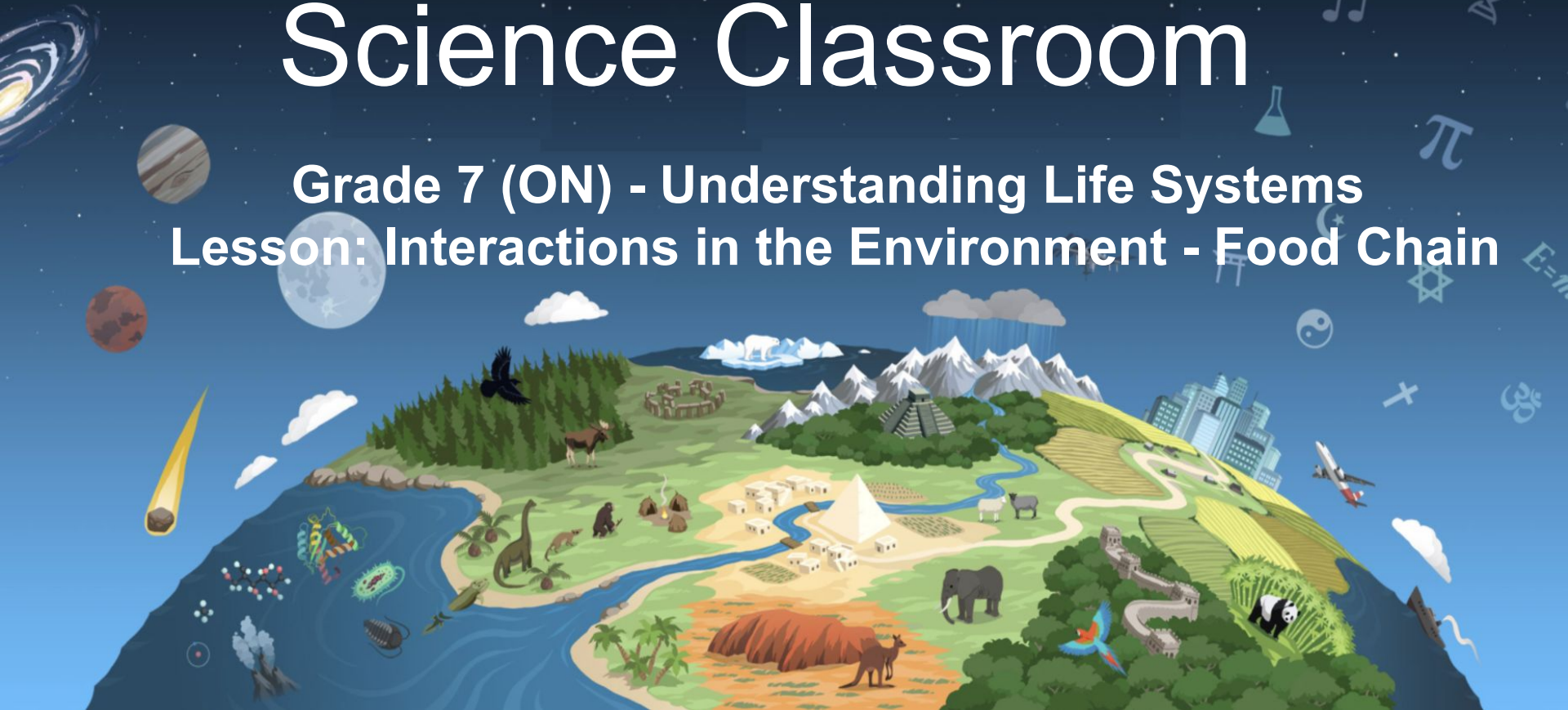


Binogi in Your Science Classroom

Grade 7 (ON) - Understanding Life Systems
Lesson: Interactions in the Environment - Food Chain



Supported by



Resource Guide for Teachers

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Please visit:

<https://escapeprojects.ca/> for additional resources and information

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Grade 7 Understanding Earth and Space System Learning Objectives and Big Ideas

Overall Expectation

3. Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment

Specific Expectation

3.4 Describe the transfer of energy in a food chain and explain the effects of the elimination of any part of the chain ([ON Science Grade 7 Curriculum](#), p. 128)

Learning Objectives

Understanding the how energy transfers from a prey to a predator and the consequences when the population of prey and/or predator decreases.

Big Ideas

Understand the relationship between plants/animals in a food chain.

Assessment

1. Assessment FOR

Diagnostic questions, Minds On, Action, Consolidation

2. Assessment AS: Consolidation

Scientific Terms and Resources/Materials

Vocabulary

energy, food chain, producers, (primary, secondary, tertiary) consumers

Pair/Group Activities

Please follow your school's **Covid-19 safety protocols** for any pair/group activities.

Language Friendly Pedagogy

At the beginning of the lesson, students will be invited to add key terms in their [Concept Detective](#) and add any new words that they come across throughout the lesson.

Binogi Related Resources

[Food Chains and Food Webs](#)

[Ecological Pyramids](#)

Additional Binogi Videos Connected to this Unit

[The Nutrient Chain](#)

[Population Size and Limiting Factors](#)

[Additional Binogi Videos on Ecology](#)

Other Resources

[Curriculum Mapping](#)

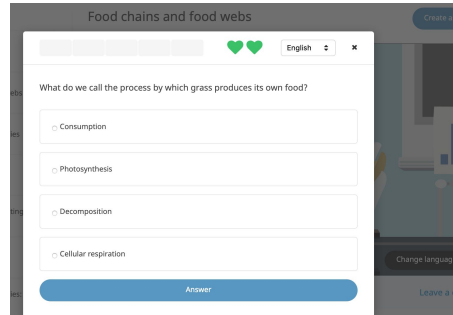
[Food Chain](#) (Nelson p. 125 - 128)

[Smarter Steps to Science Inquiry Framework](#)

At the beginning of class... (5 ~ 10 min)

1. Share learning objectives - *Understanding the how energy transfers from a prey to a predator and the consequences when the population of prey and/or predator decreases.*
1. Co-create success criteria
 - Sample :
 - *I can explain the relationship between plants/animals in a food chain.*
2. Ask the students to add the following words in their [Concept Detective](#) which they will fill in throughout the lesson:
ie: energy, food chain, producers, (primary, secondary, tertiary) consumers
3. **Diagnostic Questions**: Teachers should systematically start with 2 or 3 diagnostic questions to identify learner's learning gap by:

a) using [Binogi quiz](#) - level 1



Minds On

Task Component	Instruction	Assessment Focus Look Fors	Notes
<p>Before (Activation/ Review) ~ 10 mins</p> <p>Resources:</p>	<p>1. 4-Corners Activity</p> <p>: each corner will have the following sign - strongly agree, agree, disagree, strongly disagree</p> <p>: read out the following statements and students move to the corner that aligns best with their thinking; after each statement, students discuss with peers within the same corner and share what they discussed with the class</p> <ol style="list-style-type: none"> We can live without plants. Animals and plants are independent of each other. Climate does not influence animals and plants in a habitat. When animals and plants die, they are used by plants as energy. <p>2. POE (Predict, Observe, Explain): Explain the Food Chain Activity (slides 12-13) and make predictions using the Smarter Steps to Science Inquiry framework.</p>	<p>How do students represent their understandings and linkages between concepts?</p> <p>How does the activity connect to, and help prepare students for problem solving?</p> <p>How are you interacting with your students?</p>	<p>Teacher records answer / wonderings / understanding s. Asks students to elaborate/explain their responses with the class.</p>



Action

Task Component	Instruction	Assessment Focus Look Fors	Notes
<p>During (Working on it) ~15-20 mins</p> <p>Materials:</p> <p>paper, markers, blocks, ruler, graph paper</p>	<p>Food Chain activity</p> <p>1) Prepare the followings: 50 green counters (represent algae), 20 red counters (represent toxic chemicals), name tags, paper cups, small bounce balls.</p> <p>2) Divide the class into 3 groups: small aquatic insects/fish, mallard ducks, humans</p> <p>3) Assign half of the class as small aquatic insects/fish, ~ 40% of the class as mallard ducks, and ~ 10% as humans. Then each student write what they are representing on a name tag and wear it. Each of the "small aquatic insects/fish" student get a paper cup.</p> <p>4) Ask students which species is eaten by which? Write down the order on the board (algae, aquatic insects/fish, mallard ducks, humans). Inform students this is called "Food Chain"- a sequence that shows how energy and nutrients flow from one organism to another.</p> <p>5) Scatter all the counters on the floor/field ("lake").</p>	<p>What role do I and my students play during the problem solving process?</p> <p>What strategies do we predict students will use to do the math?</p> <p>What strategies are students using to do the math?</p>	<p>Have your students watch the videos in the language of their choice.</p> <p>Record students' thoughts.</p> <p>Think-pair-share: student thinks on their own first, then they share with their partner, then with the class.</p>

Action

Task Component	Instruction	Assessment Focus Look Fors	Notes
<p>During (Working on it) ~15-20 mins</p> <p>Materials:</p> <p>paper, markers, blocks, ruler, graph paper</p>	<p>Food Chain activity continued...</p> <p>6) Small aquatic insects/fish enter the "lake" for 30 seconds, pick up as many counters as they can and keep them in the paper cup. They stop once 30 seconds is up. (** no running)</p> <p>7) Mallard ducks enter the "lake" for 30 seconds and small aquatic insects/fish hand over the cup when they are approached by mallard ducks. (** no running, but they can move fast)</p> <p>8) Ask Mallard Ducks to count the number of red counters they have in their cup.</p> <p>9) Humans use small bounce balls to catch mallard ducks from outside the "lake". Mallard ducks to hand over the cup when they are caught. (** Inform students that this is not a dodgeball activity)</p> <p>10) Ask Humans to count the number of red counters they have in their cup.</p>	<p>What role do I and my students play during the problem solving process?</p> <p>What strategies do we predict students will use to do the math?</p> <p>What strategies are students using to do the math?</p>	<p>Have your students watch the videos in the language of their choice.</p> <p>Record students' thoughts.</p> <p>Think-pair-share: student thinks on their own first, then they share with their partner, then with the class.</p>

Consolidation/Reflection

Instruction

Small Group Discussion:

students write their responses in a chart paper and the teacher circulates and observes the discussions.

- 1) Share any observations they made. How would you visually present the relationship between the 3 groups: aquatic fish, Mallard ducks, and humans?
- 2) What are the differences in the number of red counters at the beginning and at the end of the activity? - ie. did all the small aquatic insects/fish have red counters? Mallard ducks? Humans?
- 3) Based on the responses in Q2, what does this tell us about contamination and its effects in the food chain? - ie. What would happen if small aquatic insects/fish die from the contamination? What are the causes of toxic chemical in the water?
- 4) Does all the energy in algae transferred to small aquatic insects/fish? Why or why not?
- 5) How would a food chain for an animal look like?
- 6) What are some factors that disrupt a food chain?
- 7) Go back to their hypothesis, reflect, and write the conclusion in their notebook.

Language Friendly Pedagogy

Students complete their [Concept Detective](#).

Assessment Focus Look Fors

How are you consolidating student learning? Which strategy was used (Congress, Gallery Walk, Bansho, etc.) and why?

How do you determine what should be highlighted? How is it connected to the learning goal/expectations? How is student thinking annotated?

What roles do you and your students take on during the consolidation?

Extensions & Differentiation/Modifications

Extension ideas:

- Research about a case on animal/plant population decrease or increase that has interrupted a food chain and its causes and consequences. Plan what actions can be taken to solve the problem.

Parent and Community Connection

Home Assignment

: Watch Binogi videos and do quizzes - [Food Chains and Food Webs](#) and [Ecological Pyramids](#). Students fill out [Concept Detective](#) as they watch the videos.

: Students share the Food Chain Activity with their parents/caretakers; and ask if their parents/caretakers know any cases of animal population concerns and its reasons.

