

# Food Chains and Food Webs

Grade 7 – Science and Technology



## Lesson Details

<b>Grade Level:</b>	7	<b>Curriculum Links:</b>	Science and Technology	<b>Time Needed:</b>	40 minutes – 1 hour
<b>Learning Goal</b>	To understand food chains/webs and how living things are connected in an ecosystem. To become familiar with species in an Ontario wetland and science terminology. Students will critically think about factors that can affect the balance of the ecosystem.				
<b>Success Criteria</b>	By the end of this lesson, students will understand how organisms are connected within an ecosystem. Students will be comfortable with reading food webs and will be able to use science vocabulary.				
<b>Specific Expectations</b>	<p><i>Interactions in the Environment: Interactions in the Environment</i></p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of an ecosystem as a system of interactions between living organisms and their environment;</li> <li>• Identify biotic and abiotic elements in an ecosystem, and describe the interactions between them;</li> <li>• Describe the roles and interactions of producers, consumers, and decomposers within an ecosystem;</li> <li>• Describe the transfer of energy in a food chain and explain the effects of the elimination of any part of the chain.</li> </ul>				
<b>Materials Needed</b>	Worksheet (attached), Pencil.				

## Lesson Description

<b>Overview</b>	Students will learn about food chains and food webs by exploring a beaver pond food web and the life within it.
<b>Activity</b>	<ol style="list-style-type: none"> <li>1. Begin by introducing the concept of a food web. Additionally, explain what a food chain is and how energy is transferred through it.</li> <li>2. Ask the students to list off a food chain they are familiar with.</li> <li>3. Next introduce the beaver pond and ask the students what organisms might live within it.</li> <li>4. Hand out the attached worksheet to be completed individually.</li> <li>5. Optional: take up the worksheet together as a class.</li> </ol>
<b>Background Information</b>	<p>Wetlands teach us the relationships between the environment, plants, and animals. For example, wetlands have systems to filter water, which benefits turtles. In return, turtles provide valuable services to wetlands, including consuming debris and dispersing seeds. In an ecosystem everything is connected, and we have food chains and webs to help us visualize such connections. Organisms, such as living things like a fish, interact with other living things, but also non-living things, such as water.</p> <p>A <b>food web</b> shows the complex relationships and interactions between all the organisms in an ecosystem, rather than the few in a food chain. A <b>food chain</b> can be made up of the following <b>trophic levels</b>: Energy Producer (E.g. Sun), Producer (E.g. Lily Pad), Primary Consumer (E.g. Fish), Secondary Consumer (E.g. Turtle), Apex Predator (E.g. Eastern Grey Wolf), and Decomposer (E.g. Fungi). If one element of the food chain suddenly disappears there is an increase in the others which often times results in poor conditions for the ecosystem as the organisms are out of balance. <b>Producers</b> are</p>

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	typically plants and algae; these do not usually eat other organisms, but instead pull nutrients from the soil or create their own food using photosynthesis. <b>Consumers</b> are organisms that cannot create their own food, therefore they need to eat other organisms. <b>Apex Predators</b> are the organisms at the top of a food chain that do not get consumed. <b>Decomposers</b> break down dead plant and animal matter and release this as energy and nutrients back into the ecosystem.
<b>Blacklist Masters</b>	<ul style="list-style-type: none"> <li>• Worksheet (attached)</li> <li>• Video Link(s): <a href="#">Turtle Food Chains and Food Webs</a></li> <li>• For more information, please visit <a href="https://www.turtleguardians.com/why-saving-turtles-is-important/">https://www.turtleguardians.com/why-saving-turtles-is-important/</a></li> </ul>
<b>Place-Based Learning</b>	Students will reflect on their own community and how local environments are connected through a food chain or web. Having this knowledge will allow the students to become more conscious about environmental conservation and how organisms are connected.
<b>Inquiry-Based Learning</b>	Using <b>Structured Inquiry</b> , students will complete the worksheet and investigate the connections amongst wildlife.  Ask the students: <ul style="list-style-type: none"> <li>• What words are associated with a food web or chain? (E.g. Biotic, Abiotic, Producer, Consumer, etc.) And how does a food web or chain function?</li> <li>• What happens when something is removed from the chain or web?</li> </ul>
<b>Turtle Stories</b>	Visit a natural area and create a food web based on the plant and animal life you find. How complex is it? Students are encouraged to share their experiences, pictures, and worksheets on the Turtle Stories website, found here: <a href="https://www.turtlestories.ca/">https://www.turtlestories.ca/</a>
<b>Turtle Guardian Program Links</b>	After completing <b>Level 1</b> (Ontario Turtle Identification) of the <b>Turtle Guardian Program</b> , students can move onto <b>Level 2</b> (Wetland Watchers). In this level the students learn the importance of wetland protection and how to protect turtle nests. They then can become official nest sitters and wetland watchers (when accompanied by an adult). For more information, please visit <a href="https://www.turtleguardians.com/what-is-a-turtle-guardian/">https://www.turtleguardians.com/what-is-a-turtle-guardian/</a>

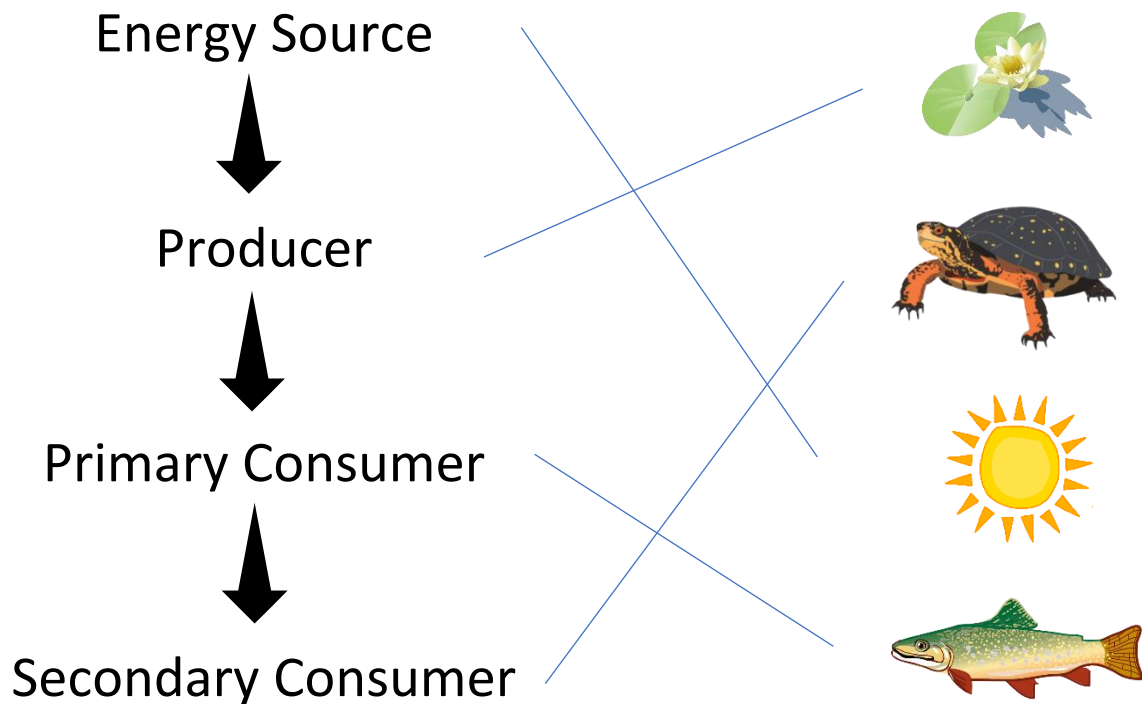
## My Notes



## Food Chains and Food Webs

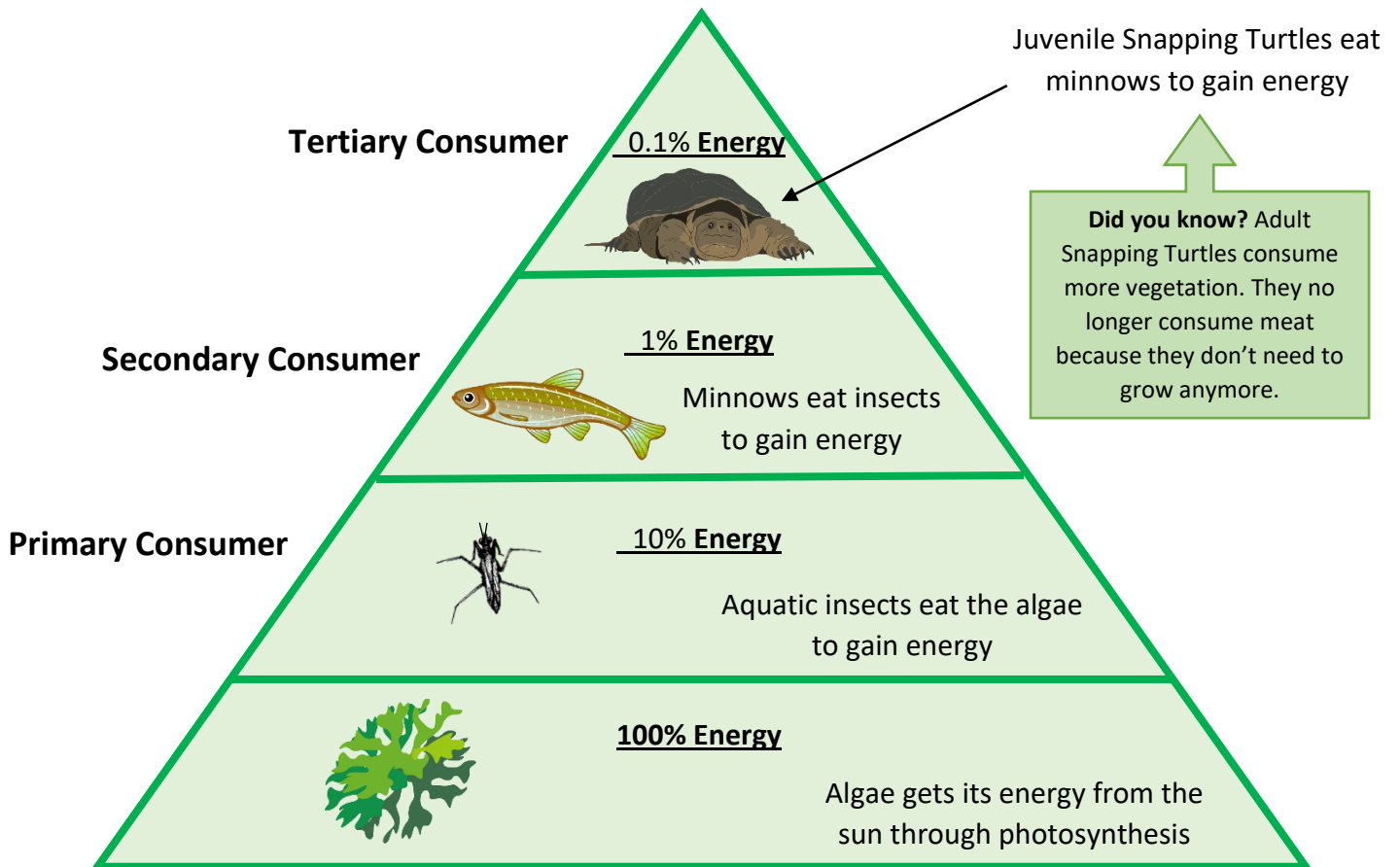
Let's explore a wetland that was created by beavers. The beavers dammed up a stream and created a whole new environment. This is called a beaver pond. There are many living things in a beaver pond. The pond is an **ecosystem**, where everything is connected. All of the living things (called **organisms**) interact with each other and with non-living things like the water.

**Question 1.** Let's review a simple food chain. Match the correct picture with where it belongs in the food chain.



Now, let's look at how energy is transferred through a food chain. Each level of the food chain is called a **trophic level**. As energy moves up the food chain, 10% is lost at each trophic level.

**Question 2.** Since we begin with 100% energy at the producer level, and we lose 10% of the energy at each proceeding level, fill in the blanks with the percentage that is lost in the other trophic levels.



**Question 3.** There are many different roles within an ecosystem. Match the terms with the correct descriptions:

- |            |                  |  |
|------------|------------------|--|
| Herbivore  | <del>_____</del> | A living thing                                       |
| Biotic     | <del>_____</del> | Gets energy from the sun and utilizes photosynthesis |
| Carnivore  | <del>_____</del> | An organism that only eats plants                    |
| Producer   | <del>_____</del> | A non-living thing                                   |
| Decomposer | <del>_____</del> | An organism that eats both meat and plant material   |
| Omnivore   | <del>_____</del> | An organism that only eats meat                      |
| Consumer   | <del>_____</del> | Cannot make its own food, so it eats other organisms |
| Abiotic    | <del>_____</del> | An organism that breaks down decaying organisms      |

A **food chain** shows us the interaction or relationships between a few organisms in the pond. Now we will explore a **food web**, which shows many interactions in the pond. This helps us to understand how everything is connected. Take a look at the food web on page 4 to answer the following questions.

**Question 4.** How would you describe an ecosystem?

A community of living and non-living organisms, interacting in a physical environment.

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**Question 5.** Explain a food chain that is happening within the food web.

Example: Cattail → Painted Turtle → Great Blue Heron

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**Question 6.** Name one abiotic and one biotic element that is in a beaver pond. How are they connected?

Abiotic → Dead log; Biotic → Turtle

A turtle will lay on a dead log to bask in the sun.

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**Question 7.** Turtles are species at risk in Ontario, meaning they may disappear. How would the ecosystem be affected if turtles disappeared?

The Great Blue Heron would eat more Painted Turtles, Green Frogs, and Garter Snakes which would reduce their population. The Red-sided Dace would increase in population as the Snapping turtle is not longer eating it.

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**Question 8.** Where does a human fit into this food web? How do humans affect this ecosystem?

Humans influence many elements of this food web. Humans hunt wolves, they fish, we build human-made dams which can alter how a beaver has designed their pond, ultimately affecting all wildlife within it.

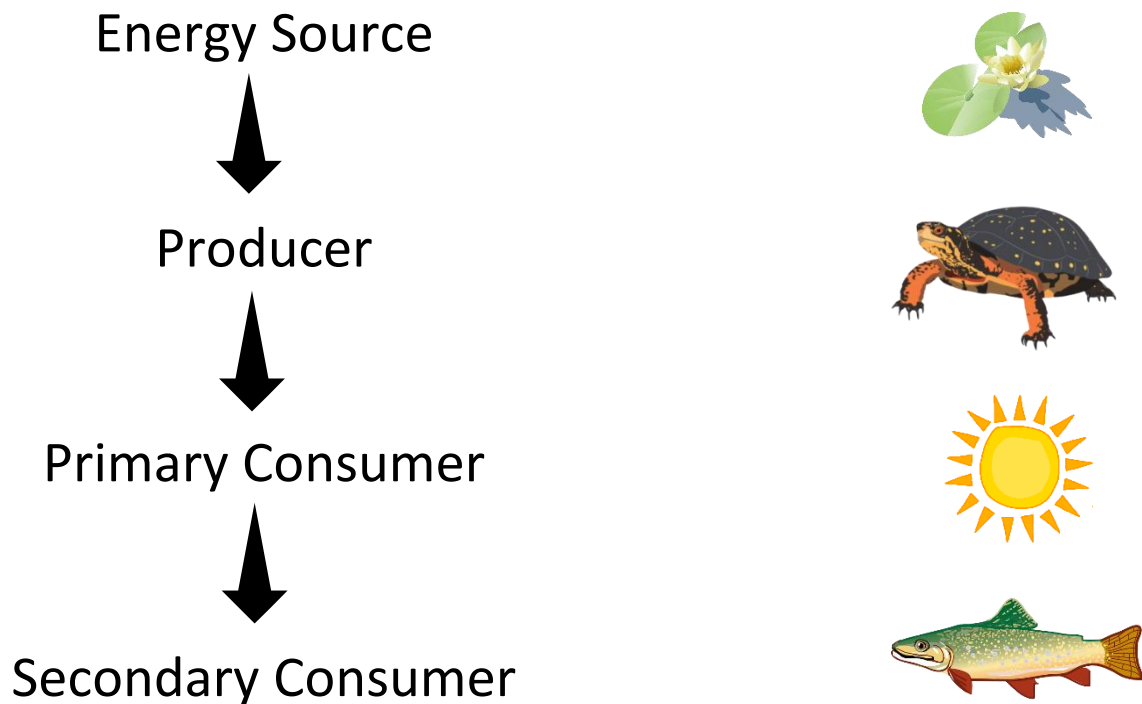
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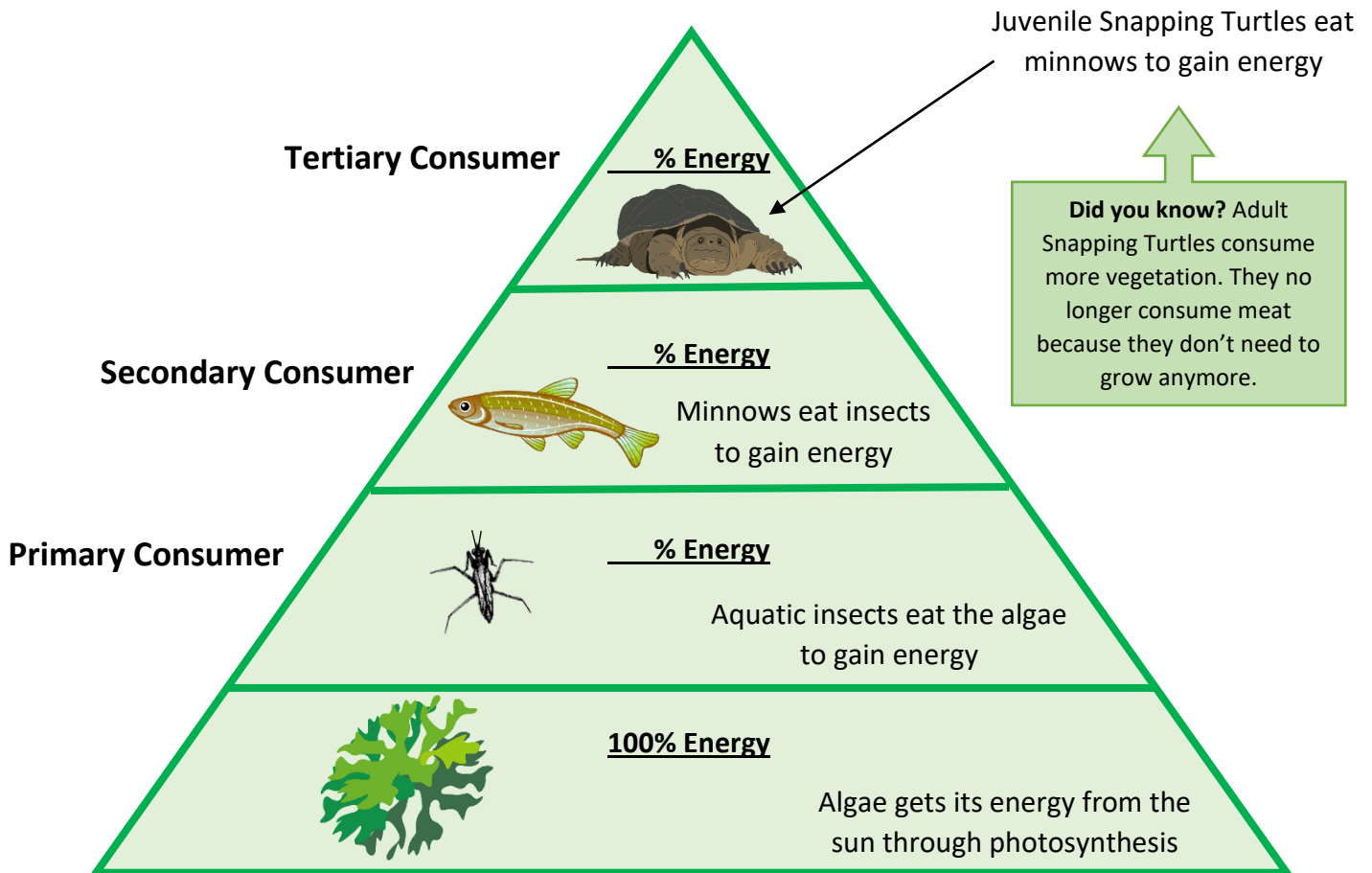
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# Beaver Pond Food Web

