Understanding Place Value

Understanding Place Value: Models and Computation

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QUICK REVIEW

Each place is ten times the place to its right. In 6.482, the 4 is 4 tenths (0.4), the 8 is 8 hundredths (0.08), and the 2 is 2 thousandths (0.002). A zero holds an empty place.

Worked example

What is the value of 7 in 3.075?

1. The digits after the point are 0 tenths, 7 hundredths, and 5 thousandths.
2. Seven hundredths is $7 \times 0.01 = 0.07$.
3. Check: $3 + 0.07 + 0.005 = 3.075$.
Answer: 0.07.

Practice Problems

Show your thinking.

1. Give the value of 6 in 8.364.

2. In 5.555, how many times as great is the value of the tenths 5 as the hundredths 5?

3. Complete the place-value row for 4.209: ones, tenths, hundredths, thousandths.

Ones	Tenths	Hundredths	Thousandths

4. Write 3 ones, 8 tenths, and 4 thousandths as a decimal.

5. How many thousandths equal 0.27?

6. A digit has value 0.08 in 2.483. Name the digit and its place.

7. A scale shows 7.032 kg. What mass does the digit 3 contribute?

8. Correct: The 4 in 0.046 means four tenths.

Answer Key

1. 0.06.
2. 10 times.
3. $4, 2, 0, 9$.
4. 3.804.
5. 270 thousandths.
6. 8; hundredths.
7. 0.03 kg.
8. It means four hundredths, 0.04.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The 6 is the second digit after the decimal point: hundredths.
2. $6 \times 0.01 = 0.06$; $8 + 0.3 + 0.06 + 0.004 = 8.364$.

Problem 2

1. The two values are 0.5 and 0.05.
2. $0.5 \div 0.05 = 10$; $10 \times 0.05 = 0.5$.

Problem 3

1. $4.209 = 4 + 0.2 + 0 + 0.009$.
2. The 0 holds hundredths, so the 9 stays in thousandths.

Problem 4

1. The parts are 3, 0.8, and 0.004.
2. $3 + 0.8 + 0.004 = 3.804$; a zero is needed in hundredths.

Problem 5

1. $0.27 = \frac{27}{100} = \frac{270}{1000}$.
2. $270 \times 0.001 = 0.27$; the value did not change.

Problem 6

1. $0.08 = 8 \times 0.01$.
2. In 2.483, the second decimal digit is 8, so its place matches 0.01.

Problem 7

1. The decimal places are 0 tenths, 3 hundredths, 2 thousandths.
2. $3 \times 0.01 = 0.03$ kg; $7 + 0.03 + 0.002 = 7.032$ kg.

Problem 8

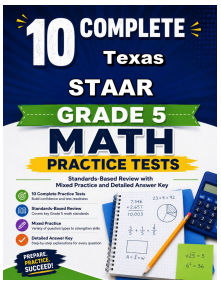
1. The tenths digit is 0; the 4 is one place farther right.
2. $4 \times 0.01 = 0.04$, whereas four tenths would be 0.4.

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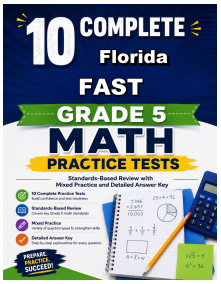
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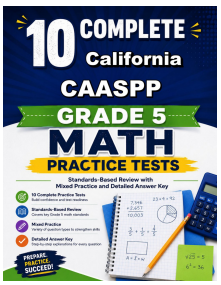
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