>Temp: | <b>8.</b><br>Time:<br>Temp: | <b>12.</b><br>Time:<br>Temp: | <b>16.</b><br>Time:<br>Temp: | <b>20.</b><br>Time:<br>Temp: | <b>24.</b><br>Time:<br>Temp: | <b>28.</b><br>Time:<br>Temp: | <b>32.</b><br>Time:<br>Temp: |



## Plant Observations



Write down any other observations you make about plants during the eclipse. Make sure that you write down what time you made the observation.

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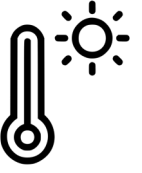
## Plant Observations

Plants change their behavior based on the amount of light they get. Pick one plant to observe and see if you can see any changes during the eclipse. Sketch your observations.

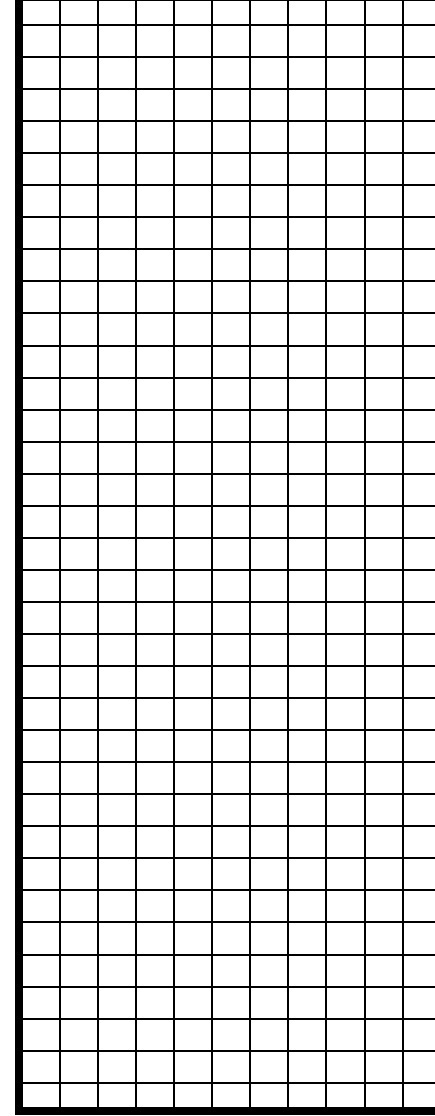
|                       |                       |
|-----------------------|-----------------------|
| First Contact         | 4th Contact           |
| 2nd Observation       | 6th Observation       |
| 10 min before Maximum | 10 mins after Maximum |



## Tracking Graphing Temperatures



Air Temperature Changes Over The Length of a Solar Eclipse



Temperature



Observation

Using the graph paper above make a line graph that shows the changes in air temperature you observe during the length of the eclipse. A long the way, make sure to compare your graph with the one your teacher is creating as part of the GLOBE Eclipse citizen science project.



## Animal Observations

Animals rely on the rhythm of the sun to tell them when it is time to eat, sleep, and perform other biological functions.

During a Solar Eclipse the amount of light that reaches the earth changes. It is your job to see if the changes in light affect types and behaviors of living things that you see.

The types of habitat you are in effects the types of plants/animals we expect to see. Answer the questions below to let researchers know what animals they should expect to see.

### Type of Location (Circle)

Urban                      Suburban                      Rural

### Habitat (Circle)

School Yard                      Park                      Backyard

Forest                      Stream                      Wetland

Other:



## Plant Observations



Like animals, plants also rely on the rhythm of the sun to tell them when to complete different biological functions such as photosynthesis and blooming.

During a Solar Eclipse changes in the amount of light reaching a plant can change the plant's behavior. The type of plant being observed affects the type of behavior you can expect to see.

In the space below describe the plant that you are observing during this eclipse.

Type of plant:

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Description of plant:

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Sketch of plant:







## Animal Observations

6th Observation - *I see or hear*

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |

4th Contact - *I see or hear*

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |



## Animal Observations



For this experiment we will be using our eyes and ears to make observations of living things during the eclipse. When making observations some questions to ask yourself are:

- Are the animals I see now different from the ones I saw during from the last observation?
- Do I see any different behaviors?
- Do I hear any different sounds or did any sounds get louder/quieter?

1st Contact - *I see or hear*

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |





## Animal Observations

**2nd Observation - *I see or hear***

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |

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**10 mins before Maximum - *I see or hear***

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |



## Animal Observations



**Eclipse Maximum - *I see or hear***

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |

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**10 mins after Maximum - *I see or hear***

|         |          |            |
|---------|----------|------------|
| Insects | Birds    | Amphibians |
| Mammals | Reptiles | People     |

