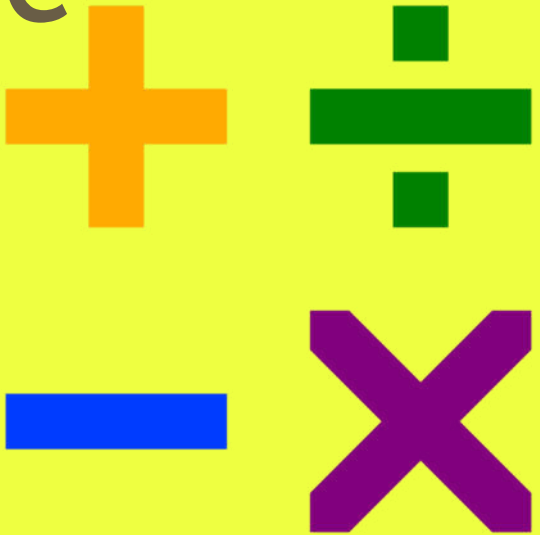
Solving Problems Involving Fractions

Lesson # 16

Addressing	**6.NS.A.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?

Let’s add, subtract, multiply, and divide fractions.



Today's Goals

- ❏ I can use mathematical expressions to represent and solve word problems that involve fractions.

Operations with Fractions

Warm Up 16.1

- Estimate the value of each expression.
- Order the expressions based on their value from least to greatest.
- Give me a signal once you have them in order and can explain.

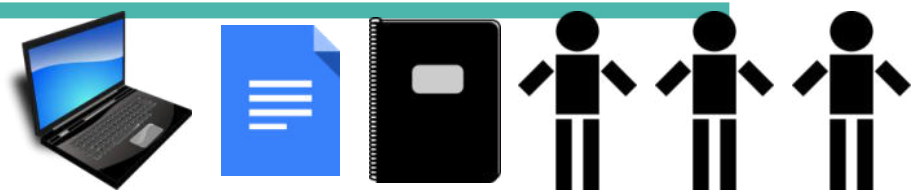
Without calculating, order the expressions according to their values from least to greatest. Be prepared to explain or show your reasoning.

$\frac{3}{4} + \frac{2}{3}$ $\frac{3}{4} - \frac{2}{3}$ $\frac{3}{4} \cdot \frac{2}{3}$ $\frac{3}{4} \div \frac{2}{3}$

Situations with ¾ and ½

Activity 16.2

- MLR1: Stronger & Clearer Each Time
- Think Pair Share



Here are four situations that involve $\frac{3}{4}$ and $\frac{1}{2}$.

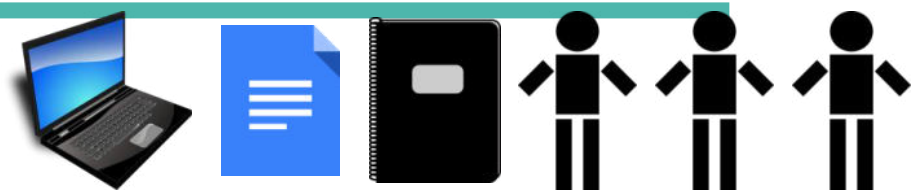
- Before calculating, decide if each answer is greater than 1 or less than 1.
- Write a multiplication equation or division equation for the situation.
- Answer the question. Show your reasoning. Draw a tape diagram, if needed.

1. There was $\frac{3}{4}$ liter of water in Andre's water bottle. Andre drank $\frac{1}{2}$ of the water. How many liters of water did he drink?
2. The distance from Han's house to his school is $\frac{3}{4}$ kilometer. Han walked $\frac{1}{2}$ kilometer. What fraction of the distance from his house to the school did Han walk?
3. Priya's goal was to collect $\frac{1}{2}$ kilogram of trash. She collected $\frac{3}{4}$ kilogram of trash. How many times her goal was the amount of trash she collected?
4. Mai's class volunteered to clean a park with an area of $\frac{1}{2}$ square mile. Before they took a lunch break, the class had cleaned $\frac{3}{4}$ of the park. How many square miles had they cleaned before lunch?

Pairs of Problems

Activity 16.3

- MLR7: Compare & Connect
- MLR6: Three Reads
- Notice and Wonder
- Think Pair Share



Skim the two sets of problems.

What do you notice? What do you wonder?

Work with a partner to write equations for the following questions. One person should work on the questions labeled A1, B1, . . . , E1 and the other should work on those labeled A2, B2, . . . , E2.

1. Trade papers with your partner, and check your partner's equations. If there is a disagreement about what an equation should be, discuss it until you reach an agreement.
2. I will assign 2–3 questions for you to answer. For each question:
    a. Estimate the answer before calculating it.
    b. Find the answer, and show your reasoning.

1st Read: Shared Reading

What is this situation about?

2nd Read: Team Reading

What is countable or measureable in this story?

3rd Read: Team Reading

How might you begin to solve this task?

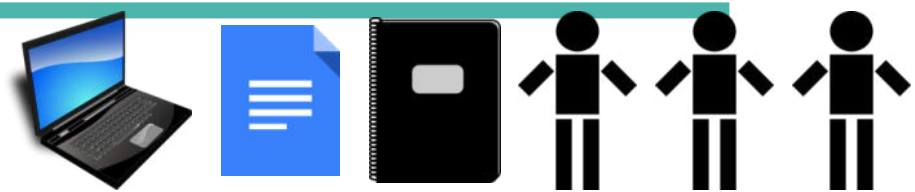
Start working on your own.

Then we'll discuss your thinking as a class!

Baking Cookies

Activity 16.4

- MLR5: Co-Craft Questions & Problems
- MLR6: Three Reads
- Think Pair Share



Baking Cookies

Mai, Kiran, and Clare are baking cookies together. They need $\frac{3}{4}$ cup of flour and $\frac{1}{3}$ cup of butter to make a batch of cookies. They each brought the ingredients they had at home.

- Mai brought 2 cups of flour and $\frac{1}{4}$ cup of butter.
- Kiran brought 1 cup of flour and $\frac{1}{2}$ cup of butter.
- Clare brought $1\frac{1}{4}$ cups of flour and $\frac{3}{4}$ cup of butter.

If the students have plenty of the other ingredients they need (sugar, salt, baking soda, etc.), how many whole batches of cookies can they make? Explain your reasoning.

1st Read: Shared Reading

What is this situation about?

2nd Read: Team Reading

What is countable or measureable in this story?

3rd Read: Team Reading

How might you begin to solve this task?

Start working on your own.

Then we'll discuss your thinking as a class!

Lesson Synthesis

- How did you add or subtract fractions with different denominators?
- How did you multiply fractions?
- What methods did you use to divide a number by a fraction?
- How did you know which operation to chose for each situation? How did you know if you chose the right operation?

Today's Goals

- ❏ I can use mathematical expressions to represent and solve word problems that involve fractions.

A Box of Pencils

Cool Down 16.5