

What's for Lunch?



**Lab Program Curriculum
For Grades 1-2**



OREGON COAST AQUARIUM

Program Description

This 45–60 minute lab program will introduce your students to a variety of food chains. During this program your students will participate in a brief discussion about marine food chains and the habitat where these animals and plants make their home. Students and chaperones will then travel to four stations where they will explore materials such as shark skin, a sea turtle skull, squid and plankton. Participating in this program and using the enclosed activities will help your students meet the grade three Common Curriculum Goals and Benchmarks listed on the back of this sheet.

Chaperones will be asked to take an active role in the lab program, which is designed so that they read informational cards in English to the students in their group. It will also be the chaperone's responsibility to monitor the students' behavior during the lab program.

Before you visit:

- Using pictures from magazines or the internet make ocean plant and animal cards. Use these and the enclosed **Flash Card Notebook** activity to familiarize students with organisms they may see at the Aquarium. Incorporate appropriate vocabulary, play concentration or use them as flash cards for plant and animal identification.
- Using the **Nature's Chains and Webs** activity to introduce your students to the concepts of food chains and food webs.
- Review the **vocabulary words** *food web, food chain, predator, prey and habitat* with your students before their classroom program.
- Use the **A Few Words About Food Chains** activity to reinforce vocabulary words that will be used in their lab program.
- Use the activities in the self-guided folder to further prepare your students for their self-guided tour of the Aquarium.

During your visit:

- Provide your students with copies of the **Oregon Coast Aquarium Student Activity Book**. A master copy of the pages needed to create this booklet is included in the center of your packet.
- An **Oregon Coast Aquarium Chaperone Guide Book (sample enclosed)** will be provided for your chaperones when your group arrives at the Aquarium. This guide book will allow chaperones to more effectively direct their students as they use their activity books.

After your visit:

- Have each student complete the **Sea Links** activity.
- Have each student complete the **Adding Up Food Chains** mathematic activity.
- Use the **Animal Flashcards** to review characteristics of the animals students saw at the Aquarium.

WHAT'S FOR LUNCH? addresses the following Oregon Common Curriculum Goals and Benchmarks

Science

Grade 3

LIFE SCIENCE (ORGANISMS)

- **Common Curriculum Goal (Organisms):** Understand the characteristics, structure, and functions of organisms.

Content Standard: Describe the characteristics, structure, and functions of organisms.

- Describe the basic needs of plants and animals.

LIFE SCIENCE: (DIVERSITY/INTERDEPENDENCE)

- **Common Curriculum Goal:** Understand the relationships among living things and between living things and their environments.

Content standards: Explain and analyze the interdependence of organisms in their natural environment.

- Describe a habitat and the organisms that live there.

English/Language Arts

GRADE 2

READING

- **Common Curriculum Goal:** Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.

DECODING AND WORD RECOGNITION

- Read regular multi-syllabic words.
- Use letter-sound correspondence knowledge to sound out unknown words.

VOCABULARY

- Understand, learn, and use new vocabulary that is introduced and taught directly through orally read stories and informational text as well as student-read stories and informational text.
- Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud.

READ TO PERFORM A TASK

- Read written directions, signs, captions, warning labels, and informational books.

Grade 3

Reading

- **Common Curriculum Goal:** Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.

- Read regular words with several syllables.
- Use letter-sound correspondence knowledge and structural analysis to decode words.
- Know and use more complex word patterns when reading (e.g., -ight) to decode unfamiliar words to grade level.

LISTEN TO AND READ INFORMATIONAL AND NARRATIVE

- Listen to, read, and understand a wide variety of grade-level informational and narrative (story) text including children's magazines and newspapers, dictionaries, other reference materials, online information, classic and contemporary literature, and poetry.

VOCABULARY

- Understand, learn, and use new vocabulary that is introduced and taught directly through orally read
- stories and informational text as well as student-read stories and informational text.
- Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud.

Mathematics: Calculations and Estimations

Grade 2

- **CALCULATIONS AND ESTIMATIONS**

Common Curriculum Goal: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

- Read, write, order, model, and compare whole numbers less than 100.
- Read number words less than one hundred and write the corresponding numeric value.
- Compose and decompose whole numbers less than one hundred by place value (e.g., $426=4\text{-}100\text{'s}$, $2\text{-}10\text{'s}$, $6\text{-}1\text{'s}$).

COMPUTATIONS AND ESTIMATIONS

- Develop and evaluate strategies for adding and subtracting whole numbers.
- Apply with fluency sums to 18 and related subtraction facts.

What's For Lunch? addresses the following National Science Education Standards:

Life Science CONTENT STANDARD C

Grades K-4:

- The characteristics of organisms
- Life cycles of organisms
- Organisms and environments

Food Chains and Food Webs

Background Information

Most food chains begin with the energy of the sun. Through the process of photosynthesis, plants transform this light energy into chemical energy and store it as a source of food. Because plants can make or produce their own food, they are called **producers**. The energy is then carried up the food chain by **consumers**. Consumers are divided into herbivores (plant eaters), carnivores (meat eaters) and **omnivores** (plant and meat eaters). **Decomposers** break down dead plant and animal material and return nutrients to the cycle. The animals being killed are **prey** and the hunters are the **predators**. Animals that eat meat that is already dead are **scavengers**.

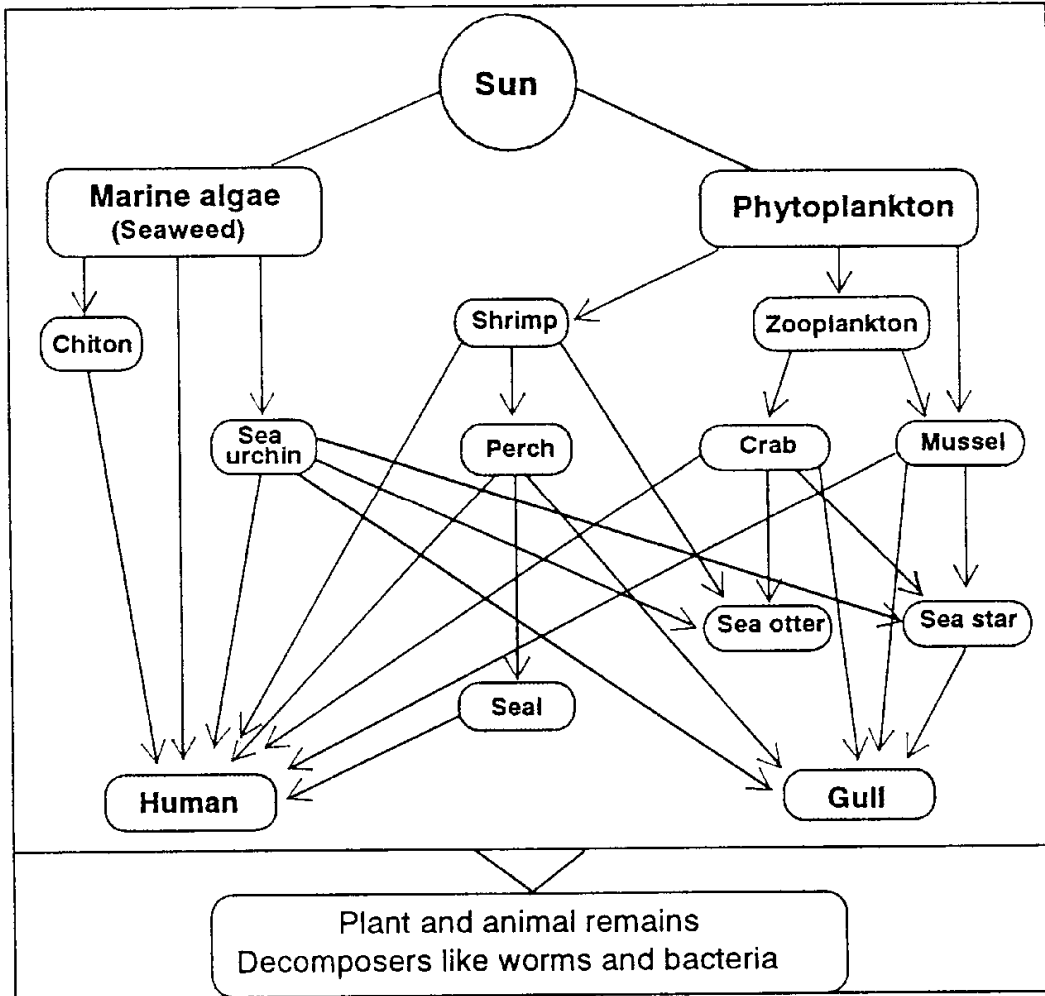
	TERRESTRIAL	OCEAN	OCEAN
SUN	sun	sun	sun
PRODUCERS	grass	marine algae (seaweeds)	phytoplankton (microscopic plants)
CONSUMER HERBIVORE/PREY	rabbit	sea urchin	zooplankton (microscopic animals)

Food Webs

But energy transfer in any ecosystem is seldom so linear and simple. For example, a fox does not eat only rabbits, a sea urchin does not eat only one type of marine algae and a sea otter eats many things besides sea urchins. Food chains are interwoven into complex food webs.

Food webs are the intricate relationships among producers, consumers, scavengers and decomposers. All of the plants and animals of a food web are interdependent. If one component of the web disappears, all of the components are affected.

An example of an ocean food web:



The arrows on the above diagram indicate the direction of energy transfer.

As it is on land, life in the sea is an eat-or-be-eaten world. Animals must constantly adapt to their complex environment in order to get enough to eat and, at the same time, avoid being eaten.

Food Chains and Food Webs Vocabulary

adaptation (*A-dap-TAY-shun*): a characteristic, such as a body part, color pattern or behavior, that helps an organism survive in its environment.

bivalve (*BIE-valv*): a member of the class Bivalvia (bie-VAL-vee-ah), a group of mollusks with a pair of shells hinged together. Clams mussels and oysters are bivalves.

Carnivore: (*CAR-nih-vore*): an organism that eats animals

chlorophyll (*CLOR-uh-fil*): the green, light-absorbing pigment important to the process of photosynthesis

community: the plants and animals that associate together in a habitat. A community is often named for its most prominent feature: pier piling community, rocky intertidal community, etc.

competition: the result of a common demand of two or more organisms on a limited resource such as food, settling space or mates

consumer: an organism that eats other organisms

decomposer (*DEE-kum-POE-zer*): an organism that causes the decay of dead plants and animals. Bacteria and fungi are decomposers.

deposit feeder: an organism that eats detritus or other material on or in the seafloor

detritus (*dih-TRIE-tus*): disintegrated material such as particles of uneaten food, fecal pellets and fragments of dead plants or animals.

echinoderm (*ee-KIE-nuh-derm*): a member of the phylum Echinodermata (*ee-KIE-nuh-dur-MAH-tah*), a group of invertebrates with hard, spiny skeletons, radially symmetrical bodies and a water vascular system. Sea stars, sea urchins, sand dollars and sea cucumbers are echinoderms.

ecosystem (*EE-coe-sis-tum*): a community of organisms interacting with each other, plus the environment in which they live and with which they interact. An ecosystem includes nonliving components (minerals, soil, etc.), living components, and the climate.

energy transfer: the movement of energy along a food chain

filter feeder: an organism that eats by filtering, or straining, small particles of food from the water

food chain: a sequence in which organisms eat and are eaten, in a transfer of energy along the chain

food web: interconnected food chains

habitat: the place where an animal lives

herbivore (*HER-bih-vore*): an organism that eats plants

interdependence: organisms relying on each other for the basics of life

intertidal zone: the part of the shore between the highest high tides and lowest low tides

invertebrate (*in-VER-tuh-brut*) an animal without a backbone

kelp: any of the large brown seaweeds, such as bull kelp

krill: shrimplike crustaceans that are the primary food of some whales and fishes

nematocyst (*neh-MA-tuh-sist*): stinging structures that cnidarians use to capture food and protection

omnivore (*AHM-nih-vor*): an organism that eats both plants and animals

organism: a living thing, such as a plant or animal

photosynthesis (*FOE-toe-SIN-theh-sis*): process by which green plants and some algae use the sun's energy to convert water and carbon dioxide into sugar and oxygen

phytoplankton (*FIE-toe-PLANK-tun*): photosynthesizing members of the plankton, mostly plants and algae

plankton (*PLANK-tun*): organisms suspended in water that drift with currents and swim only weakly or not at all

predator (*PREH-duh-ter*): an animal that is killed and eaten by a predator

prey: an animal that is killed and eaten by a predator

producer: an organism that produces its own food through photosynthesis

radula (*RA-dyoo-lah*): the filelike band of teeth that snails, chitons and many other mollusks use to scrape, tear and bore

respiration: the absorption of oxygen from the environment

scavenger: an organism that eats dead plants and animals or their parts

siphon (*SIE-f'n*): the tube or tubelike part of an animal's body through which water, air or food passes

species (SPEE-sesz) (singular and plural): a group of organisms that have common physical structures and can interbreed and produce fertile offspring

substrate (SUB-strate): the surface (sand, rock, wood or even another animal) on which an animal lives

terrestrial (teh-RES-tree-ul) of or pertaining to the land

test: the shell, or covering of animals such as sand dollars and sea urchins

tide: the regular rise and fall of sea level caused by the gravitational pull of the sun and the moon, the rotation of the earth, and other factors

tide pool: a pool of water left on the shore when the tide goes out

tube feet: soft, hollow, movable extensions of some echinoderms' water vascular system, which aid in locomotion, feeding and grasping

vertebrate (VER-tuh-brut): a member of the subphylum Vertebrata (VER-tuh-BRAH-tah), a group of animals that have a segmented spinal column. Mammals, fishes, birds, reptiles and amphibians are vertebrates.

zooplankton (zoe-uh-PLANK-tun): non-photosynthesizing members of the plankton, mostly animals

Food Chain & Food Web Resources

General Field Guides:

Harbor, Rick M. *Whelks to Whales*. Madeira Park, BC Canada; Harbour Publishing, 1999

McConnaughey, Baynard H, and Evelyn. *The Audubon Society Nature Guides: The Pacific Coast*. New York: Alfred A Knopf, inc., 1985

General References

Barns, Robert D. *Invertebrate Zoology*. Philadelphia, Pennsylvania: Hold, Rinehart & Winston, 1974.

Ganeri, Anita. *The Oceans Atlas*. New York: DK Publishing, Inc., 1994

Sumich, James L. *An Introduction to the Biology of Marine Life*. Dubuque, Iowa: Wm. C Brown Publishers, 1992

Waller, Geoffrey ed. *Sealife: A complete guide to the Marine Environment*. Washington D.C.: Smithsonian Institution Press, 1996

Food Chain and Food Web Books for Young Readers

Lauber, Patricia. *Who Eats What: Food Chains and Food Webs*. New York: HarperCollins Publishers Inc., 1995

Mullin, Rita Thievon. *Who's for Dinner?: Predators and Prey*. New York: Crown Publishers, Inc. Discovery Channel Publishing, 1998.

Sabin, Francine. *Ecosystems and Food Chains*. U.S.A.: Troll Communications L.L.C., Troll Associates, 1985.

Shahan, Sherry. *Barnacles Eat With Their Feet: Delicious Facts About the Tide Pool Food Chain*. Brookfield, Connecticut The Millbrook Press, 1996.

Videos:

Eyewitness series. New York: DK Publishing – www.dk.com

Ocean—history, physical oceanography, short clips on ocean food chains. (Approx. 35 minutes)

Seashore—history, habitat conditions of sandy shore, rocky shore, tropical and temperate climates. (Approx. 35 minutes)

Web Sites:

Aliens Explore Earth

[www.aliexplorer.com.ecology.topic4.html](http://www.aliexplorer.com/ecology.topic4.html)

Nature Nevada Classroom

www.unr.edu/hnap/PW.pw.fdchain.htm

UCLA/CSO Programs

www.lalc.k12.ca



Flash Card Notebook

Lesson at a Glance:

This activity will allow students to identify some of the animals they will see at the Aquarium.

Oregon State Benchmarks and Common Curriculum Goals

LIFE SCIENCE (ORGANISMS)

- **Common Curriculum Goal (Organisms):** Understand the characteristics, structure, and functions of organisms.
Content Standard: Describe the characteristics, structure, and functions of organisms.
Grade 3 Benchmark: Describe the basic needs of plants and animals.

LIFE SCIENCE: (DIVERSITY/INTERDEPENDENCE)

- **Common Curriculum Goal:** Understand the relationships among living things and between living things and their environments.
Content standards: Explain and analyze the interdependence of organisms in their natural environment.
Grade 3 Benchmark: Describe a habitat and the organisms that live there.
Grade 5 Benchmark: Describe the relationship between characteristics of specific habitats and the organisms that live there.

Materials:

- A copy of the flash cards for each student
- 25 solid colored 3x5 inch index cards for each student
- Crayons
- Glue for each student
- Scissors for each student (or pre-cut the flashcards)
- A hole punch
- Yarn or a binder ring



Giant Pacific Octopus

Background Information:

This activity will introduce the students to some of the animals they will see at the Aquarium during their visit.

Activity:

1. Hand each student a set of flashcards, index cards, glue and scissors (if appropriate).
2. Have the students attach their flash cards to the index cards with the picture of the animal on one side and the information on the opposite side.
3. Have the students color the pictures of the animals.
4. Have the students decorate two of the remaining index cards. These will be the cover of their notebook.
5. Place the remaining six index cards at the back of the picture cards and inside the cover.
6. Punch a hole in the left hand corner of each animal card. Tie the cards together using either yarn or a binder ring to complete the notebook.
7. During or following their visit to the Aquarium, have your students draw some of the other animals they saw at the Aquarium.
8. Have the students write interesting facts they learned on their trip on the opposite side of their picture.
9. Have the students share their notebooks with their classmates.

Summary:

1. Review what the students learned about the animals at the Aquarium.

Continuation:

1. Have the students identify which animals are predators and which animals are prey animals. Can they create a food chain using the animals in their notebooks?

Assessment:

1. Have the students write a story about the animals in their notebook.
2. Have the students draw a picture of the animals in their notebook. Are they able to place the animals in their correct habitats? Are they able to label the animals in their drawing?

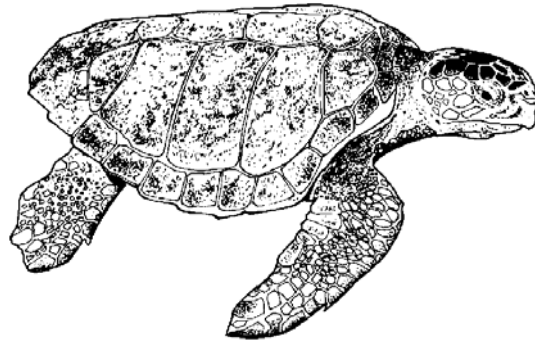
Loggerhead sea turtle

Size: Loggerhead sea turtles reach lengths of up to 41 inches from head to tail; can weigh up to 223 pounds.

Color: Loggerheads are reddish brown on their backs and orange-yellow underneath. Barnacles and seaweed often grow on their shells.

Diet: Loggerhead turtles have jaws that crush and grind crabs, clams, shrimp, jellyfish and plants.

Did you know? Sea turtles often mistake plastic bags and balloons for jellyfish. If they eat this kind of trash, they often die.



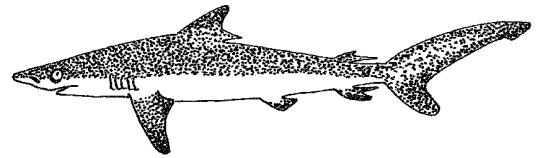
Silky shark

Size: Silky sharks reach lengths of up to 10 ½ feet from head to tail.

Color: Silky sharks are dark gray or gray-brown on their backs and black to white on their bellies.

Diet: Silky sharks eat fishes, squid and crabs.

Did you know? Although they are often found in large schools around divers, silky sharks have never attacked a person.



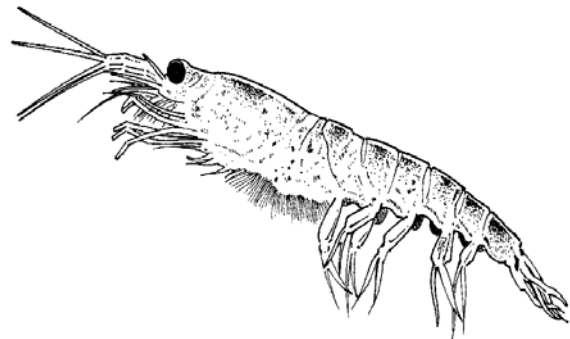
Krill

Size: Krill reach a length of about one inch.

Color: Krill are pale pink to light orange in color.

Diet: Krill feed on tiny plants called phytoplankton, that float in the ocean.

Did you know? Krill are eaten by baleen whales, seals, penguins, fishes, invertebrates and many seabirds. Krill can live without food for over 200 days!



Northern sea otter

Size: Males: up to 5 feet long; can weigh up to 100 pounds. Females: up to 4 1/2 feet long; can weigh up to 72 pounds.

Color: Sea otters are covered with dark brown fur. Sometimes as they get older the fur on their head becomes blonde.

Diet: Sea otters eat hard, crunchy animals like crabs, shrimp, abalone, sea urchins and clams.

Did you know? Sea otters can have up to one million hairs in one square inch on their bodies. That's more hair than you have on your whole head.



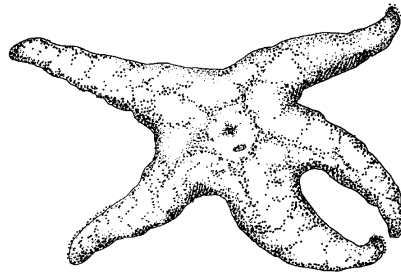
Ochre sea star

Size: Up to 12 inches across from tip to tip.

Color: They may be yellow, brown, orange, reddish, or purple.

Diet: Mussels, barnacles, snails, limpets, and chitons.

Did you know? Ochre stars have many tube feet used for moving and holding onto rocks and prey. The ochre star eats by holding onto the shell of its prey with its tube feet, then pushing its stomach out of its body and into the shell of its prey to digest the meat.



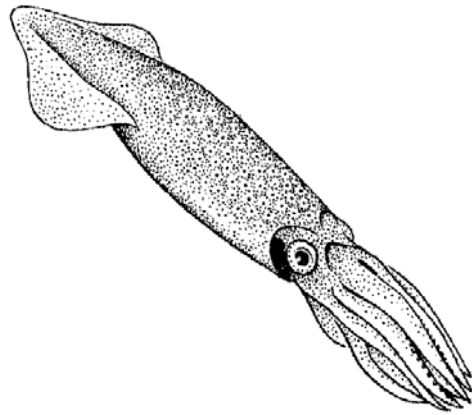
Common Squid

Size: Males: up to 11 inches. Females: up to 8 inches. These measurements include their 8 arms but not their feeding tentacles, as these tentacles often vary in length.

Color: Common squid are pale bluish white, changing to spotted brown and gold in the light or to dark brown or dark red when they are feeding, frightened or excited.

Diet: Common squid feed on krill, fishes, worms and other squid.

Did you know: Squid are related to snails and octopus. A female squid may lay many large egg capsules. Each capsule may hold up to 300 eggs!



A Few Words about Food Chains

Lesson at a glance:

The purpose of this activity is to introduce students to the concept of food chains and food webs and familiarize them with some of the vocabulary they will encounter in the *What's for Lunch?* lab program at the Aquarium.

Oregon State Benchmarks and Common Curriculum Goals

Grade 2:

READING

- **Common Curriculum Goal:** Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.

DECODING AND WORD RECOGNITION

- Read regular multi-syllabic words.
- Use letter-sound correspondence knowledge to sound out unknown words.

VOCABULARY

- Understand, learn, and use new vocabulary that is introduced and taught directly through orally read stories and informational text as well as student-read stories and informational text.
- Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud.

READ TO PERFORM A TASK

- Read written directions, signs, captions, warning labels, and informational books.

Grade 3:

READING

- **Common Curriculum Goal:** Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.

DECODING AND WORD RECOGNITION

- Read regular words with several syllables.
- Use letter-sound correspondence knowledge and structural analysis to decode words.
- Know and use more complex word patterns when reading (e.g., -ight) to decode unfamiliar words to grade level.

LISTEN TO AND READ INFORMATIONAL AND NARRATIVE TEXT

- Listen to, read, and understand a wide variety of grade-level informational and narrative (story) text including children's magazines and newspapers, dictionaries, other reference materials, online information, classic and contemporary literature, and poetry.

VOCABULARY

- Understand, learn, and use new vocabulary that is introduced and taught directly through orally read stories and informational text as well as student-read stories and informational text.
- Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud.

Materials:

- Food chains introduction text: **Fun With Food Chains**-a copy for each student
- What's For Lunch?** Word Search for each student
- A pen or pencil per student

Background:

The source of energy for most marine food chains is the sun. Marine plants, such as kelp, use the sun's energy to make their own food. This process is called **photosynthesis**. Because these plants make their own food, they are called **producers**. Most of the producers in the ocean are microscopic plants called **phytoplankton**.

When plants and animals are linked together by what they eat, the connection is called a **food chain**. A sample food chain might be:

Sun → Phytoplankton → Anchovy → Sea lion

In this food chain, the anchovy and the sea lion are **consumers** because they cannot produce their own food and must eat other organisms to survive. Most animals eat more than one type of food, so they are often part of a several different food chains. When food chains become linked together, they are called **food webs**. Although there are specific food webs for each habitat in the ocean, animals in one habitat often eat other animals in an adjacent habitat, creating one huge ocean food web.

Activity:

1. As students to share what they know about food chains.
2. Have them list examples of food chains that they are familiar with.
3. Hand out Finding Out About Food Chains for the students to read as you read it out loud to them.
4. When you have finished reading, have them find the vocabulary words in the Having Fun With Food Chains Word Search using the bold words included in the Finding Out About Food Chains text.
5. Draw several food chains on the boards. Link them together to make a food web.

What's For Lunch? Vocabulary Words

Producer, consumer, herbivore, carnivore, omnivore, habitat, food chain, food web, link and sun

Summary:

- Go over the answers to the word search with your students.
- Have your students cut out five animal pictures from a magazine and bring them in to class. As a group, have your students work together to create food chains and food webs with their pictures.

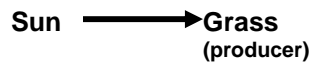
Finding Out About Food Chains

When an animal eats a plant or another animal, it is part of a food chain. Food chains are made every time a plant grows or an animal eats. Each plant or animal is a link in the chain.

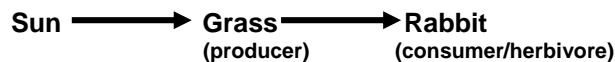
Most food chains begin with the sun. The sun helps the plants grow.



Plants are called **producers**. Producers (plants) make their own energy with help from the sun. Following the sun, a plant is the next link in a food chain. Grass is a producer



Consumers are the animals that eat the plants and other animals. A rabbit is a consumer of grass. Because rabbits eat only plants, they are called **herbivores**. Herbivores are the third link in a food chain.



An animal that eats another animal is called a **carnivore**. A wolf would eat a rabbit so it is a carnivore it is also a consumer because it eats something else. Carnivores are the fourth link in this food chain.



If an animal eats both plants and meat, it is called an **omnivore**. People are omnivores.

Just like people, most animals eat more than one kind of food. When two or more food chains are linked together they make a **food web**. When you link many chains together, it looks like a giant spider web.

Having Fun with Food Chains

Word Search

S	P	R	O	D	U	C	E	R	H	U
T	C	A	R	N	I	V	O	R	E	I
G	H	F	N	F	B	M	C	X	R	Z
Y	H	C	B	O	T	Y	X	E	B	N
U	U	F	O	O	D	C	H	A	I	N
O	U	T	T	D	B	O	A	F	V	H
P	D	E	E	W	Y	N	B	I	O	I
K	Y	H	Y	E	E	S	I	T	R	E
L	E	T	D	B	G	U	T	G	E	H
H	G	H	K	R	D	N	A	T	Y	U
H	R	F	G	J	K	E	T	L	O	P
O	M	N	I	V	O	R	E	P	K	W
W	R	C	O	N	S	U	M	E	R	I
E	E	G	H	R	T	F	L	I	N	K

Find the following words:

SUN

HABITAT

CONSUMER

FOOD CHAIN

HERBIVORE

FOOD WEB

OMNIVORE

LINK

PRODUCER

CARNIVORE

Nature's Chains and Webs

Lesson at a glance:

This lesson is designed to teach students the basic elements of several food chains and the definitions of the term's food chains and food webs.

Oregon State Benchmarks and Common Curriculum Goals

LIFE SCIENCE (ORGANISMS)

- **Common Curriculum Goal** (Organisms): Understand the characteristics, structure, and functions of organisms.

Content Standard: Describe the characteristics, structure, and functions of organisms.

Grade 3 Benchmark: Describe the basic needs of plants and animals.

Grade 5 Benchmark: Classify organs by the system to which they belong.

LIFE SCIENCE: (DIVERSITY/INTERDEPENDENCE)

- **Common Curriculum Goal:** Understand the relationships among living things and between living things and their environments.

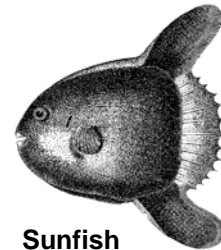
Content standards: Explain and analyze the interdependence of organisms in their natural environment.

Grade 3 Benchmark: Describe a habitat and the organisms that live there.

Grade 5 Benchmark: Describe the relationship between characteristics of specific habitats and the organisms that live there.

Materials:

- Four or five balls of string or yarn
- A length of chain such as a dog leash
- Food chain pictures (attached)
- Five clothes pins



Sunfish

Background information:

The sun's light is the first link in every food chain because it produces the energy that plants (producers) need to grow.

No living thing can live by itself. We all rely on something else. For example, animals rely upon plants or other animals, while plants can't live without the nutrients they receive through water and soil. An ecosystem is the place where air, soil and water can support a community of plants and animals. Within an ecosystem, food chains and food webs are found. These support the living and nonliving things within the ecosystem.



Living things that eat each other form a **food chain**. In most food chains, big animals eat little animals and the little animals eat plants, which rely on the soil, which received its nutrients from decaying plants and animals. When many food chains are linked together, a **food web** is formed.

Activity:

1. Introduce the concept of food chains by describing each part of a food chain as a link, like the links in a chain. Hook the attached pictures to each link of your chain with a clothes pin. Remove one of the pictures from the chain. Ask the students what happens to the food chain when the link is removed.
2. Now have the students brainstorm some possible food chains. Write them on the board.
3. Divide the students into groups of four or five. Give each group a ball of string. Select one student from each group to be the sun. Have the sun hold on to the end of the string and gently toss it to another student in the group. That student should name a plant and toss it to another student in the group. This student must name something that eats the plant and then passes the string on. Continue this process until each student is holding onto the yarn.
4. Ask the students to share their food chains with the class. Write the food chain created by each group on the board.

Summary:

1. Discuss what would happen if one of the links in each of the chains were removed. Would there be enough food for the animals? Would there be too many animals for the food sources available? Where do people fit into each of these food chains?

Extension:

1. Have your students do this activity again. Write the food chains up on the board and introduce the topic of food webs. Have the students help you link the food chains together to form a food web. Explain that by linking food chains together and creating a web, the food chains not only grow bigger but also stronger.
2. **For older students:** Introduce the vocabulary words *producer*, *consumer*, *predator*, *prey* and *photosynthesis*. Look at each of the food chains and place the appropriate word next to each link in the food chain.



Beaver



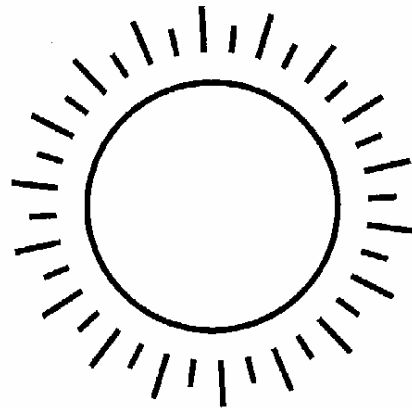
Alder



Bobcat



Sun



Sea Links

Lesson at a glance:

This lesson is designed to teach students the basic elements of four marine food chains.

Oregon State Benchmarks and Common Curriculum Goals

LIFE SCIENCE (ORGANISMS)

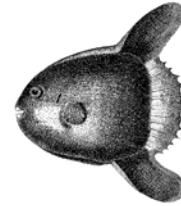
- **Common Curriculum Goal** (Organisms): Understand the characteristics, structure, and functions of organisms.
Content Standard: Describe the characteristics, structure, and functions of organisms.
Grade 3 Benchmark: Describe the basic needs of plants and animals.
Grade 5 Benchmark: Classify organs by the system to which they belong.

LIFE SCIENCE: (DIVERSITY/INTERDEPENDENCE)

- **Common Curriculum Goal:** Understand the relationships among living things and between living things and their environments.
Content standards: Explain and analyze the interdependence of organisms in their natural environment.
Grade 3 Benchmark: Describe a habitat and the organisms that live there.
Grade 5 Benchmark: Describe the relationship between characteristics of specific habitats and the organisms that live there.

Materials:

- Photocopied food chain (four masters attached)
- Crayons
- Scissors
- Glue



Sunfish

Background information:

The source of energy for most marine food chains is the sun. Marine plants, such as kelp, use the sun's energy to make their own food. This process is called **photosynthesis**. Because these plants make their own food, they are called **producers**. Most of the producers in the ocean are microscopic plants called **phytoplankton**.

When plants and animals are linked together by what they eat, the connection is called a **food chain**. A sample food chain might be:

Sun → Phytoplankton → Jelly → Ocean sunfish.

In this food chain, the jelly and the sunfish are **consumers** because they cannot produce their own food and must eat other organisms to survive. Most animals eat more than one type of food, so they are often part of several different food chains. When food chains become linked together, they are called **food webs**. Although there are specific food webs for each habitat in the ocean, animals in one habitat often eat other animals in an adjacent habitat, creating one huge ocean food web.

Activity:

1. Precut the four food chains vertically into four strips each.
2. Introduce the concept of food chains by describing each item in a food chain as a link, like the links in a chain.
3. Give each student a set of four strips for of food chain #1. Have them color each strip of paper.

4. Beginning with the sun, have the students glue the strip of paper into a circle (like the link on a paper chain). Next have them insert the kelp strip through the circle and glue the ends together. Now have them insert the sea urchin strip through the kelp link and glue the ends together. Lastly, have them insert the sea otter strip through the sea urchin link and glue the ends together. They have just created a marine food chain.
5. Follow the same steps for food chains #2 through #4. When you are finished your class will have created the following four food chains:

Sun → Kelp → Sea urchin → Sea otter

Sun → Plankton → Shore crab → Sea turtle

Sun → Plankton → Mussel → Ochre star

Sun → Plankton → Squid → Silky shark

Summary:

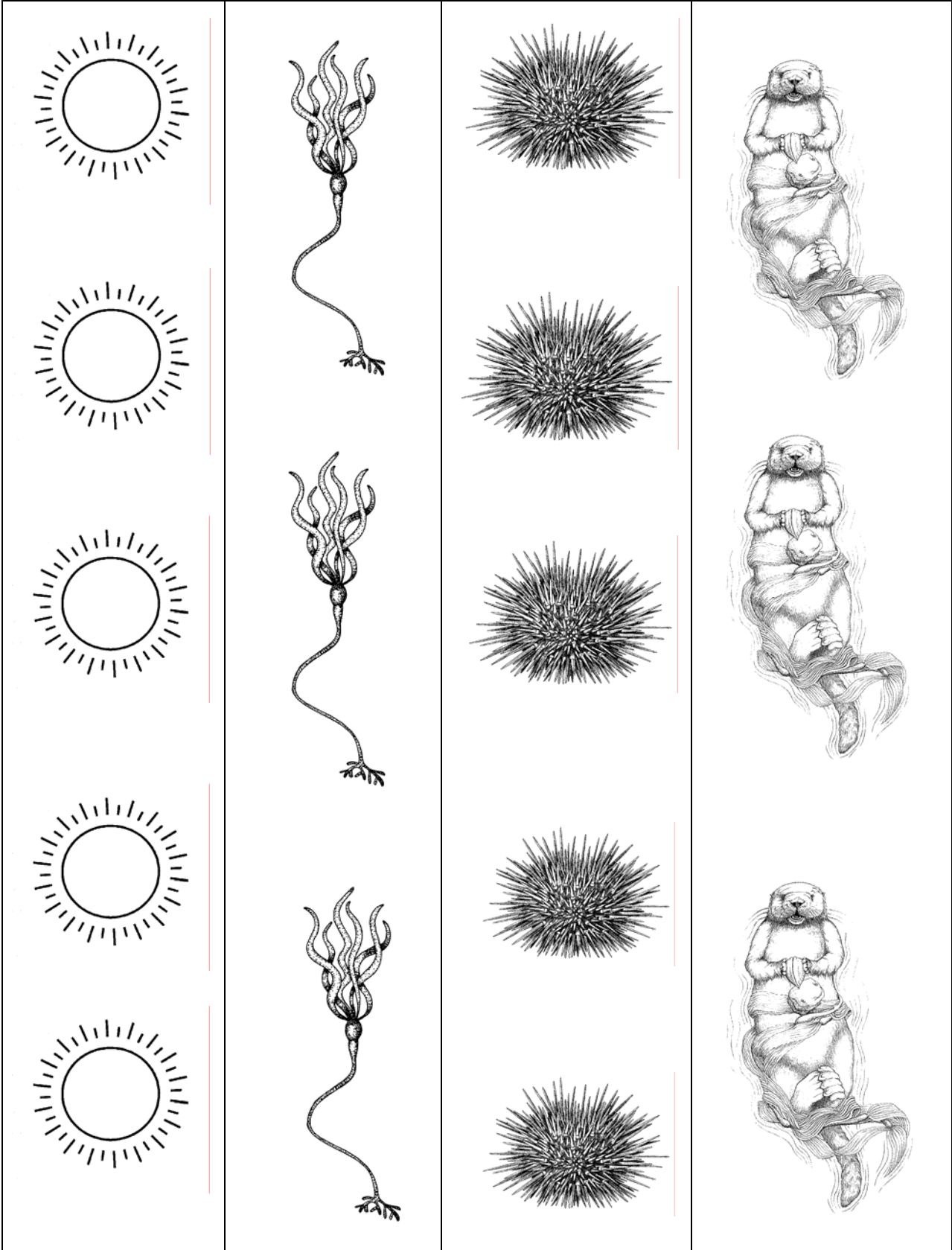
1. Discuss what would happen if one of the links in each of the chains were removed. Would there be enough food for the animals? Would there be too many animals for the food sources available? Where do people fit into each of these food chains?

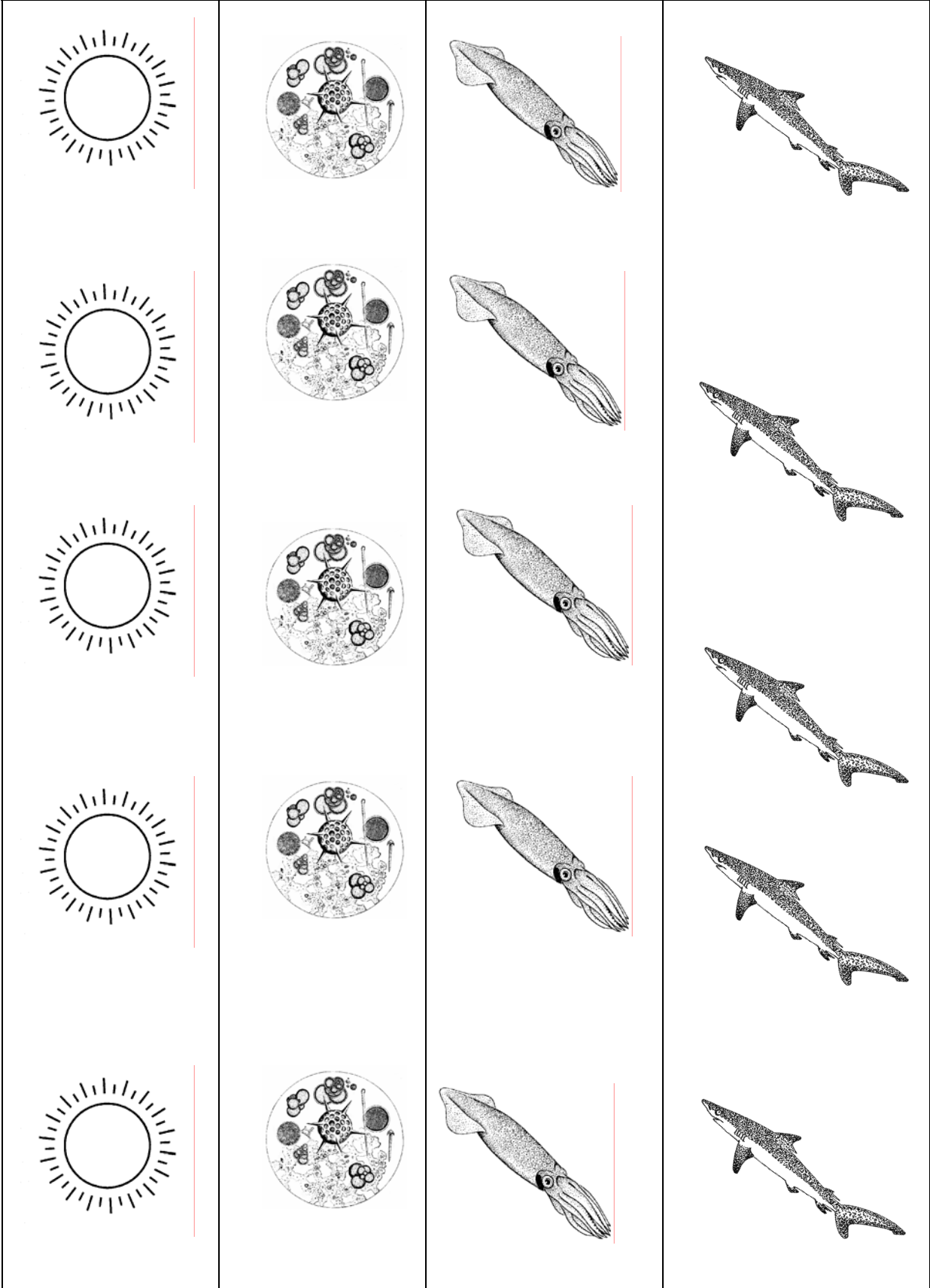
Extension:

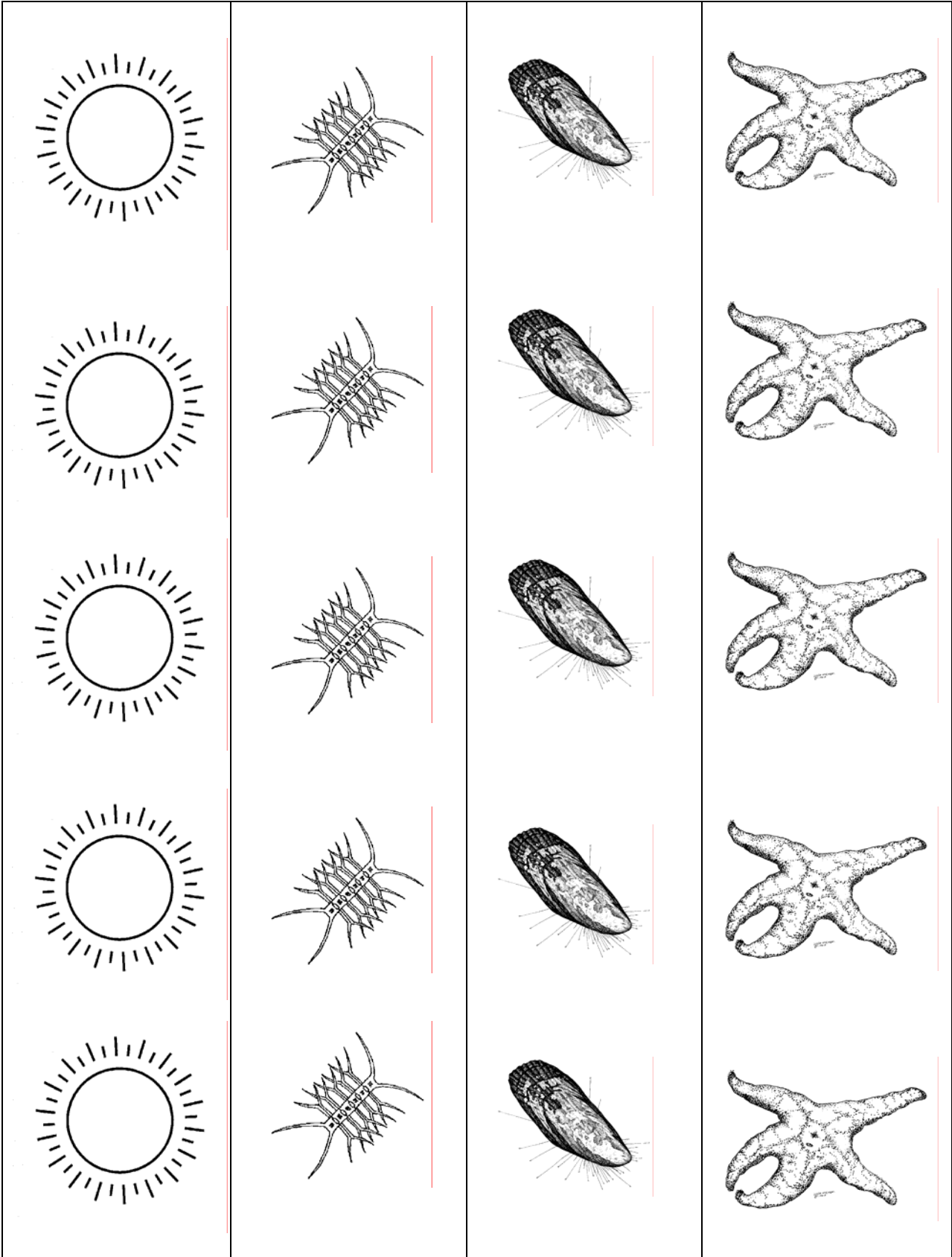
1. Create a food web by linking the animals together that share food preferences.
2. **For older students:** Introduce the vocabulary words *producer*, *consumer*, *predator*, *prey* and *photosynthesis*. Look at each of the food chains and place the appropriate word next to each link in the food chain.

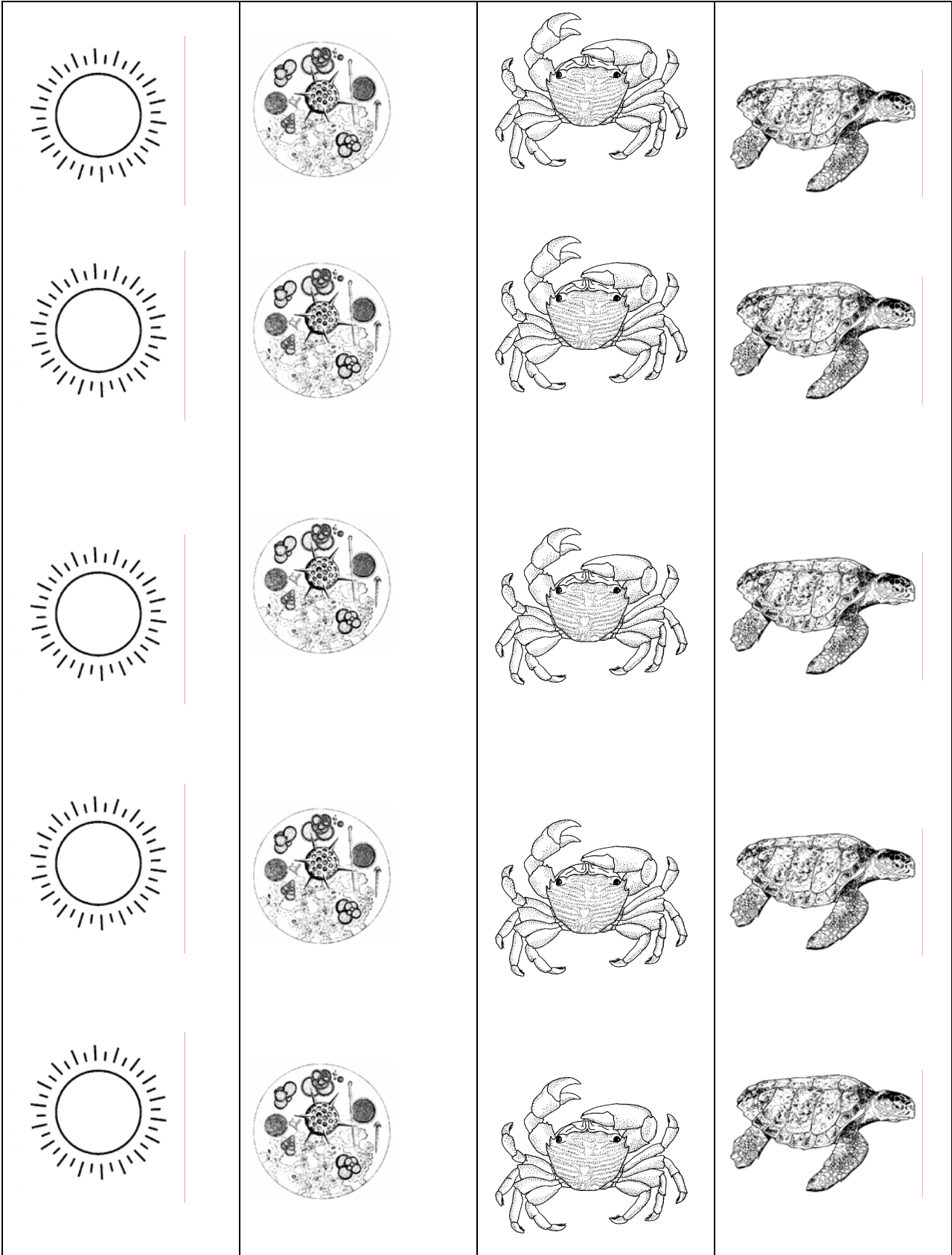
Assessment:

1. Give your students a list of vocabulary words and have them write a short story using the words correctly. Use the included rubric to score their work.









Assessment:

Sea Links Writing Assignment

Student Name: _____

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.	



Adding Up Food Chains

Lesson at a glance

Students use mathematical skills and problem solving to solve several mathematic equations.

Oregon State Common Curriculum Goals and Benchmarks:

Mathematics: Calculations and Estimations

Grade 2

- **CALCULATIONS AND ESTIMATIONS**

Common Curriculum Goal: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

NUMBERS

- Read, write, order, model, and compare whole numbers less than 100.
- Read number words less than one hundred and write the corresponding numeric value.
- Compose and decompose whole numbers less than one hundred by place value (e.g., $426=4\text{-}100\text{'s}$, $2\text{-}10\text{'s}$, $6\text{-}1\text{'s}$).

COMPUTATIONS AND ESTIMATIONS

- Develop and evaluate strategies for adding and subtracting whole numbers.
- Apply with fluency sums to 18 and related subtraction facts.

Materials:

- Copies of the math problems
- Pencils

Activity:

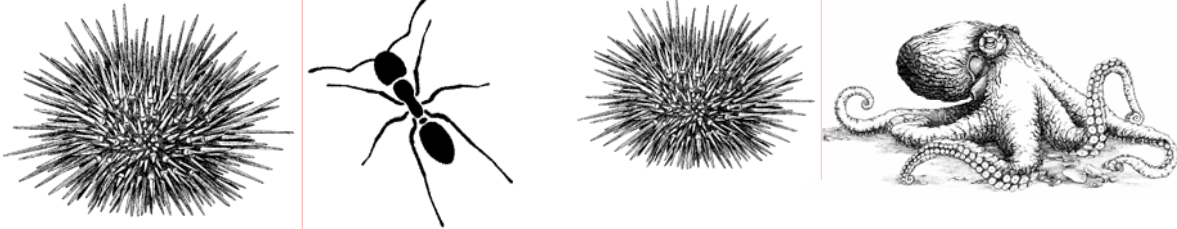
Please see attached worksheets.

Extensions:

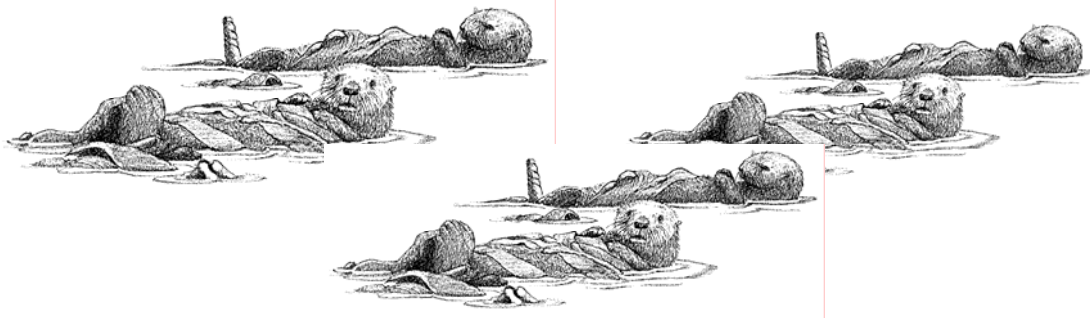
1. Have your students graph the number of each species.
2. Have your students count the number of species by pairs.
3. Have your students color the animals and then count by color.

Mathematic Munching

1. How many sea urchins do you count? _____

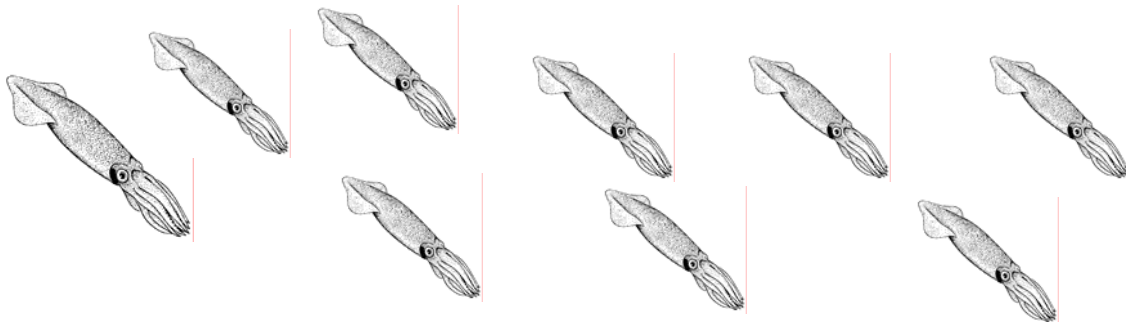


2. How many sea otters do you count? _____

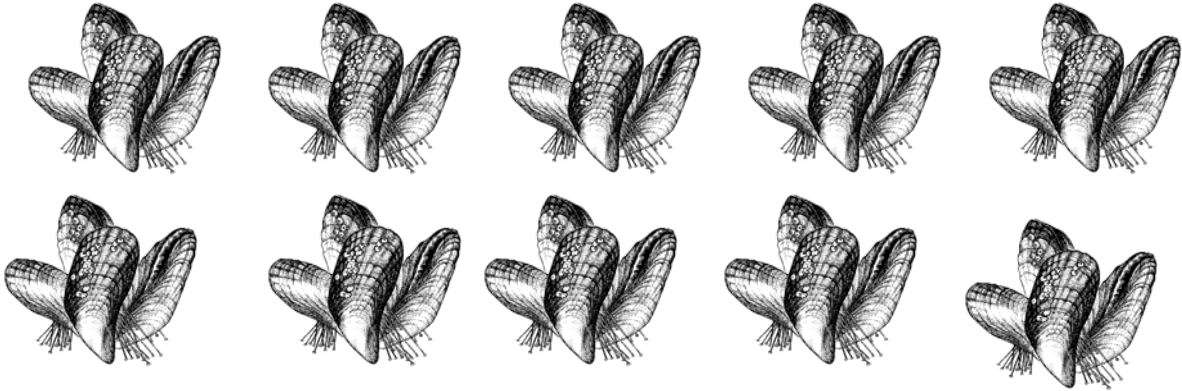


3. How many pairs of sea otters do you count? _____

4. How many squid do you count? _____

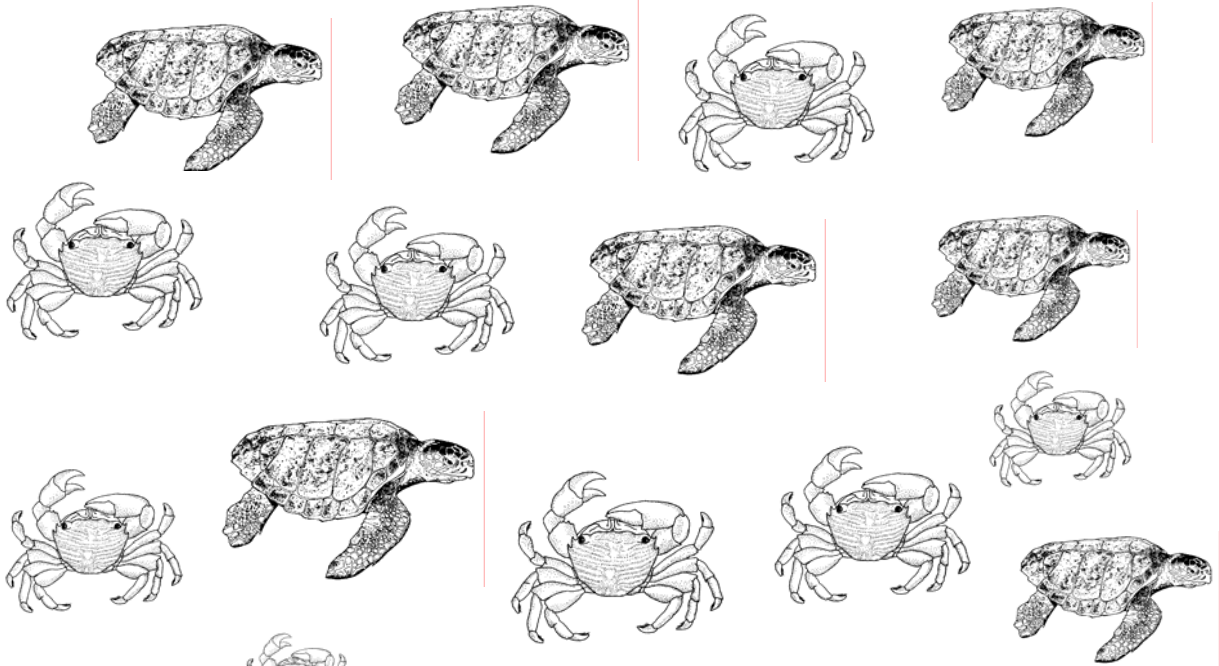


5. How many groups of  mussels do you count? _____



6. How many  mussels are in a group? _____

7. How many  sea turtles do you count? _____



8. How many  shore crabs do you count? _____

Addition Problems

Example:



How many  sea turtles in all? 3 + 2 = 5

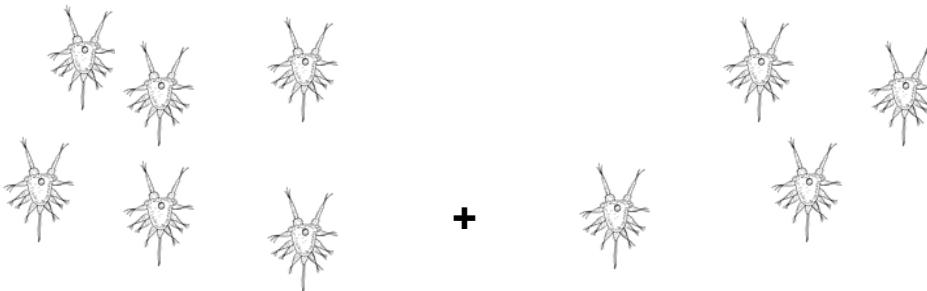
Read the story problem. Write the equation.



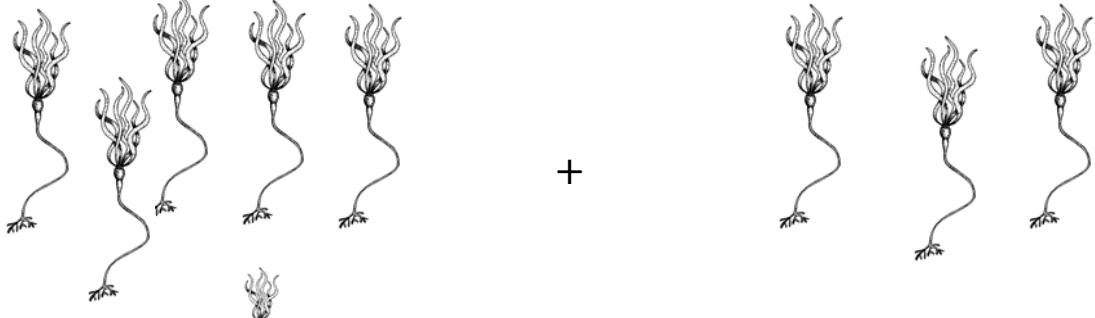
1. How many  sea urchins in all? + =




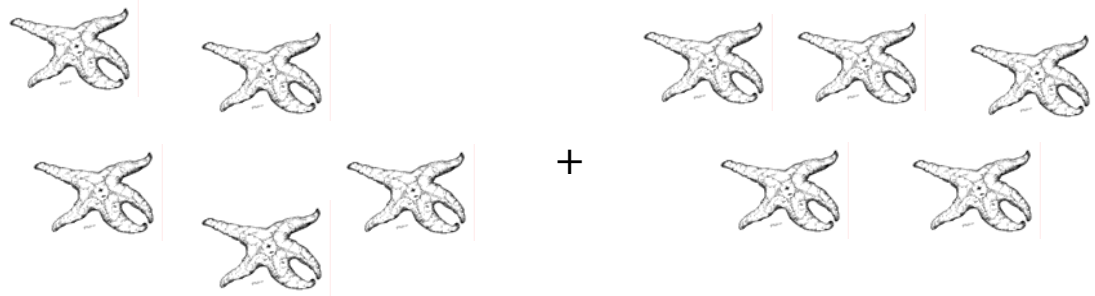
2. How many  sea otters in all? + =




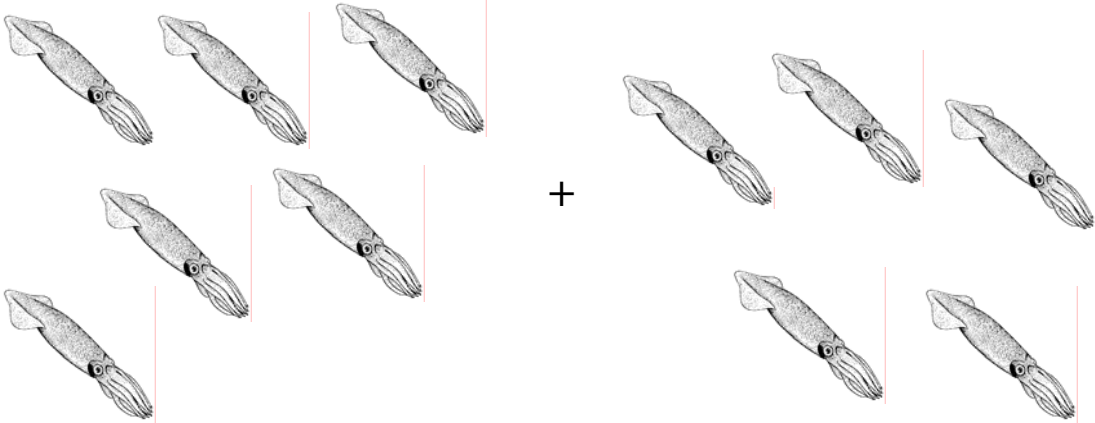
3. How many  plankton in all? + =




4. How many  kelp are there? + =



5. How many  sea stars are there? + =



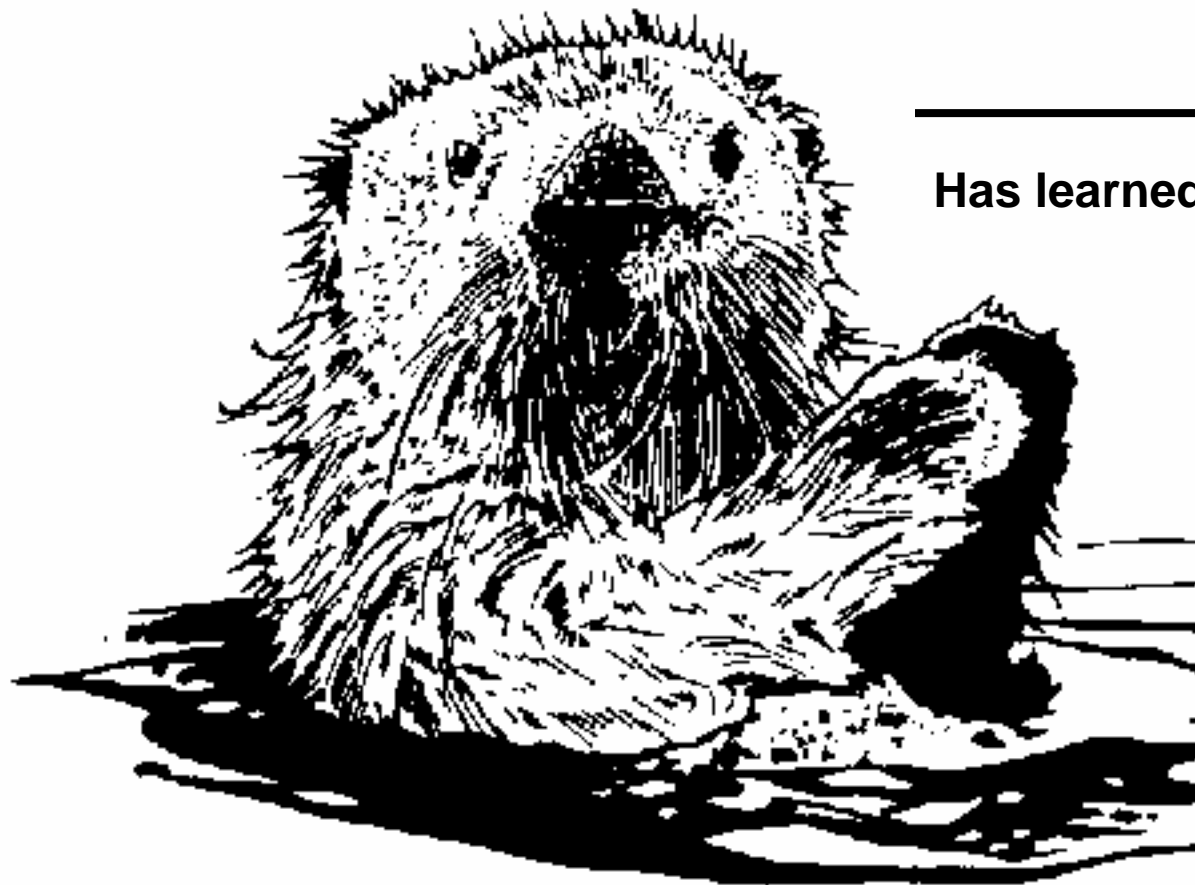
6. How many  squid are there? + =

Assessment:

Math - Problem Solving Rubric

Student Name: _____

CATEGORY	4	3	2	1	Score
Mathematical Errors	90-100% of the steps and solutions have no mathematical errors.	Almost all (85-89%) of the steps and solutions have no mathematical errors.	Most (75-84%) of the steps and solutions have no mathematical errors.	More than 75% of the steps and solutions have mathematical errors.	
Use of Manipulatives	Student always listens and follows directions and only uses manipulatives as instructed.	Student typically listens and follows directions and uses manipulatives as instructed most of the time.	Student sometimes listens and follows directions and uses manipulatives appropriately when reminded.	Student rarely listens and often "plays" with the manipulatives instead of using them as instructed.	
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.	
Completion	All problems are completed.	All but 1 of the problems are completed.	All but 2 of the problems are completed.	Several of the problems are not completed.	



Has learned about marine food chains

**What's
For
Lunch?**

Congratulations



