

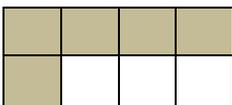
Grade 4 Important Math Information

“Fractions and Decimals”

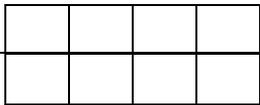
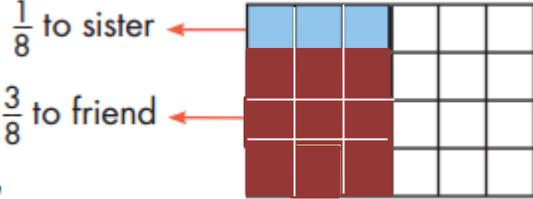
Dear Family,

Our class is beginning a unit of study in mathematics called *Fractions and Decimals*. During this unit of study, students investigate the meaning of fractions and the ways fractions can be represented. They use halves, fourths, eighths, thirds, sixths, twelfths, fifths, and tenths to compare the value of fractions and use representations to add fractions. Students also work with decimals in the tenths and hundredths. In our math class, students spend time discussing problems in depth and are asked to share their reasoning and solutions. It is important that your child solve math problems in ways that make sense to him or her. At home, encourage your child to explain the math thinking that supports those solutions. The specific learning goals your student will be working toward are listed below with examples of student work showing understanding of each learning goal.

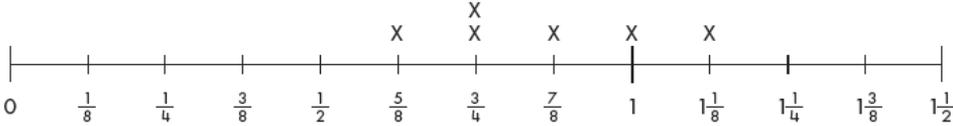
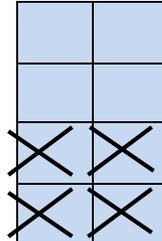
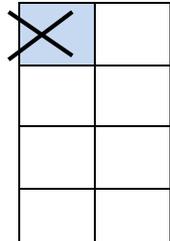
Learning Goal: Generate equivalent fractions using models, compare two fractions using the symbols $>$, $=$, and $<$, and justify thinking.

| Example Problem | Example Student Solution |
|--|---|
| <p>Steven and Stephanie each made a pan of brownies. Steven has $\frac{5}{8}$ of his brownies left over. Stephanie has $\frac{1}{2}$ of her brownies left over. Who has the greater amount of leftover brownies?</p> | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Steven's Brownies</p>  </div> <div style="text-align: center;"> <p>Stephanie's Brownies</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>“I know that $\frac{4}{8}$ is equivalent to $\frac{1}{2}$. So $\frac{5}{8}$ would be greater than $\frac{1}{2}$.”</p>  </div> <div style="text-align: right; margin-top: 20px;"> <p>“I am going to begin by drawing a model of my problem.”</p> $\frac{5}{8} > \frac{1}{2}$ </div> |

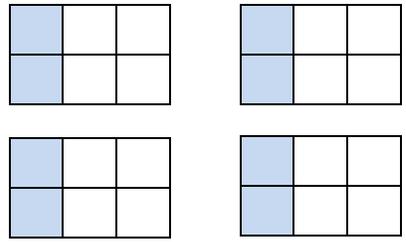
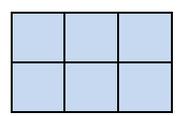
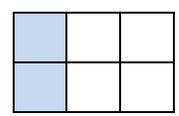
Learning Goal: Solve problems involving addition and subtraction of fractions, including mixed numbers, with like denominators or denominators of 10 and 100, and use models and equations to represent the problems.

| Example Problem | Example Student Solution |
|---|--|
| <p>Kimberly had 24 baseball cards. She gave $\frac{1}{8}$ of the cards to her sister and $\frac{3}{8}$ of the cards to a friend. What fraction of her cards did Kimberly give away?</p> | <div style="text-align: center; margin-bottom: 20px;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center; margin-top: 20px;"> $\frac{1}{8} + \frac{3}{8} = \frac{4}{8} \text{ or } \frac{1}{2}$ <p>Kimberly gave away half of her cards.</p> </div> <div style="text-align: right; margin-top: 20px;"> <p>“I used a 4 X 6 rectangle to solve the problem. The rectangle has 24 squares, just like Kimberly's 24 baseball cards. I shaded $\frac{1}{8}$ blue and $\frac{3}{8}$ red. Together, these two fractions are equivalent to half the rectangle.”</p> </div> |

Learning Goal: Make a line plot from a set of measurements to the nearest $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ unit and solve problems involving addition and subtraction of data in the line plot.

| Example Problem | Example Student Solution |
|---|---|
| <p>Pepper listed the weight of her puppies in the line plot. How many more pounds did the heaviest puppy weigh than the lightest puppy?</p> | <div style="text-align: center;">  <p>Weights of Pepper's Puppies (pounds)</p> </div> <div style="margin-top: 20px;"> <p><i>"I begin by analyzing the data on the line plot. I see that the heaviest puppy weighs $1\frac{1}{8}$ pound. The lightest puppy weighs $\frac{5}{8}$ pound. To find my answer I am going to subtract the two fractions."</i></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>1 pound</p> </div> <div style="text-align: center;">  <p>$\frac{1}{8}$ pound</p> </div> </div> <p><i>"After subtracting $\frac{5}{8}$ of a pound, I have $\frac{4}{8}$ of a pound remaining. I know that $\frac{4}{8} = \frac{1}{2}$. So the heaviest puppy is $\frac{1}{2}$ pound heavier than the lightest puppy."</i></p> </div> |

Learning Goal: Solve problems involving multiplication of a fraction by a whole number and use models and equations to represent the problems.

| Example Problem | Example Student Solution |
|--|---|
| <p>Jess brought 4 cakes to a birthday party. At the end of the party, $\frac{2}{6}$ of each cake was left over. How much cake was left over in all?</p> | <div style="text-align: right; margin-bottom: 20px;"> $4 \times \frac{2}{6} = \underline{\quad ? \quad}$ </div> <div style="margin-bottom: 20px;"> <p><i>"First, I am going to write an equation for the story problem. Then I am going to create a model to go with it."</i></p> <div style="display: flex; justify-content: space-around;">  </div> </div> <div style="margin-bottom: 20px;"> <p>There is $1\frac{2}{6}$ cake left over.</p> <div style="display: flex; justify-content: space-around;">   </div> </div> <div style="text-align: right;"> <p><i>"I see that I have $\frac{8}{6}$ cake left over. $\frac{8}{6}$ is equivalent to $1\frac{1}{3}$."</i></p> </div> |

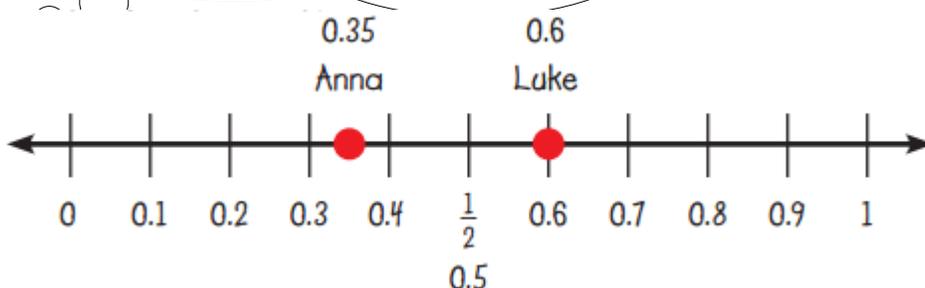
Learning Goal: Understand how fractions with denominators of 10 and 100 relate to decimals and locate decimals on a number line and compare decimals.

Example Problem

Anna and Luke both walk to school from their homes. Anna walks 0.35 miles. Luke walks 0.6 miles. Who walks farther?

Example Student Solution

"I used a number line from 0 to 1. First I marked $\frac{1}{2}$. Then I marked tenths. I know that $\frac{1}{2}$ mile is the same as 0.5. Luke walks 0.6 miles, which is a little more than $\frac{1}{2}$. Anna walks 0.35 miles, which is between 0.3 and 0.4 miles and is less than $\frac{1}{2}$. So, Luke walks farther than Anna."



Mathematical Thinking and Practices Learning Goal: Represent and solve problems using various appropriate models that are adjusted as needed.



Things you can do at home to support your student throughout this unit of study:

Fraction and Decimal Scavenger Hunt: At school, students have been developing an understanding of fractions. Be on the lookout for examples of fractions (or decimal numbers) in your world—in the kitchen, in a toolbox or a sewing kit, in grocery or hardware stores, or in magazines and newspapers. Take these opportunities to talk with your child about what the fraction means.

Fair Shares: You can build on the work of this unit of study at home by capitalizing on everyday situations that involve fractions. Issues of fairness often offer wonderful examples.

- After making a batch of brownies and giving away part of the batch to the neighbors, you want to divide what's left equally among 3 people. What is $\frac{1}{3}$ of 18 brownies? What if you want to divide it equally among 6 people? What is $\frac{1}{6}$ of 18 brownies?
- Three people are sharing a pizza: one third has mushrooms, one third has pepperoni, and one third has onions. What might the pizza look like?

Fractions in the Kitchen: Cooking is another great way to learn about fractions. Ask your child questions such as, How can we measure $\frac{3}{4}$ cup? Look together at how the fractions appear on a measuring cup. Doubling recipes or cutting them in half can help your child understand relationships such as $\frac{1}{4}$ cup + $\frac{1}{4}$ cup = $\frac{1}{2}$ cup.

Math and Literature: Here are some suggestions of children's books that contain relevant mathematical ideas about fractions. Look for these books at your local library.

- The Doorbell Rang by Pat Hutchins
- Polar Bear Math by Ann Whitehead Nagda
- Fraction Fun by David Adler

