mobile inquiry technology
Teacher Notes

Daily Log Introduction

In this activity, students will use visual graphs to explore percentages. Students will compare and graph data to display a daily log. They will use a spreadsheet to relate how their time was used in a 24-hour period.

Students will develop a number of key concepts related to percentages including:

- investigating a pie chart as a means of visualizing data;
- comparing and organize data;
- relating the data to fractions of the whole and percentages;
- applying knowledge gained to compare and describe patterns among students.

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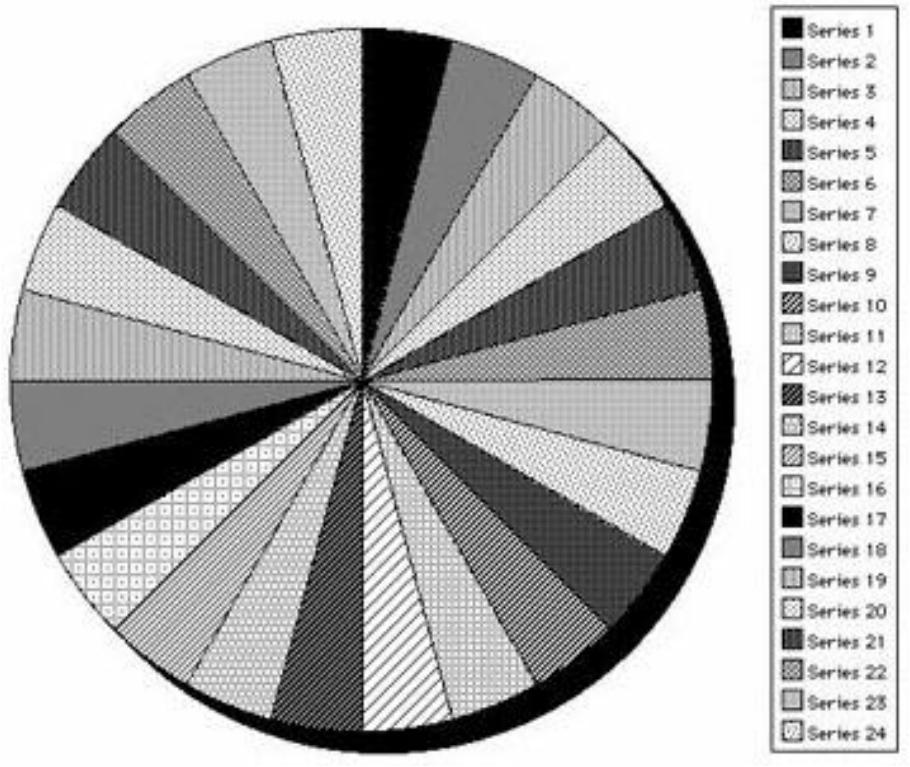
Discussion Guide

Ask the class as a group to give examples of the kinds of data that they have collected? Review the ways in which they have recorded and represented the data. (They will probably indicate that they have recorded the data in tables and represented the data in various types of graphs.) Ask the students about the advantages of each type of graphic representation. Discuss other purposes for collecting data about people.

Propose that one interesting data collection might be to record and compare how each of us spend our day. What mathematical unit would be best for recording this data? (Answers may be in minutes, hours, or parts of a day.) Discuss with the class what graphs might be best for representing data on how each of us spends our days. If it is not brought up, propose that one useful tool would be a pie chart (or circle graph). Display an example of a pie chart divided into one-hour parts. Ask students what each part represents. Ask students how they would represent parts of an hour.

Demonstate for the students how to place the time from their daily log in parts of an hour. Some of the daily log activities may be in fractions or multiples of an hour.



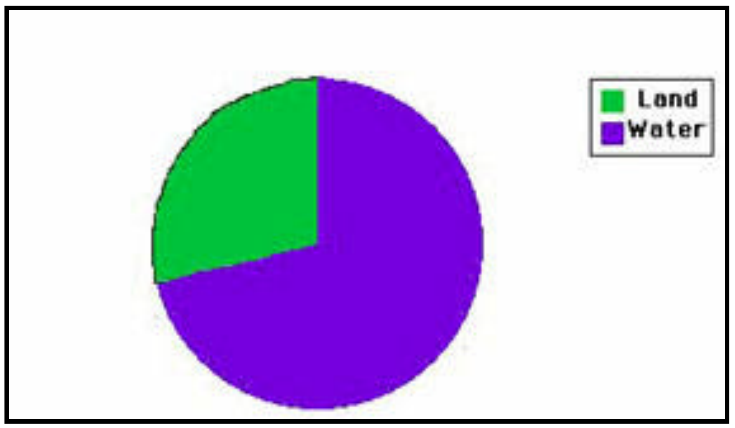
Ask students to brainstorm how they might present a numerical and graphic representation that would give us a picture of the relative parts of the day they spend on each activity. Allow each group a few minutes to discuss the issues. Hold a brief discussion for groups to present. If it does not come up, present the idea that converting the data into percentages and displaying on a pie chart would make a clearly understandable representation of the shape of the data.

Discuss the type of calculations that this would entail. This should be an opportunity to assess the students understanding of percentage. (See below for a useful tool for reviewing percentage.)

Discuss with the students how to predict the number of slices that would be one quarter of the pie. How many slices would be one half of the pie? Once students select the correct number of days for each, spend time reducing the fractions to one quarter and one half. Divide the fractions to display how to find the percentages.

Propose that using the calculating and graphing capabilities of a computer spreadsheet would make it possible to easily manipulate the data to calculate percentages and create pie charts.

A good way to introduce percentages to students is to use a globe of the world. Have the students look at a globe and tell you how much is water and how much is land. Have the students write down their estimations after a discussion. (Based on the land mass of the earth, the percentage of water is around 71%.) Ask the students to draw a circle. Explain to the students that this will represent the whole earth. Using the percentage given, ask the students to color in the part of the earth in blue that would represent the amount that is water. Have them color the remaining area in green for land. Ask the students how this makes the land versus water relationship clearer than looking at a globe. Encourage the students to discuss how circle (or pie) charts will help them see the bigger picture.



Explain to the students that a spreadsheet can also help them organize data. In fact, data in a spreadsheet can be easily graphed in a pie (or circle) chart. Percentages can even further add to understanding the pie chart. This can be done by clicking on the graph and selecting the Series and label feature. It will display the percentages of each part of the circle. Refer to Technical Hints to see how to make a pie chart with percentages.

Direct the students to "Thinking About the Question".

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Additional Teacher Background

A circle is often difficult for students to divide into parts, especially if the parts are not multiples of four. For this type of division it is often easier to introduce angle measures to help them make the circle graphs. Using a protractor on the overhead, you can show how half of the circle could be divided into 180 degrees.

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Daily Log Suggested Timeline

The amount of time you spend on introductory discussions, data collection, and analysis, will determine your overall timeline. The following represents a possible timeline.

- One class period - Introductory Discussion
- One class period - Investigation I: Keep a daily log
- One class period - Investigation II: Find percentage of time use
- One class period - Investigation III: Making a pie (or circle graph) chart
- One class period - Analysis

Additional days can be used for further investigations.

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