Lesson 8: Estimating Quantities

Classwork

Exercise 1

The Federal Reserve states that the average household in January of had in credit card debt. About how many times greater is the U.S. national debt, which is ? Rewrite each number to the nearest power of that exceeds it, and then compare.

Exercise 2

There are about students attending school, kindergarten through th grade, in New York. Express the number of students as a single-digit integer times a power of .

The average number of students attending a middle school in New York is . How many times greater is the overall number of K-12 students compared to the number of middle school students?

Exercise 3

A conservative estimate of the number of stars in the universe is . The average human can see about stars at night with his naked eye. About how many times more stars are there in the universe, compared to the stars a human can actually see?

Exercise 4

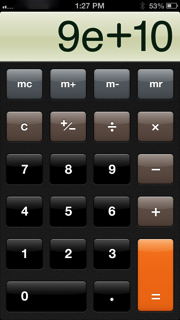
The estimated world population in was . Of the total population, million of those people were left-handed. Approximately what percentage of the world population is left-handed according to the estimation?

Exercise 5

The average person takes about breaths per day. Express this number as a single-digit integer times a power of .

If the average American lives about years (or about days), how many total breaths will a person take in her lifetime?

Problem Set

1. The Atlantic Ocean region contains approximately gallons of water. Lake Ontario has approximately gallons of water. How many Lake Ontarios would it take to fill the Atlantic Ocean region in terms of gallons of water?
2. U.S. national forests cover approximately square miles. Conservationists want the total square footage of forests to be square miles. When Ivanna used her phone to do the calculation, her screen showed the following:
   1.  What does the answer on her screen mean? Explain how you know.
   2. Given that the U.S. has approximately million square miles of land, is this a  
       reasonable goal for conservationists? Explain. .
3. The average American is responsible for about kilograms of carbon emission pollution each year. Express this number as a single-digit integer times a power of .
4. The United Kingdom is responsible for about kilograms. Which country is responsible for greater carbon emission pollution each year? By how much?