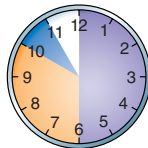


Connect

There are many models that help us add fractions.

- We could use clocks to model halves, thirds, fourths, sixths, and twelfths.



$$\frac{1}{2} + \frac{1}{3} + \frac{1}{12} = \frac{11}{12}$$

Circle models are useful when the fractions are less than 1.

- The example below uses fraction circles to add fractions.

Example

Zack and Ronny each bought a small pizza.

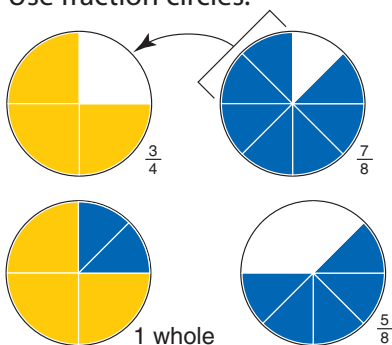
Zack ate $\frac{3}{4}$ of his pizza and Ronny ate $\frac{7}{8}$ of his.

How much pizza did Zack and Ronny eat together?

A Solution

Add: $\frac{3}{4} + \frac{7}{8}$

Use fraction circles.



Use eighths to fill the circle for $\frac{3}{4}$.
Two-eighths fill the circle.

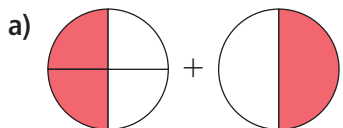
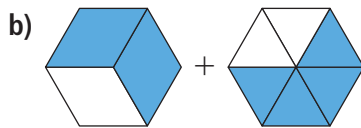
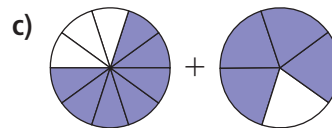
1 whole and 5 eighths equals $1\frac{5}{8}$.
So, $\frac{3}{4} + \frac{7}{8} = 1\frac{5}{8}$

Together, Zack and Ronny ate $1\frac{5}{8}$ pizzas.

Practice

Use Pattern Blocks or fraction circles.

- Model each picture. Then, find each sum.



2. Use a model to show each sum. Sketch the model.

Write an addition equation for each picture.

a) $\frac{7}{8} + \frac{1}{2}$

b) $\frac{3}{10} + \frac{2}{5}$

c) $\frac{2}{3} + \frac{1}{2}$

d) $\frac{2}{3} + \frac{5}{6}$

e) $\frac{3}{6} + \frac{1}{12}$

f) $\frac{1}{4} + \frac{2}{8}$

g) $\frac{1}{3} + \frac{1}{2}$

h) $\frac{1}{2} + \frac{4}{10}$

3. Simon spends $\frac{1}{6}$ h practising the whistle flute each day.

He also spends $\frac{1}{3}$ h practising the drums.

How much time does Simon spend each day practising these instruments?

Show how you found your solution.

4. a) Add.

i) $\frac{1}{5} + \frac{1}{5}$

ii) $\frac{2}{3} + \frac{1}{3}$

iii) $\frac{4}{10} + \frac{3}{10}$

iv) $\frac{1}{6} + \frac{3}{6}$

- b) Look at your work in part a. How did you find your solutions?

How else could you add fractions with like denominators?

5. Is each sum greater than 1 or less than 1? How can you tell?

a) $\frac{1}{4} + \frac{2}{4}$

b) $\frac{2}{5} + \frac{7}{5}$

c) $\frac{3}{4} + \frac{1}{4}$

d) $\frac{1}{10} + \frac{3}{10}$

6. **Assessment Focus** Bella added 2 fractions. Their sum was $\frac{5}{6}$.

Which 2 fractions might Bella have added?

Find as many pairs of fractions as you can.

Show your work.

7. Asani's family had bannock with their dinner.

The bannock was cut into 8 equal pieces.

Asani ate 1 piece, her brother ate 2 pieces, and her mother ate 3 pieces.

- a) What fraction of the bannock did Asani eat?

Her brother? Her mother?

- b) What fraction of the bannock was eaten?

What fraction was left?

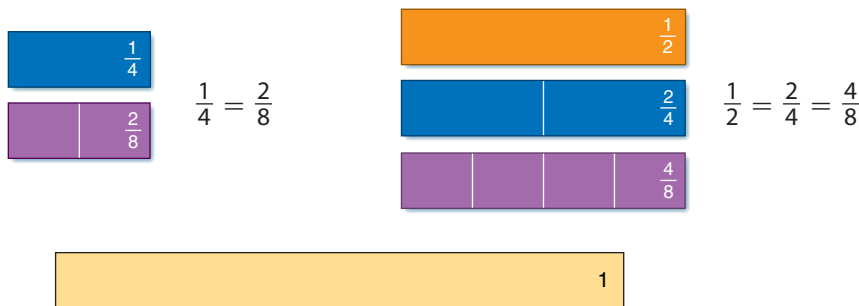


Reflect

Which fractions can you add using Pattern Blocks? Fraction circles?

Give an example of fractions for which you cannot use these models to add.

Here are more fraction strips and some equivalent fractions they show.



Recall that equivalent fractions show the same amount.

This strip represents 1 whole.

To add $\frac{1}{4} + \frac{1}{2}$, align the strips for $\frac{1}{4}$ and $\frac{1}{2}$.

Find a single strip that has the same length as the two strips.

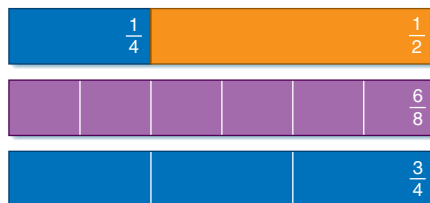
There are 2 single strips: $\frac{6}{8}$ and $\frac{3}{4}$

So, $\frac{1}{4} + \frac{1}{2} = \frac{6}{8}$

And, $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$

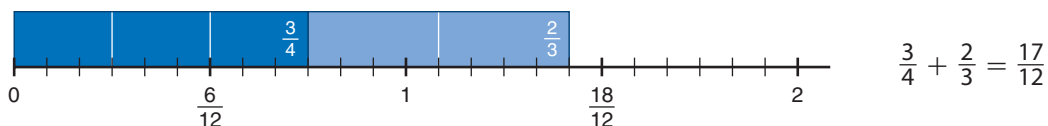
$\frac{3}{4}$ and $\frac{6}{8}$ are equivalent fractions.

The fraction $\frac{3}{4}$ is in simplest form.



A fraction is in **simplest form** when the numerator and denominator have no common factors other than 1.

When the sum is greater than 1, we could use fraction strips and a number line.



Example

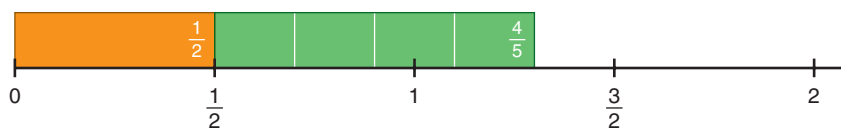
Add. $\frac{1}{2} + \frac{4}{5}$

A Solution

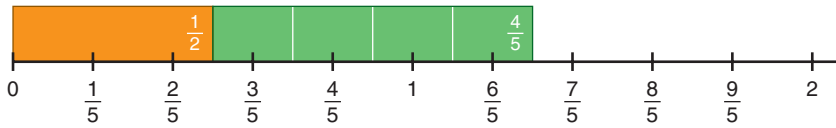
$\frac{1}{2} + \frac{4}{5}$

Place both strips end-to-end on the halves line.

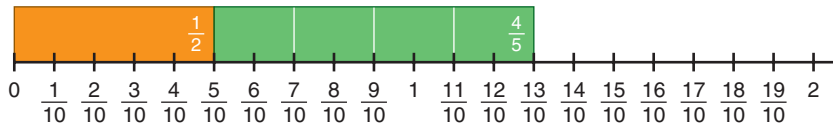
The right end of the $\frac{4}{5}$ -strip does not line up with a fraction on the halves line.



Place both strips on the fifths line.



The right end of the $\frac{4}{5}$ -strip does not line up with a fraction on the fifths line.
Find a line on which to place both strips so the end of the $\frac{4}{5}$ -strip lines up with a fraction.



Another Strategy
We could add these fractions using fraction circles.

The end of the $\frac{4}{5}$ -strip lines up with a fraction on the tenths line.
The strips end at $\frac{13}{10}$. So, $\frac{1}{2} + \frac{4}{5} = \frac{13}{10}$

Practice

Use fraction strips and number lines.

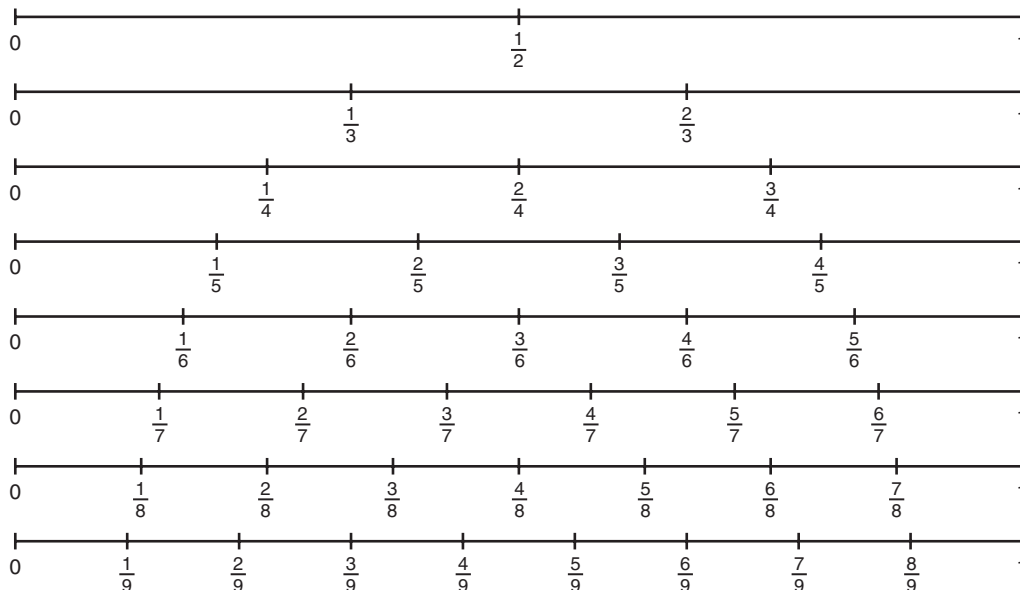
1. Use the number lines below. List all fractions equivalent to:

a) $\frac{1}{2}$

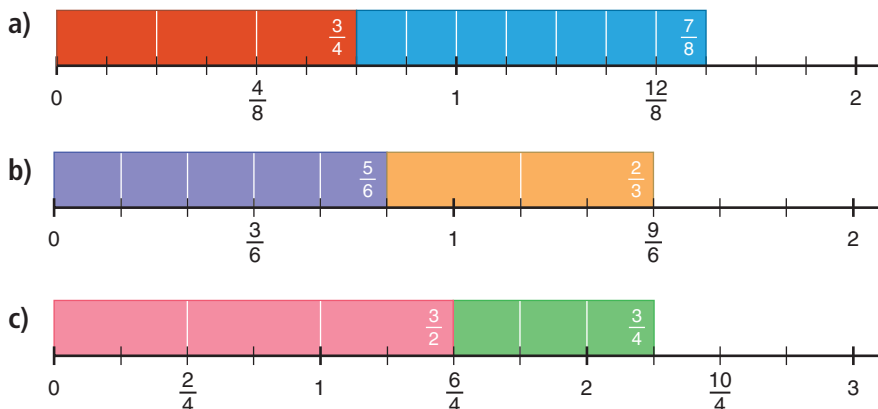
b) $\frac{1}{4}$

c) $\frac{2}{3}$

Use a ruler to align the fractions if it helps.



2. Write an addition equation for each picture.



3. Use your answers to question 2.

- a) Look at the denominators in each part, and the number line you used to get the answer. What patterns do you see?
- b) The denominators in each part of question 2 are **related denominators**. Why do you think they have this name?

4. Add.

a) $\frac{1}{3} + \frac{5}{6}$ b) $\frac{7}{12} + \frac{1}{3}$ c) $\frac{3}{5} + \frac{1}{10}$ d) $\frac{1}{6} + \frac{1}{12}$

5. Add.

a) $\frac{1}{3} + \frac{1}{2}$ b) $\frac{3}{4} + \frac{5}{6}$ c) $\frac{3}{5} + \frac{1}{2}$ d) $\frac{2}{3} + \frac{1}{5}$

6. Look at your answers to question 5.

- a) Look at the denominators in each part, and the number line you used to get the answer. What patterns do you see?
- b) The denominators in each part of question 5 are called **unrelated denominators**. Why do you think they have this name?
- c) When you add 2 fractions with unrelated denominators, how do you decide which number line to use?

7. Add.

a) $\frac{1}{3} + \frac{2}{7}$ b) $\frac{3}{4} + \frac{2}{9}$ c) $\frac{4}{5} + \frac{5}{8}$ d) $\frac{2}{5} + \frac{3}{7}$

8. Abey and Anoki are eating chocolate bars.

The bars are the same size.

Abey has $\frac{3}{4}$ left. Anoki has $\frac{5}{6}$ left.

How much chocolate is left altogether? Show your work.

- 9. Assessment Focus** Use any of the digits 1, 2, 3, 4, 5, 6 only once. Copy and complete. Replace each $\square$ with a digit.

$$\frac{\square}{\square} + \frac{\square}{\square}$$

- a) Find as many sums as you can that are between 1 and 2.
b) Find the least sum that is greater than 1.
Show your work.

- 10.** Find 2 fractions with a sum of $\frac{3}{2}$. Try to do this as many ways as you can. Record each way you find.

- 11. Take It Further** A jug holds 2 cups of liquid. A recipe for punch is $\frac{1}{2}$ cup of orange juice, $\frac{1}{4}$ cup of raspberry juice, $\frac{3}{8}$ cup of grapefruit juice, and $\frac{5}{8}$ cup of lemonade. Is the jug big enough for the punch? Explain how you know.

- 12. Take It Further** A pitcher of juice is half empty. After $\frac{1}{2}$ cup of juice is added, the pitcher is $\frac{3}{4}$ full. How much juice does the pitcher hold when it is full? Show your thinking.

Math Link

Music

Musical notes are named for fractions.

The type of note shows a musician how long to play the note. In math, two halves make a whole — in music, two half notes make a whole note!

				
whole note	half note	quarter note	eighth note	sixteenth note



Reflect

What do you now know about adding fractions that you did not know at the beginning of the lesson?