NAME DATE TIME

End-of-Year Assessment

① Darlene solved a multiplication problem using U.S. traditional multiplication. Her work is shown at the right.

$$\begin{array}{r} {\scriptstyle 2\ 4\ 1\ \ } \\ 3\,7\,2 \\ *\quad 1\,4\,6 \\ \hline 2\,2\,3\,2 \\ 1\,4\,8\,8\,0 \\ +\quad 3\,7\,2\,0 \\ \hline 2\,0,\,8\,3\,2 \end{array}$$

a. Make an estimate for Darlene's problem. Does her answer make sense? Explain.

Sample answer: 400 * 150 = 60,000. 60,000 is not very close to 20,382, so I do not think that Darlene's answer makes sense.

b. Explain Darlene's mistake. Sample answer: Instead of multiplying 372 by 100 to get the final partial product, she multiplied 372 by 10. If she fixes the final partial product, she should get the correct answer.

c. Solve the problem using U.S. traditional multiplication. Show your work.

$$\begin{array}{r} {\scriptstyle 2\ 4\ 1\ \ } \\ 3\,7\,2 \\ *\quad 1\,4\,6 \\ \hline 2\,2\,3\,2 \\ 1\,4\,8\,8\,0 \\ +\,3\,7\,2\,0\,0 \\ \hline 5\,4,\,3\,1\,2 \end{array}$$

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End-of-Year Assessment (continued)

(2) **a.** Jerome is helping pack canned goods into boxes for the food pantry. There are 647 cans of food. He can put 16 cans in each box. How many boxes does Jerome need?

Jerome needs 41 boxes.

b. Explain how you solved this problem.

Sample answer: First, I used partial-quotients division to divide 647 by 16. I got 40 with a remainder of 7. I knew that the 7 extra cans would still need to be put into a box, so I rounded my answer up to 41 boxes.

(3) **a.** Write the value of the **2** in each of the following numbers.

3**2**,048.671 2,000

214.9 200

406.97**2** 0.002

0.0**2**8 0.02

b. Look carefully at your answers to Part a. How does the value of the 2 change as it shifts one place to the left? To the right?

Sample answer: Each time the 2 moves a place to the left, it is worth ten times as much. When it moves to the right, it is worth $\frac{1}{10}$ as much.

c. Use the information in Parts a and b to write a rule about the value of any digit when it moves one place to the left or one place to the right in a number.

Sample answer: The value of a digit in any number is ten times what it represents in the place to its right, and $\frac{1}{10}$ of what it represents in the place to its left.

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End-of-Year Assessment (continued)

④ **a.** $36 * 10^6 =$ 36,000,000

b. $184.72 \div 10^2 =$ 1.8472

c. $0.973 * 10^{\boxed{4}} = 9{,}730$

d. $150 * 10^{\boxed{5}} = 15{,}000{,}000$

e. Explain how you solved Part a. Sample answer: I know that every time I multiply a number by 10, the digits move one place to the left. I show this by attaching a zero. So to multiply 36 by 10^6, I attached 6 zeros to 36.

f. Explain how you solved Part b. Sample answer: I know that every time I divide a number by 10, the digits move one place to the right. I show this by moving the decimal point to the left. So to divide by 10^2, I moved the decimal point 2 places to the left.

⑤ Fill in the blanks with >, <, or =.

a. 2.781 < 58.6

b. 5.081 > 5.008

c. 6 = 6.000

d. 72.3 > 72.289

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End-of-Year Assessment (continued)

Make an estimate and then solve Problems 6–8.
Show your work on the computation grid below.
Use your estimate to check whether your answer makes sense.

⑥ 15.8 + 6.97 = 22.77

Estimate: Sample answer: 16 + 7 = 23

⑦ 38.4 − 12.88 = 25.52

Estimate: Sample answer: 40 − 13 = 27

⑧ 184 − 65.27 = 118.73

Estimate: Sample answer: 180 − 60 = 120

⑨ Explain how you solved Problem 8. Sample answer: First I had to make the numbers have the same number of digits after the decimal point, so I rewrote 184 as 184.00. Then I used trade-first subtraction to subtract 184.00 − 65.27. I got an answer of 118.73. That was close to my estimate of 120.

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End-of-Year Assessment (continued)

10 Gary walked $2\frac{1}{3}$ miles on Monday, $3\frac{1}{2}$ miles on Tuesday, and $1\frac{3}{4}$ miles on Wednesday. How many miles did he walk in the three days?

Gary walked $6\frac{19}{12}$, or $7\frac{7}{12}$ miles.

11 Angela was trying to find a fraction equivalent to $\frac{5}{6}$.
She showed the following work:

$$\frac{5 * 100}{6 * 100} = \frac{500}{600}$$

a. Is $\frac{500}{600}$ equivalent to $\frac{5}{6}$? Explain how you know.

Yes. Sample explanation: She multiplied the numerator and denominator of $\frac{5}{6}$ by 100. That's like multiplying $\frac{5}{6}$ by $\frac{100}{100}$, which is equal to 1. Any number times 1 equals itself, so $\frac{500}{600}$ is equivalent to $\frac{5}{6}$.

b. Would Angela get an equivalent fraction if she multiplied $\frac{5}{6}$ by $\frac{250}{250}$? Why or why not?

Yes. Sample explanation: $\frac{250}{250}$ is equal to 1. As long as Angela multiplies the numerator and the denominator by the same number, that is like multiplying by a fraction equal to 1, and she will get an equivalent fraction.

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End-of-Year Assessment (continued)

12 Reed's class is painting a giant chessboard on the playground.
A chessboard consists of 64 squares arranged in 8 rows and 8 columns.
His class is making each square $\frac{1}{3}$ m by $\frac{1}{3}$ m.

a. What will be the length and width of the chessboard in meters? Show your work.

Length: $\frac{8}{3}$, or $2\frac{2}{3}$ meters Width: $\frac{8}{3}$, or $2\frac{2}{3}$ meters

b. What will be the area of the completed chessboard? Show your work.
Give your answer in square meters.

Number model: $2\frac{2}{3} * 2\frac{2}{3} = A$

Area: $\frac{64}{9}$, or $7\frac{1}{9}$, m^2

c. How could you use the number of squares on the chessboard to find the area of the chessboard in square meters?

Sample answer: The chessboard is made of 64 squares that are $\frac{1}{3}$ m by $\frac{1}{3}$ m, or $\frac{1}{9}$ m^2. This means that there are 9 squares in each square meter. $64 \div 9 = \frac{64}{9}$, or $7\frac{1}{9}$, square meters.

13 Mrs. Donlon is preparing pieces of string for her art class. She has 10 feet of string.
She wants each of the 23 students in her class to get the same amount of string.
How many inches of string will each student get? Show your work.

Each student will get $5\frac{5}{23}$ inches of string.

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End-of-Year Assessment (continued)

14 Hudson and Molly both solved the problem 12.8 * 6.4 = ?. Here is their work.

Hudson's work

Estimate: 15 * 6 = 90

$$\begin{array}{r} {\scriptstyle 1\ 4} \\ {\scriptstyle 1\ 3} \\ 1\ 2\ 8 \\ *\quad\ 6\ 4 \\ \hline 5\ 1\ 2 \\ +\ 7\ 6\ 8\ 0 \\ \hline 8,\ 1\ 9\ 2 \end{array}$$

12.8 * 6.4 = 81.92

Molly's work

12.8 * 10 = 128 6.4 * 10 = 64

$$\begin{array}{r} {\scriptstyle 1\ 4} \\ {\scriptstyle 1\ 3} \\ 1\ 2\ 8 \\ *\quad\ 6\ 4 \\ \hline 5\ 1\ 2 \\ +\ 7\ 6\ 8\ 0 \\ \hline 8,\ 1\ 9\ 2 \end{array}$$

8,192 ÷ 10^2 = 81.92

12.8 * 6.4 = 81.92

a. Explain Hudson's method of multiplying. Sample answer: Hudson made an estimate and then ignored the decimal points and multiplied. He used his estimate to put the decimal point in the correct place in the answer.

b. Explain Molly's method of multiplying. Sample answer: Molly multiplied both factors by a power of 10 to get whole numbers. Then she multiplied the whole numbers and divided her answer by the powers of 10 she originally multiplied by to get the final answer.

c. Use Hudson's method or Molly's method to multiply 27.2 * 8.8. Explain why you chose that method.

27.2 * 8.8 = 239.36

Explanation: Explanations vary.

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End-of-Year Assessment (continued)

(15) **a.** Solve. Show your work.

64.8 ÷ 1.8 = ?

64.8 ÷ 1.8 = 36

b. Explain how you solved the problem. Sample answer: I multiplied both 64.8 and 1.8 by 10 to make the equivalent problem 648 ÷ 18. I used partial-quotients division to solve and got an answer of 36.

(16) Graham has $\frac{1}{3}$ box of food for his iguana that needs to last 6 days. How much food should he give his iguana each day so that it gets the same amount every day?

Number model: $\frac{1}{3} \div 6 = i$

Answer: $\frac{1}{18}$ box of food

(17) Benjamin has 15 feet of ribbon to cut into $\frac{1}{3}$-foot sections for a scrapbooking project. If he needs 48 pieces of ribbon to complete the project, does he have enough ribbon? Show your work and explain your answer.

Number model: $15 \div \frac{1}{3} = r$

Answer: No; Sample explanation: He will only have 45 pieces of ribbon, so he needs 3 more pieces.

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End-of-Year Assessment (continued)

18 $\frac{5}{8}$ of the students in Siena's class have brown eyes. $\frac{2}{3}$ of the students with brown eyes are girls. What fraction of the students in Siena's class are girls with brown eyes?

Number model: $\frac{2}{3} * \frac{5}{8} = b$

Answer: $\frac{10}{24}$ of the students in Siena's class are girls with brown eyes.

19 Jeanne's parents bought a new refrigerator.
It is 30 inches long, 18 inches wide, and 60 inches high.
What is the volume of the refrigerator? Remember to include the units.

The volume of the refrigerator is 32,400 cubic inches.

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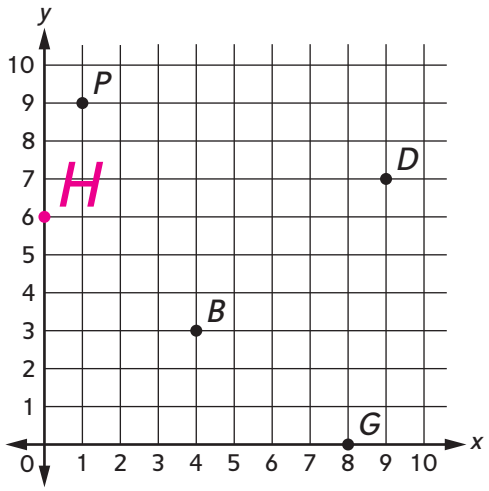
End-of-Year Assessment (continued)

20 Marlena is running errands. She needs to go to the bakery (*B*), the pet store (*P*), the dry cleaner (*D*), and the grocery store (*G*).



a. Write the coordinates of each location shown on the map above.

bakery (*B*): (4, 3) pet store (*P*): (1, 9)

dry cleaner (*D*): (9, 7) grocery store (*G*): (8, 0)

b. Marlena's house (*H*) is located at (0, 6).
Plot and label the location of Marlena's house on the grid.

c. On the map, each square side represents one block. If Marlena decides to ride her bike from home to the pet store, the dry cleaner, the grocery store, the bakery, and back home (in that order), how many blocks will she ride?

36 blocks

d. If each block is $\frac{1}{8}$ mile, how many miles will she be riding to finish all her errands?

Number model: $36 * \frac{1}{8} = r$

Answer: $\frac{36}{8}$, or $4\frac{4}{8}$, or $4\frac{1}{2}$, miles