Multiples of a Fraction

Explore ideas and representations

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

QUICK REVIEW

Positive multiples of a fraction are $1, 2, 3, \ldots$ copies. For $\frac{1}{6}$, they begin $\frac{1}{6}, \frac{2}{6}, \frac{3}{6}$. With a step of $\frac{a}{b}$, each new multiple adds a pieces of size $\frac{1}{b}$.

Worked example

List the first four positive multiples of $\frac{2}{9}$.

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{2}{9}$.
2. $1 \times \frac{2}{9} = \frac{2}{9}$; $2 \times \frac{2}{9} = \frac{4}{9}$.
3. $3 \times \frac{2}{9} = \frac{6}{9}$; $4 \times \frac{2}{9} = \frac{8}{9}$.
Answer: $\frac{2}{9}, \frac{4}{9}, \frac{2}{3}, \frac{8}{9}$.

Practice Problems

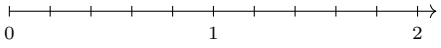
Show your thinking.

1. List the first four positive multiples of $\frac{2}{7}$.

2. Write the first five positive multiples of $\frac{3}{8}$.

3. Generate four positive multiples of $\frac{4}{9}$.

4. Mark the first three positive multiples of $\frac{2}{5}$ on the line.



5. Fix the list of multiples of $\frac{2}{5}$: $\frac{2}{5}, \frac{3}{5}, \frac{4}{5}$.

6. Which positive multiple of $\frac{3}{8}$ is $\frac{15}{8}$?

7. Which is the first positive multiple of $\frac{4}{7}$ greater than 1?

8. Each ribbon segment is $\frac{3}{5}$ m. How long are four segments?

Answer Key

1. $\frac{2}{7}$, $\frac{4}{7}$, $\frac{6}{7}$, $1\frac{1}{7}$.
2. $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{2}$, $1\frac{7}{8}$.
3. $\frac{4}{9}$, $\frac{8}{9}$, $1\frac{1}{3}$, $1\frac{7}{9}$.
4. $\frac{2}{5}$, $\frac{4}{5}$, $1\frac{1}{5}$.
5. $\frac{2}{5}$, $\frac{4}{5}$, $\frac{6}{5}$.
6. 5.
7. The second: $\frac{8}{7} = 1\frac{1}{7}$.
8. $\frac{12}{5} = 2\frac{2}{5}$ m.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{2}{7}$.
2. $1 \times \frac{2}{7} = \frac{2}{7}$; $2 \times \frac{2}{7} = \frac{4}{7}$.
3. $3 \times \frac{2}{7} = \frac{6}{7}$; $4 \times \frac{2}{7} = \frac{8}{7}$.

Problem 2

1. Multiply the fraction by $1, 2, \ldots, 5$ in order. Each new step adds one more $\frac{3}{8}$.
2. $1 \times \frac{3}{8} = \frac{3}{8}$; $2 \times \frac{3}{8} = \frac{6}{8}$.
3. $3 \times \frac{3}{8} = \frac{9}{8}$; $4 \times \frac{3}{8} = \frac{12}{8}$.
4. $5 \times \frac{3}{8} = \frac{15}{8}$.

Problem 3

1. Multiply the fraction by $1, 2, \ldots, 4$ in order. Each new step adds one more $\frac{4}{9}$.
2. $1 \times \frac{4}{9} = \frac{4}{9}$; $2 \times \frac{4}{9} = \frac{8}{9}$.
3. $3 \times \frac{4}{9} = \frac{12}{9}$; $4 \times \frac{4}{9} = \frac{16}{9}$.

Problem 4

1. Multiply the fraction by $1, 2, \ldots, 3$ in order. Each new step adds one more $\frac{2}{5}$.
2. $1 \times \frac{2}{5} = \frac{2}{5}$; $2 \times \frac{2}{5} = \frac{4}{5}$.
3. $3 \times \frac{2}{5} = \frac{6}{5}$.

Problem 5

1. The step must be $\frac{2}{5}$, not $\frac{1}{5}$.
2. $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$.
3. $\frac{4}{5} + \frac{2}{5} = \frac{6}{5}$.

Problem 6

1. Each multiple adds 3 eighths.
2. $15 \div 3 = 5$ equal groups.
3. $5 \times \frac{3}{8} = \frac{15}{8}$, so it is the fifth multiple.

Problem 7

1. The first is $\frac{4}{7} < \frac{7}{7}$.
2. The second is $2 \times \frac{4}{7} = \frac{8}{7}$.
3. $8 > 7$, so the second is the first beyond one.

Problem 8

1. The first three totals are $\frac{3}{5}$, $\frac{6}{5}$, $\frac{9}{5}$ m.
2. Add one more $\frac{3}{5}$: $\frac{9}{5} + \frac{3}{5} = \frac{12}{5}$ m.
3. $\frac{12}{5} = 2\frac{2}{5}$ m.

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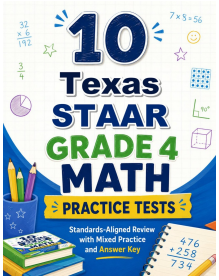

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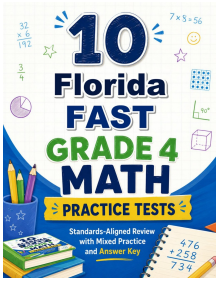

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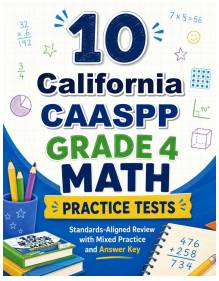

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