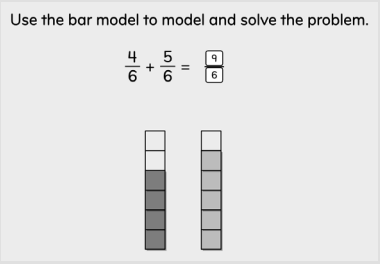
InsightMath

Extending Addition and Subtraction to Fractions

Family Guide | Grade 4 | Unit 6

Your student is exploring how thinking flexibly about how fractions, whole numbers, and mixed numbers are composed can help to add and subtract efficiently.

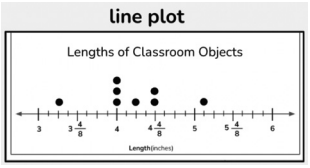
Key Math Ideas

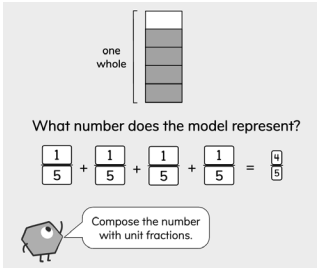


In this unit, your student will expand their understanding of fractions to learn to add and subtract fractions and mixed numbers with common denominators, such as $\frac{4}{5} - \frac{2}{5}$, where both parts of the problem have five as the denominator. When fractions have the same denominator, that means they have the same-sized pieces, which allows us to add or subtract them. In doing so, students recognize that while the numerator may change, the denominator stays the same because the size of the parts stays the same. For example, in the problem to the right, when adding $\frac{4}{6} + \frac{5}{6}$ the sum is $\frac{11}{6}$, showing how the numerator changes but the denominator stays the same. In earlier grades, students explored how they could decompose a number in multiple ways, such as 10 = 5 + 5 and 10 = 6 + 4. In this unit they extend that understanding to decompose fractions multiple ways, such as $\frac{4}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ or $\frac{4}{8} = \frac{3}{8} + \frac{1}{8}$).

→ In the beginning of the unit, your student will learn to

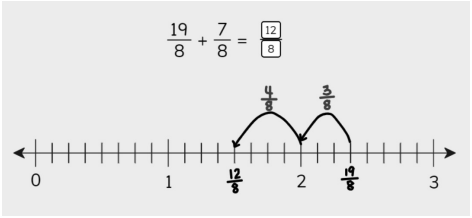
- compose fractions from unit fractions, as shown in the example to the right where $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$ represents each part that is shaded blue and $\frac{4}{5}$ represents all parts together;
- decompose fractions into two or more fractional parts, such as breaking apart $\frac{12}{4}$ into $\frac{8}{4} + \frac{4}{4}$ or $\frac{9}{4} + \frac{3}{4}$;
- measure objects to the nearest half, quarter, or eighth inch and plot the length of each object onto a line plot.





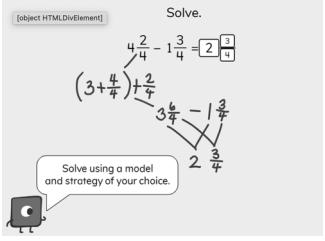
→ In the middle of the unit, your student will learn to

- explain why adding and subtracting fractions may change the numerator but does not change the denominator;
- represent situations involving addition and subtraction of fractions using bar models and number lines and use the models to solve;
- add and subtract fractions with the same denominator in a variety of problems, including word problems.



→ By the end of the unit, your student will learn to

- represent situations involving addition and subtraction of mixed numbers using bar models and number lines and use the models to solve;
- estimate the sum or difference of two mixed numbers with the same denominator.
- add and subtract mixed numbers with the same denominator using flexible strategies.



Helpful Hint

When adding and subtracting fractions, sometimes students make the mistake of adding or subtracting the denominators. It will be helpful for you to ask your student what is the part and what is the whole in the fractions. It is also helpful to encourage your student to use models, such as number lines or bar models, to represent the problem.

Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ At the beginning of the unit:

- What unit fractions can you add to make up the fraction?
- How many different ways can you decompose this fraction?
- How can you break apart the fraction using a bar model or a number line?
- How are fractions on a number line similar to rulers? How are they different?

→ In the middle of the unit:

- How can you use bar models or number lines to add or subtract fractions with common denominators?
- Did the denominators change when you found the sum? Why or why not?

→ By the end of the unit:

- How can you add or subtract mixed numbers with common denominators?
- What strategy did you use to solve? What did you do next?

If...	Try...
Your student is subtracting mixed numbers incorrectly or in the wrong direction, such as when subtracting $4\frac{1}{4} - 1\frac{3}{4}$, students write $3\frac{2}{4}$ (subtracting 1 from 4 and $\frac{3}{4}$ from $\frac{1}{4}$, reversing the order for the fraction) . . .	having your student estimate before computing. Encourage students to identify when regrouping is necessary before calculating, recognizing that 1 from the whole number part of the mixed number can be shifted into the fraction (such as rewriting $4\frac{1}{4}$ as $3\frac{5}{4}$).

Student Strengths Spotlight

I learn from my mistakes.	Students often make mistakes while solving problems, however, they do learn how to modify their work and reach the correct response.
I am precise with the words I use to explain thinking.	Students use their own words to explain why they worked out a problem in a certain way, or why they chose a specific strategy to workout a problem.
I notice patterns and try to apply them.	Recognizing patterns and using them to explore new problems supports students to think flexibly and in new ways.

Try This Together!

- **Recipe Fractions.** Try out a recipe with your student and use the opportunity to ask them questions involving addition or subtraction of fractions or mixed numbers with common denominators. Here are some ideas:
  - **Find the total:** In a recipe with different but similar ingredients, ask students to find the total. For example, if the recipe calls for $\frac{3}{4}$ cup white sugar and $\frac{1}{4}$ cup brown sugar, ask your student how much total sugar does the recipe use?
  - **How much more?** Compare amounts in a recipe for ingredients that use fractions with common denominators. For example, ask "Does the recipe uses more sugar or flour? How much more?" Ask your student to share their subtraction strategy.
- **Book Measurements.** Have your students use a ruler to measure the length of several of their favorite books to the nearest quarter inch. Ask your student to plot the measurements on a line plot (provide blank line plot for them), then ask them questions about the data. For example, you might ask "What is the most common book length?" or "How much longer is the longest book than the shortest book?"
- **Play a Game!** Use index cards or pieces of paper to make some fraction and mixed number cards all with the same denominator. Place the cards face down. Each player draws two cards and adds the two numbers together. Whoever has the largest number wins and takes all of the cards from that round. Once all of the cards are gone, whoever has the most cards wins the game.