Using Models to Add Fractions

Let the yellow hexagon represent 1:
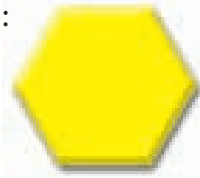
Then the red trapezoid represents $\frac{1}{2}$:

the blue rhombus represents $\frac{1}{3}$:

and the green triangle represents $\frac{1}{6}$:

Explore

Use Pattern Blocks.

Bakana trains for cross-country one hour a day. Here is her schedule:

Run for $\frac{1}{3}$ of the time, walk for $\frac{1}{6}$ of the time,

then run for the rest of the time.

How long does Bakana run altogether?

What fraction of the hour is this?

- Use fractions to write an addition equation to show how Bakana spent her hour.
- Bakana never runs for the whole hour.
  Write another possible schedule for Bakana.
  Write an addition equation for the schedule.
- Trade schedules with another pair of classmates.
  Write an addition equation for your classmates' schedule.

Reflect & Share

For the same schedule, compare equations with another pair of classmates.
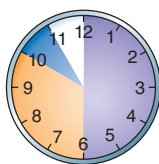Were the equations the same? How can you tell?
When are Pattern Blocks a good model for adding fractions?
When are Pattern Blocks not a good model?

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.
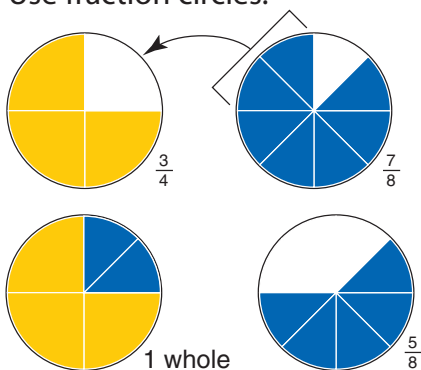
Example

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.

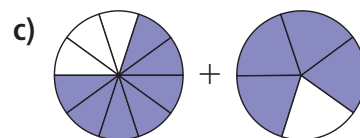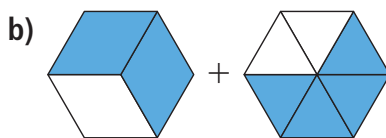Use eighths to fill the circle for $\frac{3}{4}$.
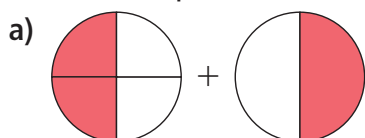Two-eighths fill the circle.

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.

1. Model each picture. Then, find each sum.

a)

b)

c)

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.