

Grade 5 · Place Value and Powers of 10 · Worksheet Answer Key

Common Core 5.NBT.A.1, 5.NBT.A.2 · mathovore.fr

Every solution shows the place-value reasoning, the digit shift and the final answer in bold.
Compare your steps with the key, and look again at any problem where a decimal point or a zero ended up in the wrong place.

Grade 5 Common Core: 5.NBT.A.1 · 5.NBT.A.2

Problem 1: Comparing two 6s

The left 6 is in the thousands place: 6,000. The right 6 is in the hundreds place: 600. Since $6,000 \div 600 = 10$, the left 6 is worth 10 times as much.

Thousands	Hundreds	Tens	Ones
6	6	0	0

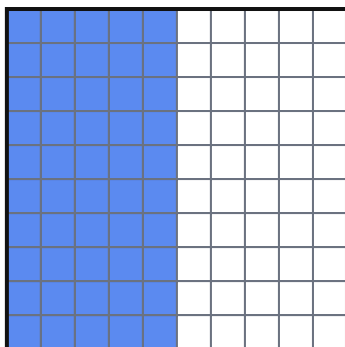
Moving one place left

$$600 \times 10 = 6,000.$$

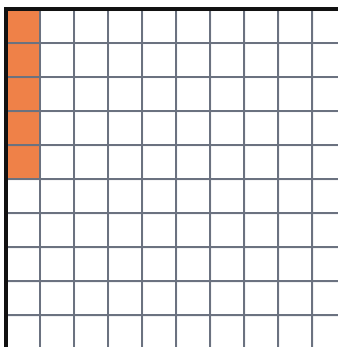
10 times as much.

Problem 2: Tenths and hundredths

0.5 is 50 hundredths and 0.05 is 5 hundredths. Since $50 \div 5 = 10$, 0.5 is 10 times as much as 0.05.



0.5 = 50 squares



0.05 = 5 squares

Ten groups of 5 squares make 50 squares.

10 times as much.

Problem 3: One tenth and ten times

- a. $0.3 \div 10 = 0.03$. **0.03**
- b. $40 \div 10 = 4$. **4**
- c. $0.07 \times 10 = 0.7$. **0.7**

Problem 4: Times 10 and divided by 10

- a. $8.5 \times 10 = 85$. **85**
- b. $8.5 \div 10 = 0.85$. **0.85**
- c. $0.062 \times 10 = 0.62$. **0.62**
- d. $62 \div 10 = 6.2$. **6.2**

Problem 5: Reading the power-of-10 picture

- a. $10^3 = 10 \times 10 \times 10 = 1,000$. **1,000**
- b. 10,000 has four zeros, so $10,000 = 10^4$. **10^4**
- c. $10^5 = 100,000$ (five zeros). **100,000**

Problem 6: Writing powers of 10

- a. Three factors of 10: 10^3 .
- b. 1,000,000 has six zeros: 10^6 .
- c. One factor of 10: 10^1 .

Problem 7: Evaluating powers of 10

- a. $10^2 = 100$. **100**
- b. $10^4 = 10,000$. **10,000**
- c. $10^7 = 10,000,000$ (seven zeros). **10,000,000**

Problem 8: Counting zeros

- a. The exponent 9 means 9 zeros: $10^9 = 1,000,000,000$. **9 zeros**
- b. 1 followed by 5 zeros is 100,000, so 10^5 .

Problem 9: Multiplying by 10, 100 and 1,000

- a. $6.3 \times 10 = 63$. **63**
- b. $6.3 \times 100 = 630$. **630**
- c. $6.3 \times 1,000 = 6,300$. **6,300**

Problem 10: Shifting digits left

Move each digit 2 places left: the 3 goes to hundreds, the 4 to tens and the 5 to ones.



The digits move two places left.

$$3.45 \times 10^2 = 345. \mathbf{345}$$

Problem 11: Decimals times powers of 10

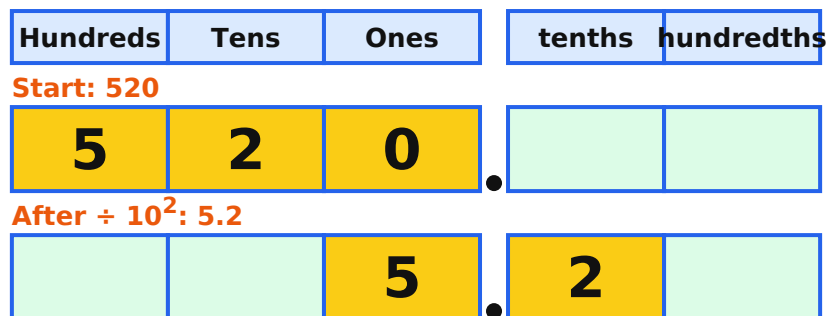
- a. $0.48 \times 100 = 48. \mathbf{48}$
- b. $0.048 \times 1,000 = 48. \mathbf{48}$
- c. $7.5 \times 1,000 = 7,500. \mathbf{7,500}$
- d. $0.9 \times 10 = 9. \mathbf{9}$

Problem 12: Dividing 530 by powers of 10

- a. $530 \div 10 = 53. \mathbf{53}$
- b. $530 \div 100 = 5.3. \mathbf{5.3}$
- c. $530 \div 1,000 = 0.53. \mathbf{0.53}$

Problem 13: Shifting digits right

Move each digit 2 places right: the 5 goes from hundreds to ones, and the 2 goes from tens to tenths.



$$520 \div 10^2 = 5.2.$$

$$520 \div 10^2 = 5.2. \mathbf{5.2}$$

Problem 14: Decimals divided by powers of 10

- a. $4.7 \div 10 = 0.47. \mathbf{0.47}$

- b. $36 \div 100 = 0.36$. **0.36**
- c. $0.8 \div 10 = 0.08$. **0.08**
- d. $5 \div 1,000 = 0.005$. **0.005**

Problem 15: Missing exponent in multiplication

- a. 4.2 becomes 4,200 when the digits move 3 places: 3.
- b. 0.75 becomes 75 after 2 places: 2.
- c. 6 becomes 600,000 with 5 zeros added: 5.

Problem 16: Missing exponent in division

- a. 9,000 to 9 is 3 places right: 3.
- b. 560 to 0.56 is 3 places right: 3.
- c. 31 to 3.1 is 1 place right: 1.

Problem 17: Power-of-10 patterns

- a. Each number is 10 times the last: $0.4 \times 10 = 4$ and $4 \times 10 = 40$. **4 and 40**
- b. Each number is divided by 10: $20 \div 10 = 2$ and $2 \div 10 = 0.2$. **2 and 0.2**

Problem 18: Which is greater?

- a. $10 \times 0.36 = 3.6$ and $0.36 \div 10 = 0.036$. 10×0.36 **is greater**.
- b. $0.5 \times 1,000 = 500$ and $5.2 \times 100 = 520$. 5.2×10^2 **is greater**.

Problem 19: Find the error

Liam only added zeros at the end, which does not change the value: $2.500 = 2.5$. Multiplying by 100 moves each digit 2 places left, so the 2 goes to hundreds and the 5 to tens, with a zero in the ones place.

$$2.5 \times 100 = 250. \text{ **250**}$$

Problem 20: Explain with place value

Dividing by 10^2 moves each digit 2 places right. The 8 starts in the ones place, moves to the tenths place, and then to the hundredths place. An 8 in the hundredths place is 0.08.

$$8 \div 10^2 = 0.08$$

Problem 21: School store pencils

Each box has 100 pencils. $37 \times 10^2 = 3,700$.

3,700 pencils.

Problem 22: Running laps

$0.65 \times 10 = 6.5$. The digits move 1 place left.

6.5 miles.

Problem 23: Stack of paper

$0.004 \times 10^3 = 4$. The 4 moves from thousandths to ones.

4 inches.

Problem 24: Honey at the farmers market

Total: $6.40 \times 10^2 = 640$, so \$640. Each envelope: $640 \div 10 = 64$.

\$64 per envelope.

Problem 25: Beads for bracelets

Total: $0.07 \times 10^3 = 70$, so \$70. Each share: $70 \div 10 = 7$.

\$7 each.

Problem 26: Juice jugs

Total juice: $0.75 \times 10^3 = 750$ gallons. Each tank: $750 \div 10^2 = 7.5$.

7.5 gallons per tank.