

Answer Key: Exploring Expressions and Equations

Worksheet 1:

Using Variables in Expressions

“Planning a Trip to the Amazon”

1 a. $0.5h; \frac{1}{2}h$
b. $0.5(12) = 6$ times

2 a. $3h$
b. 36 times

3 a. $7,500d$
b. 547,500 calories
c. 480,000 calories

4 a. $5,500,000 = 17u$
$$\frac{5,500,000}{17} = \frac{17u}{17}$$

 $u \approx 323,529$ square kilometers

5 a. $2300y$
b. $2300\left(\frac{1}{4}\right) = 575$ millimeters

Worksheet 2:

Translating Word Problems Into Equations

“Exploring the Amazon”

1 a. $40d$
b. $6,400 = 40d$
$$\frac{6400}{40} = \frac{40d}{40}$$

 $d = 160$ days

2 a. $p = 450 + 1.2y$
b. $p = 450 + 1.2(15) = 468$ people

3 a. $s = 145,000 + 110y$
b. $s = 145,000 + 110(20) = 147,200$ species

4 a. $p = 500 - 3.4y$
b. $0 = 500 - 3.4y$
 $-500 = -3.4y$
 $y \approx 147$ years

Worksheet 3:

Performing Operations With Scientific Notation

“The Amazon in Perspective”

1 a. 6.2×10^5 cubic yards
b. $6.2 \times 10^5 \times 60 \times 60$
 $= 6.2 \times 10^5 \times 6.0 \times 10^1 \times 6.0 \times 10^1$
 $= 6.2 \times 6.0 \times 6.0 \times 10^5 \times 10^1 \times 10^1$
 $= 6.2 \times 6.0 \times 6.0 \times 10^{(5+1+1)}$
 $= 223.2 \times 10^7$
 $= 2.232 \times 10^9$ cubic yards

2 $3.048 \times 10^3 \div 7.62 \times 10^1$
 $= 3.048 \div 7.62 \times 10^3 \div 10^1$
 $= 3.048 \div 7.62 \times 10^{3-1}$
 $= 0.4 \times 10^2$
 $= 4 \times 10^1$ times larger

3 a. $3.977 \times 10^3; 3.78788 \times 10^{-2}; 4.16 \times 10^3$
b. $3.977 \times 10^3 \div 3.78788 \times 10^{-2}$
 $= 3.977 \div 3.78788 \times 10^3 \div 10^{-2}$
 $= 3.977 \div 3.78788 \times 10^{3-(-2)}$
 $\approx 1.05 \times 10^5$ times longer

c. $4.16 \times 10^3 \div 3.977 \times 10^3$
 $= 4.16 \div 3.977 \times 10^3 \div 10^3$
 $= 4.16 \div 3.977 \times 10^{3-3}$
 $= 4.16 \div 3.977 \times 10^0$
 $\approx 1.05 \times 10^0$ times longer

4 a. 60 meters = $60\cancel{\text{m}} \times \frac{100\cancel{\text{cm}}}{\cancel{\text{m}}} = 6,000$ cm, or 6×10^3 centimeters
b. $6 \div 8.5 \times 10^{3-0} \approx 0.706 \times 10^3 = 7.06 \times 10^2$ times larger
c. 8.5 centimeters = $8.5\cancel{\text{cm}} \times 10^2 \frac{1\cancel{\text{m}}}{100\cancel{\text{cm}}} = 0.085$ m,
or 8.5×10^{-2} meters
d. $60 \text{ m} = 60 \times 10^1; 6 \div 8.5 \times 10^{1-(-2)} \approx 0.706 \times 10^3 = 7.06 \times 10^2$
times larger
e. They are the same.

Think It Through: The answers to questions 2, 3c, 4b, and 4d might make more sense expressed in standard notation because those quantities are not extremely large or extremely small. It might be more efficient to express them in standard notation.