

# OIMB GK12 CURRICULUM

4th Grade

60 minutes

## Kelp Forest Food Webs

### Oregon Science Content Standards:

- 4.1 Structure and Function: Living and non-living things can be classified by their characteristics and properties.
- 4.2 Interaction and Change: Living and non-living things undergo changes that involve force and energy.
- 4.2L.1 Describe the interactions of organisms and the environment where they live.

### Ocean Literacy Principles:

- 5. The ocean supports a great diversity of life and ecosystems.

### Goals:

- To get students thinking about what different animals eat and how they acquire energy.
- To show that organisms are connected through feeding interactions.
- To familiarize students with the terms: carnivore, herbivore, predator, prey, producer and consumer.

### Concepts:

- Almost all organisms rely either directly or indirectly on energy from the sun.
- A food web illustrates energy transfer through feeding interactions.
- Organisms are connected to each other through feeding interactions.

### Materials:

- Laminated Kelp forest food web cards (one per student) – include the sun
  - from the Kelp Forest Field Guide in the Sea Searcher’s Handbook (Monterey Bay Aquarium Foundation. 1996. Sea Searcher’s Handbook. Pp 71-74.)
  - or from MARE ‘Build a Kelp Forest’ lesson (Regents of the University of California. 2002. “Build a Kelp Forest”, MARE Teacher’s Guide to Kelp Forest.)
- Yarn
- Pictures of land food web organisms to project or tape on the board (sun, grass, rabbit, fox, cricket, mouse, eagle included below)

### Lesson Plan:

Introduce the phrase food web –define and show an example.

1. A food web is a tool scientists use to look at the interactions between plants and animals. It shows which organisms eat other organisms. A food web combines many separate food chains, since most organisms feed on more than one other thing.
2. Go through an example using a simple terrestrial food chain. Start with grass, rabbits, and a fox. Start with the grass, then add the rabbit and draw in the arrow that shows that the grass is eaten by the rabbit (the energy--and arrow representing the energy--goes from the grass to the rabbit). Define producer and consumer. A producer makes energy from the sun (the grass); a consumer cannot make its own energy from the sun, but gets it from

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feeding on other organisms (the rabbit). Ask where the fox would go in this chain. It is also a consumer, consuming the rabbit. The arrow and energy go from the rabbit to the fox.

3. Bring in the Sun -- the source of energy for the grass. Remind them that the grass is the primary producer – it uses sunlight to grow. The arrow goes from the sun to the grass.
4. Define prey (animal hunted or caught for food), predator (animal that lives by preying on other animals), carnivore (an animal that feeds on flesh/meat), and herbivore (an animal that feeds on plants). Ask which animal in this chain is the predator (fox), which is the prey (rabbit), which is the carnivore (fox) and which is the herbivore (rabbit).
5. The plants are the food for herbivores.
6. Herbivores are food for carnivores.
7. Now turn the simple chain to the start of a web. Have the students place the arrows in the correct direction. Add a cricket that eats the grass, a mouse that eats the cricket and an eagle that eats the mouse and rabbit.
8. Have students point out prey, predators, herbivore and carnivores for the new organisms.

### Yarn Game to visualize a food web

9. Explain to the students that they are now going to see how organisms in a kelp forest are connected. They are going to pretend to be different plants and animals that live in a kelp forest.
10. Ask how they think an ocean food web is different from a land food web. Explain that in land food webs, the sun provides energy for plants to grow, which are then food for animals. Ask what grows from sunlight in the kelp forest. Briefly discuss algae and phytoplankton as primary producers needing sunlight to grow.
11. Hand out laminated kelp forest organism cards. The front of the card should show a picture of an organism. On the back of each card is a list of that organisms' predators and prey (have enough cards for each student to have one). Have students stand or sit in a circle.
12. Explain the rules of the game. When you are rolled the yarn, keep hold of it and roll the loose ball to either your predator or your prey. Keep hold of your bit!
13. Explain that we started the land food web with the sun, and that here in the kelp forest we will also start with the sun. Hand the end of the yarn to the student with the sun card. The sun gets to feed either phytoplankton or kelp...the yarn keeps getting passed to new organisms (each time either to a predator **or** a prey organism). For the first few rounds, help the students figure out who to give the yarn to. If the student gets stuck, for example the student holding the kelp card, ask the class "Who wants to eat the kelp?" Suggest that they look to see if kelp is listed as one of their prey items, and if so, to raise their cards. The kelp student can then roll the ball of yarn to any of those with their cards raised.
14. Emphasize that everything is connected and needs everything else to survive.

**Assessment:** Have students cut out pictures of animals and glue them to a blank paper. Have the students draw in arrows pointing in the direction of the energy flow.

**GK12 Fellows:** Ben Grupe, Tim Davidson; Teachers at Blossom Gulch

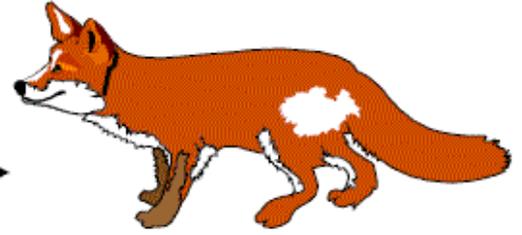
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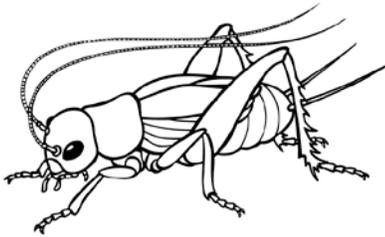
grass



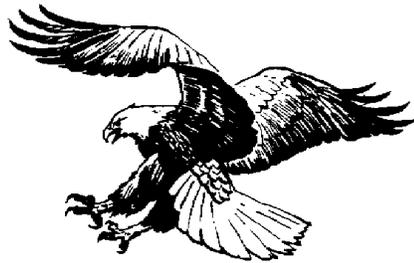
rabbits



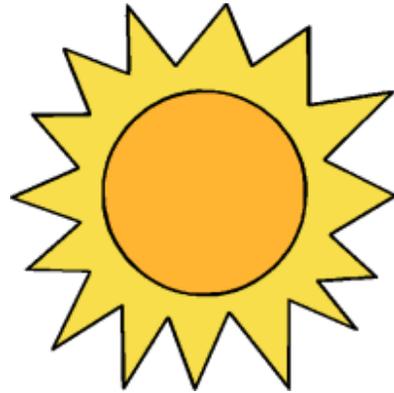
fox



Cricket



Eagle

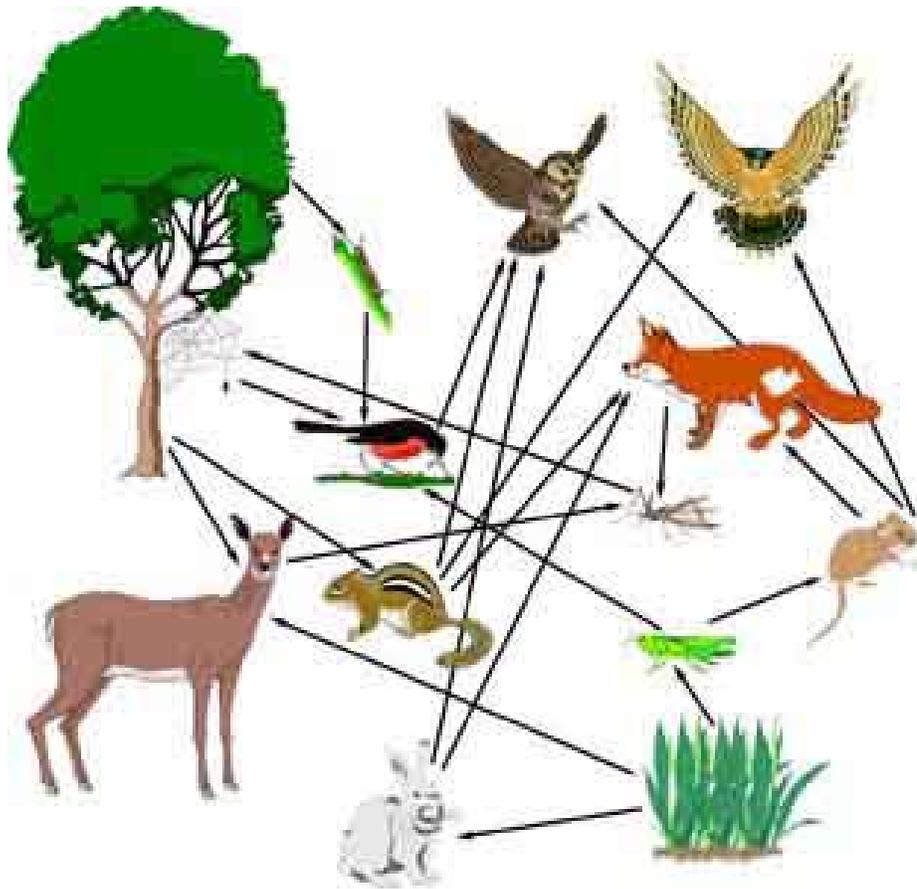


SUN



Mouse

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Note the gray insect is a mosquito!