



TAKE CARE OF TEXAS: EDUCATOR MATERIALS

LESSON PLAN

Aquatic Food Web

Objectives

The students will learn about aquatic food webs. They will also learn why dissolved oxygen levels increase and decrease in aquatic environments.

Prerequisites

None

Duration

45 minutes

Materials

- 15 precut strings (5 long, 5 medium, and 5 short strings)
- Index cards labeled with the following terms:
 - Aquatic Insects, Zooplankton, Phytoplankton, Fish, Scavengers, Decomposers, Aquatic Plants, Nutrients, and Sunlight
- Aquatic Food Web sort
- 1 sheet of construction paper per group
- Aquatic Food Web handout

Introduction

TEACHER BACKGROUND INFORMATION:

Food chains tell you what an organism eats by linking it to one of its food sources, whereas food webs link an organism to multiple food sources. Aquatic food webs for surface water ecosystems begin with the **sun**, the source of light that is absorbed by **primary producers** (such as phytoplankton and aquatic plants). Through a process called photosynthesis, primary producers use this light to convert carbon dioxide and water into carbohydrates and oxygen. A portion of these carbohydrates and oxygen are used during **respiration** (the process by which organisms exchange gases between their cells and the environment).

Animals respire so they can create energy to move, grow. Since animals cannot produce their own food like the primary producers, they must consume (eat) their food. Animals that eat primary producers are called **primary**



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consumers, herbivores, or plant eaters (such as zooplankton, aquatic insects, and even some fish). Animals that eat primary consumers are called **secondary consumers**, carnivores, or meat eaters (some fish, birds, and small rodents). The secondary consumer group may contain more than one level of carnivore; therefore, a food web may have **tertiary consumers**, animals that eat secondary consumers (such as snakes, crocodiles, and large birds).

In addition, a food web may also contain **omnivores**—animals that eat plants and meat. Animals that eat dead organic materials are called **scavengers**. They are an important part of the food web because they help decomposition by shredding and eating dead organic materials. **Decomposers** (bacteria and fungi) are the final link in the food web. They break down dead material and release nutrients that can be used by primary producers. Teachers can use the **Sample Food Web** provided to show students an example of a food web.

DISCUSSION

Ask students, “What types of food webs do you know about?” and pause to field responses. Explain that students will be learning about aquatic food webs. Using the prelabeled index cards, give out the index cards to students. Have those students stand or come to the front of the group. Explain that students will need to look at the labels and create a food web using the precut strings. When students are done, they will present their food web and the connections between each animal. Ask the whole group the following questions:

- “Does this food web work?”
- “What animal or animals is a primary producer?”
- “What animal or animals is a primary consumer?”
- “Is there or are there animals that can be two types of consumers?”

During the discussion, make sure to review the vocabulary words: *primary producer*, *primary consumer*, *secondary consumer*, *tertiary consumer*, *sun*, *decomposer*, *scavenger*, *omnivore*.

Procedure

Now that students have a good grasp of food webs and the different types of consumers, group students into small groups and pass out the **Aquatic Food Web sort** with a sheet of construction paper. Students will need to sort the animals into the correct categories: Primary Producer, Primary Consumer, Secondary Consumer, Tertiary Consumer, Scavenger, Decomposer. If students don't know about a certain animal, they can visit the **Common Freshwater Organisms** page from *Texas Parks and Wildlife* for detailed information. Once all the groups are done, review the correct sort and have students fix any errors, before gluing the labels on the construction paper under each category. Students will use this in the next part of the activity.

Pass out the **Aquatic Food Web handout** and explain that students will use the animals from the sort to create their own aquatic food web. Students will need to include the name and picture of the animal and arrows to show the transfer of energy. They will then match vocabulary words and finally work in small groups to answer some reflection questions.

Assessment

Teachers can use the Aquatic Food Web handout as a formative assessment, while also using the discussion before, during, and after the activity as informal assessments.

Glossary

- **Decomposers** – bacteria and fungi that break down dead material and release nutrients
- **Food Web** – a group of interconnected food chains within an ecosystem
- **Nutrients** – substances that are essential for healthy growth and development
- **Omnivores** – animals that eat plants and meat
- **Oxygen** – a colorless, odorless gas that is essential for almost every living organism
- **Primary Consumers** – animals that eat primary producers

- **Primary Producers** – organisms that make their own food through photosynthesis
- **Respiration** – the process by which organisms exchange gases between their cells and the environment
- **Scavengers** – animals that eat dead organic material
- **Secondary Consumers** – animals that eat primary consumers
- **Sun** – the star at the center of our solar system
- **Tertiary Consumers** – animals that eat secondary consumers
- **Water** – a clear liquid that makes all life on earth possible

Applicable TEKS

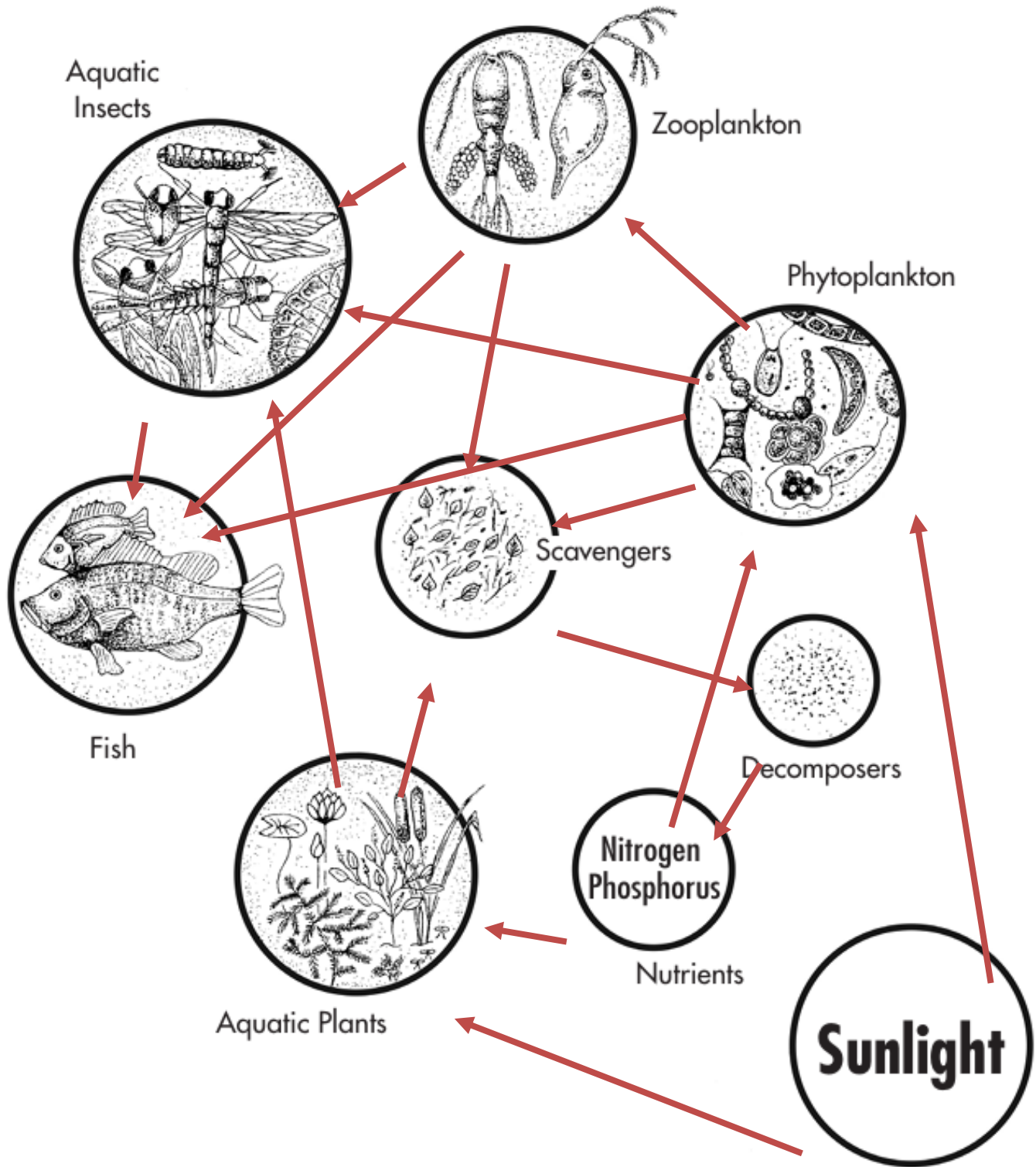
Science TEKS

- **4th Grade** – Section 112.6.b.3A-C; 5A-G; 11A-B; 12A-B.
- **5th Grade** – Section 112.7.b. 3A-C; 5A-G; 11A; 12A-C.
- **6th Grade** – Section 112.26.b. 3A-C; 5A-G; 12A-C.

References

- Texas Parks and Wildlife. *Common Freshwater Organisms*. tpwd.texas.gov/education/resources/texas-junior-naturalists/bugs-bugs-bugs/common-freshwater-organisms

Sample Aquatic Food Web



Aquatic Food Web Sort

PRIMARY PRODUCERS

Aquatic Plants
Cattails
Phytoplankton
Pondweed
Water Lilies

SECONDARY CONSUMERS

Crayfish
Frogs
Leeches
Salamanders
Small Trout

SCAVENGERS

Catfish
Clams
Crayfish
Snails
Snapping Turtles

PRIMARY CONSUMERS

Fairy Shrimp
Larvae
Minnows
Tadpoles
Zooplankton

TERTIARY CONSUMERS

Bald Eagles
Hérons
Largemouth Bass
River Otters
Snapping Turtles

DECOMPOSERS

Bacteria
Fungi
Isopods
Protozoa
Tubifex Worms