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Earth Science Curriculum Map

The experiments fall under topics that relate to three aspects of earth and space science:

1. **Conservation of Energy**
2. **Renewable and Non-Renewable Resources**
3. **Weather**

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.

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

Introduction:

- At a Glance
- Introduction
- Table of Contents
- Teacher Assessment Rubric
- Student Self-Assessment Rubric

LESSON TOPICS

Lesson 1 - Water in our World

Lesson 2 - Salt and Freshwater

Lesson 3 – Watersheds

Lesson 4 - Effects on the Water

Lesson 5 - Washing In, Washing Out!

Lesson 6 - Erosion and Deposition

Lesson 7 - Your Water Supply

Lesson 8 - Nature's Water

Lesson 9 - Water Testing

Lesson 10 - The Aquatic Environment

WATER IN OUR WORLD

Learning Intention:

Students will learn about the water cycle, forms of water, and world distribution of water.

Success Criteria:

- describe how the water cycle creates precipitation in our natural environment
- recreate the water cycle
- identify water in different forms and conditions
- determine percentages of our world water distribution
- research facts about salt and fresh water

Materials Needed:

- a copy of "The Water Cycle" Worksheet 1 for each student
- a copy of "Exploring the Water Cycle" Worksheet 2 and 3 for each student
- a copy of "Forms of Water" Worksheet 4 for each student
- a copy of "The Water on our Earth" Worksheet 5 for each student
- a copy of "Getting the Facts!" Worksheet 6 for each student
- a clear glass jar, a foil pan, about 6 ice cubes (a set for each group of students)
- a large jug of water, a few desk lamps, a large funnel

Procedure:

***This lesson can be done as one long lesson, or be divided into three or four shorter lessons.**

1. Give students Worksheet 1. Read through the information about nature's water cycle. Discuss the concepts of 'condensation', 'precipitation', and 'evaporation' with students to ensure their understanding of how each is created and part of the cycle.

2. Explain to students that they will recreate the water cycle. Divide students into groups and give them Worksheets 2 and 3, and the materials to conduct the examination. Read through the materials needed and what to do sections with students to ensure their understanding of the task. Students will record their observations and conclusion on Worksheet 3.

3. Give students Worksheet 4. They will engage in a 'think-pair-share' activity to discuss and record forms and conditions in which water exists in the environment. Sample responses:

   Solid
   - ice, snow, hail, sleet, frost
   - present in glaciers, polar ice caps

   Gas
   - fog, water vapor, clouds
   - present as a gas in the atmosphere

   Liquid
   - rain, dew
   - present in oceans, lakes, rivers, ponds, streams, in ground water

4. Give students Worksheet 5. With access to the internet, they will research the percentages of salt water, fresh water, solid water, and gaseous water on our Earth. The data is to be presented in a pie chart.

5. Give students Worksheet 6. With access to the internet, they will research interesting facts about salt water and fresh water on our Earth. The facts are to be organized in the T-chart.

Differentiation:

Slower learners may benefit by working as one small group with teacher support to complete Worksheet 4 together on chart paper. An additional accommodation could be to discuss the 'Challenge Question' on Worksheet 3, as a small group, in place of individual written responses.

For enrichment, faster learners could label a world map, indicating world water distribution. They should locate oceans, bodies of fresh water, polar ice caps, presence of ground water, etc.

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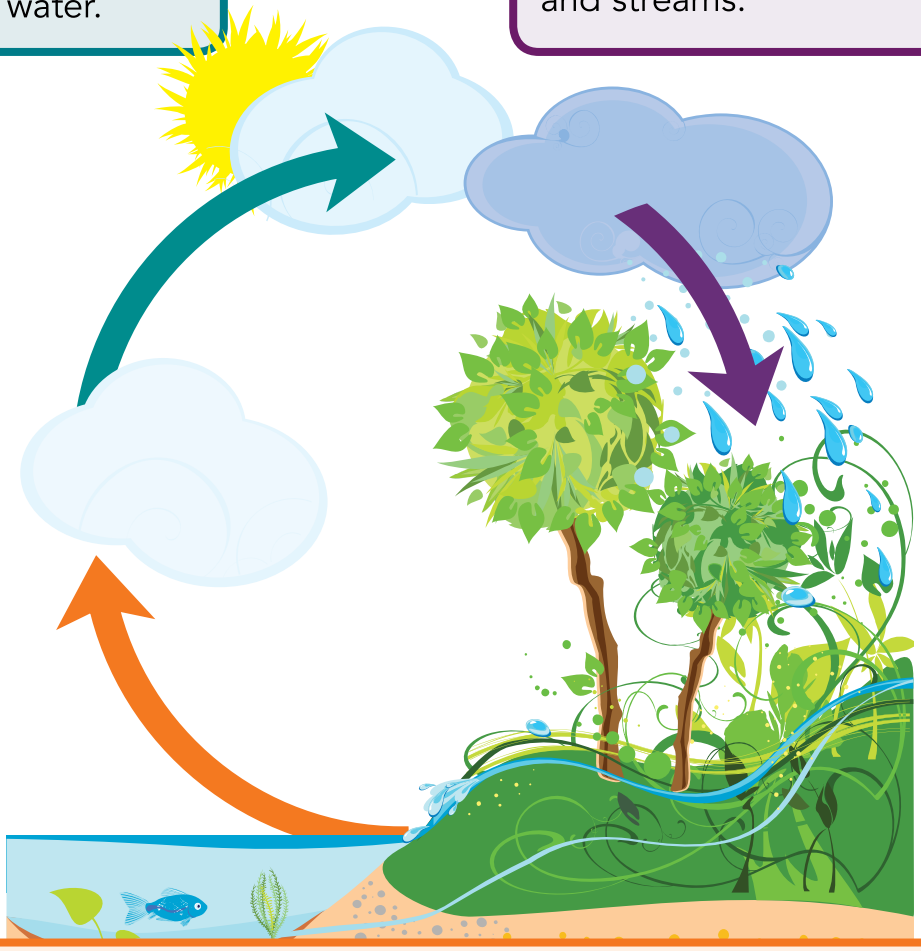
Worksheet 1 Name:

The Water Cycle

Water exists in three different forms. It can be a solid, liquid, or a gas. Let's learn exactly how these forms of water cycle through the environment.

Condensation happens when water in a gas form meets cooler air. It will form a cloud in the sky where this gas changes into droplets of water.

These droplets of water, called precipitation, fall back down to Earth. **Precipitation** can be in the form of rain, snow, sleet, or hail. It wets the ground, and fills up rivers, lakes, oceans, and streams.



As the sun heats the ground, oceans, rivers, lakes, and streams, the water evaporates. **Evaporation** is water in its gas form rising again to condense as a cloud.

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Worksheet 2 Name:

Exploring the Water Cycle

Create your own water cycle. Try this!

You'll need:

- a clear glass jar, half filled with water
- a foil pan
- about 6 ice cubes
- a desk lamp

What to do:

1. Place the foil pan on top of the glass jar that is half filled with water.
2. Put the ice cubes on the foil pan.
3. Shine the light from the lamp directly at the ice cubes.
4. Make observations and record them on Worksheet 3.
5. Make conclusions and record them on Worksheet 3.

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Worksheet 3 Name:

Let's Observe

Describe what you see sticking to the bottom of the aluminum pan inside the glass.

If the water in the bottom of the jar represents a lake, then:
What do you think the lamp represents?

What do you think the aluminum pan and the ice cubes represent?

Let's Conclude

Use your observations to explain what is happening inside the jar.

Challenge question:

Do you think the water in the jar will ever get used up? Explain your thinking.

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Worksheet 4 Name:

Forms of Water

You have learned that water exists in three different states. These states are as a solid, as a liquid, and as a gas.

With a partner, do some thinking and sharing of ideas about the forms and conditions in which these three states of water exist in our environment. Record your ideas below.

Water as a solid

Water as a liquid

Water as a gas

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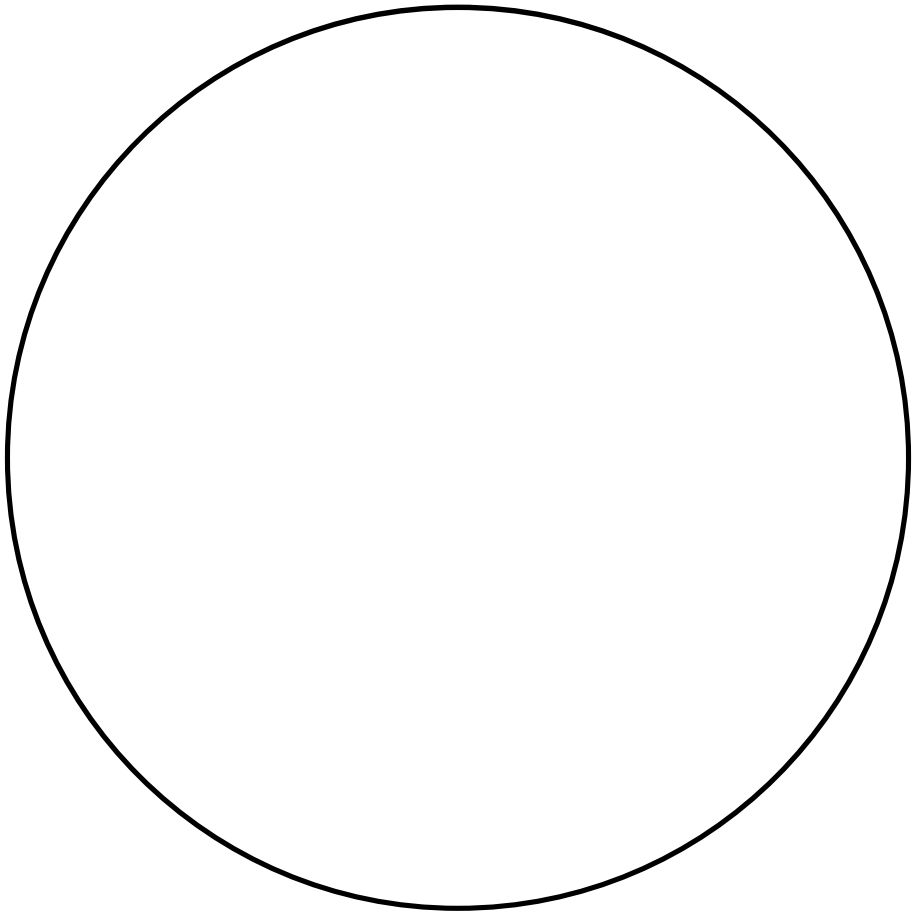
Worksheet 5 Name:

The Water on our Earth

Do some research in order to create a pie chart that illustrates the water distribution on our Earth. Your graph should indicate the percentages of:

- salt water
- fresh water
- solid water
- gaseous water

Title: _____



Explain the importance of fresh water conservation. Justify your response.

_____

_____

_____

_____

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Worksheet 6 Name:

Getting the Facts!

Continue your research about water. Research and record some interesting facts about salt water and fresh water in our world. Use the T-chart below to organize your findings.

Salt Water	Fresh Water

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