Chapter 2 Project

Going to Extremes!

An activity to demonstrate the use of signed numbers in real life.

When asked what the highest mountain peak in the world is, most people would say Mount Everest. This answer may be correct, depending on what you mean by highest. According to geology.com, there may be other contenders for this important distinction.

The peak of Mount Everest is 8850 meters or 29,035 feet above sea level, giving it the distinction of being the mountain with the highest altitude in the world. However, Mauna Kea is a volcano on the big island of Hawaii whose peak is over 10,000 meters above the nearby ocean floor, which makes it taller than Mount Everest. A third contender for the highest mountain peak is Chimborazo, an inactive volcano in Ecuador. Although Chimborazo only has an altitude of 6310 meters (20,703 feet) above sea level, it is the highest mountain above Earth's center. Most people think that the Earth is a sphere, so how could a mountain that is only 6310 meters tall be higher than a mountain that is 8850 meters tall? Because the Earth is really not a sphere but an "oblate spheroid". It is widest at the equator. Chimborazo is 1° south of the equator which makes it about 2 km farther from the Earth's center than Mount Everest.

What about the other extreme? What is the lowest point on Earth? As you might have guessed, there is more than one candidate for that distinction as well. The lowest exposed area of land on Earth's surface is on the Dead Sea shore at 413 meters below sea level. The Bentley Subglacial Trench in Antarctica is the lowest point on Earth that is not covered by ocean but it is covered by ice. This trench reaches 2555 meters below sea level. The deepest point on the ocean floor occurs 10,916 meters below sea level in the Mariana Trench in the Pacific Ocean.

For the following problems, be sure to show all math work to justify your results.

1. Calculate the **difference** in elevation between Mount Everest and Chimborazo in both meters and feet. What operation does the word **difference** imply?
2. Write an expression to calculate the **difference** in elevation between the peak of Mount Everest and the lowest point on the Dead Sea shore in meters and simplify.
3. If you were to travel from the bottom of the Mariana Trench to the top of Mount Everest, how many meters would you travel?
4. If you were to travel from the bottom of the Dead Sea Shore to the top of Chimborazo, how many meters would you travel?
5. If Mount Everest were magically moved and placed at the bottom of the Mariana Trench, how many meters of water would lie above Mount Everest's peak?
6. How much farther below sea level (in meters) is the Mariana Trench as compared to the Dead Sea shore?
7. How much farther below sea level (in meters) is the Mariana Trench as compared to the Bentley Subglacial Trench?
8. Add the elevations (in meters) together for Mount Everest, Chimborazo, the Dead Sea Shore, the Bentley Subglacial Trench, and the Mariana Trench and show your result. Is this number positive or negative? Would this value represent an elevation above or below sea level?
9. If you calculate the difference in the absolute values of the elevations for Mount Everest and the Dead Sea shore, do you get the same result as in problem 2?
10. Describe how to perform the order of operations in evaluating the expression in problem 9. Be sure to use complete sentences.