Using a Bar Graph to Compare Length
Lesson Plan

Grade Level: 1-2	**Curriculum Focus:** Mathematics	**Lesson Duration:** Two class periods

Student Objectives

- Practice measuring the length and width of objects around the classroom.
- Create two bar graphs, comparing length and width.
- Discuss why bar graphs are useful in displaying data.

Materials

- Discovery School video on *unitedstreaming*: *Math Investigations 2*
  Search for this video by using the video title (or a portion of it) as the keyword.

  Selected clips that support this lesson plan:

  - Length
  - Weather

- Paper and pencils
- Common objects: desk, chair, notebooks, textbooks
- Rulers and tape measures
- Graph paper (optional)
- Colored pencils (optional)

Procedures

1. Tell students that they will learn measuring and graphing skills.
2. Divide the class into small groups. Tell students that each group will measure the length and width of the objects listed below; they will draw one bar graph showing their lengths and a second bar graph showing the widths.

   Objects to Measure:

   - desk
   - book
   - notebook

- chalkboard
- tissue box

3. Give students time in class to work on the activity. Remind them to measure accurately and record the width and length of each object. This will help them organize the data and have it available when it is time to create the graphs. (Be sure to tell them whether they should measure in inches and feet or meters and centimeters.)
4. Next, show students how to draw a bar graph. You may distribute graph paper, or have students draw the graphs on unlined paper. For the first graph, label the horizontal axis "Object" and the vertical axis "Length." For the second graph label the horizontal axis "Object" and the vertical axis "Width." Students may use a different color for each object.
5. If students have questions about how to draw a graph, show "Weather," Segment 2, which explains how to make bar graphs and why they are useful.
6. After each group has measured the objects and drawn the graphs, bring the students together for a discussion. Did the groups get similar results? What kinds of variations were in the results? What caused the differences?
7. Conclude by discussing why bar graphs are used to display data. Do students think it is easier to compare data looking at a graph or looking at a chart? Help students understand that a bar graph is a quick way to show results and compare data.

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Students were engaged by the activity and worked effectively in their groups to measure different objects, drew accurate and complete graphs, and participated actively in class discussions.
- 2 points: Students were somewhat engaged by the activity and worked in their groups to measure different objects, drew partially accurate and mostly complete graphs, and participated in class discussions.
- 1 point: Students were not engaged by the activity and had difficulty working in their groups to measure different objects, did not complete their graphs, and participated minimally in class discussions.

Vocabulary

bar graph

Definition: A pictorial representation of quantities; a bar graph is often used to compare amounts.

Context: A store owner may create a bar graph to compare monthly sales over the course of a year.

horizontal axis

Definition: The reference line on a graph that is on the bottom and is drawn from left to right

Context: When making a bar graph showing temperatures over a year, the months are often indicated on the horizontal axis.

math

Definition: The study of number, quantity, form, and relations

Context: Drawing graphs and analyzing data are important parts of math.

measure

Definition: The length, width, quantity, or capacity of an object or a liquid

Context: To measure the width of a book, hold the left edge of the ruler on the left edge of the book, then look at the number at the right edge of the book.

ruler

Definition: A piece of wood, plastic, or other material off in units such as inches that is used for measuring length, width, and height.

Context: Builders, architects, dressmakers, and graphic artists use rulers regularly in their work.

vertical axis

Definition: The reference line on a graph that is on the left side and is drawn from top to bottom.
Context: On a bar graph comparing the cost of a private school over a three-year period, the year is usually on the horizontal axis, and the cost is on the vertical axis.

Academic Standards

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit http://www.mcrel.org/.

This lesson plan addresses the following national standards:

- Understands and applies basic and advanced properties of the concepts of numbers

The National Council of Teachers of Mathematics (NCTM)

NCTM has developed national guidelines for teaching mathematics. To view the standards online, go to http://standards.nctm.org/.

This lesson plan addresses the following math standards:

- Numbers and Operations: Understand measurable attributes of objects and the units, systems, and processes of measurement:
- Numbers and Operations: Apply appropriate techniques, tools, and formulas to determine measurements:

- Numbers and Operations: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them:

Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- http://school.discovery.com/teachingtools/teachingtools.html