Scientific Notation Worksheets

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

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.

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 than Pluto's mass?

Scientific Notation Worksheets

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

$$300\,000\,000 = 3 \times 10^8$$
$$\frac{1.5 \times 10^{11}}{3 \times 10^8} = \frac{1.5}{3} \times \frac{10^{11}}{10^8}$$
$$= 0.5 \times 10^3$$
$$= 0.5 \times 10 \times 10^2$$
$$= 5 \times 10^2$$

It takes 500 *seconds for sunlight to reach Earth.*

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.

$$26\,000\,000 = 2.6 \times 10^7$$
$$(2.6 \times 10^7)(7.3 \times 10^{22})$$
$$= (2.6 \times 7.3)(10^7 \times 10^{22})$$
$$= 18.98 \times 10^{29}$$
$$= 1.898 \times 10 \times 10^{29}$$
$$= 1.898 \times 10^{30}$$

The mass of the sun is $1.898 \times 10^{30}\ kg$

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

$$13\,000\,000\,000\,000\,000\,000\,000$$
$$= 1.3 \times 10^{22} 5.9 \times 10^{24} - 1.3 \times 10^{22}$$
$$= (5.9 \times 10^2) \times 10^{22} - 1.3 \times 10^{22}$$
$$= (590 - 1.3) \times 10^{22} = 588.7 \times 10^{22}$$
$$= 5.887 \times 10^2 \times 10^{22} = 5.887 \times 10^{24}$$

The mass of Earth is $5.887 \times 10^{24}\ kg$ *greater than the mass of Pluto.*