Warm Up

Student Worksheet (1 of 3)

- Answer the following questions.
- 1. Give two reasons that plants or producers are one of the most abundant types of organisms on Earth? *Hint...what are two things animals get from plants?*
 - •
 - •

Understanding a Food Chain

A **food chain diagram** represents the food energy that flows through an **ecosystem**. The sun provides energy for the **producers** (plants and algae) to make their own food through photosynthesis. The producers are the base of the food chain and are eaten by many organisms. The producers are called **primary producers** because they make the initial sugar that the entire food web depends upon.

A **consumer** is an organism that cannot make its own food. **Herbivores** are **primary consumers** that eat plants. **Omnivores** are both primary consumers that eat plants and secondary consumers that eat animals. **Carnivores** are typically secondary, tertiary, or quaternary consumers that only eat other animals.

Below is a diagram of a food chain often found in the lakes, rivers, streams, and wetlands in Montana. Notice the arrows are pointed to the animal populations that are consuming the food.







Understanding a Food Web

Student Worksheet (2 of 3)

A food web diagram represents a series of interlocking and independent food chains found in an ecosystem. Food webs can be greatly impacted by an ecological disturbance, an event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment. For example, the Arctic tundra food web is depicted below.



A keystone species is a species that many other species in the ecosystem greatly depend upon.

- 4. Which animal do you think is the keystone species in this habitat?
- 5. List two ecological disturbances that could negatively impact this food web.

6. Look carefully at this food web, select one animal, and explain what you think would happen to its population size if an ecological disturbance caused the Artic hare population to drastically decline.



Flathead Lake Case Study: The Mystery of the Missing Salmon



BIO STATION

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Abundance

20

0

979

982

.86

983

984

Facts to consider:

- Mysis stay at the bottom of the lake during the daytime and come up to the surface to feed at night.
- Kokanee salmon are sight feeders that hunt during the daytime.
- Light does not penetrate past 20 m (60 ft) in the lake during the day.
- Flathead Lake max. depth =~112 m (~370 ft)
- Adult Lake Trout are piscivores (fish eaters).
- 7. Use specific details from the information provided above to explain how the introduction of the Mysis shrimp caused the Kokanee salmon population to disappear.

Kokanee X 1000 140 Eagles X 7 Mysis 120 100 80 60 40

8. What other organisms in this food web were impacted by the introduction of the shrimp? Provide evidence to support your answer.

Food Web Challenge Activity

Your final task will be to build your own Flathead Lake Food Web, to introduce an aquatic invasive species to this web, and then to explain how that species impacts the web.

- A. **CUT OUT** the provided food web cards.
- B. **NEATLY WRITE** "Flathead Lake Food Web" across the top of a poster.
- C. SORT the organisms into stacks of 5 producers and 19 consumers.
- D. **SET ASIDE** the invasive zebra mussel that does not currently live in Flathead Lake.
- E. **PLACE** the producers along the bottom of the poster.
- F. ARRANGE the individual food chains on your poster and then BUILD your food web.
- G. **INSERT** the zebra mussel into the web and **LABEL** it as an aquatic invasive species.
- H. Use a ruler to **NEATLY DRAW ARROWS** that **MOVE UP** through the web.
- I. GLUE or TAPE the food web cards onto the poster.
- J. On an index card (or separate sheet of paper) WRITE ONE PARAGRAPH THAT EXPLAINS how the invasive zebra mussels could impact the lake food web and possibly cause an ecological disturbance. **IDENTIFY** the organisms that would be <u>directly</u> impacted by predation or a loss of food. ATTACH the index card or paper to the poster.



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Food Web Cards

Student Activity Cards (1 of 2)





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Food Web Cards

Student Activity Cards (2 of 2)





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