



Lesson 8: Food Chains

Objectives: Students will identify components of and trace energy flow in baleen & toothed whale food chains.

You will need:

- Copy of Whale Food Chain activity sheets (pages 8-5 through 8-7) for each student
- Scissors for each student
- Glue sticks or clear tape
- Optional: Computer with internet access and projector (or smartboard)
- Optional: Laptops/computers with internet access for each student or small groups of students
- Whiteboard and colored markers

Vocabulary:

Food Chain	Toothed whales
Predator	Phytoplankton
Prey	Zooplankton
Producer	Herbivore
Consumer	Carnivore
Baleen whales	Omnivore

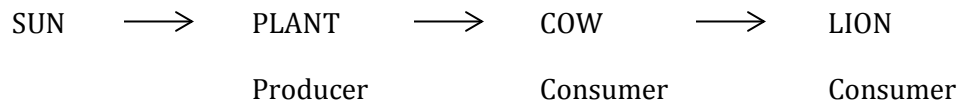
Sunshine State Standards: SC.4.L.17.2; SC.4.L.17.3; SC.4.L.17.4

Strategy:

1. (Optional) Watch *Magic School Bus Gets Eaten (Season 1 Episode 4)* to introduce the concept of food chains. This can be accessed via the YouTube link: http://www.youtube.com/watch?v=eYY_NpTt390 (22 min)
2. Explain to students that this lesson will focus on food chains. If you have previously introduced the concept of food chains, you may want to skip to #12.
3. Remind students that all living things depend on each other to survive. Explain that a food chain shows the relationships between plants and animals in an environment.
4. In a food chain, there are two basic levels: producers and consumers. Remind students that plants are called producers because they can make their own food. Ask students if they remember where plants get the energy to make their own food [*from the sun*].
5. Write the word SUN and the word PLANT on the board. Connect them with an arrow pointing from the sun to the plant [SUN → PLANT]. Explain that the arrow shows what direction the energy is flowing (i.e. from the sun to the plant).
6. Write the word “producer” underneath PLANT on the board.
7. Ask students to tell you the name of something that eats plants. Choose one of these answers and write it on the board, with an arrow pointing from PLANT to the animal (e.g. COW).



8. Write the word “consumer” underneath COW. Explain that consumers cannot make their own food, so they have to get their energy from eating other things.
9. Ask students if they can think of an animal that eats the animal you listed on your food chain (using the example of cow, answers could include humans, lions, etc.). Add this animal to the food chain.
10. You should now have something that looks like this:



11. Explain to the students that what you have just created is called a food chain. Ask them to remember what the arrows show [*the flow of energy through the food chain*]. Point out that there will always be a producer at the start/bottom of a food chain. Explain that consumers are animals, but that some consumers eat only plants, others eat only animals/meat and others eat a combination of plants and animals.
12. Ask students if they can think of an example of an animal that only eats plants. List correct answers on the side of the board. Explain that these animals are called herbivores. Many herbivores have only molars (grinding teeth) in their mouths. Some students may be familiar with the term vegetarian; if so, explain that vegetarian is a term used for humans who do not eat meat.
13. Ask students if they can think of an example of an animal that only eats meat. List these animals on the board using a different colored marker. Explain that these animals are called carnivores.
14. Ask students if they can think of an example of an animal that eats both plants and animals (humans is the obvious example). Explain that animals that eat both plants and animals are called omnivores.
15. (Optional, but recommended) If you have internet access, you may want to do the interactive food chain activity at http://www.ecokids.ca/pub/eco_info/topics/frogs/chain_reaction/index.cfm. This could be done as a class (with the website projected) or individually if laptops or computer stations are available. This is a good activity as it includes having links in the food chain removed and shows what could happen as a result.
16. Give each student a copy of the Whale Food Chain activity sheet for “baleen and toothed whales”. Point out to students that the organisms for the baleen whale food chain box are on the left side of page 8-7 and those for the toothed whale food chain are on the right side of that page. Review each of the organisms with the students (copepods are animals that are part of the plankton and eat phytoplankton; phytoplankton are tiny plants that float around in the water; fish eat copepods; right whales eat copepods; orcas eat fish).
17. Point out that students need to use ALL of the possible organisms when creating each of their food chains. Students should cut out each of the organisms and glue or tape them into the appropriate box. They will then draw arrows to show the energy flow through the two food chains, so they should think about the energy flow before sticking their organisms onto the paper. Ask the students what direction the arrows should point [*from the thing giving the energy to the thing taking the energy, or from the thing being eaten to the thing doing the eating*].



Point out to the students that the instructions say to draw a triangle around the producer (what is a producer?) and a circle around the consumers.

18. Once students have completed the activity, review the food chains with them. Ask the students to compare and contrast the two food chains. Select items in the food chain and ask the students where each of these gets its energy. Ask what might happen to the toothed whale food chain if people created better fishing nets and were able to catch lots more fish than they have been catching. *[If fish were removed from the food chain, toothed whales might starve, copepods would increase and phytoplankton might decrease.]* Might this have an effect on right whales? *[If there are more copepods, that could mean more food for right whales...and that would lower the grazing pressure on the phytoplankton, so the phytoplankton wouldn't all get eaten.]*

Optional Activities:

Have students create a food chain from one meal that they have eaten in the last 48 hours. Students will list everything they ate during the meal, and then draw the various types of plants and animals which helped create their meal. Draw arrows to show the energy flows. Draw a triangle around the producers, circle the consumers. Remind students not to forget to include themselves and the sun in their food chain!

Give your students the list of vocabulary words and have them write a short story using the words correctly. Use the rubric below to score their work. Addresses Common Core Standards: CCSS.ELA-Literacy.RI.4.4; CCSS.ELA-Literacy.W.4.2; CCSS.ELA-Literacy.W.4.3; CCSS.ELA-Literacy.W.4.4

References:

- Optional activity adapted from Oregon Coast Aquarium:
http://aquarium.org/pdf/Curriculum_Grade1-2_FoodChains.pdf.



Grading Rubric

CATEGORY	4	3	2	1	Score
Knowledge Gained	Student could easily and correctly use all of the vocabulary words in their story.	Student could easily and correctly use 3 to 4 of the vocabulary words in their story.	Student could easily and correctly use 1-2 of the vocabulary words in their story.	Student could NOT correctly use any of the vocabulary words in their story.	
Creativity	The story contains many creative details and/or descriptions that contribute to the reader's enjoyment. The author has really used his imagination.	The story contains a few creative details and/or descriptions that contribute to the reader's enjoyment. The author has used his imagination.	The story contains a few creative details and/or descriptions, but they distract from the story. The author has tried to use his imagination.	There is little evidence of creativity in the story. The author does not seem to have used much imagination.	
Setting	Many vivid, descriptive words are used to tell when and where the story took place.	Some vivid, descriptive words are used to tell the audience when and where the story took place.	The reader can figure out when and where the story took place, but the author didn't supply much detail.	The reader has trouble figuring out when and where the story took place.	
Action	Several action verbs (active voice) are used to describe what is happening in the story. The story seems exciting!	Several action verbs are used to describe what is happening in the story, but the word choice doesn't make the story as exciting as it could be.	A variety of verbs (passive voice) are used and describe the action accurately but not in a very exciting way.	Little variety seen in the verbs that are used. The story seems a little boring.	
Characters	The main characters are named and clearly described in text as well as pictures. Most readers could describe the characters accurately.	The main characters are named and described. Most readers would have some idea of what the characters looked like.	The main characters are named. The reader knows very little about the characters.	It is hard to tell who the main characters are.	



Whale Food Chain Worksheet

Name: _____

Baleen Whale Food Chain



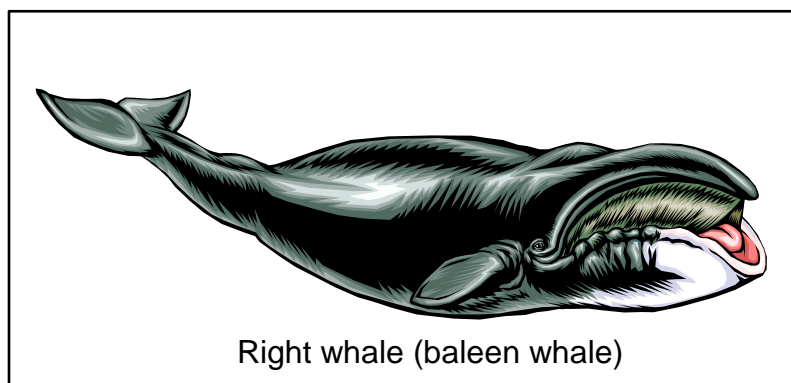
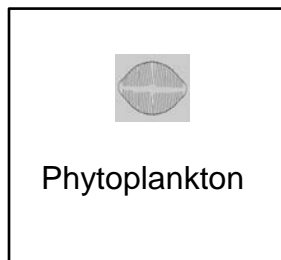
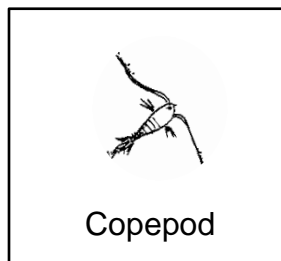
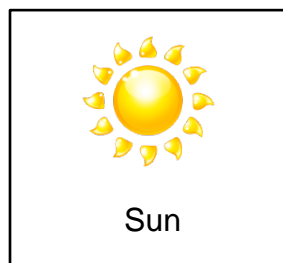
Whale Food Chain Worksheet

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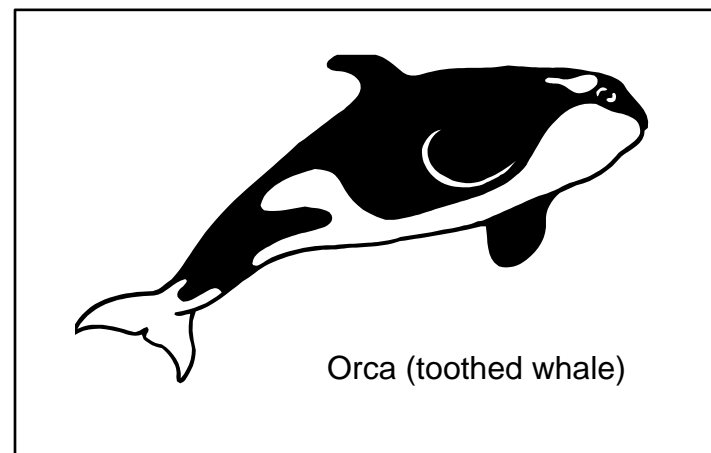
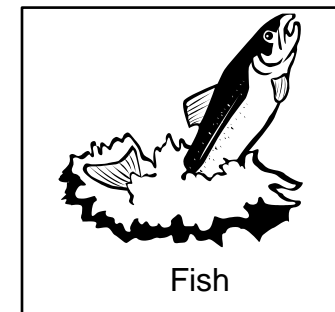
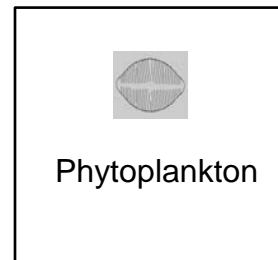
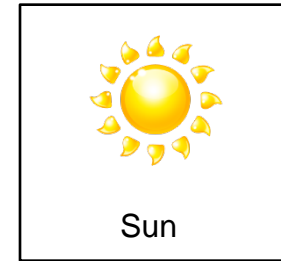
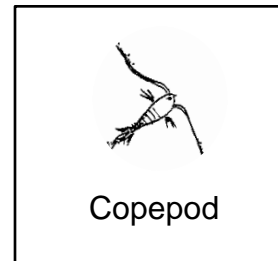
Toothed Whale Food Chain



INSTRUCTIONS: Cut out these pictures and stick them onto the baleen whale food chain (pictures on the left) and toothed whale food chain (pictures on the right) worksheets to create food chains. Draw arrows to show the direction of energy flow in the food chains. Draw a TRIANGLE around the producer in each food chain. Draw a CIRCLE around each of the consumers in the food chains.



Baleen whale food chain pictures



Toothed whale food chain pictures