

Lesson 3: Water, Weather, & Climate

Overview

Summary: Students learn how much water we use daily and that our water comes from lakes. Students discuss how we rely on rainfall to fill these lakes and review the water cycle. They observe the results of an evaporation experiment, started 2 days before the lesson, and discuss the role of oceans in the water cycle. They watch a video to learn about drought in Texas and listen to a recording to learn the difference between weather and climate. They reflect on how droughts affect our water supply and the need to conserve water.

Teacher Prep Time: 20 minutes

Student Prep Time: 0 minutes

Lesson Time: 60 minutes

- Classroom Activity: 15 minutes (2 days prior to lesson)
- Classroom Delivery: 40 minutes
- Student Assessment: 5 minutes

Focus Questions:

- How much water do we use daily?
- Where does our water come from?
- How do droughts affect our water supply?
- What can we do to provide more water for everyone?

Learning Intentions:

- We use large quantities of clean water in our homes every day: 80-100 gallons per person.
- The water we use comes from lakes built by the Tarrant Regional Water District and local cities to provide drinking water and flood control. These lakes are filled with rain which comes from water vapor that has

evaporated from the oceans with help from the sun.

- Droughts regularly occur in Texas and decrease available water supplies.
- To provide more water to meet people's needs, we can reduce our water use and prevent water waste.

Student Assessment: 5 minutes, Student Workbooks, page 10

Homework Exercise: 15 minutes, online lesson for "Water, Weather, and Climate" in the Student Portal.

TEKS (paraphrased):

- S.5.1.B – make informed choices in the conservation of materials
- S.5.3.C – connect grade-level appropriate science concepts with science careers
- S.5.5.C – identify changes in physical properties of solutions such as dissolving salt in water
- S.5.8.A – differentiate between weather and climate
- S.5.8.B – explain how the sun and the ocean interact in the water cycle

Common Misconception:

- *Misconception:* Because of the water cycle there is an infinite amount of fresh water for people to use.
- *Correction:* There is a finite amount of freshwater on the earth. Some places like Texas experience regular droughts when it rains less than normal. We must plan and manage our water supplies carefully to meet people's needs.

Materials:

- Teacher computer and projector
- PowerPoint or Google Slides from Teacher Portal
- Student Workbooks
- Activity supplies: shallow bowl, table salt, marker or tape, water, measuring cup (1 cup), a teaspoon

Teacher Preparation

Time: 10 minutes

1. Gather and prepare materials for the ocean evaporation experiment.
2. Download the slides and review content. Be sure to look at the notes for each slide.
3. Preview Video 3a about drought in Texas in the teacher portal (Source: Vibby).
4. Preview Video 3b about weather and climate in the teacher portal (Source: Vimeo).

Classroom Activity: Ocean Evaporation Experiment

Time: 15 minutes

Materials: Shallow bowl (colored if possible), table salt, marker or tape, warm water, measuring cup (1 cup), spoon (1 teaspoon)

Instructions:

1. Explain that we are going to do an experiment to better understand what happens when water evaporates from the oceans.
2. Set up the bowl and pour 1 cup of water into the bowl. Explain that this bowl represents the ocean. (If you want to use more water, be sure your bowl is quite shallow and increase the salt proportionally in step 5.)
3. Mark the level of water on the bowl with the marker or tape.
4. Ask students if the water in the ocean is freshwater or salt water. Confirm that it is salt water.
5. Add two (2) teaspoons of salt to the water and mix until all the salt is dissolved.
6. Ask the students where the water in the ocean comes from. Confirm that it comes from rain and runoff. Ask them if the rain is salty. Ask them why the ocean is salty if they rain is not. Suggest that this experiment will help to explain or prove their ideas. (Note: Freshwater contains small amounts of salt and minerals that are left behind in the ocean when water evaporates.)
7. Set the bowl in a protected sunny space outside or in a warm sunny window.

8. Ask students what they think is going to happen.
9. Explain that you will revisit this experiment in a few days.
Note: Once most of the water has evaporated, you will see salt crystals form on the sides and bottom of the bowl.

Classroom Delivery

Time: 40 minutes

1. Open the PowerPoint or Google Slide presentation
2. Slide 1: Introduce the lesson.
3. Slide 2: Ask how much water the average person uses in a day.
4. Slide 3-5: Discuss where our water comes from and that we rely on rain to fill up our lakes.
5. Slides 6-7: Discuss the water cycle and the role of the ocean.
6. Slide 8: Observe and discuss results of the ocean evaporation experiment.
7. Slide 9: Explain that most rain in Texas comes from the ocean in the Gulf of Mexico.
8. Slides 10-13: Discuss how droughts occur regularly in Texas. Watch Video 3a.
9. Slides 14-15: Discuss the difference between weather and climate. Listen to Video 3b. Refer students to photos on page 8 and 9 of their student workbooks that are mentioned in the recording.
10. Slide 16-18: Reflect on how droughts affect our water supply and how we can help make sure we have enough water. Discuss how we can use less and prevent water waste.
11. Slide 19: Ask students to complete the lesson assessment on page 10 of their workbooks.
12. Ask students to complete the online homework exercises for this lesson on the Student Portal.

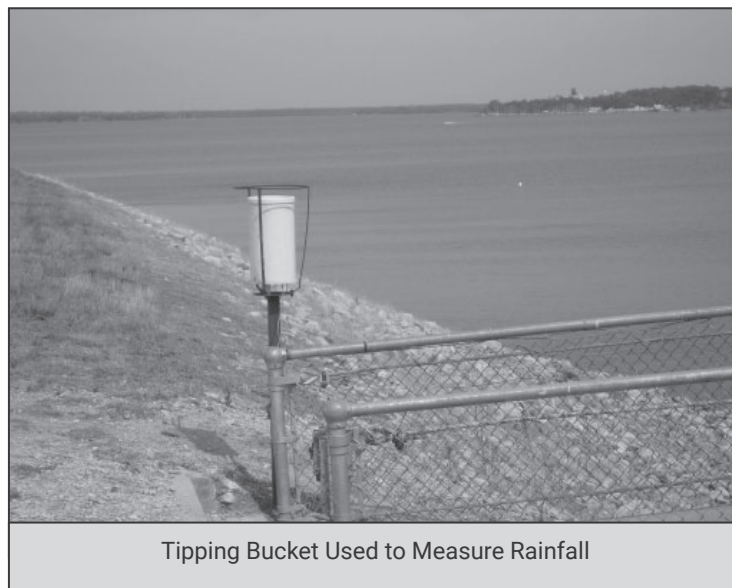
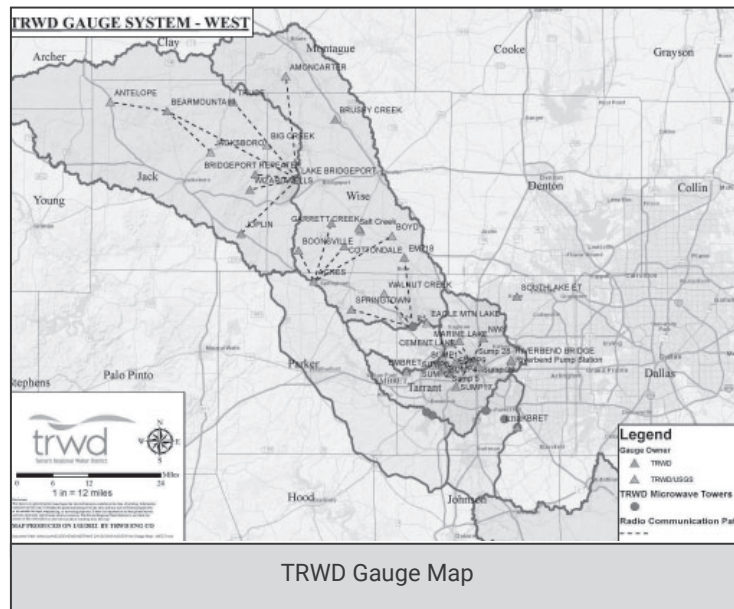
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Student Activity

Visual Aids

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VISUALS



Lesson 3: Water, Weather, & Climate

Student Assessment Visual Aids

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VISUALS



Tipping Bucket Used to Measure Rainfall

System Data From 1/1/2022 To 1/5/2022

Data Retrieved: 8/23/2022 3:05:34 PM

Station ID	Sensor Name	Time Tag	Source	Original Value	Edited Value
800ENSD	RAIN	1/1/2022 12:00:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 12:15:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 12:30:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 12:45:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 1:00:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 1:15:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 1:30:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 1:45:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 2:00:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 2:15:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 2:30:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 2:45:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 3:00:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 3:15:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 3:30:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 3:45:00 AM	T	0.00	0.00
800ENSD	RAIN	1/1/2022 4:00:00 AM	T	0.02	0.02
800ENSD	RAIN	1/1/2022 4:15:00 AM	T	0.01	0.01
800ENSD	RAIN	1/1/2022 4:30:00 AM	T	0.00	0.00



Weather Gauge Station Report



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Student Activity

Answer Key

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ASSESSMENT

1. Where does the most evaporation occur on earth?
 - a. Lakes and reservoirs
 - b. Rivers and streams
 - c. **Oceans**
 - d. Snow in the mountains

2. Who is our local raw water provider?
 - a. City of Fort Worth
 - b. State of Texas
 - c. Tarrant County
 - d. **Tarrant Regional Water District**

3. Where does most of the rain that falls in North Texas come from?
 - a. The Pacific Ocean
 - b. **The Gulf of Mexico**
 - c. The Great Lakes
 - d. The Caribbean Sea

4. Which of the following is true about drought?
 - a. Once it starts, a drought does not end
 - b. **A drought can occur at any time**
 - c. It never rains during a drought
 - d. Drought happens only during the spring

5. Drought can increase the risk for other natural disasters. Which natural disaster would be more likely after a long drought?
 - a. Earthquake
 - b. **Wildfire**
 - c. Flood
 - d. Tsunami