

Food Webs Lesson Plan

Course: Grade 9 Academic Science

Strand / Topic: Biology – Diversity of Living Things (Food Chains / Webs)

Duration: Two class periods (approximately 120 minutes)

Curriculum Expectations

- B1. Relating Science to Technology, Society, and the Environment
- B1. assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts
- B2. Developing Skills of Investigation and Communication
- B2. investigate factors related to human activity that affect terrestrial and aquatic ecosystems and explain how they affect the sustainability of these ecosystems.

Other Connections

- Connection to human impacts - students will relate the content to humans' impact on ecosystems and food webs
- Elder connection: students will discuss an Indigenous perspective on ecosystems called the Honourable Harvest

Equity / Diversity and Social Justice

- Multiple intelligences - students will complete a Multiple Intelligences quiz prior to this lesson. This will help them determine their learning style and these preferences and strengths can be incorporated into the lesson (for example: including more visuals or kinesthetic tasks)
- Students can work on the EcoJars activity individually or in groups (depending on their preference for collaborative or independent work)

Lesson Structure

The 5 E's (Engage, Explore, Explain, Elaborate, and Evaluate) are considered in this lesson and are bolded throughout this section

- Minds-ons activity - will allow students to activate their prior knowledge (assessment for learning) and work with their peers to explore new definitions introduced in this lesson

- o Students will **ENGAGE** in the lesson through the collaborative Minds-On activity
- Action - the tasks for this lesson will incorporate visual powerpoints and videos, kinesthetic tasks, and auditory explanations to incorporate the needs of various learning styles
 - o Students will **EXPLORE** and **EXPLAIN** their thinking through think-pair share questions and discussions about human impact and the Honourable Harvest
- Debrief - the final task will allow students to work independently on a summative assessment so they can gauge their level of understanding and receive feedback from the educator
 - o Students will **ELABORATE** on their thoughts through the EcoJar assessment where they will conduct online research and discover how human activities disrupt food chains
 - o Students will be **EVALUATED** through formative assessment (observation and one-on-one conversations) throughout the lesson. Summative assessment strategies will be used to assess students' EcoJar experiments. Scaffolding and conferences will be used to guide students through this assessment (See "Assessments" section at the end of the lesson plan)

Materials Required

- Cut-out images of: sun, grass, grasshopper, frog, and a snake (x5) for all groups
- Online Google Slides presentation:
 - o https://docs.google.com/presentation/d/1A0G1z2prp_59O2seaQ3dPxf6RXn8OoGxiXR5EZ6Kw/edit?usp=sharing
 - o Key terminology from the Google Slides presentation: Food chain, food web, consumer, producer, sustainable ecosystems
- EcoJars project materials: Water bottles, soil, seeds, several types of treatment, and string
- EcoJars Handout for each student:
 - o <https://docs.google.com/document/d/1E7q5O-P8ltw8BQzDBY6WZ4EC3KildlAA/edit?usp=sharing&oid=107763264156083703373&rtpof=true&sd=true>
- Chromebooks
- String and larger cut-out images of various animals from a chosen food web

Tasks and Activities

Type	Tasks	Questions to Ask	Accommodations
Minds-On	<ul style="list-style-type: none"> ● Students will view the YouTube Video "Fabulous Food Chains" by Crash Course Kids ● Students will be put into groups of 3-4 	<ul style="list-style-type: none"> ● How did you categorize the images? ● What made you organize them this way? 	<ul style="list-style-type: none"> ● Students will have the option to work independently

	<ul style="list-style-type: none"> • They will receive a package that has the following cut-out images: sun, grass, grasshopper, frog, and a snake • They will be asked to organize these images and explain why they organized them the way they did 		<ul style="list-style-type: none"> • Students can organize the images online – they will be posted on Google Classroom
Action - Think Pair Share and Key Terminology	<ul style="list-style-type: none"> • Through a visual powerpoint presentation students will: <ul style="list-style-type: none"> ◦ View diagrams of a food chain/web and participate in a think-pair-share in groups of three to answer guiding questions • Present students with a list of key terms for the lesson and their definitions • Have key words underlined in the PowerPoint and allow students to copy the definitions into their notebooks • Explain the definitions and provide images and examples 	<ul style="list-style-type: none"> • What things do you notice? • How is it different from a food chain? • If pacific tree frogs go extinct, what would happen to the food web? • If hawks invade this ecosystem, what would happen to the food web? 	<ul style="list-style-type: none"> • Students will have the option to work independently or in pairs and groups. • All slides, handouts, and other material will be posted on Google Classroom for students to refer back to as required and for students to use as a study resource • Students may use Chromebooks for accessibility purposes (e.g., note taking, spell check, fast translations for ELL students, etc.) and for research purposes (e.g., to support their answer during the “Human Impact” discussion)
Action - personal connection	<ul style="list-style-type: none"> • Students will be asked to make a personal food chain (incorporating themselves and foods they regularly eat) • This will allow students to share their backgrounds in terms of diverse food preferences 	<ul style="list-style-type: none"> • What foods do you typically eat? • How can you represent this in a food web? 	
Action - Human Impact Discussion	<ul style="list-style-type: none"> • Briefly explain to students the impact of human activities on food webs and provide an example • Present students with a discussion question and allow them time to jot down answers (they may quickly conduct research online to assist them with formulating an answer) • Ask students to share their answers and thoughts to generate a class-wise discussion regarding the question 	<ul style="list-style-type: none"> • How does the fishing industry impact the food chains of fish? 	

Action - Honourable Harvest	<ul style="list-style-type: none"> ● Discuss the Indigenous perspective on ecosystems called the Honourable Harvest (which explains the importance of environmental sustainability) <ul style="list-style-type: none"> ○ Additional information/resources as attached at the end of the lesson plan 	<ul style="list-style-type: none"> ● Do you agree that we should limit the resources we take from the land? ● Why would this be helpful? Why is this challenging in our current society? 	
Action - kinesthetic activity	<ul style="list-style-type: none"> ● Students will stand in a circle ● Each student will be assigned a different part of a food chain (for example: sun, grass, grasshopper, frog, and a snake) ● The person who represents the snake (top of food chain) will start by holding a ball of yarn ● They will hold the end of the string and toss it to the next person in the food chain (for example, a student across the circle who is assigned as the frog) ● They will hold onto the string and continue to pass the ball of yarn ● After, students will see how they are all connected in a food chain/web 	<ul style="list-style-type: none"> ● What happens to our food web if one person let's go of the yarn? ● What happens if we add another person (invasive species) into our food web? 	
Consolidation - EcoJars project	<ul style="list-style-type: none"> ● Introduced to the EcoJar project, through which they will observe how human actions affect the ecosystem and food chains ● Students will get an EcoJar Handout ● Students will begin the project by: 1) Building their EcoJar, and 2) Choosing the treatment they will apply to their plant along with water 	<ul style="list-style-type: none"> ● What treatment do you want to add to your EcoJar? ● How do you think this will affect its growth, soil, etc...? 	<ul style="list-style-type: none"> ● Students will have the option to work independently, in pairs, or in groups

Safety Precautions

General Science lab safety precautions

- No running
- No chewing gum or eating
- Be aware of the emergency exit routes and the location of eye wash station
- Wear gloves and goggles when handling chemicals
- Wear close-toed shoes

EcoJar Task

- EcoJar materials must be handled with care
- Students will wear gloves when applying different treatments to their EcoJar plants
- If water or EcoJar 'treatments' are spilled, a teacher must be informed and the substance will be cleaned from the floor

Covid Precautions

- Students must remain 6 feet apart
- Students will sanitize their hands upon entry of the classroom
- Students must remain at their desks (which are spaced 6 feet apart) throughout the lesson
- Students must wear a mask that covers their nose and mouth
- Students desks and other high-frequency touch areas (example: door handles) will be disinfected after each class period

Assessments

- Formative assessment: Informal observation and questioning throughout the lesson (e.g., during discussion and Think-Pair-Share tasks)
- Summative assessment: provide feedback on students' final EcoJar assignment
- Assessment for learning: during the Minds-On activity, the educator will go to each group and have small-group discussions. By viewing how they arranged the animals and asking students questions, the educator can determine their prior knowledge
- Assessment as learning: during the kinesthetic activity, students will be asking guiding questions, which will help them determine their current level of understanding from the lesson, and areas they need to focus on going forward
- Assessment of learning: EcoJar assessment will be a summative assessment
 - To assist students through this process:
 - Conferences and scaffolding will be used
 - Daily check ins to evaluate their observation tables and ensure progress
 - weill be held

Next Steps

- Learn about aquatic ecosystems and how human activities affect ecosystems, food chains, and our health / society / economy, etc.

References

The Honourable Harvest

- Video: The Honourable Harvest - Robin Kimmerer → <https://www.youtube.com/watch?v=cEm7gblax0o>
- <https://bioneers.org/robin-kimmerer-mishkos-kenomagwen-the-teachings-of-grass-bioneers/>
- <https://thegaiaproject.ca/en/the-honourable-harvest-guiding-principles-to-restoring-our-relationship-to-the-natural-world/>