Introduction to Arctic Marine Food Webs, Commercial Fisheries and Conservation Areas to Protect Corals and Sponges

Objectives

- To understand the key elements of fish habitat.
- To describe organisms in the Arctic marine food web.
- To describe ways in which species interact with each other.
- To describe the importance of animals in the food web to Inuit communities.
- To understand the nature of the Arctic offshore commercial fisheries.

Materials

- Presentation on fish habitat
- Individual species cut outs
- Optional - Yarn (or something similar to hold on to) to connect the organisms in the food web (i.e. individual species cut outs)

Key **Concepts**

Use presentation on habitat elements and food web to introduce main concepts and set the stage for activities:

- The sun is the source of energy. Plankton is the base of marine food chains and food webs.
- In the Arctic, plankton blooms begin in the spring with increased sunlight and last until the end of September.
- There are multiple connections within the food web, from tiny animals and plants to large marine mammals.
- Climate change will impact the marine food web.
- The links between the species that are seen from land or hunted traditionally and those which are now the basis of commercial fisheries.
- The importance of the seafloor habitat and existence of corals and sponges which create complex habitat on the seafloor. Coral “reefs” exist in the Arctic!
- The need for habitat protection.
- Discussion of the differences and similarities between Inuit knowledge and science. Also how the connections within a food web are similar to connections understood between Inuit, animals and the environment.
- Discussion on principles of environmental stewardship or *Avatittinnik Kamatsiarniq*.

Additional concepts

- If an element of a food web is upset, it affects the rest of the food web.
- Food energy flows from one living creature to another in a series of steps called a food chain.
- The difference between a food chain and a food web. Few animals rely on a single source of food so interlocking food chains form food webs. Food webs are part of every ecosystem.
- Plants and animals are classed as producers, consumers and/or decomposers based on different ways of getting food energy.

Activities

1. Introduce organisms based on their roles in the food chain (producers, consumers and decomposers).

• Plants are producers. They trap energy from the sun and store it in the form of sugars. Animals can then get the stored energy by eating the plants such as phytoplankton and seaweed.
• Consumers eat plants or other animals to get food energy.
• Decomposers, such as bacteria and fungi, take dead animal or plant material and turn them into chemical energy.

2. Review examples of filter feeders, predators, scavengers and grazers.

How can you tell what an animal eats?

• Filter feeders filter small creatures out of the water. Review what plankton is and what eats it. Create a mini food chain.
• Predators or Carnivores eat other live animals. Create a mini food chain.
• Inuit rely on marine mammals for food. Increasingly, commercial fisheries are an important part of income to Nunavut. Create the links between people on the land, fishing, hunting and the food chain.

3. Review what some of the creatures in marine food web eat. (Use quick facts or ask students what they think).

4. Food Web Activity

Students sit or stand in a circle with a species cut out in front of them.
One student represents the sun and a food web is created with each student being a part of it.
Yarn is given to the student representing the sun.
It is then tossed to the person with the phytoplankton card. More different coloured balls of yarn are used if one animal is connected to more than another.

Students continue to hold onto the yarn so that the yarn makes a colourful web.

A. Ask students why some students have more strands of yarn than others.
B. Ask students what are important elements of habitat within which the food web exists (some elements might be missing from the food web materials – such as ice, water, air. These can be added by students taking on their role and surrounding the web with yarn).
C. Ask students to say one thing they know about their food web element (see Key facts).
D. Have one person gently tug on the yarn and see how many others feel it.
E. What happens if one person lets go of the yarn?
F. Discuss the conservation areas – why might they be important?

Lesson plan courtesy of

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