Highs and Lows

Purpose

Students will demonstrate how a number line can be extended on the other side of zero to represent negative numbers and give examples of instances where this is useful.

Materials

For the teacher: chalk, chalkboard
For each pair of students: copy of Black Line Master (BLM) *Highs and Lows*, graph paper, pencils, erasers

Activity

A. Pre-Activity Discussion

1. Write the following two sentences on the chalkboard:
   - Mount Everest is the highest continental point above sea level.
   - The Dead Sea is the lowest continental point below sea level.
2. Ask students to explain the two statements.
3. Discuss how sea level is the mean level halfway between high and low tide and that it is used as a standard for measuring land elevation or sea depths.

B. Activity

1. Divide students into pairs and distribute graph paper and a copy of the BLM *Highs and Lows*.
2. Ask students: "How could you use a number line to represent this data?"
3. Direct students to plot the data. Monitor students as they work and probe them with questions, such as:
   - What would be the *x*-axis? What would be the *y*-axis?
   - Could you make a bar graph?
   - How will you show the below sea level data?
4. As students work, guide them and discuss how the below sea level data can be plotted as negative numbers.
5. Explain to each pair that zero on the graph represents sea level. Discuss how all locations above sea level should be plotted above zero on the number line, while the locations below sea level should be plotted below zero.

(continued)

INCORPORATING TECHNOLOGY

Direct students to use computer software to construct their graphs and present them to the class.

connecting across the curriculum

Mathematics

Have students find the average temperatures in Antarctica for the year and plot the data on a number line.

Standards Link
7.2.7

Activity (continued)

C. Discussion

1. Have students share their graphs and discuss their reasoning behind how they plotted their data.
2. Discuss how negative numbers are used in science and in daily routines. Explain that measuring temperature is one example.
3. Ask students for other examples of how negative numbers are used and how they can be plotted on number lines. Discuss examples, such as water level readings during drought conditions.

Classroom Assessment

Basic Concepts and Processes

At the end of the activity, ask questions, such as the following:


Give examples of how using a number line to plot negative numbers is useful.


How did you go about constructing your number line for the data given in the activity?

Name: _____

Highs and Lows

Highest and Lowest Continental Points

Highest Points Above Sea Level		
Name	**Continent**	**Height Above Sea Level (Meters)**
Mount Everest	Asia	8,848
Mount Aconcagua	South America	6,960
Mount McKinley	North America	6,194
Mount Kilimanjaro	Africa	5,963
Mount El'Brus	Europe	5,642
Vinson Massif	Antarctica	4,897
Mount Kosciusko	Australia	2,228

Lowest Points Below Sea Level		
Name	**Continent**	**Depth Below Sea Level (Meters)**
Lake Eyre	Australia	12
Caspian Sea	Europe	28
Salinas Grandes	South America	40
Death Valley	North America	86
Lake Assal	Africa	156
Dead Sea	Asia	411