Taking Inspiration from Nature

Eco360 Jr.
Activity
Grade Level: 3-8

Main Objectives

Learners will learn about how we can take inspiration from nature to design better products and systems to eliminate plastic waste.

Learning Outcomes

By the end of this activity, learners will:

- Be able to identify design elements in nature that can inspire us to develop innovative design solutions that eliminate plastic waste
- Be able to think critically about a reimagined economy - one that does not generate waste - by taking inspiration from nature
- Be able to understand and talk about the connection of Indigenous Peoples to nature

Length of Activity: 1 - 1.5 hours

Step 1: Read *Sila and the Land* and discuss
Step 2: Play a game on food webs

Materials Required

- Book Sila and the Land by Ariana Roundpoint, Lindsay DuPré, and Shelby Angalik (available for purchase at the Outdoor Learning Store: https://outdoorlearningstore.com/product/sila-and-the-land/ ; or use the link to the recorded reading of the book: https://programs.greenlearning.ca/course/meet-the-co-author
- Index cards with animal names/numbers written on them (see the game instructions below), bandanas or pinnies

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Activity

Step 1: Read Sila and the Land (45 minutes)

As we have seen in the Plastics in our Oceans activity, plastic pollution has become a huge problem in our world. Indigenous Peoples all over Canada view water as something very special, and something that is being destroyed, by plastic pollution. By taking on a circular economy approach to plastic and reducing our waste, we can protect our precious Canadian waters. The book Sila and the Land, shows the point of view of an Indigenous girl realizing how precious nature really is.

Read Sila and the Land to the class or have learners take turns reading a page or watch the recorded reading by co-author Ariana Roundpoint. (15 min)

Discuss the following questions as a class: (30 min)

1. Who are the characters that Sila meets along her journey? What message do each of these characters have for Sila? (Caribou, Ptarmigan, Rock, Salmon, Tree, Wind, Eagle)
2. How did Sila feel as she flew over the land on the Eagle's back? Why did she feel this way?
3. How are humans damaging the Earth? What is this damage causing? (Climate Change)
4. What is your culture's relationship to the land? Why is the land, air and water important to our culture?
5. Why do Indigenous Cultures value the land, air and, especially, the water?
6. The Eagle said that we are all connected to the land and each other. What did the Eagle say we need to do to respect the land? What was the Eagle's message for Sila?
7. What can we do now to help the problem of plastic pollution.

Extension Activities

For more Sila and the Land activities, explore GreenLearning's program here:

https://programs.greenlearning.ca/sila-and-the-land

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Step 2: Web of Life Game (30 minutes)

Web of Life demonstrates food webs and other ecological concepts in a lively, experiential way. It emphasizes the concept of biological magnification and can be used to demonstrate how plastics build up in organisms in the food web.

Step 1:

- To prepare, write on cards the names of plants, plant-eaters, predators, and one top, or apex, predator. Number each card with its trophic level (plants, 1; plant-eaters, 2; primary predators (meat-eaters), 3; and top predator (the predator that eats everything), 4). There should be a greater number of plants and plant-eaters and less of the predators. Have bandanas or pinnies available, enough for all of the plants and plant-eaters, for Step 4.

- Because plants and animals form an interconnected community, choose subjects from a local habitat or ecosystem, such as freshwater, grassland, or ocean. For example, if your class wants to focus on an ocean ecosystem players could be phytoplankton or kelp (1), fish (2), seals (3), and a shark (4) (as the top predator).

Step 2:

- Give each player a card. Then ask players with a 1 on their card to come forward, form a line facing the rest of the group, and introduce themselves. You can then ask, Are you all plants? Yes, they reply. Ask the plants to kneel in a line facing you.

- Then ask those with 2 on their cards to come forward and introduce themselves:
  - Are you all phytoplankton/plant-eaters? Yes. Please line up (standing) right behind the phytoplankton/plants.
  - Predators? Yes. Please line up behind the phytoplankton-eaters/plant-eaters.

- Now there is only one person left. Ask if anyone has a 4. When that player comes forward and introduces himself/herself/their self and have him/her/them stand behind the third row.

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Step 3:

- Explain that each stage of the food chain is called a trophic stage. As life moves around the food web from one trophic stage to the next, each stage retains only ten percent of the biomass of the previous level. That is, a thousand pounds of plant biomass supports a hundred pounds of plant-eater, which in turn supports ten pounds of carnivore, which supports one pound of apex predator. (Educator can draw this as a diagram on the whiteboard to depict for younger learners. Biomass is defined as organic material or coming from living things.)

- Ask the kneeling plants/herbivores, "If we built a web to represent the food web, could you support all the animals behind you?" NOOOO!!! "Well, we're not going to build a web today, so you can relax!"

- Explain that you will, however, use the trophic levels to demonstrate how plastics concentrate as they move around the food web. The toxins in plastics remain in the tissue of whatever life is exposed. When that life form is eaten by another, the chemicals are also absorbed. The greater amounts of food eaten, the greater the concentration of plastic toxins.

Step 4:

- Tell the first row that they are contaminated by microplastics. Give each one a bandana.

- Now ask the second row to tag the 'plants'; when they tag someone collect their bandana from the plants/tiny organisms and put them on their own heads as if they had just eaten the plants. Then have the primary predators (third row) tag the plant-eaters and place the bandanas on their heads. Finally, the apex predator gathers all the bandanas and piles them on his or her head.

- Tell the group, "The apex predator, which consumes a large variety of herbivores and predators, inherits ALL the plastic. Apex predator, could you now keel over and succumb to plastic poisoning?"

Step 5:

Explain that the scientific name for the increasing concentration of toxic chemicals in the tissues of organisms at higher levels in a food chain is "biological magnification."

Web of Life Game adapted from https://www.sharingnature.com/pyramid-of-life.html

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Further Background

- If students have questions about plastics in their food - have a discussion around solutions for this. How can they find out if the food they eat has plastic in it? (Hint: Google “sources of plastic in our food”)
- For more on Eco-Anxiety and how to help learners navigate it, refer to the following article, or Google “Eco-Anxiety”:

https://www.psy-ed.com/wpblog/understanding-eco-anxiety-and-why-many-kids-today-experience-it/

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