

# STEM SPARK

Presents

## Citizen Science:

## Firefly Finders!



# Citizen

# Science



Citizen science is when curious kids and adults become real scientists by making observations and collecting data for fun projects!

Citizen science projects can be anything, but usually they are really big, stretching across the entire country sometimes! The more people that help, the more information scientists have to make important decisions about things like the environment.

The best part is anyone can be a citizen scientist, even you! In this project you are going to learn about and observe fireflies in your own backyard. Are you ready?

# The Pennsylvania

# Firefly




Did you know fireflies are actually beetles?!

These incredible insects use a chemical reaction in their bottoms to make a bright flash. In addition to looking really pretty at night, fireflies use these lights like a morse code. This allows them to talk to other fireflies and find friends like them.


There are dozens of species of fireflies in Pennsylvania. Each firefly species has their own flash pattern. See if you can identify these common fireflies in your own backyard!

# Frequent Flyers


Here are some common firefly types in the Northeast. See if you can find some of these flying friends near you!



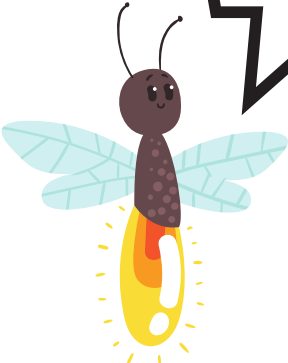
Hi, my name is Photinus Ignitus! I have one medium flash every 5 seconds!




Hi, my name is Photinus Pyralis! I have one bright flash shaped like a J every 6 seconds




Hi, my name is Photinus Consanguineus! I have a small double flash. They happen super quick!



Hi, my name is Photinus Marginellus! I have one bright flash every 3 seconds!



Hi, my name is Photinus Macdermotti! I have a tiny double flash about 2 seconds apart



Hi, my name is Photinus Carolinus! I have a series of 6 medium flashes in a quick burst!

# My Firefly Observation Sheet



Date: \_\_\_\_\_

Temperature: \_\_\_\_\_

Where are you?    Open Field    Mowed Lawn    Wetlands    Forest    Pavement    Other

Has this place been mowed this summer?    Yes    No    Not sure

Is it raining?    No    Foggy    Light Rain    Heavy Rain

Is it windy?    No    Slight breeze    Strong gusts

Is it cloudy?    Clear Night    Partly Cloudy    Overcast

Is there light?    No    Yes, in the area    Yes, near the area    Yes, far away

Set a timer for 10 seconds. Observe and record the number of fireflies you see in the boxes below.

**Observation #1**    Time Start: \_\_\_\_\_    Time Stop: \_\_\_\_\_

How many fireflies did you see?    None    1-5    6-10    11-25    More than 25

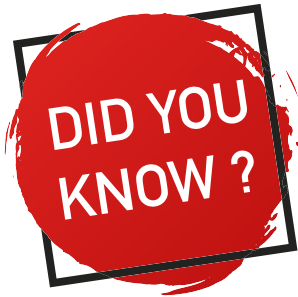
**Observation #2**    Time Start: \_\_\_\_\_    Time Stop: \_\_\_\_\_

How many fireflies did you see?    None    1-5    6-10    11-25    More than 25

**Observation #3**    Time Start: \_\_\_\_\_    Time Stop: \_\_\_\_\_

How many fireflies did you see?    None    1-5    6-10    11-25    More than 25

# Science Extension!



Fireflies sleep in the grass during the day. This is why things like pesticides, weed killer, chemicals that help lawn growth and mowing have an huge impact on the number of fireflies you see at night.



Now that you are a firefly expert, conduct new observations the night after mowing, in a field that does not get mowed, and in the woods.

## My hypothesis:

I think **my yard/ a field/ the woods** will have the most fireflies

I think **my yard/ a field/ the woods** will have the least fireflies.

# My Firefly Observation Sheet



Date: \_\_\_\_\_

Temperature: \_\_\_\_\_

Where are you?    Open Field    Mowed Lawn    Wetlands    Forest    Pavement    Other

Has this place been mowed this summer?    Yes    No    Not sure

Is it raining?    No    Foggy    Light Rain    Heavy Rain

Is it windy?    No    Slight breeze    Strong gusts

Is it cloudy?    Clear Night    Partly Cloudy    Overcast

Is there light?    No    Yes, in the area    Yes, near the area    Yes, far away

Set a timer for 10 seconds. Observe and record the number of fireflies you see in the boxes below.

**Observation #1**    Time Start: \_\_\_\_\_    Time Stop: \_\_\_\_\_

How many fireflies did you see?    None    1-5    6-10    11-25    More than 25

**Observation #2**    Time Start: \_\_\_\_\_    Time Stop: \_\_\_\_\_

How many fireflies did you see?    None    1-5    6-10    11-25    More than 25

**Observation #3**    Time Start: \_\_\_\_\_    Time Stop: \_\_\_\_\_

How many fireflies did you see?    None    1-5    6-10    11-25    More than 25



## My conclusion:

I saw that **my yard/ a field/ the woods** had the most fireflies

I saw that **my yard/ a field/ the woods** had the least fireflies.

## I learned:

Fireflies are actually **beetles/ house flies/spiders!** A chemical reaction in their bodies makes them **fly/light up/ chirp.** They sleep **in the grass/ on trees/ in beds** during the day.

## STEM-Spark Stumper:

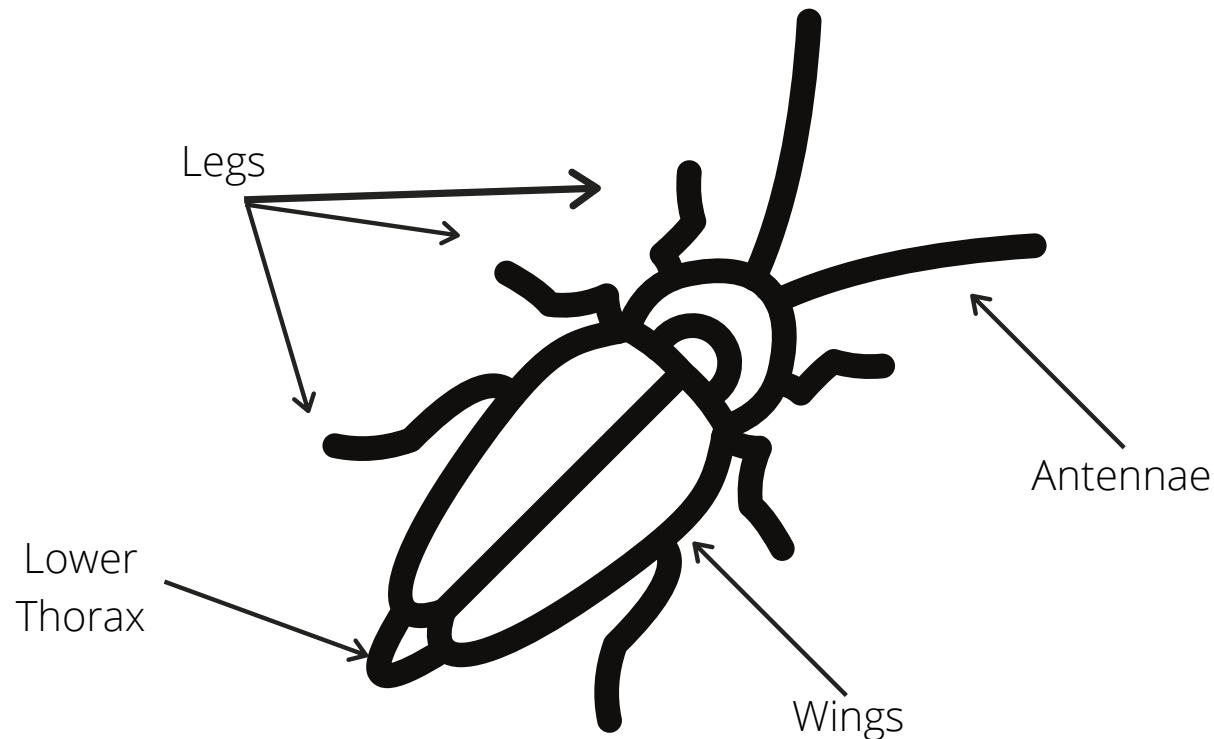
Try to capture one of these incredible insects and draw what you observe. Be sure to let it go when you are done!



# STEMSpark Stumper Drawing

Draw your observations in the box!

**Example:**



This firefly has a **small/medium/bright** flash. It flashes **once/twice/ alot of times** in \_\_\_\_\_ seconds so I think this firefly is a Photinus **Ignitus/ Marginellus/ Pyralis/ Macdermotti/ Consanguineus/ Carolinus**.

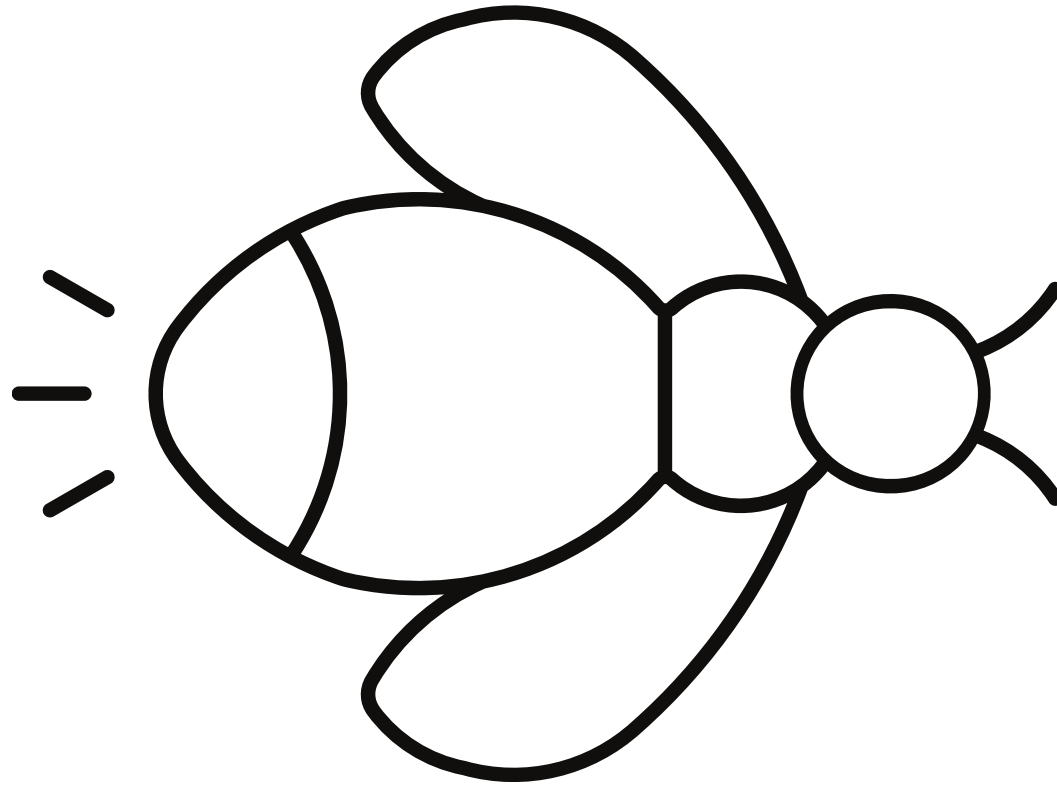
# STEMSpark Stumper Drawing

**Draw your observations in the box!**



This firefly has a **small/medium/bright** flash. It flashes **once/ twice/ alot of times** in \_\_\_\_\_ seconds so I think this firefly is a Photinus **Ignitus/ Marginellus/ Pyralis/ Macdermotti/ Consanguineus/ Carolinus.**

Firefly Finders!



I am a citizen scientist

# References:

- [https://www.pennlive.com/wildaboutpa/2016/06/fireflies\\_about\\_to\\_make\\_flashy.html](https://www.pennlive.com/wildaboutpa/2016/06/fireflies_about_to_make_flashy.html)
- <https://www.massaudubon.org/get-involved/citizen-science/firefly-watch/how-to-participate>
  - Firefly Observation Sheet and Frequent Flyer  
Infographic adapted from Mass Audobon resources