Dear Parents,

We will begin our next unit of study in math soon. The information below will serve as an overview of the unit as you work to support your child at home. If you have any questions, please feel free to contact me. I appreciate your ongoing support.

Sincerely,
Your Child's Teacher

Unit Name: Using Models to Add and Subtract Decimals and Fractions

North Carolina Content State Standards:

NC.5.NF.1
Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths.
- Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
- Solve one- and two-step word problems in context using area and length models to develop the algorithm. Represent the word problem in an equation.

NC.5.NBT.7
Compute and solve real-world problems with multi-digit whole numbers and decimal numbers.
- Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
- ~~Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value.~~
- ~~Divide a whole number by a decimal and divide a decimal by a whole number, using repeated subtraction or area models. Decimals should be limited to hundredths.~~
- Use estimation strategies to assess reasonableness of answers.

NC.5.OA.2
Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving:
- Parentheses, using the order of operations.

Commutative, associative and distributive properties.

Math Language:

- Place Value Chart
- Place Value Disk
- Hundredths
- Benchmark Fractions
- Rectangular Model
- Tenths Grid

- Regroup
- Number Line
- Thousandths
- Fraction
- Area Model
- Hundredths Grid

- Ungroup
- Decimal
- Sum
- Denominator
- Numerator

- Decompose
- Tenths
- Estimate
- Equivalent
- Mixed Numbers

Unit Overview:

This unit builds on the understanding of addition and subtraction of whole numbers to the addition and subtraction of decimals and fractions. Students will progress naturally from place value understanding to decimal computation. Students use the same length and area models to add and subtract decimals within real-world and word problem contexts, developing an understanding that the meaning of addition and subtraction does not change simply because the numbers are decimals and fractions rather than whole numbers.

Students will build conceptual understanding that fractions are equal parts of a whole. They will apply this understanding to equivalent fractions when adding and subtracting fractions with unlike denominators. Additionally, students will understand that quantities can be named in different

ways (ex. decimal, fraction, mixed number). Students will also be able to represent word problems in equations and use estimation to determine reasonableness of their solutions.

Skills/Strategies:
Students will be able to:
- Solve real-world problems with multi-digit whole numbers
- Solve real-world problems with decimal numbers
- Add and subtract decimals using place value understanding
- Use estimation to determine reasonableness of an answer
- Write and explain numerical expressions involving operations
- Add and subtract fractions, including mixed numbers, with unlike denominators
- Use benchmark fractions to estimate mentally and assess the reasonableness of answers
- Use number sense of fractions to estimate mentally and assess the reasonableness of answers
- Use area and length models
- Use area and length models to solve one- and two-step word problems in context
- Represent word problems with equations
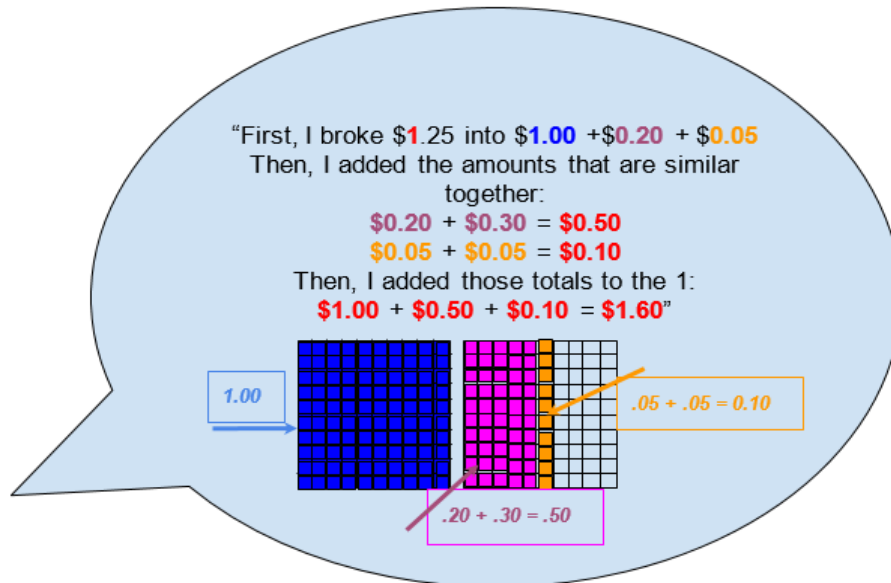
Strategies that Students Will Learn:
Students will learn that adding and subtracting decimals is very much like adding and subtracting whole numbers. When adding and subtracting whole numbers, it is often helpful to represent the number in expanded form and then add similar values together. See example:

234 + 321

200 + 300 = 500   30 + 20 = 50   4 + 1 = 5

500 + 50 + 5 = 555
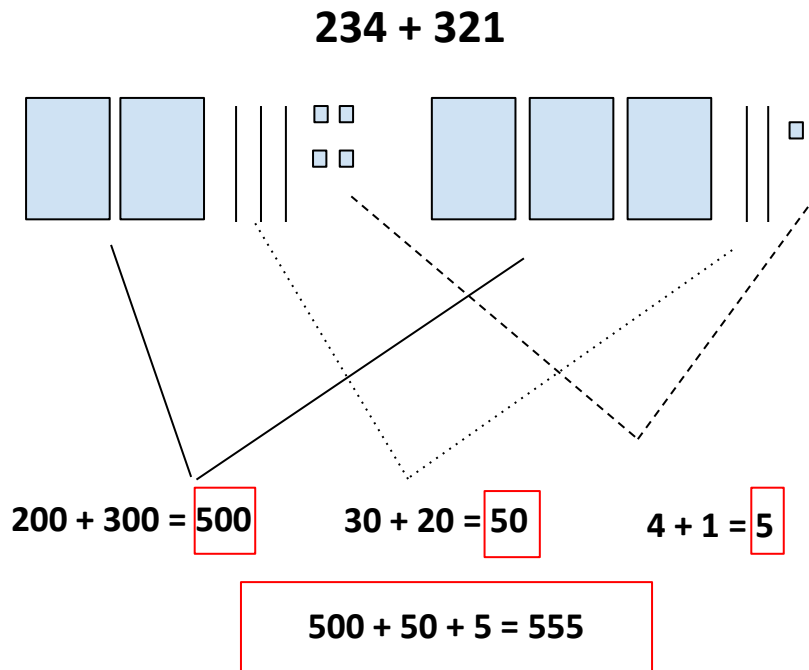
The same is true for adding and subtracting decimals. See the Student #1's explanation below:

While cleaning her room, Rachel found $1.25 on her dresser, $0.30 in her drawer and $0.05 on the floor. How much money did Rachel find?

$1.25 + $0.30 + $0.05

"First, I broke $1.25 into $1.00 + $0.20 + $0.05
Then, I added the amounts that are similar together:
$0.20 + $0.30 = $0.50
$0.05 + $0.05 = $0.10
Then, I added those totals to the 1:
$1.00 + $0.50 + $0.10 = $1.60"
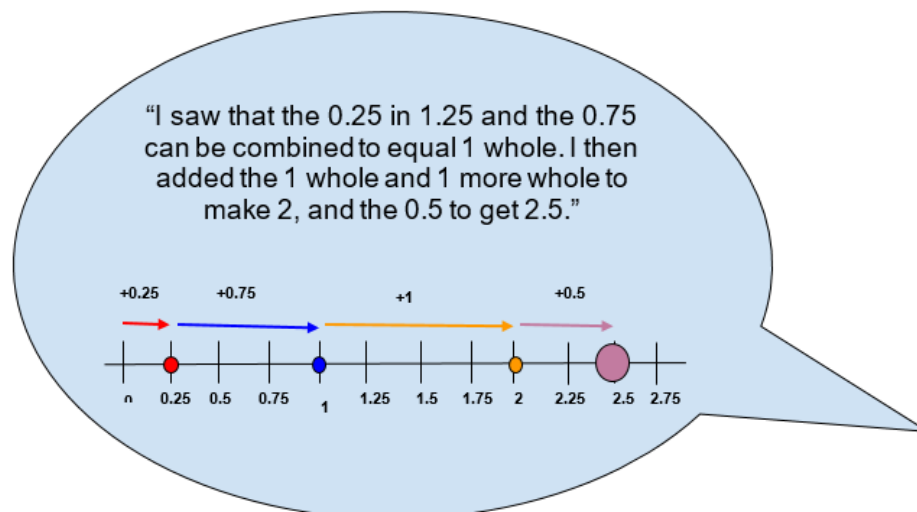
1.00

.05 + .05 = 0.10

.20 + .30 = .50

Students often have difficulty remembering the value of the parts of the numbers they break apart. It is very important that students represent and justify their thinking with the use of models, as shown in the student explanation above.

Students may also choose to use a number line to represent their thinking. See Student #2's explanation:

Grandma's recipe calls for 0.75 cups of oil, 0.5 cups of water and 1.25 cups of milk. How many ounces of liquid are in her recipe?
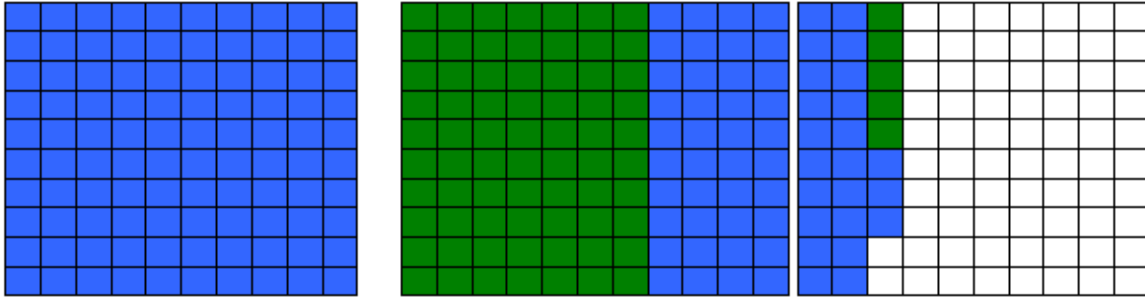
0.75 + 0.5 + 1.25

"I saw that the 0.25 in 1.25 and the 0.75 can be combined to equal 1 whole. I then added the 1 whole and 1 more whole to make 2, and the 0.5 to get 2.5."

+0.25   +0.75   +1   +0.5

0   0.25   0.5   0.75   1   1.25   1.5   1.75   2   2.25   2.5   2.75

Students may use Base 10 blocks (place value blocks) and grids to solve problems.

$0.75 + 1.53 = $ __2.28__

*Students may also use base 10 blocks or drawings to solve this problem.*

Students use these same ideas dealing with parts of numbers when subtracting decimals:
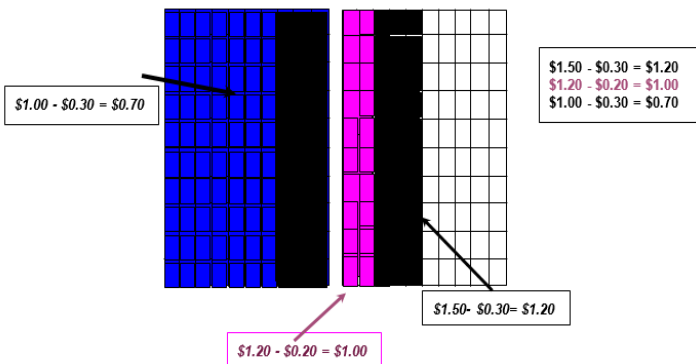
Angie had $1.50 when she went shopping this morning. She spent $0.30 on a pack of gum and $0.50 on a bottle of water. How much money does she have left?
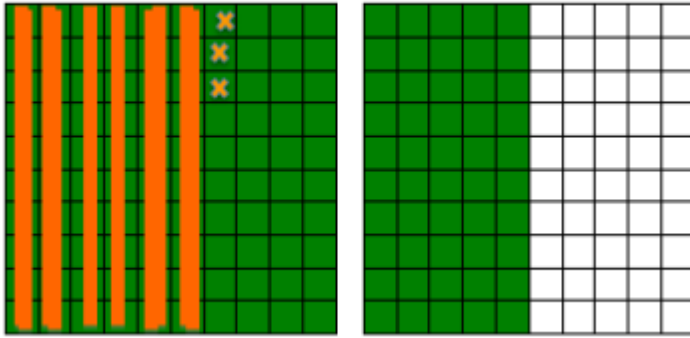
$$\$1.50 - \$0.30 - \$0.50$$

A student might choose to subtract $0.50, then take the remaining $0.30. Then, take away the remaining $0.50. This leaves Angie with $0.70.

$1.50 - $0.50 = $1.00
$1.00 - $0.30 = $0.70

$1.50- $0.50= $1.00

$1.00 - $0.30 = $0.70
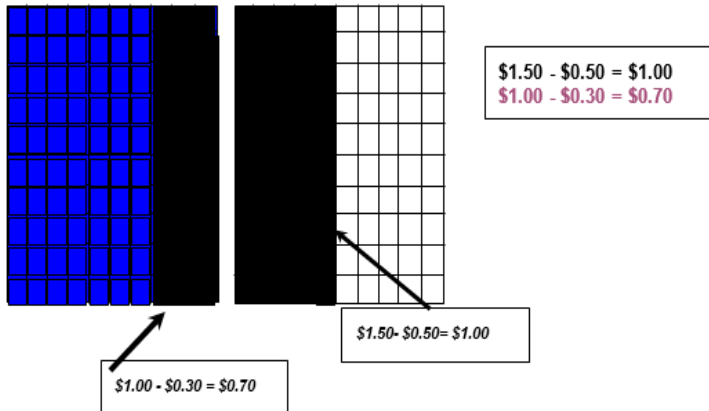
A student might also choose to subtract $0.30, then take the remaining $0.20 left before taking from the whole dollar.
Then, take away the remaining $0.50. This leaves Angie with $0.70.

$1.50 - $0.30 = $1.20
$1.20 - $0.20 = $1.00
$1.00 - $0.30 = $0.70

$1.00 - $0.30 = $0.70

$1.50- $0.30= $1.20

$1.20 - $0.20 = $1.00

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*This document should not replace on-going communication between teachers & parents.*

3. $1.5 - 0.63 =$ _0.87_

In this unit, students will extend their understanding of addition and subtraction with fractions by adding and subtracting fractions with unlike denominators. For example:

$$\frac{3}{4} + \frac{2}{8} = ?$$
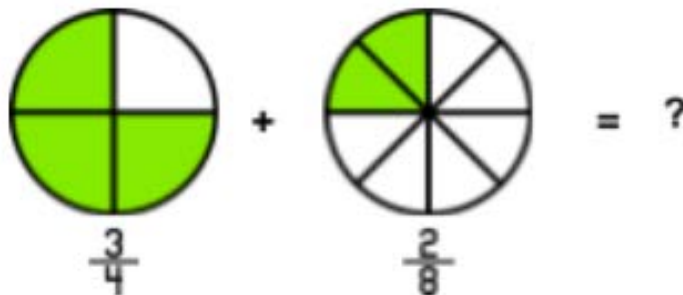
Students use what they know from previous grades about equivalent fractions to add fractions with unlike denominators. They know that one fourth is equivalent to two eighths, so three fourths is equivalent to six eighths

$$\frac{3}{4} = \frac{6}{8}$$
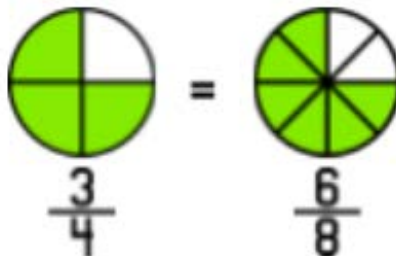
Six eighths plus two eighths is the same as eight eighths or one whole:
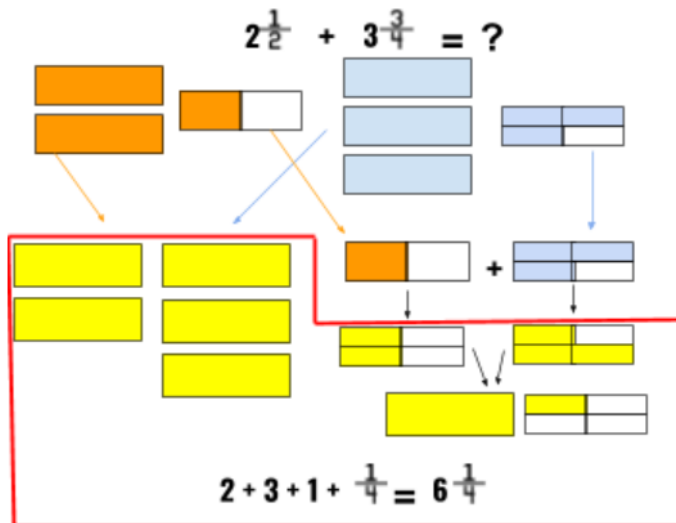
$$\frac{6}{8} + \frac{2}{8} = \frac{8}{8} \text{ or 1 whole}$$
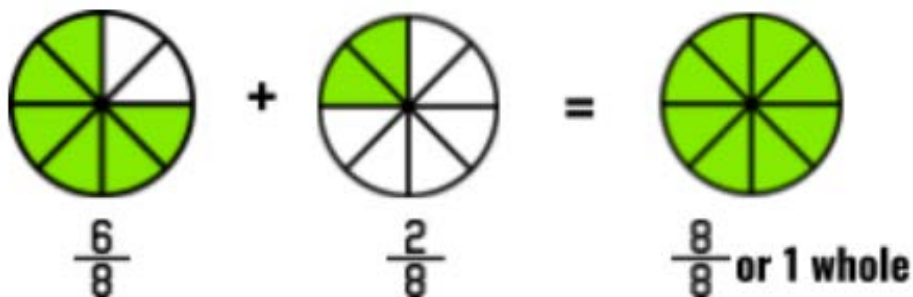
Likewise, students use equivalent fractions to help them with subtraction of fractions with unlike denominators:

$$\frac{3}{4} \qquad \frac{1}{3}$$
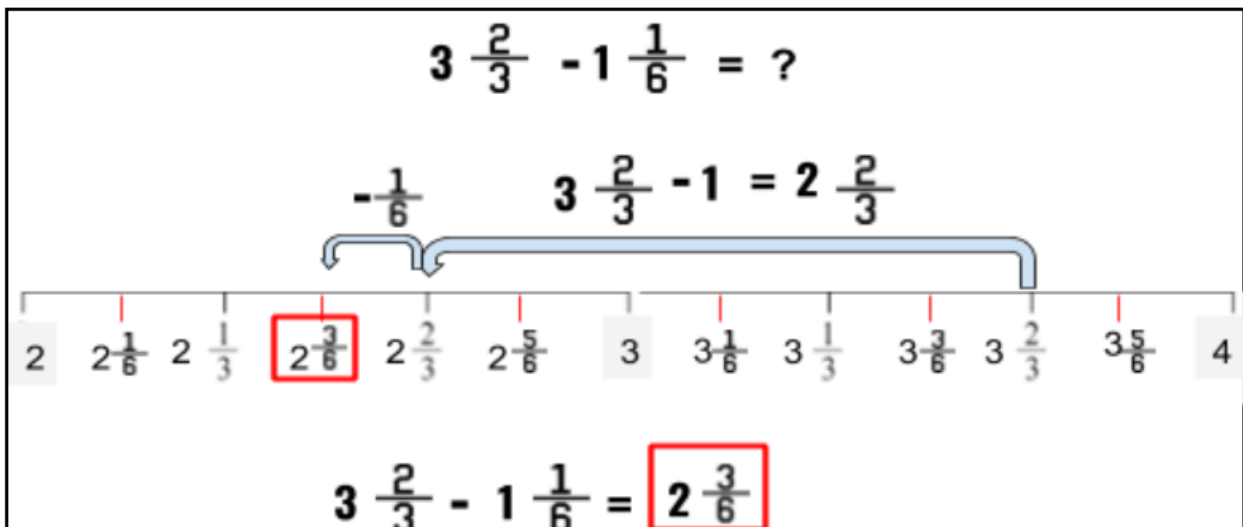
$$\frac{9}{12} \quad \frac{4}{12} \quad \frac{5}{12}$$
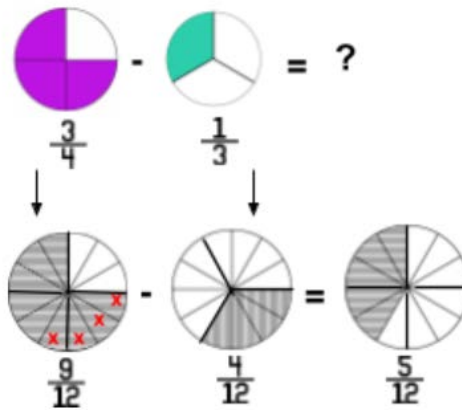
5th grade students also work with mixed numbers (whole numbers and fractions), as they use equivalent fractions to add and subtract:

Addition:

$$2\frac{1}{2} + 3\frac{3}{4} = ?$$

$$2 + 3 + 1 + \frac{1}{4} = 6\frac{1}{4}$$

Subtraction:

$$3\frac{2}{3} - 1\frac{1}{6} = ?$$

$$-\frac{1}{6} \qquad 3\frac{2}{3} - 1 = 2\frac{2}{3}$$

$$2 \quad 2\frac{1}{6} \quad 2\frac{1}{3} \quad 2\frac{3}{6} \quad 2\frac{2}{3} \quad 2\frac{5}{6} \quad 3 \quad 3\frac{1}{6} \quad 3\frac{1}{3} \quad 3\frac{3}{6} \quad 3\frac{2}{3} \quad 3\frac{5}{6} \quad 4$$

$$3\frac{2}{3} - 1\frac{1}{6} = \boxed{2\frac{3}{6}}$$

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Video Support:

Video support can be found on The WCPSS Academics YouTube Channel.
http://tinyurl.com/WCPSSAcademicsYouTube
- ES 5 Math Add & Subtract Decimals w Base Ten Blocks
- ES 5 Math Add & Subtract Decimals with Number Lines
- ES 5 Math Adding Fractions w/ Area Models
- ES 5 Math Adding Mixed Numbers w/ Area Models
- ES 5 Math Adding Fractions w/ Number Lines
- ES 5 Math Subtracting Fractions w/ Area Models
- ES 5 Math Subtracting Mixed Numbers w/ Area Models
- ES 5 Math Subtract Fractions with Number Lines

Additional Resources:
- NCDPI Additional Resources

Questions to Ask When Helping Your Child with Math Homework

Keep in mind that homework in elementary schools is designed as practice. If your child is having problems, please let the classroom teacher know. When helping your child with his/her math homework, you don't have to know all the answers! Instead, we encourage you to ask probing questions so your child can work through the challenges independently. Some examples may include the following:
- What is the problem you're working on?
- What do the directions say?
- What do you already know that can help you solve the problem?
- What have you done so far and where are you stuck?
- Where can we find help in your notes?
- Are there manipulatives, pictures, or models that would help?
- Can you explain what you did in class today?
- Did your teacher work examples that you could use?
- Can you go onto another problem & come back to this one later?
- Can you mark this problem so you can ask the teacher for an explanation tomorrow?