

PRECIPITATION

LEARNING INTENTION:

Students will learn about the water cycle and measure weather in terms of precipitation.

SUCCESS CRITERIA:

- describe how the water cycle creates precipitation in our natural environment
- recreate the water cycle
- construct a rain/ snow gauge to measure precipitation amounts
- collect data and display results in a graph
- make conclusions and connections to the environment

MATERIALS NEEDED:

- a copy of “Where Does Precipitation Come From?” Worksheet 1 for each student
- a copy of “Exploring the Water Cycle” Worksheet 2 and 3 for each student
- a copy of “A Measure of Precipitation!” Worksheet 4, 5, and 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
- 2 tall clear glass jars (or beakers) that are about 30 cm in height, a large funnel, a ruler, a permanent marker, some plasticine, some rocks (a set for each group of students)
- pencils, clipboards, chart paper, markers

PROCEDURE:

***This lesson can be done as one long lesson, or be divided into two 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 in order to examine it more closely. 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. **This activity can be done in small groups or as one large group, and it will span over a period of 5 days.** Give students Worksheets 4, 5, and 6, and the materials to create the rain (or snow) gauge. In order for students to complete the graph on Worksheet 6, they will need to access the internet to research previous daily precipitation amounts in their area. An option is to graph these findings as a large group on chart paper.

DIFFERENTIATION:

Slower learners may benefit by working as a small group with teacher direction to discuss their conclusions on Worksheet 3, instead of writing them out. Also, if the rain gauge activity is not done as a large group, it would be beneficial for these learners to work on it as small group with teacher support in order to take accurate daily measurements. The graphing activity could be done as a small group on chart paper.

For enrichment, faster learners could access the internet to research the average daily precipitation amounts for the month you are in, for your area, for the past 10 years. They can display these results in a bar graph. They can make a conclusion about typical climate conditions for the area for the month you are in. An option is to have these learners present their findings to the large group.



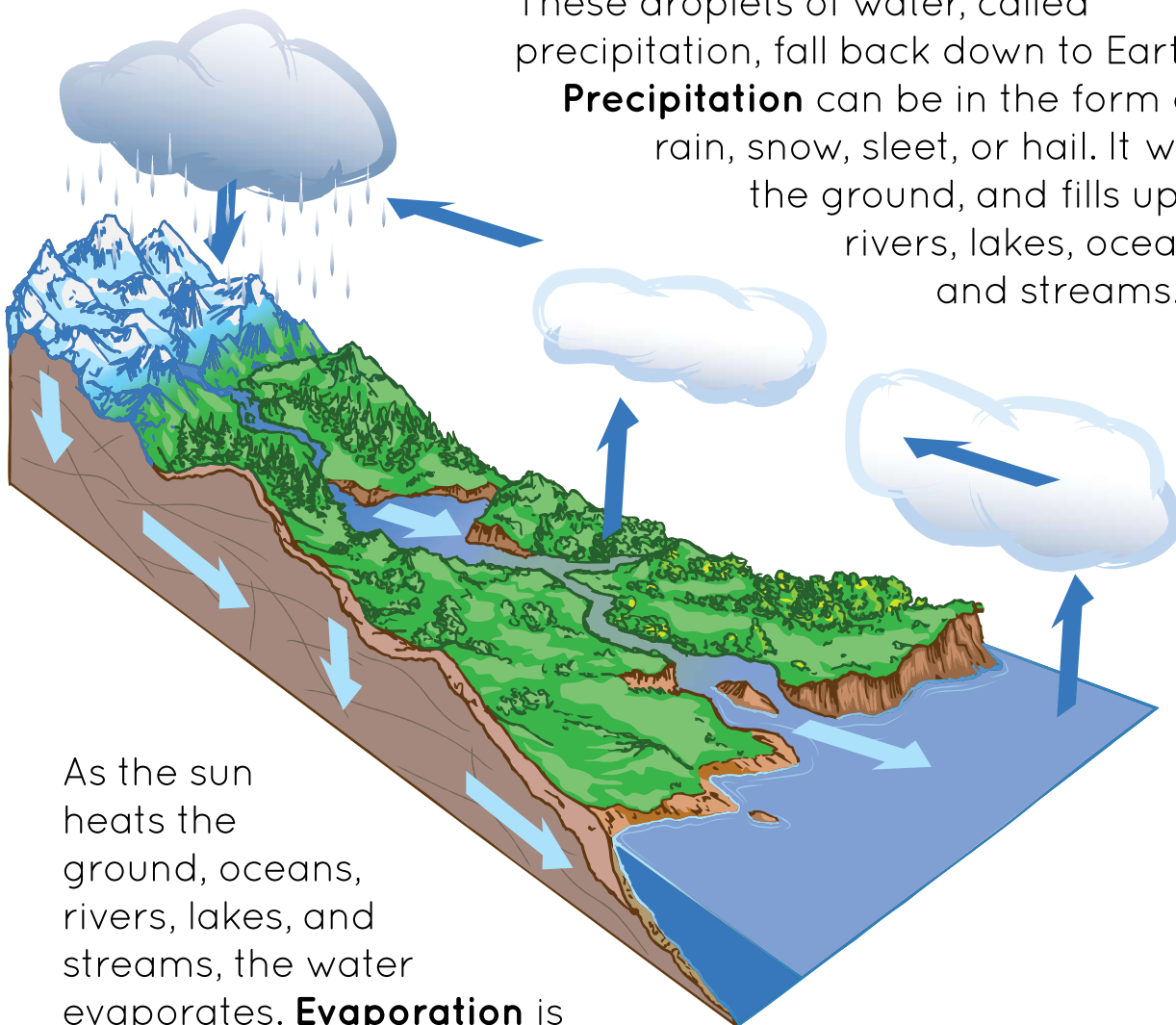
Where Does Precipitation Come From?

Precipitation is the moisture that falls from the sky. Precipitation can be in different forms. It can fall in forms such as rain, snow, sleet, or hail. Have you ever wondered where precipitation comes from exactly? Let's learn how precipitation is created in our 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.

Exploring the Water Cycle

You know where precipitation comes from, now you can create your own water cycle!

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.



Let's Observe

Describe what you see sticking to the bottom of the aluminum pan that is 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.



A Measure of Precipitation!

Have you wondered how precipitation is measured? Rain can be collected and measured by using a **rain gauge**. A rain gauge measures rainfall in millimetres (mm).

Snowfall is another form of precipitation that can be collected and measured. Snowfall is measured in centimetres (cm). Did you know that 10 cm of fallen snow is equivalent to 10 mm of rainfall?

Let's investigate precipitation a little further by making a rain gauge or a snow gauge to measure just how much of it falls from the sky!

You'll need:

- plasticine
- a ruler
- a permanent marker
- some rocks
- a tall clear glass jar (two jars if you are collecting snow)
- a funnel with a mouth wider than the glass jar

What to do:

(to measure rain)

1. Using the ruler and marker, measure and mark off each 2 mm going up the glass until you reach 20 mm.
2. Use the plasticine to make a ring around the top of the jar.
3. Place the funnel over the top of the glass, so that it is sitting on the ring of plasticine and secured.



4. Place the rain gauge outside in a clear area. Surround the bottom of the glass with rocks so that it does not tip over.
5. Measure the height of water in the gauge **at the same time every day**, for a period of 5 days.
6. Record the daily rainfall amounts on Worksheet 6.
7. Record observations and make conclusions about precipitation patterns in your area on Worksheet 6.

What to do:

(to measure snow)

1. Using the ruler and marker, measure and mark off each 2 cm going up both of the glasses until you reach 20 cm on each one.
2. Place the snow gauge (one jar, with no funnel) outside in a clear area. Surround the bottom of the glass with rocks so that it does not tip over.
3. Measure the height of snow in the gauge **at the same time every day**, for a period of 5 days. Do this by:
 - replacing the measured glass with the empty one
 - take the measured glass indoors so that the snow melts completely
 - then measure the height of the water
4. Record the daily snowfall amounts on Worksheet 6.
5. Record observations and make conclusions about precipitation patterns in your area on Worksheet 6.

Precipitation Amounts

	Day 1	Day 2	Day 3	Day 4	Day 5
Rainwater (mm)					
Snow (cm)					
Melted Snow (mm)					

Research the precipitation amounts in your area for all 20 days **before** you started measuring. Plot these amounts **along with your results** using a bar graph. Remember to label your graph!



Explain the type of climate you have experienced this past month. _____



**Here's your
FREE
lesson!**



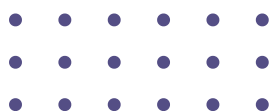
We hope you enjoy it!

Get full access to all of our lessons, join our membership at

www.onthemarkcurriculum.com

We give you the lessons, so you can do what you love! TEACH!

Join Now!



Earth Science Curriculum Map

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

1. **Rocks, Minerals, and Erosion**
2. **Weather**
3. **Waste and Our World**

The activities have two intentions: to teach concepts related to earth and space science and to provide students the opportunity to apply the 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 One: Rock Types

Lesson Two: Fossils

Lesson Three: Exploring Minerals

Lesson Four: Mining

Lesson Five: Fun with Rocks

Lesson Six: Experimenting with Erosion

Lesson Seven: Erosion Prevention!

Lesson Eight: Weather Patterns

Lesson Nine: Precipitation

Lesson Ten: Weather Instruments

Lesson Eleven: Waste

Lesson Twelve: Managing Waste

Lesson Thirteen: Reduce, Reuse, Recycle!