Virginia 4-H STEM @ Home Activity

Backyard Biodiversity!

iNaturalist app showing the user interface and observations made by the user.

Supplies:
Internet Connected/Mobile Device Version:
- Mobile device with internet connection,
- iNaturalist app (iNaturalist, LLC). Compatible with iPhone, iPad, and iPod touch with iOS 9.3 or later. Compatible with Android 6.0 and up.

iNaturalist app.

No Internet/No Mobile Device Version:
- Various plant and animal field guides (Audubon, Peterson, etc.), these can be found at your local library
- Notebook
- Pencil/Pen

Age:
4+, 13+ to create an iNaturalist account
(Parents can join in on the fun and confirm IDs too!)

SOLs:
Scientific Investigation, Reasoning, and Logic: 1.1, 2.1, 3.1, 4.1, 5.1, 6.1;
Life Processes: 1.4, 1.5, 2.4, 2.5, 3.4, 4.4;
Living Systems: 3.5, 3.6, 4.5, 5.5, 6.7;
Earth Resources: 4.9;
Life Science: LS.4, LS.8, LS.9, LS.10, LS.11, LS.13;
Biology: BIO.1, BIO.6, BIO.8

5C:
Critical Thinking, Collaboration, Communication

Life Skills:
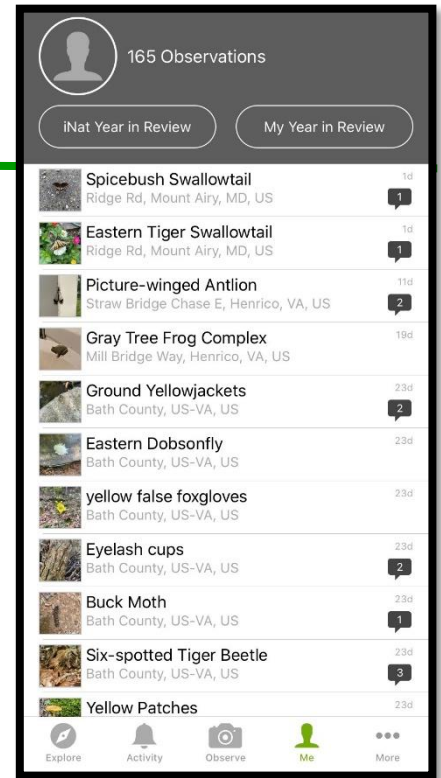Keeping Records, Learning to Learn, Responsible Citizenship

Time:
30 minutes +

An assortment of field guide books for identifying living things. National Audubon Society and Peterson Field Guides are a couple examples.
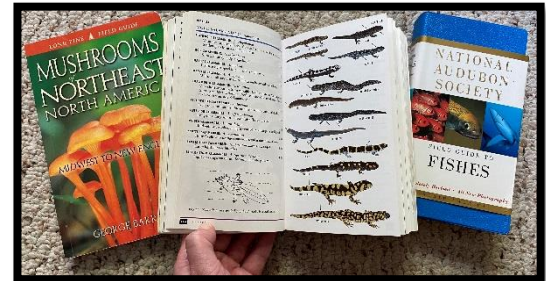
Background:
Discover the biodiversity (variety of life) in your backyard! Have you taken the time to see what plants and animals are living in your backyard? With a little patience and careful observation, you might see a lot more living there than you previously thought!

If you choose to use the iNaturalist app on your mobile device, you will be contributing to a large "citizen science" project created by the California Academy of Sciences and the National Geographic Society. By recording your observations, you will create data scientists can use (research-quality) to understand where different species live, and how many there are so they can understand and protect nature. You will also be able to connect with scientists or other people interested in nature, and get help identifying hundreds of thousands of plants and animals! For more information: https://www.inaturalist.org/ For help, visit the Getting Started and Video Tutorial sections of the site: https://www.inaturalist.org/pages/getting+started

Virginia Cooperative Extension
Virginia Tech • Virginia State University
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No internet or no mobile device? No problem! You can use field guides (a book used for identification of birds, reptiles, or other living organisms) while sketching and recording other information about what you find in a field notebook. Many scientists still do this today! Scientists keep careful records of the habitats they explore- note things such as the weather conditions, date , time, and geographic area. iNaturalist will automatically collect date, time, and latitude/longitude for you when making observations. If using a field notebook, be sure to record this information!

Organisms are classified into "taxonomic ranks". These are Domain, Kingdom, Phylum, Class, Order, Family, Genus, and Species. Domain is the most broad and species is the most specific. You may be most familiar with genus and species: for humans, these are Homo (genus) and sapiens (species). In this activity, you will try to identify living things as specifically as possible. Internet searches can help you to determine which rank you've found if you aren't sure.

Project Goal: Find as many types of living things (plants, animals, etc.)as you can in a chosen area, and keep a record of what you see!

What to Do:

1. If using a mobile device, make sure the iNaturalist app is installed and that you have permission to use it. If you are not familiar with iNaturalist, follow the information provided in the app after downloading or visit the help section of the iNaturalist website.
2. Get outside! Choose an area you would like to explore (your backyard, a park, etc.).
3. Use all of your senses. What do you hear? Smell? See? Carefully look on the undersides of leaves, cover items such as logs (always roll towards you for safety), or in places you haven't explored before. Record descriptions of the habitat/environment in your notebook or use iNaturalist.
4. Look for any kind of living thing including plants, animals, fungi, insects, etc. If you can do so safely, take pictures (multiple angles are best!). Use the "Observe" feature in the iNaturalist app to add to your observation list (save the observations). If you can't take pictures, try making a sketch of what you see. Record observations of their behavior.
5. Try to identify the organisms you found. You can use your field guides, search on the computer, or use the automatic identifying feature in iNaturalist. If the app says it is "pretty sure" of an ID, you can save it. If you aren't sure and the automatic ID doesn't seem right, it is ok to leave it as "Unknown". The community can help you to ID!
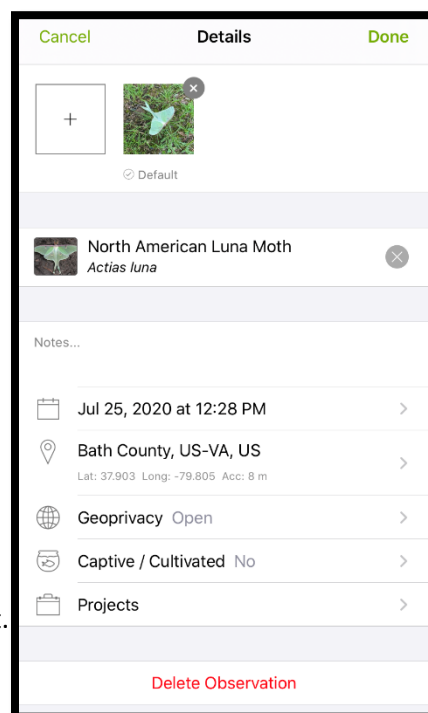
The app after taking a photo observation. The bar with "North American Luna Moth" will say "unknown" until you select it to get identification suggestions. In this case, the insect was able to be identified to include the genus (Actias) and species (luna) level.

Reflect:

1. What kinds of organisms did you find? How are they alike and how are they different?
2. How far down the taxonomic rank were you able to classify organisms?
3. How many different kinds of organisms did you find? The more you found, the more biodiverse the habitat is.
4. Try the same activity in a different type of environment. For example, if you tried the activity in your backyard, try the woods instead. Is the other environment more or less biodiverse? Why do you think this is the case?

Apply:

1. Why do you think these organisms are important in the environment?
2. Do they have any features or behavior that suggest what their function is? For example, an animal with large eyes, claws, and teeth may be a predator. Green plants use energy from the sun and nutrients from the soil to make food for themselves and serve as food for other organisms.
3. Why is biodiversity important? Think about the products and medicines we get from plants and animals, and why some animals get sick from certain diseases when others don't.
4. How can you increase the biodiversity in your back yard? Think of what different specific plant, animal, and insect species need to survive.

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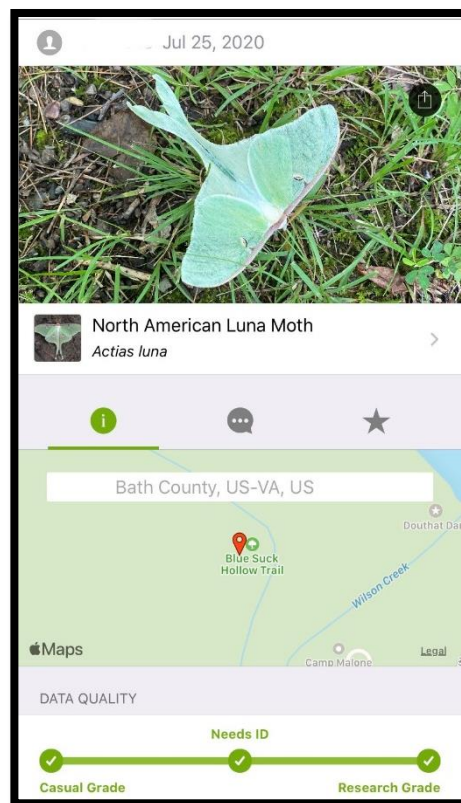
Final observation data in iNaturalist. Includes your photo, the common name identification (North American Luna Moth) with taxonomic level (Genus and species: *Actias luna*), a map showing where the observation was made (must allow your device to record location for this feature), and data quality. If your observation reaches "research grade" this means that other users have confirmed your ID and scientists can use your data in their projects!

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