Educator Guide: Using iNaturalist with Students

iNaturalist is an free observation platform that acts as a place for people to record biodiversity observations, interact with other enthusiasts, and learn about organisms. Observations from iNaturalist can also contribute to biodiversity science by being shared with open science projects such as the Global Biodiversity Information Facility (GBIF) and the Encyclopedia of Life (EOL). Scientists (and anyone) can freely access and use these data to address their research questions.

iNaturalist is designed to be used by anyone, and with practice can be a great tool for students. This guide will walk you through recommendations for the best ways to use iNaturalist with students in formal or informal settings so they learn from the experience and contribute high-quality observations to the iNaturalist community.

Before the City Nature Challenge

Build a Foundation in iNaturalist Before Engaging Students

It's important to have a strong foundation using iNaturalist before introducing it to students. Spend time viewing tutorials, reading the iNaturalist Teacher's Guide, making observations, and interacting with the iNaturalist community. The iNaturalist team recommends making 20-30 observations in the area where you plan to bring students or participants so you learn the technology and become familiar with some of the organisms your students may find.

Set up iNaturalist Account(s)

Users must be at least 13 years old to have an iNaturalist.org account. Educators must decide if they want students to have their own accounts or if they want a class or group account that all students have access to. There are pros and cons for both options.

- Individual Student Accounts (only for students 13 years or older)

  Pro: Students have the ability to have their accounts and keep using it once the experience is over.
  Cons: If students are posting inappropriate observations or identifications, there is no teacher-level ability to correct. Having students sign up as individuals might violate school-specific rules.

- Class or Group Account

  Pro: Teacher has the ability to check observations. Class dataset can be used over many years.
  Cons: Students can't take the account with them (we recommend changing the group password after each batch of students). No record of which specific student is making which observation.

Explore iNaturalist Features

- Learn how to set up an iNaturalist Project for your class to practice making observations
- Have students explore the features of iNaturalist including filters and observation maps, especially if you plan to do a follow-up data analysis activity after the City Nature Challenge (see extensions)
- Try the Encyclopedia of Life's Introduction to iNaturalist Lesson for a guided student exploration.

Practice Making Good Observations

Explain what is appropriate to record (see iNaturalist teacher's guide for more)

- ***Most living things*** you find outside like plants, animals, fungi, even microorganisms!
- ***Uninvited house guests*** (pests or critters you are not raising to live with you)
- ****Note:*** If an organism is not wild, it will be marked as a "casual" observation and although it will count for your city's total observations in the CNC, it will not be counted as a verifiable observation and cannot become research grade.

Explain what is NOT appropriate to record (see iNaturalist teacher's guide for more)

- ***House plants and pets***
- ***Zoo animals***
- ***Greenhouse plants***
- ***Human faces***

Learn what to observe for different taxa and how to photograph them

- ***Take multiple photos if possible, at different scale***. Start with the whole organism, then zoom in on some characteristics like leaves and bark of plants, top and bottom of mushrooms, and various characteristics for animals. Think of the characteristics that are important for identifying the organism.
- ***Look for recommendations from experts in the iNaturalist community*** on your observations for what include in photos for different organisms.

Add multiple photos of the same organism/species in the same observation.

- ***Mobile App***: Take multiple pictures or photograph beforehand and select several from your camera roll.
- ***Desktop***: On the upload tool, drag and drop multiple photos into one observation.
- ****Note: Be sure there is only a single species in each observation***

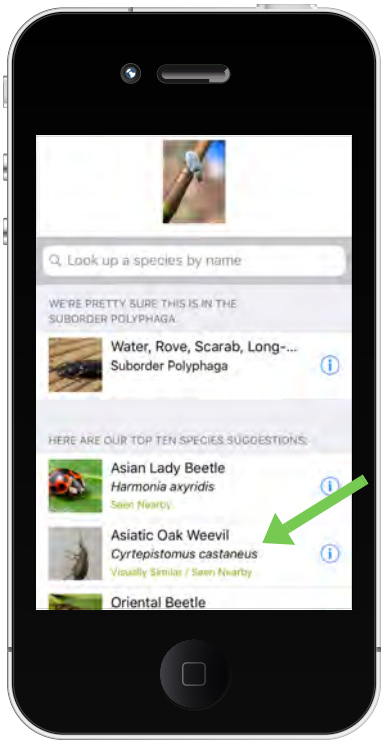
Tag your Observation to a Taxonomic Group

Add an identification by tagging each observation to a taxon, or taxonomic group. You do not need to know the species, but it is best practice to tag it to some group so iNaturalist users can find and offer identification suggestions.

For example: If you took a picture of an insect but aren't sure what kind, you can start typing "insect" in "what did you see" and you will see a list drop down with options. Choose the "Insects" taxon.

In both the mobile and desktop versions, the iNaturalist tool will suggest IDs for your observations. This is a fantastic feature, but is not always perfect. Only choose the suggestions if you are confident that it is accurate.

For example: If you have a blurry picture of a hawk, the tool may only recognize parts of the image and suggest sparrows as the ID result. In that case, type "hawks" or a higher taxon (birds).



I recognize this weevil I found as an Asiatic Oak Weevil, one of the iNaturalist suggestions

Using Smartphones or Tablets in the Field

Before going outside, demonstrate strategies for photographing with mobile devices:

- Hold the device still.
- Stand close enough to see the subject clearly, but not too close so that the image is blurry.
- For insects or other invertebrates, temporarily hold in a petri dish or similar container to photograph.
- Focus on *one* subject if looking at multiple species.
- ***Pro-tip****:* Try an inexpensive smartphone macro lens, which you can order online. Clamp the lens over your phone lens and move it closer until the subject becomes clear.

Have students practice inside the classroom or other indoor space:

- Collect some leaves, insects in petri dishes, and fungi or lichen from outside temporarily.
- Place different specimen around your classroom and have students practice taking pictures without uploading first.
- Have students practice uploading in the app, learning the necessary steps for an observation: image(s), tagging a taxon, setting up automatic geolocation or choosing location, adding observations to a project.
- ***Note***: Please delete “practice” observations or multiple observations of the same test subject (i.e. if 25 students upload the same millipede).

Assign roles for the field:

- Refer to the "Tips for Bringing Students Outside" Guide for an equipment list for field exploration.
- Students are more likely to stay on task and use technology appropriately if they work in groups. Assign roles such as photographer, observers/collectors, recorder, supply master.
- Students can take turns in each of these roles so they share responsibility and learn from each job
- Remind students to value quality over quantity. They will learn more from discussing the characteristics of what they are observing in the field rather than from a blurry picture of a distant bird.

Photo: Amy Lorenz, Encyclopedia of Life

Photo: National Park Service

Interact with the iNaturalist Community

- Help manage student accounts, or simply have a class account.
- Check your dashboard and project to see which observations the iNaturalist community has identified.
- Make comments or thank members who helped ID something.
- Be sure to consider feedback from the community, everyone can learn a lot from these interactions.

During the City Nature Challenge

Send Students out to Participate!

- **Have students join your local CNC project** to receive important notifications. In the iNaturalist.org Projects tab, search for "City Nature Challenge 2018" + your city. Click on the correct project and click the "Join this Project" in the upper right-hand corner.
- **Keep track of student participation:** have students add their observations to your class project so you can see what students are observing, make comments and suggestions, and "be a steward" of your class data.
- **Ways to participate:**
  - Do a mini "bioblitz" in your schoolyard or nearby park.
  - Have kids make observations at home or around their neighborhoods
  - Find out about organized CNC events in your area

Photo: Amy Lorenz, Encyclopedia of Life

After the City Nature Challenge

Explore CNC results and continue discovering local biodiversity!

- Investigate the results through one of our iNaturalist data analysis activities:
  Ages 10-14: Exploring iNaturalist Data (from National Geographic)
  Ages 14-18, Undergraduate: City Nature Challenge Data Exploration (from Encyclopedia of Life)
- Have students choose a group of organisms they enjoyed observing. Using iNaturalist and other resources, make a poster, presentation, or lesson about how to distinguish between organisms and give local examples. Here's an example of a guide to distinguish characteristics of arachnids.
- Visit SciStarter.com to explore opportunities to engage in more citizen science throughout the year.
- Run your own monthly or seasonal schoolyard bioblitzes to see what students can find throughout the
- year. Build a school garden or add flower boxes, bird feeders, and cover boards to enhance school habitats. Document what students see throughout the year.

Links and Resources

iNaturalist Teacher's Guide: https://www.inaturalist.org/pages/teacher's+guide
iNaturalist Video Tutorials: https://www.inaturalist.org/pages/video+tutorials
iNaturalist Getting Started Guide: https://www.inaturalist.org/pages/getting+started
iNaturalist Guide to Managing Projects: https://www.inaturalist.org/pages/managing-projects
EOL Activity: Introduction to iNaturalist: http://education.eol.org/lesson_plans/9-12_CitSci3_IntroToINat.pdf
National Geographic Activity: Exploring Data: https://www.nationalgeographic.org/activity/analyzing-bioblitz-data/
EOL Activity: CNC Data Exploration: http://education.eol.org/lesson_plans/9-12_CitSci4_CNC-Data.pdf

Have Questions or Feedback? Contact Amy Lorenz, Encyclopedia of Life [alorenz@eol.org]