Dividing Whole Numbers by Unit Fractions

Dividing Whole Numbers by Unit Fractions: Apply, Compare, and Design

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

QUICK REVIEW

Dividing a whole number by a unit fraction counts small groups. If one whole has 7 sevenths, multiply the number of wholes by 7 to count the portions. The answer counts portions; it is not the size of a portion.

Worked example

Compute $4 \div \frac{1}{7}$. Explain whether the answer counts groups or gives one share.

1. Each whole has 7 equal portions of $\frac{1}{7}$.
2. 4 wholes contain $4 \times 7 = 28$ portions.
3. Check: $28 \times \frac{1}{7} = 4$.
Answer: 28.

Practice Problems

Show your thinking.

1. Fill at least 14 identical cups from 4 L of water. Choose $\frac{1}{3}$-L cups or $\frac{1}{4}$-L cups. How many extra cups could you fill with the working choice?

2. Bag 3 kg of rice in $\frac{1}{8}$-kg bags. Set 8 bags aside. How many bags are left, and what is their total mass?

3. Roll A has 6 m and is cut into $\frac{1}{3}$-m strips. Roll B has 4 m and is cut into $\frac{1}{4}$-m strips. Which gives more full strips? Give the difference.

4. A shop wants 35 packs of $\frac{1}{5}$ kg each. Only whole kilograms can be ordered. Find the smallest order that fills every pack.

5. A student calculates $3 \div \frac{1}{9} = \frac{1}{3}$ for the number of samples in 3 L. Explain how to tell that the count cannot be less than one, and correct it.

6. Draw two whole boxes. Each whole fits 5 equal $\frac{1}{5}$-size packs. A shelf holds 8 packs. Show how many packs are left off the shelf.

7. Two dispensers hold 2 L each. One fills $\frac{1}{6}$-L cups and the other fills $\frac{1}{3}$-L cups. How many total cups can be filled without mixing the dispensers?

8. A school needs 30 bags of $\frac{1}{8}$ kg. Each sack contains 1 kg. Can 3 sacks fill the order? If not, how many bags are missing?

Answer Key

1. $\frac{1}{4}$-L cups; 2 extra cups.
2. 16 bags; 2 kg.
3. Roll A, by 2 strips.
4. 7 kg.
5. 27 samples.
6. 2 packs.
7. 18 cups.
8. No; 6 bags are missing.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Thirds: $4 \times 3 = 12$ cups, not enough.
2. Fourths: $4 \times 4 = 16$ cups.
3. $16 - 14 = 2$ extra cups could be filled.

Problem 2

1. $3 \times 8 = 24$ bags can be filled.
2. $24 - 8 = 16$ bags remain.
3. 16 eighths of a kilogram equal $\frac{16}{8} = 2$ kg.

Problem 3

1. Roll A gives $6 \times 3 = 18$ strips.
2. Roll B gives $4 \times 4 = 16$ strips.
3. $18 - 16 = 2$ more strips come from A.

Problem 4

1. Each kilogram supplies 5 packs.
2. $35 \div 5 = 7$ whole kilograms.
3. Six kilograms give only 30 packs; $7 \times 5 = 35$ packs fit exactly.

Problem 5

1. One liter alone holds 9 one-ninth-liter samples.
2. Three liters hold three groups of 9: $3 \times 9 = 27$.
3. $27 \times \frac{1}{9} = 3$ L. The answer counts samples, not liters.

Problem 6

1. Draw five equal parts in each box, for $5 + 5 = 10$ packs.
2. Mark five in the first box and three in the second: $5 + 3 = 8$ on the shelf.
3. Two unshaded parts remain: $10 - 8 = 2$ packs.



Shaded: on shelf; unshaded: left off

Problem 7

1. The first gives $2 \times 6 = 12$ cups.
2. The second gives $2 \times 3 = 6$ cups.
3. $12 + 6 = 18$ cups altogether. The two cup sizes need separate counts.

Problem 8

1. One sack fills 8 bags.
2. Three sacks fill $3 \times 8 = 24$ bags.
3. $30 - 24 = 6$ more bags are needed.

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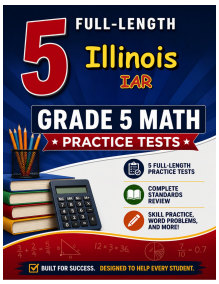

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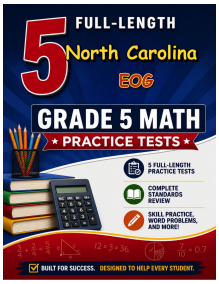

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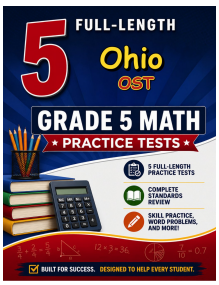

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