# When Is It Ever Going to Rain?

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| **Grade Level** | 4-5 |
| **Duration** | 1-2 class periods |

## National Standards

**GEOGRAPHY**
**Element 1: The World in Spatial Terms**
1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information
**Element 5: Environment and Society**
**16.** The changes that occur in the meaning, use, distribution, and importance of resources.
**Element 6: The Uses of Geography**
17. How to apply geography to interpret the past
18. How to apply geography to interpret the present and plan for the future

## AZ Standards

**MATHEMATICS**
**Number and Operations—Fractions**
4.NF.C.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
**Geometry**
5.G.A.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.
**Standards for Mathematical Practice**
4.MP.4. and 5.MP.4. Model with mathematics.

**SCIENCE**
**Earth and Space Standards**
**4.E1U1.8** Collect, analyze, and interpret data to explain weather and climate patterns.

## Arizona Social Science Standards

**GEOGRAPHY**
**The use of geographic representations and tools help individuals understand their world.**
4.G1.1 Use and construct maps and graphs to represent changes in the Americas over time.
5.G1.1 Use and construct maps and graphs to represent changes in the United States.

## Overview

Arizona has a shortage of water. Building reservoirs and bringing water into the state from systems such as the Central Arizona Project can help, but Arizona's lack of rainfall is a huge issue. Only by understanding where our water comes from and our lack of rainfall can students make decisions about how to conserve water and plan for Arizona's future.

## Purpose

In this lesson, students will look at 2018 rainfall data for three Arizona cities. They will then compare the 2018 rainfall amounts to the average rainfall amounts and create a line graph displaying the data.

## Materials

- Table of Rainfall for Selected Arizona Cities
- Student Worksheet and Answer Key
- Average Annual Precipitation Arizona
- Student Assessment Instructions and Assessment Checklist
- Line Graph of Rainfall Data for ____ City

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- Colored Pencils
- Graph paper

## Objectives

The student will be able to:

1. Construct a visual representation of geographic information.

## Procedures

*Prerequisite Knowledge: Students should have experience with decimals so they will understand the meaning of the rainfall data.*

**SESSION ONE**

1. Project the Average Annual Precipitation (Arizona) map. https://d3dqsm2futmewz.cloudfront.net/docs/azclimate/ArizonaMonthlyPrecipitationMaps/annual_AZprcp_map.jpg
2. Explain the legend to the map and have students identify areas that receive little rainfall in Arizona and those areas that receive more rainfall. Discuss the impact this lack rainfall has in the state: forest closures, forest fires, loss of trees to insects, water shortages in rural communities, water restrictions, etc.
3. Distribute the Table of Rainfall for Selected Arizona Cities and show the students on the Average Annual Precipitation (Arizona) map where these three cities are located. Discuss how the data is in the form of decimals and review how to read decimals if necessary.
4. Practice reading the table by asking for the data for Nogales in 2018 for the month of May or the average rainfall for Flagstaff in the month of December.
5. Distribute the Student Worksheet and allow students to independently (or as a partner) complete the worksheet.
6. If time, grade the worksheets in class. Collect both the table and the worksheet.

**SESSION TWO**

1. Distribute the Student Assessment Instructions and Assessment Checklist and the Table of Rainfall for Selected Arizona Cities. Explain the directions to the graphing activity. Explain the checklist.
2. Distribute graph paper or the Line Graph of Rainfall Data for ____ City worksheet depending on how much help your students will need in graphing the information. Model doing one month for one of the cities.
3. Collect the graphs and the Assessment Checklist.

## Assessment

**Mathematics and Geography**

The graph can be graded for accuracy and completeness using the Assessment Checklist. Mastery is considered a score of 6 or more out of the 7 items on the checklist.

The Student Worksheet can be graded for accuracy and completeness. Mastery is considered a score of 7 or more correct answers.

## Extensions

Students can explore actual ways of reducing water consumption and then “take action” by designing a visual and a written speech/essay with a specific audience in mind.

## Sources

Average Annual Precipitation (Arizona) map. https://d3dqsm2futmewz.cloudfront.net/docs/azclimate/ArizonaMonthlyPrecipitationMaps/annual_AZprcp_map.jpg

https://www.usclimatedata.com