

Fraction Match Mission

Use equal wholes, strips and number lines to explain equivalent fractions.

GRADE 4 • 4.NR.4.1

4.NR.4.1 "Using concrete materials, drawings, and number lines, demonstrate and explain the relationship between equivalent fractions, including fractions greater than one, and explain the identity property of multiplication as it relates to equivalent fractions. Generate equivalent fractions using these relationships."

NAME _____

DATE _____

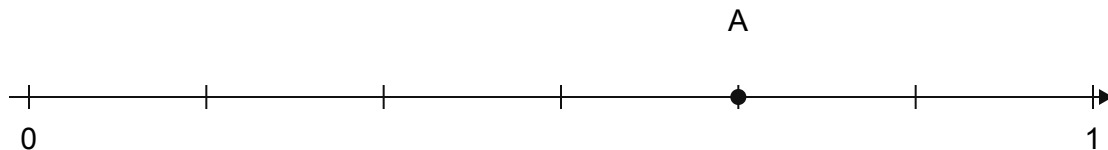
Same Amount, New Name

Equivalent fractions name the same amount of the same whole. Multiplying by $\frac{2}{2}$ multiplies by 1: the fraction gets a new name, but its value stays the same.

Worked example

Point A is 4 of the 6 equal intervals from 0 to 1. Explain why $\frac{2}{3}$ and $\frac{4}{6}$ name this same point.

One whole split into sixths (1 unit interval = 1 whole)



1. Each third contains 2 sixths, so 2 thirds contain 4 sixths.
2. $\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$. Since $\frac{2}{2} = 1$, the value stays the same.

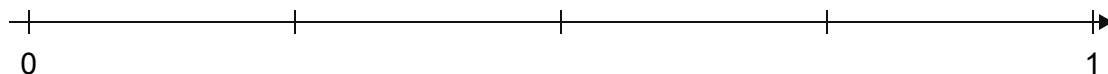
$\frac{2}{3} = \frac{4}{6}$. Both fractions name point A.

Materials: two equal-length paper strips, pencil and ruler. Each strip is one whole. Use strips in task 1. On the number lines, mark A and label it with both fraction names.

Practice 1

Fold one strip in halves and shade 1 half. Fold the other in fourths and shade 2 fourths. Align them to compare. Mark both fractions below. Why use equal-length strips?

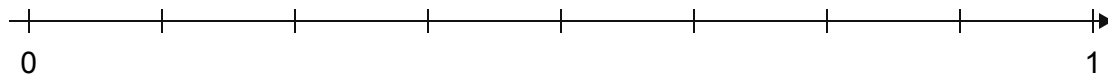
Halves and fourths (1 unit interval = 1 whole)



Practice 2

Mark $\frac{3}{4}$ on this line divided into eighths. Label the same point with its equivalent fraction in eighths. Write a multiplication-by-1 equation.

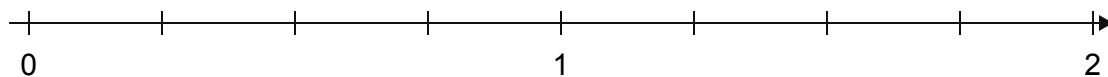
Fourth parts split into eighths (1 unit interval = 1 whole)



Practice 3

Mark $\frac{3}{2}$, count fourths from 0, and label an equivalent fraction. Explain why it lies beyond 1.

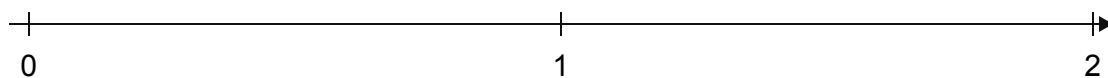
Halves and fourths beyond one (1 unit interval = 1 whole)



Practice 4

Divide each whole interval into 3 equal parts. Then split every third into 2 equal parts to make sixths. Mark $\frac{4}{3}$ and label the same point in sixths.

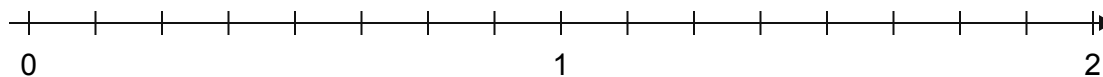
Build thirds, then sixths (1 unit interval = 1 whole)



Apply It 1

A ribbon is $\frac{5}{4}$ meter long. Use the eighth-meter intervals to mark its length. Write the length in eighths of a meter and a multiplication-by-1 equation.

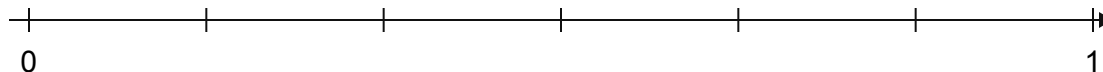
Meters along a ribbon (1 unit interval = 1 whole)



Apply It 2

A trail is $\frac{2}{3}$ mile long. A sign writer claims this is $\frac{2}{6}$ mile. Mark A at $\frac{2}{3}$ and B at $\frac{2}{6}$. Are they equal? Explain the error.

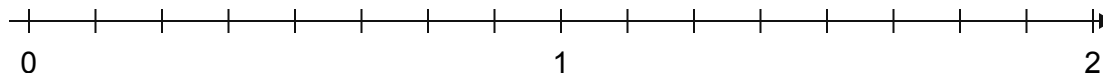
Compare the two trail claims (1 unit interval = 1 whole)



Challenge

Choose a fraction greater than 1 and less than 2 that uses halves or fourths. Mark it on the line and give an equivalent fraction in eighths. Explain why multiplying by 1 preserves its value.

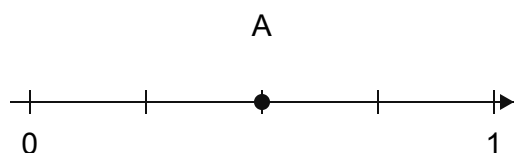
Your equivalent-fraction example (1 unit interval = 1 whole)



PRACTICE 1

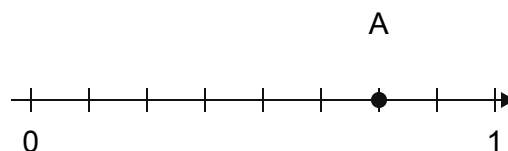
$1/2 = 2/4$ at point A halfway from 0 to 1. The shaded lengths match. Equal whole lengths are needed for a fair comparison; equal fractions of different-sized wholes need not be equal lengths.

Halves and fourths (1 unit interval = 1 whole)

**PRACTICE 2**

Point A is at $6/8$, the same as $3/4$. $3/4 \times 2/2 = 6/8$; $2/2 = 1$.

Fourth parts split into eighths (1 unit interval = 1 whole)

**PRACTICE 3**

$3/2 = 6/4$ at $1 \frac{1}{2}$. $3/2 \times 2/2 = 6/4$. It includes one whole and another half, so it lies beyond 1.

Halves and fourths beyond one (1 unit interval = 1 whole)

**PRACTICE 4**

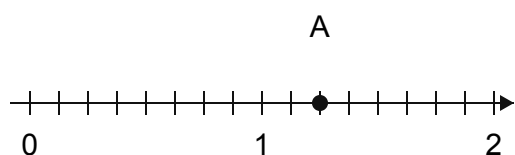
The line has six equal intervals in each whole. Point A is at $8/6 = 4/3$. $4/3 \times 2/2 = 8/6$.

Build thirds, then sixths (1 unit interval = 1 whole)

**APPLY IT 1**

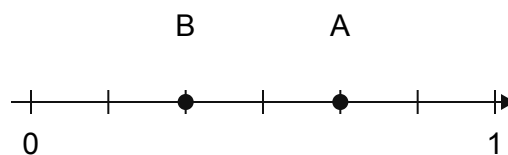
$5/4$ meter = $10/8$ meter. $5/4 \times 2/2 = 10/8$. Point A is at $1 \frac{1}{4}$ meters. Count ten eighth-meter intervals from zero. Both fraction names describe the same physical length.

Meters along a ribbon (1 unit interval = 1 whole)

**APPLY IT 2**

No. A at $2/3$ is at four sixths; B at $2/6$ is at two sixths. Only doubling the denominator halves the amount. Both numerator and denominator must be multiplied by 2 to get $4/6$. The positions differ. $2/3 \times 2/2 = 4/6$, not $2/6$.

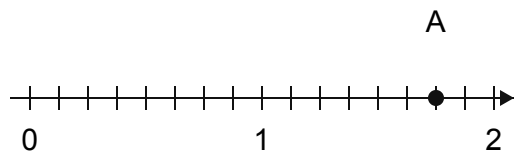
Compare the two trail claims (1 unit interval = 1 whole)



CHALLENGE

Answers vary. Example: $\frac{7}{4} = \frac{14}{8}$ at $1 \frac{3}{4}$. $\frac{7}{4} \times \frac{2}{2} = \frac{14}{8}$, and $\frac{2}{2} = 1$. Accept $\frac{3}{2} = \frac{12}{8}$ or $\frac{5}{4} = \frac{10}{8}$ with correct points and identity explanations.

Your equivalent-fraction example (1 unit interval = 1 whole)



TEACHER NOTES

Check actual strips in task 1 as well as written answers. Each unit interval is one whole; keep whole sizes consistent. Require generated fractions, matching locations and multiplication-by-1 reasoning. The challenge key shows only one example. Accept small hand-drawn spacing variation while checking equal-part intent. Number-line tick labels show whole numbers; students supply fraction labels.