Mapping Butterflies

By Tom J. McConnell

Monarch butterflies are famous for migrating to and from Mexico. But just where in the US can you find them? And when would you see them there? And what about other butterflies? Do you know what other species of butterflies live near your home? Or maybe you are curious about butterflies in other places like Costa Rica, Africa, or Europe!

If you are curious about these questions, you can do this activity using data shared by people from around the world! iNaturalist is the app you can use, and it is considered "Citizen Science" because anyone can share observations of butterflies… or any other living thing! Scientists can use the data to understand patterns in populations, changes in where we find animals, and seasonal patterns related to migrations and yearly life cycles.

NGSS Alignment

DCIs:
- LS2A: Interdependent Relationships in Ecosystems
- LS4D: Biodiversity & Humans

SEPs:
- Developing & using models.
- Analyzing & interpreting data
- Engaging in argument from evidence
- Obtaining, evaluating & communicating information

CCs:
- Patterns
- Systems & System Models

And YOU can be the scientist by asking questions and finding answers in the iNaturalist database! Here's how!

Grade Levels – 2-8
Timeline: 1 period
Driving Question: What is the range of my favorite butterflies?
Objectives:

- I can ask questions that can be answered with data.
- I can access a database of observations and data.
- I can notice patterns in data.
- I can create a map comparing habitats of different kinds of butterflies.

Download iNaturalist

The first step is to download iNaturalist. This app is FREE, and they will not send you information you do not ask for. Have an adult help to access the site and set up your account. They can check for security concerns.

iNaturalist is available from your app store for both Mac and Android smartphones and tablets. You can also use a computer to view the site at https://inaturalist.org.

When you have downloaded the site or reach the web page, create your own account. Follow the steps on the website or app. Then on the next page, follow the instructions to find data to help answer your own questions.

Finding Butterfly Data in iNaturalist

iNaturalist is a "citizen science" site that lets you post photos of living things, identify them, and share with other people. When you post an observation, other viewers may either confirm or correct your identification. The data in the site is used by professional scientists to get large amounts of data about animal habitats, location, population numbers, and other information.

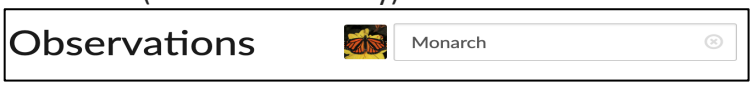
For this activity, you will "Explore" the data others have posted.

Procedure:

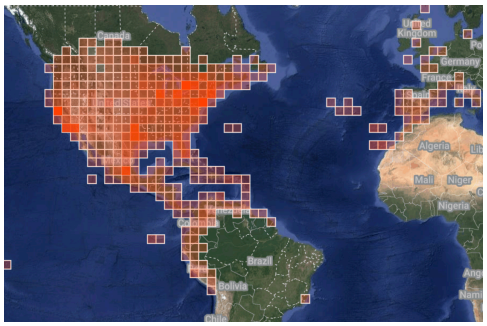
1. Log onto iNaturalist on your smartphone, tablet or computer. See page 1 for instructions for installing or accessing on the computer. Use your account login and password.

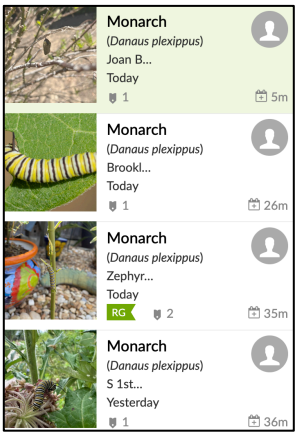
2. Click on the "Explore" tab in the top row menu.

3. When the world map loads, type "Monarch Butterfly" into the "species" box in the search bar. You will see a list of several groups of species. Click the one that says "Monarch (Monarch Butterfly)."



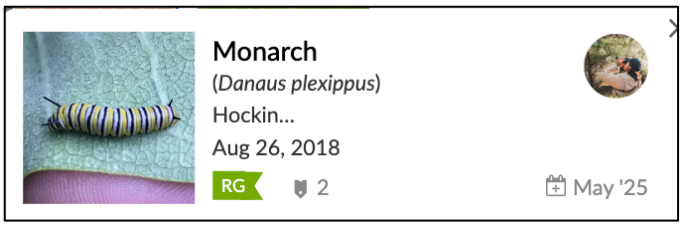
4. The map will show colored pixels where monarchs have been observed. Use the + and – buttons to the left to zoom in or zoom out, and look more closely at the area where monarchs live.

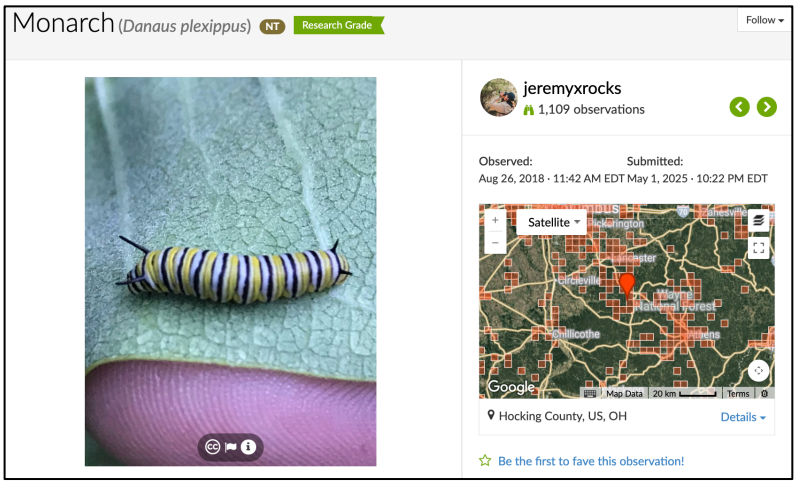




5. You will also see a list of monarch observations that might include pictures of an adult butterfly, a larva, a chrysalis (pupa) or even an egg!

6. When you zoom in far enough, you can click an individual orang pixel to see more information about that observation. Each observation tells you *where* and *when* the observation was made! You should look at some samples, and then you can use that type of data in your own investigation.





If you double click on the observation on this image, you can get more details (see image below.) This information includes the photograph of that animal, a map of the location, and any confirmation from others that this is the correct species.

Mapping Butterflies and Asking Your Own Questions!

Now you know how to FIND information. It's time to BE the scientist!! Start on Page 4 by mapping out where you find different species of butterflies. You may eventually notice a pattern on the map that tells you more about butterflies!

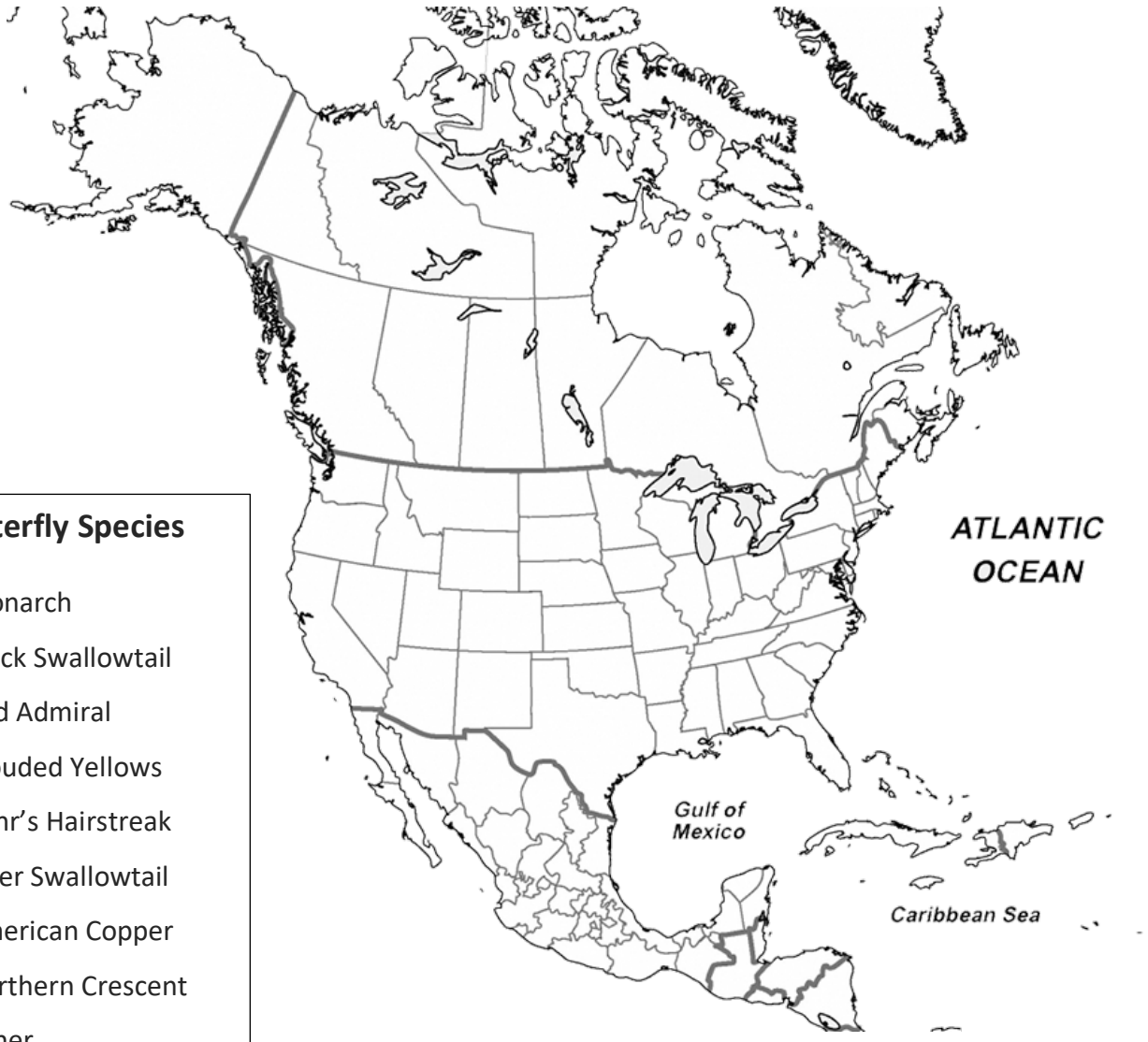
Then you can ask your own questions using the template on Page 5. Then use the information in iNaturalist to get the data you need to help answer your questions!

You can also learn more about butterflies by reading ***Conservation Tales: Monarch Butterflies***!

Mapping Butterfly Observations

Driving Question: Where do the different butterfly species live?

On the map of North America below, put colored dots on the areas where you find each species of butterfly. You get to pick what colors to use! After you look for monarch butterflies, try looking for other species, or search for others not in the list below. Make sure you color in the "key" that tells what color represents each kind of butterfly. If you want to create a map for species in other parts of the world, search for a map you can download online.



Butterfly Species

- ◯ Monarch
- ◯ Black Swallowtail
- ◯ Red Admiral
- ◯ Clouded Yellows
- ◯ Behr's Hairstreak
- ◯ Tiger Swallowtail
- ◯ American Copper
- ◯ Northern Crescent
- ◯ Other _____

Asking Your Own Questions

Now it's time to ask your own questions that you can answer using iNaturalist data.

In the table below, write some questions about butterflies that you wonder about. You will see a sample question to get you started! Then write your ideas about what you THINK will be the answer. Then use the iNaturalist app to find out more about butterflies. When you feel you have found answers, you can write your conclusions in the space provided!

Question	What data do I need to find?	Conclusions
What time of year are Monarchs found near me? In Mexico?	*Look at the dates of observations in each areas*	
What other kinds of butterflies are found near my home?	*Search "butterflies" and type your home state in the "Location box."*	

Share your questions and conclusions with a teacher or parent. They can help suggest other ways to use the data, or they might help ask other new questions!