

Human-Wildlife Interactions

Lesson Plan and Activities

Grade Level: Grade 11

Goals:

- Introduce students to the way humans interact with wildlife and how we impact wildlife, as well as our impact on their evolutionary responses.
- Highlight examples of our close association with animals/plants in urban areas.
- Introduce citizen science; show how students themselves can get involved in the scientific process.
- Encourage students to reflect upon their own interactions with wildlife and the general urban ecosystem within their day-to-day life.

Curriculum Links:

Life Science 11

- Microevolution - adapting to changing environments, natural selection
- Taxonomic principles for classifying organisms
- Binomial nomenclature

Environmental Science 11

- Ecosystem complexity - roles, relationships, population dynamics
- Benefits of Ecosystem Services
- Human Actions and their impact on ecosystem integrity
- Resources stewardship

Pre-Museum Program and Activity



For this assignment, you will need to identify a plant or animal and post your observation to the citizen-science app iNaturalist. After you complete this activity, use the Human-Wildlife Interaction worksheet (located later in this document) to explore the Beaty Biodiversity Museum.

Materials (one per student):

- Smartphone or other mobile device (with a camera)
- Paper or notebook
- Pen or pencil

Time Needed: 50 minutes

Background Information

What is iNaturalist?

iNaturalist is a free platform where nature observations can be recorded and viewed by a community of people also interested in the natural world. By adding observations, you are contributing to citizen science, which can create data for science research and conservation.

Teachers! *Seek (https://www.inaturalist.org/pages/seek_app) is another option created by iNaturalist for those who would prefer not to submit their observations or create an account. The image recognition technology used in Seek is based on iNaturalist user observations and identifications, although the data collected in Seek is not stored in the app or shared publicly. If students are more comfortable with Seek, feel free to modify the assignment as you see fit (ex. ask students to write up their observations and metadata in an informal report).*

Why citizen science?

Citizen science is an approach to collecting data that emphasizes participation by local community members from all walks of life. Citizen science can help introduce new people to scientific fields, while also being a very efficient way to collect important scientific data. The data collected in this assignment may help future research into urban evolution and/or ecosystem monitoring!

Check out these real life examples of citizen science!

Reducing newt road mortality in California's Santa Cruz Mountains:

- This online article details an initiative led by citizen science conservationists in California's Santa Cruz Mountains to document the detrimental effects of a local road on a population of endangered newts.

<https://www.atlasobscura.com/articles/pacific-newt-massacre.amp>

Identifying invasive insect pests in Canada:

- This online article highlights Canadian examples of citizen scientists who have been the first to observe invasive insect pests using iNaturalist.
- These observations provide important records of when and where insects are spreading, and may prove useful in the eradication of insect pests.

<https://theconversation.com/the-next-invasion-of-insect-pests-will-be-discovered-via-social-media-143527>

How to set up an account:

- **Step 1:** Download the iNaturalist app to your mobile device.
- **Step 2:** Create an account by making a login and password, this can also be done at the website <https://www.inaturalist.org/>
 - If you do not want to create an account or share data, try Seek (https://www.inaturalist.org/pages/seek_app)
- **Step 3:** Once you have an account you can sign in and start making observations

How to make observations:

- Open the app
- Touch the camera icon
- Take a photo, or select a photo from your photo library. Written observations can be included, as well as a sound recording (optional).
- Fill in details such as **what** you saw. Note if location services are turned on **when** and **where** you saw the species will be filled automatically.
- Touch the save button
- Touch upload

Note: if you do not know what you saw, you can leave the identification blank and the iNaturalist community will help you identify it. Additionally the community can verify the identity of your organism.

More detailed instructions for making observations with an iPhone, Android, and from the web can be found at <https://www.inaturalist.org/pages/getting+started>

Assignment details:

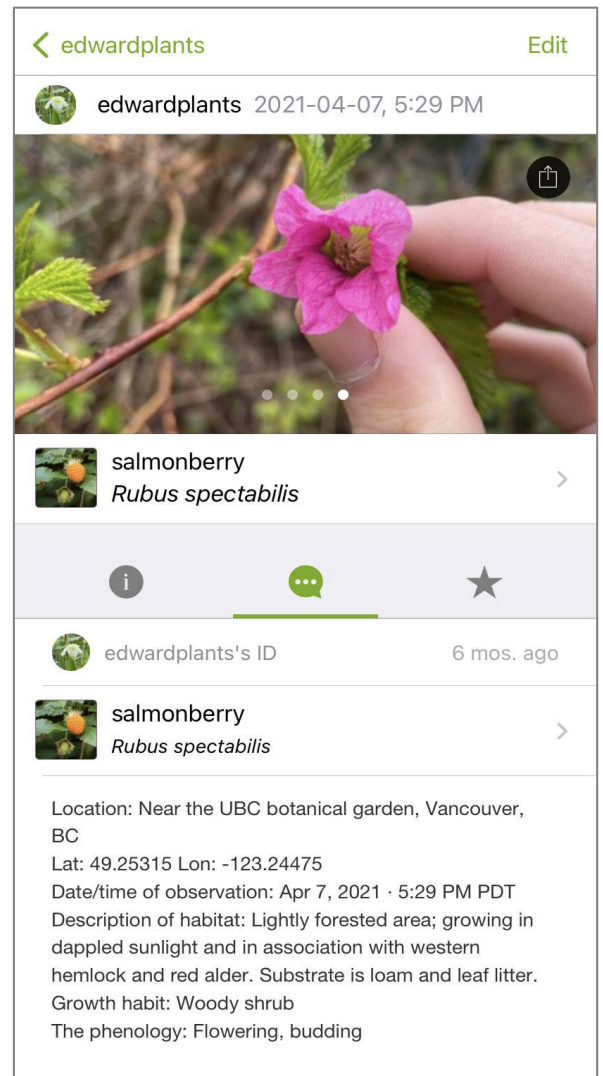
iNaturalist Biodiversity Journal

Before adding any of your own observations, take time to explore existing observations near your school on iNaturalist!

- What organisms have already been observed in your area?
- What sorts of plants, animals, and fungi might you expect to see when you begin to make your own observations?
- Try using the map feature to see which organisms exist in your vicinity, and take note of their identities before you go out into the field.

For this assignment, you need to identify a wild plant or animal and post your observation to the citizen-science app iNaturalist. If your class is using Seek, encourage them to record these details in a nature journal (either in paper or online) to accompany their observations.

1. As part of your observation, you will need to include a verifiable observation with the following metadata in the “comments” section:
 - Location (include latitude and longitude)
 - Date/time of observation
 - A brief description of the habitat, including other organisms found nearby
 - The body plan or growth habit of the observed organism
 - The phenology, or stage of life, of the observed organism
2. Attempt to identify the organism you have found by yourself, and input your own identification as part of your observation on the iNaturalist app. Explore what your classmates have recorded!



Example of a completed observation. Image created for Beaty Museum Educational use by Edward and Mira,

Tips and tricks!

- **Take clear and easily-identified photos.**
Photos that are blurry or taken from afar may be difficult for you and others to identify, and it can be impossible to verify the identity of the organism that you've found. Make sure to frame and focus on your organism of choice!
- **Take more than one photo.** Some organisms are difficult or impossible to identify from a single shot. Try to take photos of your organism from different angles/directions.
- **Try to find wild organisms.** Don't take photos of your pets, houseplants, or garden/landscaping plants.
- **Don't submit photos that include people's faces.** Please respect everyone's privacy since iNaturalist is a completely public platform.
- **Don't submit photos that are not yours.** This is a violation of iNaturalist's terms and conditions

References

- <https://www.atlasobscura.com/articles/pacific-newt-massacre.amp>
- <https://theconversation.com/the-next-invasion-of-insect-pests-will-be-discovered-via-social-media-143527>
- <https://www.inaturalist.org/pages/getting+started>
- <https://www.inaturalist.org/pages/help#general1>
- <https://www.inaturalist.org/pages/teacher's+guide>

In-Museum Activity

Head to the Beaty Biodiversity Museum to expand your knowledge on the organisms you observed in iNaturalist!

Materials (one per student):

- Paper or notebook
- Pen or pencil

Time Needed: 50 minutes

Background Information

Students will build on their iNaturalist observations. Ensure that each student has a few organisms they would like to explore!

In this document you'll see the answer guide to help facilitate the student's time at the museum. You can also find a separate printable worksheet on the museum website for easier printing.

Useful terms and concepts!

Ecosystem services: These are positive benefits humans receive from wildlife and the ecosystem. This includes food, water, fuel, building material, medicine, pollination, photosynthesis, carbon storage, contribution to culture, and much more.

Taxonomic ranking: Taxonomic rankings denote groups of organisms that are related to each other. The most commonly used taxonomic ranks include: kingdom, phylum or division, class, order, family, genus, species (in order from broadest to most specific).

Common name: A common term for a given organism. Can change depending on culture/geographic region.

Species name: When naming a species you use two identifiers, the name of the genus and the name of the species, also known as the generic epithet and specific epithet. Together, these make up the species name.

Generic epithet: The first part that makes up a scientific species name. The generic epithet is the part of the species name that tells you which genus a specific species belongs to. This name should always be italicized. The first letter should always be capitalized, and the rest of the name should be written in lowercase.

Specific epithet: The second part that makes up a scientific species name. The specific epithet is the part of the species name that denotes the specific species. This name should always be italicized and should be written in all lowercase.

THE BINOMINAL/SPECIES NAME

Lilium philadelphicum

Generic epithet

Specific epithet



THE COMMON NAME

wood lily

Image created for Beaty Museum Educational use by Edward and Mira, BIOL 490A students.

Human-Wildlife Interaction

Worksheet: **Answer Guide**

The following answer guide provides examples of student answers to the questions in the Human-Wildlife Interaction worksheet. Encourage students to answer the worksheet using their own personal experiences.

As you explore the museum, take time to consider and fill out your answers to the following questions:

1. **What wildlife do you interact with within your own day-to-day life?**

Examples include: Swatting a mosquito from your arm in the summer. Or picking and eating wild salmonberries while out on a walk. Or being woken up by bird songs in the spring. Answers will depend on each student's own lived experiences. Encourage students to be creative!

2. **Consider the species you observed using iNaturalist, describe the ways in which you have or might interact with this species.**

The answer will depend on the organism that the student has observed in iNaturalist or Seek, and should be answered through personal experience/knowledge. Examples of interactions include: Observing the organism for pleasure (such as a flower or a songbird), using the organism for food (such as wild berries or foraged vegetables), using the organism as shelter (such as a shade-providing tree), trying to get rid of the organism (such as a garden or house pest).

3. **What impact does this interaction have on you or the organism you observed?
Do you view this as a positive or negative interaction for humans?**

This answer will again depend on the organism the student has observed, as well as the student's answer to question 2. The student should come up with two impacts of the human-wildlife interaction they previously described: one affecting their chosen organism and one affecting humans. These answers should be thought of by the student, but may be inspired by museum exhibits or independent research (ex. domesticated sunflowers provide food and oil, which is a positive effect for humans; domestication also ensures the survival of sunflower lineages, a positive effect for sunflowers.).

4. Find and sketch one organism from the museum that is related (preferably within the same taxonomic class) to the species you observed using iNaturalist. Can you think of any interactions you have had with this organism? How do these interactions compare to what you put down for question 3?

Related organisms (and their respective taxonomic classes) may be found on the various museum cabinets. Depending on the organism that the student has observed, it may or may not be easy to find a close relative within the museum exhibits. If students are unable to find another organism within the same taxonomic class, ask them to find an organism in the same phylum or kingdom. Students should think of their own interactions with this new organism, or potential interactions they will eventually have with the new organism.

5. Identify at least one trait that might affect the frequency or type of interaction between humans and a given organism. Think about organisms you see/interact with frequently - do they share any similarities?
Students may come up with many different answers for this. Possible answers include: How bold the organisms is (ex. crows, raccoons) where more bold species are likely to get closer to humans. Organisms who are scavengers (ex. coyotes, black bears, raccoons, crows), which are often attracted to human garbage. And organisms that provide ecosystem services to humans, such as those that are used for food, or provide useful materials to humans such as timber, and wool.
6. Predict and find one species in this museum that might be negatively impacted by interacting with humans. Provide its full name. Why might it not do well?
Encourage students to explore the museum exhibits and think creatively to answer this question! For example: The micro-ecosystems created by moss and bromeliads might be negatively impacted by interacting with humans because they are sensitive to water quality, and because urbanization often pollutes the local water quality. Species names need to be italicized and the first letter of the generic epithet (genus name) should be capitalized. For example: *Buckiella undulata*

References

- <https://www.biosciencewriters.com/Species-Taxonomy-Nomenclature.aspx>
- <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Understanding-Conservation/Ecosystem-Services>

Post-Museum Activity

This document includes a set of coloring sheets for students to reflect on their time at the museum. Coloring sheets include a variety of plants that can be found growing around the Vancouver area, including both native and introduced species.

Materials (one per student):

- Paper or notebook
- Coloring pencils or markers

Time Needed: 15 minutes

Background Information

Students will color some of Vancouver's most iconic plants!

While coloring the plants illustrated in the following document, students will be encouraged to reflect on their time in the museum, their iNaturalist observations, and their own relationships with plants around the lower mainland. Plants provide many ecosystem services such as food, shade, and building materials.

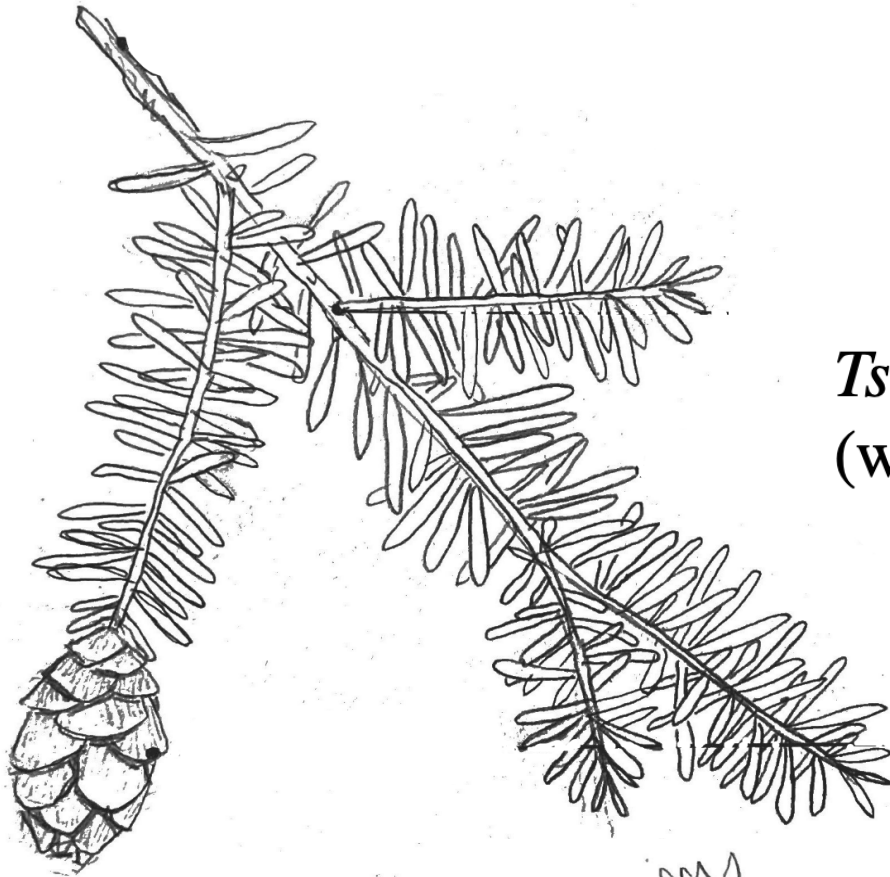
You can also find a separate printable coloring sheet on the museum website for easier printing.

Magnolia grandiflora
(southern magnolia)



Rubus armeniacus
(Himalayan blackberry)





Tsuga heterophylla
(western hemlock)

Taxus brevifolia
(pacific yew)

