

Tracking Trophic Levels in the Community

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Course: Grade 7 Science

Strand: B. Life Systems

Ministry Expectations

Overall:

B2. Exploring and Understanding Concepts: demonstrate an understanding of interactions between and among biotic and abiotic components in the environment

Specific:

B2.3 describe roles and relationships between producers, consumers, and decomposers within an ecosystem

B2.4 describe the transfer of energy in a food chain, and explain the effects of altering any part of the chain

Lesson Overview

In this lesson, students will explore a local outdoor space to identify real organisms in their natural environment. They will then classify them into trophic levels: producers, primary consumers, secondary consumers, decomposers, etc. and collaboratively construct local food webs. Students have the freedom to choose how to construct and present their food webs using materials and mediums of their choosing, supporting diverse learning preferences and creativity. The lesson also incorporates Indigenous perspectives by inviting students to reflect on their personal connection to land and role within nature, not separate or above it. Through observation, discussion, and analysis, students will deepen their understanding of ecological relationships, energy flow, and interdependence in ecosystems.

Learning Goals

Students will:

- Classify organisms into trophic levels using observations and research
- Build and analyze a local food web
- Reflect on energy flow and interdependence in ecosystems, as well as how ecosystems are impacted when disrupted

- Demonstrate respectful engagement with the land and consider Indigenous ways of knowing

Success Criteria

I can:

- Identify producers, consumers, and decomposers in a local ecosystem
- Create a food chain/web based on my observations
- Explain how energy flows through an ecosystem and how living organisms depend on one another
- Describe how changes to one part of a food web can affect the whole system
- Develop a data collection tool (i.e. chart, table, phone, or others) that aligns with nature of science standards

Materials Needed

- Clipboards and pencils
- Blank paper for observations
- Tablets or phones with cameras for recording observations and researching
- Field guides or identification apps
- Chart paper or Bristol board (for food web creation)
- Markers, string, scissors, glue, tape

Safety Considerations

- Do a site check ahead of time to identify and avoid any potential hazards in the area (e.g., uneven ground, poison ivy, etc.)
- Ensure students stay within designated boundaries and are always within an adult's eyeview.
- Be aware of any student allergies to environmental triggers, plants, or insects. Bring EpiPens if needed.
- Remind students to be prepared to go outdoors. This includes dressing appropriately (e.g., closed-toe shoes, jackets, hats, etc.) and wearing sunscreen.
- Review emergency procedures in case of an injury or if a student gets separated. Be sure to bring a first aid kit.
- Remind students to use their electronic devices responsibly outdoors, strictly for documentation or research purposes.
- Ensure students wash their hands after outdoor exploration, especially if they handle soil, plants, etc.

Lesson Plan

Minds-On (10 mins)

- Ask students: *"What did you eat for dinner last night?"*

- Have students share their responses and write some common items on the board (e.g., chicken, salad, steak, hamburger, rice, vegetables, tofu, soup)
- As a class, discuss where each food item came from and the trophic level it belongs to, for example:
 - Salad → Lettuce → Plant → Producer
 - Beef Hamburger → Cow → Ate grass → Primary Consumer
 - Fish → Ate smaller fish or zooplankton → Secondary/Tertiary Consumer
- Briefly introduce or review trophic levels: Producer (plants) → Primary (herbivores) → Secondary (carnivores/omnivores) → Tertiary (top predators) → Decomposer (break things down)
- Transition into Main Activity: *“Just like we can trace our meals to trophic levels, we can do the same with organisms around our schoolyard!”*
 - Ensure to review all safety considerations before going outside.

Action/Activity (50 mins)—Outdoor Ecosystem Exploration

- Take students outside to the schoolyard or nearby natural space. Ask students to pick up or gently touch a piece of the natural land (e.g. a leaf, rock, twig, pine cone, tree etc.)
 - Prompt: *“Take a moment to really notice this piece of nature. Where do you think it came from? Who or what depends on it? What might happen if it disappeared?”* Have students silently reflect.
- Then open the activity with a Land Acknowledgement.
 - *“I want to acknowledge that we are learning today on the land of the [local Indigenous Nation(s)]. Let’s take a moment to thank the plants, trees, insects, and animals around us for making this place so full of life. As stewards of the Earth, we know we have a responsibility to observe this land with care and respect.”*
 - This land acknowledgement will hopefully help students feel more connected to the land and nature, as well as remind them to be respectful when exploring.
- Now allow them to freely explore the environment for 10 minutes and let their curiosity run free. The goal is not to categorize yet, just observe and wonder. They may explore independently, in pairs or small groups.
- Ask them guiding questions to focus their observations, for instance:
 - *“What kinds of living things do you notice? What non-living things do you notice?”*
 - *“Try to make connections between the things you’re observing. How many connections can you make? Consider both biotic-biotic connections as well as abiotic-biotic connections.”*

- o *“Do you see any evidence of animals even if you don’t see the animals themselves?”*
- o *“Which living things may depend on each other here?”*
- o *“Where do you think the organisms you observed get their energy from?”*
- After free exploration, invite students to shift into “scientist mode” where they begin to record their field data observations in a method of their choosing (e.g., list, table/chart, photos, sketches etc.). These observations will then be used to construct a food chain/web.
- Emphasize students to record what organisms they see, what their role in the ecosystem might be/which trophic level they belong to, and evidence to support their ideas. They may also note abiotic factors as well and explain its role/connection to the biotic organisms they are observing.
 - o Students may use their devices to help identify organisms or conduct research on feeding roles.
- Once all data has been collected and observations recorded, students will use this information to create a food chain/web based on the local ecosystem they just explored.
- Allow students to present their food web in an option of their choosing, e.g., visually on chart paper or bristol board, digitally, physically using natural materials from the environment etc.
 - o Encourage students to be creative while grounding their food web in evidence from their own observations.
- Students must clearly label trophic levels and indicate the direction of energy flow using arrows.
 - o If gaps exist on their food web, allow them to infer which organism could have fulfilled this role.

Consolidation (15 mins)

- Bring students together outside and sit in a circle. Sitting in a circle reinforces inclusivity, connection, and community, as well as Indigenous knowledge and tradition.
- Each group shares their food web and speaks to their process of how they chose to record their observations and why they chose to record this way.
- Possible Guiding Discussion Questions:
 - o *“Which type of organisms were most common? Why do you think that is?”*
 - o *“Was there anything that surprised them while collecting field data?”*
 - o *“What did you learn by creating your own food web instead of being given one?”*

- “What happens to the system if one part were to be removed? What changes would we notice in our community? Can you connect this to any real-life examples?”
- End off by highlighting the Indigenous perspective of humans being connected to nature and part of the food web, not separate or above it.
 - Emphasize the importance of this and ask students to think of ways they could see themselves as part of the ecosystem rather than just observers of it.

Resources

- Encyclopædia Britannica, inc. (2025, June 21). *Food Web*. Encyclopædia Britannica.
<https://www.britannica.com/science/food-web>
- Government of Ontario. (n.d.). *B2. Exploring and Understanding Concepts*. Curriculum and Resources.
<https://www.dcp.edu.gov.on.ca/en/curriculum/science-technology/grades/grade-7/b/b2>
- Khan Academy. (n.d.). *Food Chains & Food Webs*. Khan Academy.
<https://www.khanacademy.org/science/ap-biology/ecology-ap/energy-flow-through-ecosystems/a/food-chains-food-webs>
- Learning The Land 2020. (n.d.). *Learning the Land*. Learning The Land.
<https://learningtheland.ca/>
- Oswald, R., Major, J., Hayhoe, D., Hayhoe, C., Gabber, M., Fraser, D., & DiGiuseppe, M. (2009). Interactions within Ecosystems. In *Science & Technology Perspectives 7* (pp. 122–134). Nelson Education Ltd. Retrieved from <https://www.mynelson.com/>.