Sketching an Ecosystem

Grade **7**

Subject: life science

Time: **2** weeks or more

Description

With this project, students will be creating a field journal, documenting the local ecosystem in a nearby park, their backyard, or even on school grounds. They will be given their own personal sketchbook, and be responsible for filling it out on their own time. This project teaches students about their local ecology while also giving them the opportunity to learn basic observational drawing skills, which come in handy for a variety of career fields.



State Standards

7-LS2-3 : Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Learning Objectives

Students will be able to identify specific organ - isms in a local ecosystem and their functions.

Students will be able to assess how energy transfers between various organisms in a real food web.

Students will be able to evaluate the complexity of ecosystems and expand on the impact human activities have on them.

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Materials

Required:

- Sketchbooks/lineless composition books
- Pencils and pens
- Erasers
- Crayons *(in various colors)*
- Clear tape

Additional:

- Highlighters *(for further decoration)*
- Colored pencils *(for further decoration)*
- binders/folders with copy paper *(can be used as a substitute for bound sketchbooks)*



(Your set up might look something like this)

Assessment Questions

What is the difference between a heterotroph and an autotroph? Which one stores more energy?

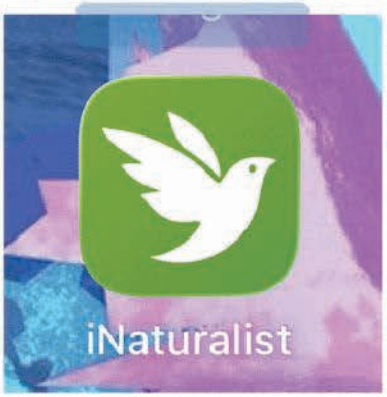
What are some examples of primary consumers in your ecosystem?

What happens to the total amount of energy as it moves up the food chain?

Instructions



1 Pass out a sketchbook to each of your students. If you are unable to secure funding for sketchbooks, you can easily do this project with some sheets of copy paper and a folder/ binder to store them in.



2 Have your students take field notes of a local ecosystem, identifying and illustrating the organisms they see or find evidence of. You can decide what type of specimens students should record or what students should specify in their notes based on what you are learning in class. Though, for identifying species, I would recommend having your students use the iNaturalist app or Google Lens for an easier time.



3 Simply download and open the iNaturalist app, and click the camera icon on the app's home screen. This can be done even if you don't create an account. It should open up your phone's camera, and you can either snap a picture of the organism or upload a picture of it from your camera roll.



4 The app should identify the organism to the best of its ability, and give you a confidence rating. Students can then look up the name of the organism and do more research on it independently.

Instructions



5 For documenting producers, students can choose to tape small specimens such as flowers, weeds, and grasses in their sketch - book. To do this, they can press the plants in between the pages of a heavy book for at least 1 to 2 days. Additionally, for any big leaves they find, they can make a leaf rubbing in their sketchbook.



6 To produce a leaf rubbing, put a leaf underneath a thin sheet of paper. Make sure the leaf is facing vein-side up. Take a crayon and unwrap it, and gently rub the crayon against the paper, making sure to hold it in place with your other hand.



7 Continue to rub the crayon until you see the full outline of your leaf. I would recommend using a darker colored crayon for this as the rubbings tend to turn out faint. Students can also redraw or outline any portions of their rubbings as necessary.



8 Now, for sketching wildlife, I understand that many students might be intimidated at first. However, I broke down the basics steps of observational drawing here so that more hesitant students can have a reference to go off of. The first step, of course, is to find your subject and sit near it or take a photo. The picture shown here is one that I got of a rabbit in my backyard before it took off.

Instructions



9 Second, look at your subject closely, and quickly draw a line of action. A line of action is a simple line that shows the ' motion , ' or general position of your subject.



10 Next, take another good look at your subject, and begin breaking it into big, simple shapes. For example, I drew the rabbit's body as a kind of split-in-half oval. I also broke up the rabbit's head as a circle and a trapezoid, and drew the ears as ovals.



11 Keep on looking at your subject and breaking it down into smaller (but still simple) shapes. Pay attention to the curves of your subject, and refine the shapes you have already drawn. Look at how big or how long some of these shapes are compared to the other shapes making up your subject, and adjust.



12 Lastly, add your subject's interior features, such as its eyes, and define its outline. Erase your ' constructing ' shapes and lines, and you should have a finished sketch from life. While your students will not automatically become master artists from following this method, they will at least be drawing what they see, not what they think.

Instructions



13 Encourage students to be creative with their sketchbook pages. Students can outline their drawings with pens, add some color with highlighters, or experiment with different note layouts. Pictured to the left is an example spread I did with little drawings: I just mostly played with text and colors.



14 And that's all there is to it! As mentioned before, you can add certain parameters or change things based on what is best for your class, deciding what kinds of information students should try to record. In the end, students will have a visual record of the natural world around them, made through their own eyes and hands.

Art History

Despite what people might initially believe, art has always played an important role in the spread of scientific knowledge. In fact, scientific illustrators specifically create artwork that communicates scientific subjects and principles to the public, and have been doing so for hundreds of years.

Scientific illustration is primarily used in medical fields to depict internal structures, as well as in life sciences to document rare organisms and ecological phenomena. Some of the earliest scientific illustrations come from field notes, in which scientists and explorers would carefully observe and sketch out their specimens to produce an accurate record of them.

Likewise, observing and recording the natural world is a key practice artists use to improve their drawing skills. In particular, the artists of the Renaissance highly valued scientific observations, with many artists such as Leornado Da Vinci producing highly detailed sketches of the human body, complete with some notes to the side. With this project, students engage with the long lineage of scientific illustration and learn how to better observe the natural phenomena happening all around them.



Page 93 from Lewis and Clark Journals, Codex J, Meriwether Lewis, 1806



Anatomical Study of the Arm, Leonardo da Vinci, 1510