

Answer Key – Reading Activity – Dissolved Oxygen



Name: _____

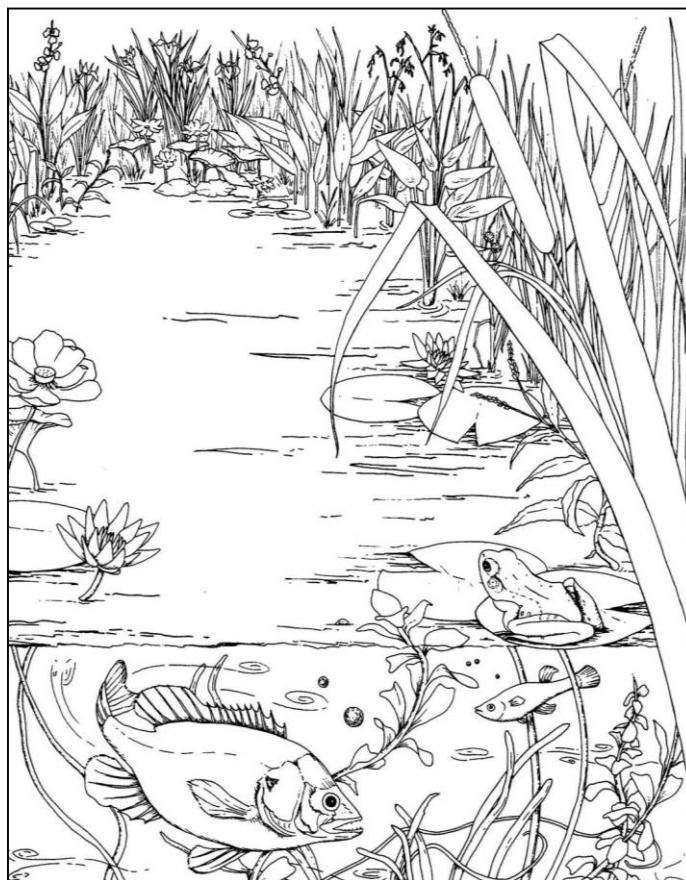
Class Period: _____ Date: _____

Fish and other **aquatic** (underwater) **animals** cannot live without oxygen. (Neither can we!) **Aquatic plants** need oxygen too. However, because they live in water, aquatic plants and animals get their oxygen in a form known as **dissolved oxygen** gas.

It is important to understand that this gas does not come from the molecules of oxygen that make up the water itself. Rather, dissolved oxygen gas is constantly entering the water from two main sources. Our atmosphere is the first of these sources. **Molecule** by molecule, oxygen is pushed into the water by pressure from the air above.

Photosynthesis is the second important source of dissolved oxygen. Photosynthesis is a process that takes place in algae and other green plants; they use carbon dioxide, water and sunlight to make their own food. Dissolved oxygen gas is released into the water as a result of this process.

Plants take in dissolved oxygen to use in their bodies in a way that is similar to how our bodies use the oxygen that we take in when we breathe. In plants, this “breathing” process is almost the opposite of photosynthesis. Oxygen helps the plant break down the food it has created through photosynthesis and turn it into energy.



At night and on very cloudy days, algae and other aquatic plants remove oxygen from the water as they breathe. During daylight hours, photosynthesizing plants usually make more oxygen than they use.

Dissolved oxygen levels in water bodies change over the course of the day, and also due to weather and other conditions. At night, dissolved oxygen levels are low because plants are no longer photosynthesizing; without sunlight, no oxygen is produced. Meanwhile, both plants and animals are still breathing and using what’s left of the oxygen in the water. This means that dissolved oxygen levels are lowest just before sunrise.

Temperature can also affect the amount of dissolved oxygen in water. Cooler water holds more dissolved oxygen than warm water. Florida’s warm summer temperatures can cause dissolved oxygen to drop to very low levels in a lake or pond.

Like humans, fish can handle short amounts of time with reduced oxygen. However, if the dissolved oxygen content *stays* low in a waterbody, a **fish kill** can occur. This type of oxygen-related fish kill is common in Florida, especially in still or slow-moving waters such as lakes and ponds. These mass die-offs of fish and other aquatic animals usually happen in the summer when water temperatures are very warm, after several days of cloudy weather.



Sharp drops in dissolved oxygen that cause fish kills can also be caused by large **algae blooms**. Algae use up lots of oxygen in a short amount of time as these tiny, single-celled plants increase in numbers rapidly and then die off. **Micro-organisms** that eat the dead algae also use up lots of oxygen in the process. The death of large numbers of bigger, multi-celled aquatic plants in a lake or pond can also cause sharp drops in dissolved oxygen as the plants decay. This can happen due to natural causes such as storms, drought, freezes and other weather events, or due to human activities such as cutting or spraying plants with weed-killer type chemicals in and around waterbodies.

Dissolved Oxygen Reading Activity (UE) – answer in complete sentences.

1. What are the two sources of dissolved oxygen gas in water?

The two sources of dissolved oxygen gas in water bodies are the atmosphere, and photosynthesis.

2. Describe the difference between photosynthesis and respiration in aquatic plants.

In photosynthesis, aquatic plants and algae use carbon dioxide, water and sunlight to make their own food. They release oxygen gas into the water. In respiration, plants “breathe” by taking in dissolved oxygen from the water.

3. What are some of the factors that affect dissolved oxygen levels in the water? When are dissolved oxygen levels usually lowest?

Temperature, cloud cover, and the time of day all affect dissolved oxygen levels in the water. Dissolved oxygen levels are usually lowest on cloudy days, warm days, and at night when no photosynthesis is taking place.

4. Name one thing that can result from sharp drops in dissolved oxygen levels in the water.

Fish kills can result from sharp drops in dissolved oxygen.



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The following is a list of suggested standards that pertain to this activity. This list is provided as a reference to incorporate and expand upon as needed.

Next Generation Sunshine State Standards

4th Grade

SC.4.N.1.4: Recognize ways plants and animals, including humans, can impact the environment.

5th Grade

SC.5.L.17.1: Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

Common Core State Standards

4th Grade

Common Core Code	FL Common Core Code	Common Core Standard
RI.4.1	LACC.4.RI.1.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
RI.4.4	LACC.4.RI.2.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
RF.4.3	LACC.4.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
RF.4.4	LACC.4.RF.4.4	Read with sufficient accuracy and fluency to support comprehension.
L.4.4	LACC.4.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

5th Grade

RI.5.1	LACC.5.RI.1.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
RI.5.4	LACC.5.RI.2.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
RF.5.3	LACC.5.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
RF.5.4	LACC.5.RF.4.4	Read with sufficient accuracy and fluency to support comprehension.
L.5.4	LACC.5.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.



Florida Invasive Plant Education Initiative • <http://plants.ifas.ufl.edu/education>

A Collaboration of the UF/IFAS Center for Aquatic and Invasive Plants

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