Understanding Place Value

Understanding Place Value: Apply, Compare, and Design

Name _____ **Date** _____ **Score** _____ / 8

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. Design a three-place decimal with 4 ones, 6 thousandths, and no tenths or hundredths.

2. Two sensors show 0.506 m and 0.056 m. Which has a 5 worth ten times as much?

3. A jar has 36 hundredth-liter portions. Write its liters and the value of its tenths digit.

4. Can a 9 in a decimal have value 0.009 if it is directly after the point? Explain briefly.

5. An instrument records 2.615 cm. Replace only the hundredths digit by 9. What is the new reading?

6. Build the smallest number using $1, 3, 5, 8$ once each, with 5 in ones and 8 in thousandths.

7. A label says 0.070 kg is seventy tenths of a kilogram. Fix only the unit name.

8. A device makes a digit worth 100 times as much. Where should the 6 in 0.006 move?

Answer Key

1. 4.006.
2. The 5 in 0.506 m.
3. 0.36 L; 0.3 L.
4. No; directly after the point it is 0.9.
5. 2.695 cm.
6. 5.138.
7. Seventy thousandths of a kilogram.
8. To tenths, making 0.6.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The decimal part is $6 \times 0.001 = 0.006$.
2. $4 + 0.006 = 4.006$; the two zeros keep the 6 in thousandths.

Problem 2

1. The values of the 5s are 0.5 m and 0.05 m.
2. $0.5 \div 0.05 = 10$; the first sensor meets the condition.

Problem 3

1. $36 \times 0.01 = 0.36$ L.
2. The 3 is in tenths, so it contributes $3 \times 0.1 = 0.3$ L.

Problem 4

1. The first decimal place has unit value 0.1, giving $9 \times 0.1 = 0.9$.
2. To have $0.009 = 9 \times 0.001$, the 9 must be in the third decimal place.

Problem 5

1. The hundredths digit changes from 1 to 9, a gain of 8 hundredths.
2. $2.615 + 0.08 = 2.695$ cm; the other digits stay fixed.

Problem 6

1. The remaining 1 and 3 fill tenths and hundredths.
2. Put the smaller digit in tenths: $5 + 0.1 + 0.03 + 0.008 = 5.138$, which is less than 5.318.

Problem 7

1. $0.070 = \frac{70}{1000}$.
2. Seventy tenths would be $70 \times 0.1 = 7$ kg, not 0.070 kg.

Problem 8

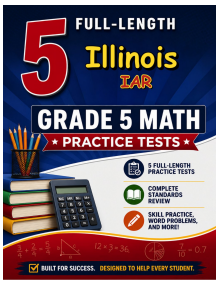
1. $0.006 \times 100 = 0.6$.
2. The two moves are $0.006 \times 10 = 0.06$, then $0.06 \times 10 = 0.6$: thousandths to tenths.

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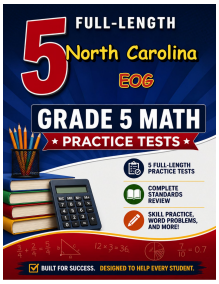
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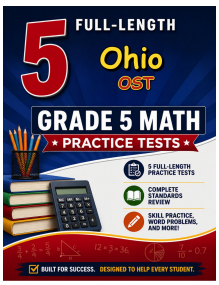
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