

## Lesson 10: Operations with Numbers in Scientific Notation

### Classwork

#### Exercise 1

The speed of light is 300,000,000 meters per second. The sun is approximately  $1.5 \times 10^{11}$  meters from Earth. How many seconds does it take for sunlight to reach Earth?

#### Exercise 2

The mass of the moon is about  $7.3 \times 10^{22}$  kg. It would take approximately 26,000,000 moons to equal the mass of the sun. Determine the mass of the sun.

**Exercise 3**

The mass of Earth is  $5.9 \times 10^{24}$  kg. The mass of Pluto is 13,000,000,000,000,000,000 kg. Compared to Pluto, how much greater is Earth's mass?

**Exercise 4**

Using the information in Exercises 2 and 3, find the combined mass of the moon, Earth, and Pluto.

**Exercise 5**

How many combined moon, Earth, and Pluto masses (i.e., the answer to Exercise 4) are needed to equal the mass of the sun (i.e., the answer to Exercise 2)?

**Problem Set**

1. The sun produces  $3.8 \times 10^{27}$  joules of energy per second. How much energy is produced in a year? (Note: a year is approximately 31,000,000 seconds).
2. On average, Mercury is about 57,000,000 km from the sun, whereas Neptune is about  $4.5 \times 10^9$  km from the sun. What is the difference between Mercury's and Neptune's distances from the sun?
3. The mass of Earth is approximately  $5.9 \times 10^{24}$  kg, and the mass of Venus is approximately  $4.9 \times 10^{24}$  kg.
  - a. Find their combined mass.
  - b. Given that the mass of the sun is approximately  $1.9 \times 10^{30}$  kg, how many Venuses and Earths would it take to equal the mass of the sun?