Water Coverage: Using Circle Graphs to Understand the Earth

Students investigate the relationship between the Earth's surface that is water and the surface that is land. They construct graphs that show the percentage of the earth that is covered by water.

Overview
Students find the percentage of Earth covered by water and construct graphs displaying the relationship.

Purpose
How much of the earth's surface is covered by water? Lead the students on an experiment that will help them make accurate estimates close to the answer of 70%. Create graphical representations to show what was discovered. The purpose of this lesson is for the students to discover the relationship between the Earth's surface that is water and the surface that is land. Students will construct graphs to show the percentage of the earth that is covered by water.

Materials
- An inflatable globe or stationary globe that spins
- Graph paper
- Pencils
- Protractors
- Calculators

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Grade Level
6-8

Duration
1 class period

National Geography Standards

ELEMENT ONE: THE WORLD IN SPATIAL TERMS
3. How to Analyze the spatial organization of people, places, and environments on Earth's surface.

ELEMENT THREE: PHYSICAL SYSTEMS
8. The characteristics and spatial distribution of ecosystems on Earth's surface.

Arizona Geography Strand 4

CONCEPT 1 World in Spatial Terms
GRDES 6, 7, and 8
PO 1 Construct maps, charts and graphs to display geographic information.
PO 3 Interpret maps, charts and geographic databases using geographic information.

Arizona Math Standard

STRAND 2 Data Analysis, Probability and Discrete Mathematics
CONCEPT 1 Data Analysis
GRADE 6
PO 2 Formulate and answer questions by interpreting, analyzing, and drawing inferences from displays of data, including histograms and stem-and-leaf plots.
GRADE 7
PO 1 Solve problems by selecting, constructing, and interpreting displays of data including multi-line graphs and scatterplots.
GRADE 8
PO 1 Solve problems by selecting, constructing, interpreting, and calculating with displays of data, including box and whisker plots and scatterplots.
**Water Coverage**

**Objectives**
The student will be able to construct a circle graph representing the percentage of the Earth's surface that is covered in water.

**Procedures**
*Prerequisite: Students need to know how to use a protractor.*

1. Ask students to estimate the percentage of the earth’s surface that is covered by water.
2. Now, show the students the inflatable globe. Tell them to change their estimate if they wish and record it.
3. Toss the globe to ten students and record on a T-Chart if the right thumb landed on land or water.
4. Find the percentage of the earth covered in water according to the T-Chart made. (Divide the number of tallies for water by the total number of tallies.)
5. Discuss that the more data that is collected, the more accurate the outcome.
6. Repeat the experiment tossing the ball for 20 tallies.
7. Find the percentage for land and for water.
8. Compare findings to the actual amount: 70%.
9. Discuss types of graphs that could be constructed to show this percentage.
10. Review circle graphs and use of protractors. Find the number of degrees in the angles in the circle by multiplying the percentage by 360 (degrees).
11. Use the protractors to draw accurate circle graphs showing the percentage of land and water on the Earth’s surface.
12. Alternative to inflatable globe, use a stationary globe that spins. Have four students stand around it, spin the globe, and they stop the globe with their index fingers. Record the results and repeat until you have 20 tallies.

**Assessment**
Rubric for Circle Graph Mastery is considered 3 or higher for geography and math assessment.

4 – Accurate use of protractor in making graph evident for degrees and angles. Graph titled appropriately. Sections of graph labeled with correct percentage and description.

3 – Degrees of angles off by more than 5 (degrees). Graph has a title. Sections of graph labeled with correct percentage. Description of each section accurate.

2 – Degrees of angles off by more than 10 (degrees). Graph has a title. Sections of graph labeled with a percentage.

1 – Graph has no title. Each section labeled with a percentage.

0 – No attempt made

Assessment for geography: students will write a sentence stating a conclusion that can be drawn from the data on the graph.

**Extensions**
Have students research different areas of this lesson and report back to the class. One group could research the uses of water in our culture.
**Water Coverage**

as well as those of other cultures. Another group could describe the effects water has on our lives and the choices that are made. A third group could research the findings of the data from Mars where no water was found. If water had been found on Mars, what could that mean for the people of Earth?