

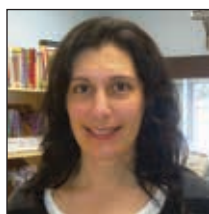
Earth & Space Science

—— Grade 2 ——

Written by Tracy Bellaire

The activities in this book have two intentions: to teach concepts related to earth and space science and to provide students the opportunity to apply necessary skills needed for mastery of science and technology curriculum objectives.

The experiments in this book fall under thirteen topics that relate to an aspect of earth and space science: **Air, Water, and Soil in the Environment**. In each section you will find teacher notes designed to provide you guidance with the learning intention, the success criteria, materials needed, a lesson outline, as well as provide some insight on what results to expect when the experiments are conducted. Suggestions for differentiation are also included so that all students can be successful in the learning environment.



Tracy Bellaire is an experienced teacher who continues to be involved in various levels of education in her role as Differentiated Learning Resource Teacher in an elementary school in Ontario. She enjoys creating educational materials for all types of learners, and providing tools for teachers to further develop their skill set in the classroom. She hopes that these lessons help all to discover their love of science!

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Learning Intentions

	Learning About Air-Pt. 1	Learning About Air-Pt. 2	The Movement of Air	Using and Needing Air	What is Water?	The Water Cycle	Water Facts	Waterproof or Waterlogged?	Needing and Using Water	Soils	Earthworm Invasion!	Erosion	Pollution
Knowledge and Understanding Content													
Recognize that air takes up space and that it has mass, identifying these as characteristics of air.	•												
Recognize that air expands and that it can create a force, identifying these as characteristics of air.		•											
Determine that air can be seen and felt when it moves.			•	•									
Describe the benefits of moving air and recognize that all living things need air to survive.				•									
Explore and describe water using the five senses; and distinguish the three states of water.					•								
Describe the water cycle and factors that affect evaporation rate.						•							
Determine the shape of water, the space it takes, and its mass; identifying these as characteristics of water.							•						
Recognize that some materials absorb water and other materials repel water.								•					
Describe where water comes from, how it is used, and ways to reduce water consumption.									•				
Identify the four components of soil and describe the different types of soil.										•			
Investigate and describe the benefit of earthworms in making nutrient rich soil.											•		
Describe the effects of moving air and water on different soils.												•	
Recognize and describe how pollution affects the air, water, and soil in our environment.													•
Thinking Skills and Investigation Process													
Make predictions, formulate questions, and plan an investigation.	•	•	•		•	•	•	•	•			•	
Gather and record observations and findings using drawings, tables, written descriptions.	•	•	•	•	•	•	•	•	•	•	•	•	•
Recognize and apply safety procedures in the classroom.	•	•	•	•	•	•	•	•	•	•	•	•	•
Communication													
Communicate the procedure and conclusions of investigations using demonstrations, drawings, and oral or written descriptions, with use of science and technology vocabulary.	•	•	•	•	•	•	•	•	•	•	•	•	•
Application of Knowledge and Skills to Society and the Environment													
Assess personal and family uses of water, determine these as efficient or wasteful, discuss ways to reduce water consumption.									•				
Assess how human activities affect the quality of air, water, and soil in the environment; develop a plan of action to reduce pollution in the local community.													•

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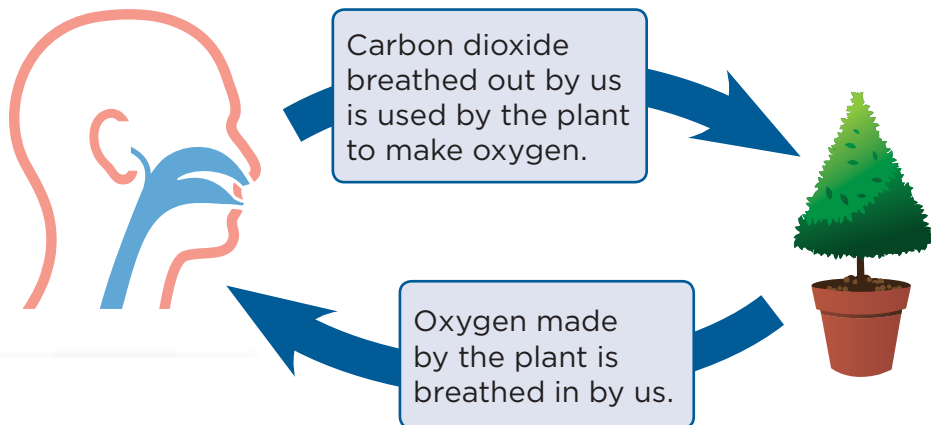
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We Need Air

All living things depend on the air to live and breathe. The air around us is made up of different gases.

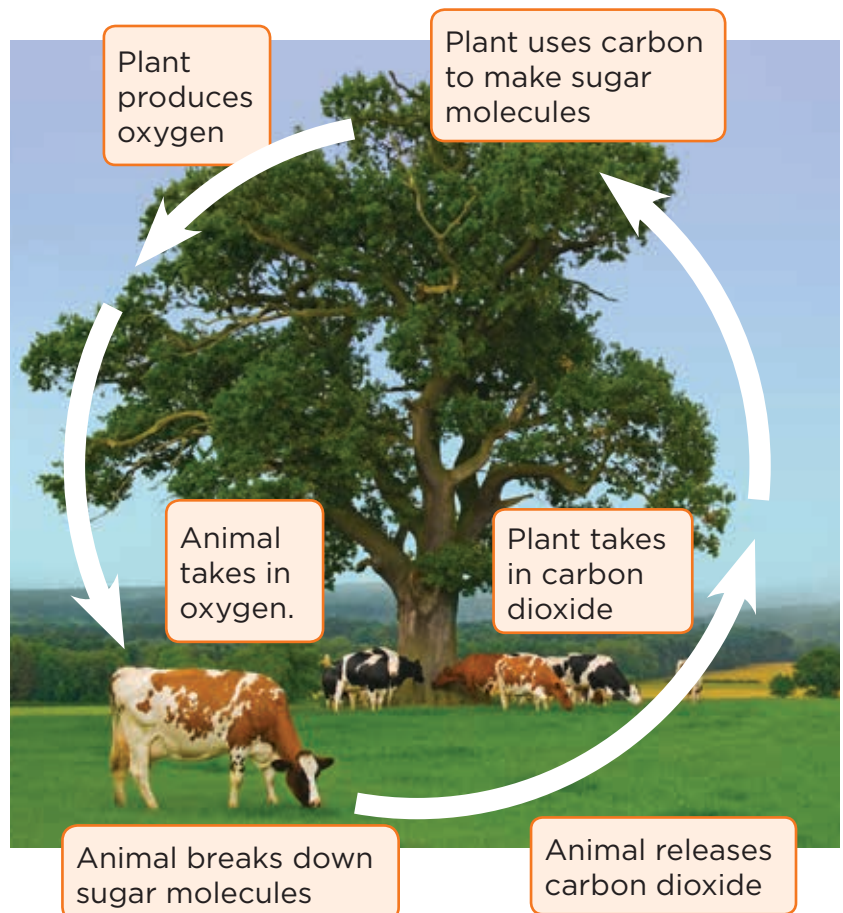
The two main ones that make up air are oxygen and carbon dioxide.



Our bodies need the oxygen in the air to live. We breathe out carbon dioxide into the air that the plants and trees need to live.

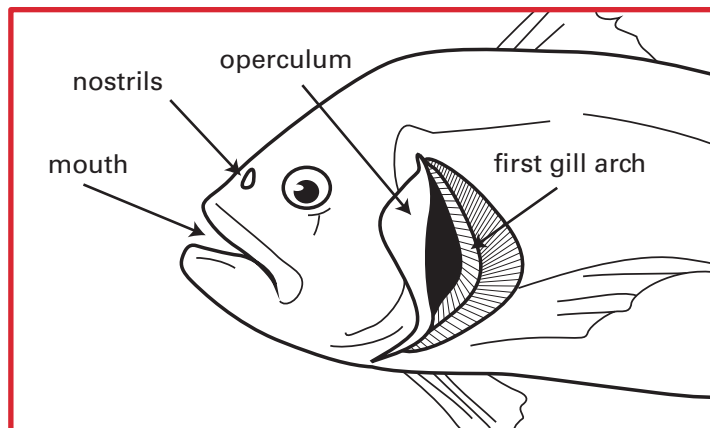
Land animals also need the oxygen in the air to live. Like humans, they breathe in the oxygen that plants and trees give off.

Animals breathe out carbon dioxide that the plants and trees need. Plants and trees use the carbon dioxide in the air, water, and sunlight to make their food.



Did you know?

Most fish get their oxygen from water and not from air. Fish get oxygen from water through tiny blood vessels that are in their gills. The gills are under a protective flap called the operculum. There is a set of gills on each side of the fish's body.



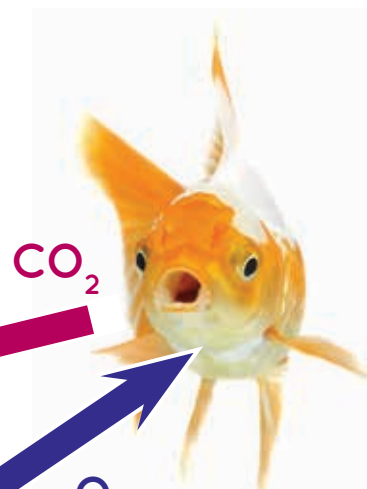
A fish opens its mouth to take in water. When its mouth is open, the operculum is closed. Then its mouth will close and the **operculum** will open.



The water that the fish took in its mouth passes over its gills and through its blood vessels. The fish uses the oxygen that is in the water to breathe. As water goes out the operculum, the fish breathes out carbon dioxide.

How does this help plants?

As part of the carbon cycle, plants release dissolved oxygen and take in carbon dioxide. Animals release carbon dioxide and take in dissolved oxygen.



It's All in the Gills!

Question: How many times per minute does a goldfish breathe?

You'll need:

a gold fish 

a fish bowl 

a timer 

What to do:

1. Make a prediction about the answer to the question then record it on Worksheet 6.
2. Locate the fish's mouth.
3. Set the timer for one minute.
4. During the minute, count the number of times the goldfish opens and closes its mouth.
5. Record your answer in the chart on Worksheet 6.
6. Repeat steps 3 – 5, this time watching the operculum open and close.
7. Draw a diagram to show your observations of the goldfish breathing in the water.
8. Make a conclusion about what you have observed.



Let's Predict

How many times per minute does a goldfish breathe?

Let's Observe

Record the number of times the goldfish opened and closed its mouth in one minute.	Record the number of times the goldfish opened and closed its operculum in one minute.
_____ times in one minute	_____ times in one minute

Diagram of the goldfish as it breathes in the water:

Let's Conclude

Explain the results. Why did the goldfish open and close its mouth and its operculum about the same number of times? _____

