Multiplying and Dividing by Powers of 10

Grade 5 Math • Section 1.2

Name: _____	Date: _____	Score: _____ / 17

Quick Review and Helpful Hints

Multiplying by a power of 10: Move the decimal point to the **right** as many places as the exponent. $3.7 \times 10^2 = 370$

Dividing by a power of 10: Move the decimal point to the **left** as many places as the exponent. $450 \div 10^3 = 0.45$

The number of zeros in $10, 100, 1{,}000, \ldots$ tells you how many places to move.

Example: Evaluate 6.42×10^3.

Since the exponent is 3, move the decimal point 3 places to the right. $6.42 \to 64.2 \to 642 \to 6{,}420$. We add a zero at the end because we need one more place.

Answer: $6{,}420$

Practice Problems

Evaluate each expression.

1. $5.3 \times 10 =$ _____
2. $0.48 \times 100 =$ _____
3. $2.7 \times 10^3 =$ _____
4. $0.006 \times 10^4 =$ _____
5. $9.15 \times 10^2 =$ _____
6. $34.1 \times 10 =$ _____
7. $720 \div 10 =$ _____
8. $53 \div 100 =$ _____
9. $8{,}400 \div 10^3 =$ _____
10. $1.9 \div 10 =$ _____
11. $460 \div 10^2 =$ _____
12. $0.35 \times 10^3 =$ _____
13. $7{,}000 \div 10^4 =$ _____
14. $12.5 \times 10^2 =$ _____
15. $6{,}300 \div 10^2 =$ _____

Word Problems

16. A factory produces 1.25 tons of cereal per day. How many tons does it produce in 10^2 days?

_____

17. An ant weighs about 0.001 grams. Write this number using a whole number divided by a power of 10. Then find how much $10{,}000$ ants weigh.

_____

Answer Keys

1. $\boxed{53}$
2. $\boxed{48}$
3. $\boxed{2700}$
4. $\boxed{60}$
5. $\boxed{915}$
6. $\boxed{341}$
7. $\boxed{72}$
8. $\boxed{0.53}$
9. $\boxed{8.4}$
10. $\boxed{0.19}$
11. $\boxed{4.6}$
12. $\boxed{350}$
13. $\boxed{0.7}$
14. $\boxed{1250}$
15. $\boxed{63}$
16. $\boxed{125}$
17. $\boxed{1 \div 1000;\ 10 \text{ grams}}$

Step-by-Step Explanations

1. Start with the main idea. For powers of 10, move the decimal 1 place(s) to the right. The result is 53. Multiplying by a power of ten moves the decimal right; dividing moves it left.

2. Keep the work tidy. For powers of 10, move the decimal 2 place(s) to the right. The result is 48. The exponent tells how many places to move, so count the moves carefully.

3. Look at what the numbers mean. For powers of 10, move the decimal 3 place(s) to the right. The result is 2700. Zeros are placeholders here, and each one helps keep the place value correct.

4. Use the setup first. For powers of 10, move the decimal 4 place(s) to the right. The result is 60. Multiplying by a power of ten moves the decimal right; dividing moves it left.

5. Check the size of the answer. For powers of 10, move the decimal 2 place(s) to the right. The result is 915. The exponent tells how many places to move, so count the moves carefully.

6. Match the operation to the words. For powers of 10, move the decimal 1 place(s) to the right. The result is 341. Zeros are placeholders here, and each one helps keep the place value correct.

7. Write the important values first. For powers of 10, move the decimal 1 place(s) to the left. The result is 72. Multiplying by a power of ten moves the decimal right; dividing moves it left.

8. Follow the pattern carefully. For powers of 10, move the decimal 2 place(s) to the left. The result is 0.53. The exponent tells how many places to move, so count the moves carefully.

9. Start with the main idea. For powers of 10, move the decimal 3 place(s) to the left. The result is 8.4. Zeros are placeholders here, and each one helps keep the place value correct.

10. Keep the work tidy. For powers of 10, move the decimal 1 place(s) to the left. The result is 0.19. Multiplying by a power of ten moves the decimal right; dividing moves it left.

11. Look at what the numbers mean. For powers of 10, move the decimal 2 place(s) to the left. The result is 4.6. The exponent tells how many places to move, so count the moves carefully.

12. Use the setup first. For powers of 10, move the decimal 3 place(s) to the right. The result is 350. Zeros are placeholders here, and each one helps keep the place value correct.

13. Check the size of the answer. For powers of 10, move the decimal 4 place(s) to the left. The result is 0.7. Multiplying by a power of ten moves the decimal right; dividing moves it left.

14. Match the operation to the words. For powers of 10, move the decimal 2 place(s) to the right. The result is 1250. The exponent tells how many places to move, so count the moves carefully.

15. Write the important values first. For powers of 10, move the decimal 2 place(s) to the left. The result is 63. Zeros are placeholders here, and each one helps keep the place value correct.

16. Follow the pattern carefully. For powers of 10, multiply 1.25 tons by $10^2 = 100$: $1.25 \times 100 = 125$ tons. Multiplying by a power of ten moves the decimal right; dividing moves it left.

17. Start with the main idea. For powers of 10, $0.001 = \frac{1}{1000}$. For $10{,}000$ ants, $10{,}000 \times 0.001 = 10$ grams. The exponent tells how many places to move, so count the moves carefully.

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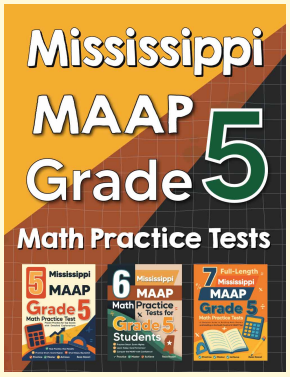

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