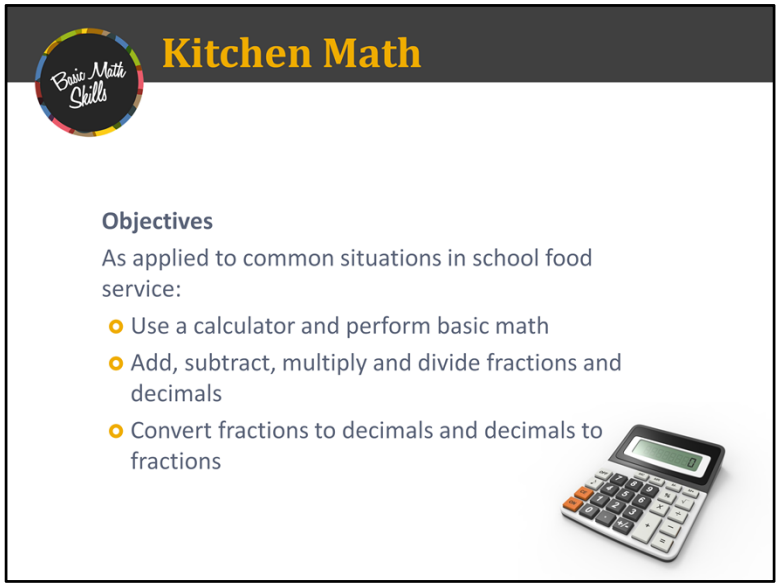

— MODULE 1 —
Basic Math Skills
KITCHEN MATH SERIES
TEAM
IDAHO
CNP
CHILD NUTRITION PROGRAMS



Welcome the participants; introduce yourself briefly and review class objectives.

Ask each person to find a learning partner at their table (or trio if odd numbers of participants). Tell participants there will be many partner activities during the workshop.

Ask the participants to work with their partner on this introduction activity.

Each partner will introduce her/himself to the other and share a tip for using a calculator accurately. Tell participants they have **2 minutes** to complete both introductions and tips and then be prepared to share tips with group.

Give a 30-second warning and then depending on group size, ask for tips. Tell the group to listen closely to the tips; after each tip, ask for a show of hands of how many others had that tip. Continue until all tips are given, about **5 minutes**.

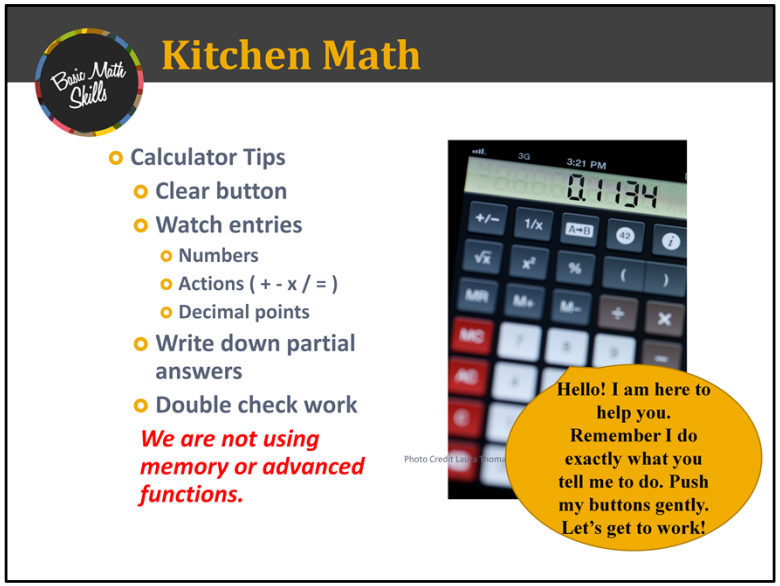
Option – if group is small, ask participants to give their names and the tip.

(Welcome, introductions, and housekeeping will take approximately 10 minutes)

This training will address these USDA Professional Development Learning codes. In recording this training in your personal records, use the learning code you feel best meets your experience today.

Kitchen Math

- Turn to person next to you.
- Introduce yourself and share one tip for using a calculator accurately.



Here are some tips I use with a calculator, this friendly tool.

Make sure to start with a clear entry. I push the clear button several times to make sure.

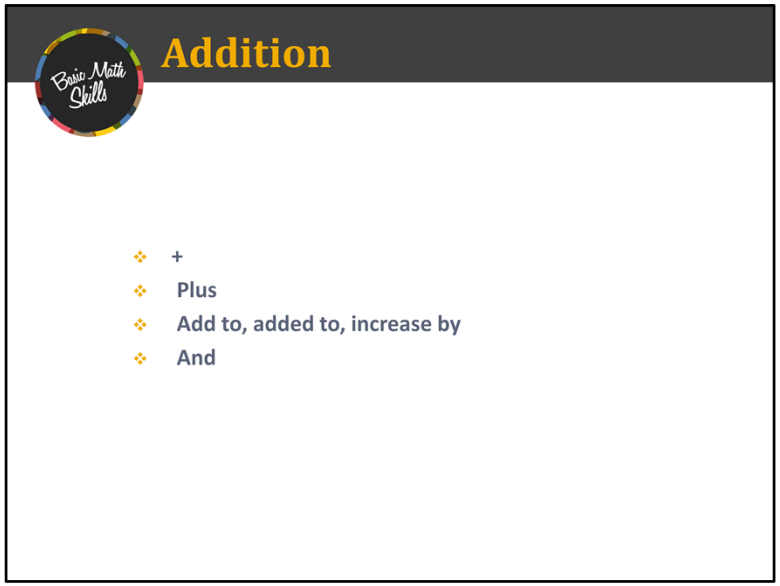
Watch the screen as numbers, actions and decimal points are entered to make sure it is what is intended.

Write down partial answers. That way if a mistake is made, it is easier to re-start in the middle of the problem.

Do the calculation twice to check work.

Also for this class, we will not use the memory function or any advanced functions on a scientific calculator. We are limiting our math to the basics.

Review of Basic Math Operations & Terminology

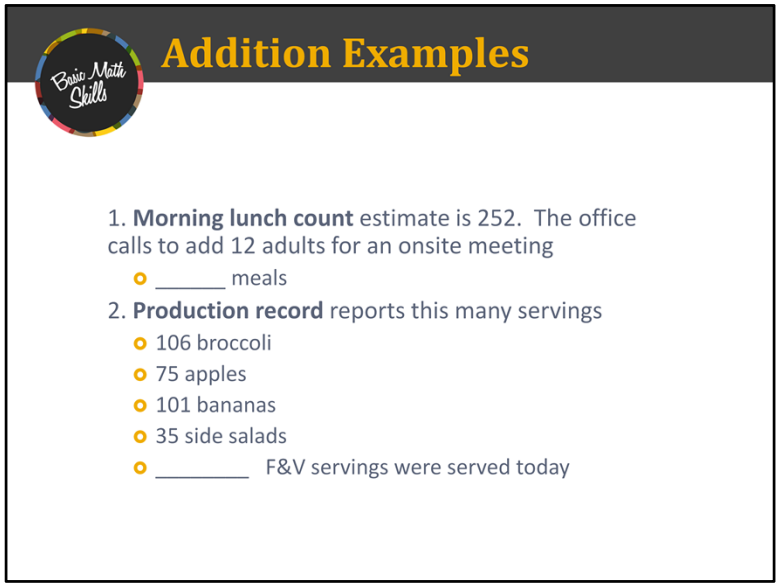


Turn to page 5 in your student workbook.
Let's do a quick review of basic math. It is important to know the terms and symbols.

The symbol for addition is the + (plus) size;
When we talk about addition, we use the words:

Plus
Add to, added to, increase by
And

Note to Cadre: Substitute any of the words for addition in place of 'plus' in the examples above to illustrate different ways we describe addition.

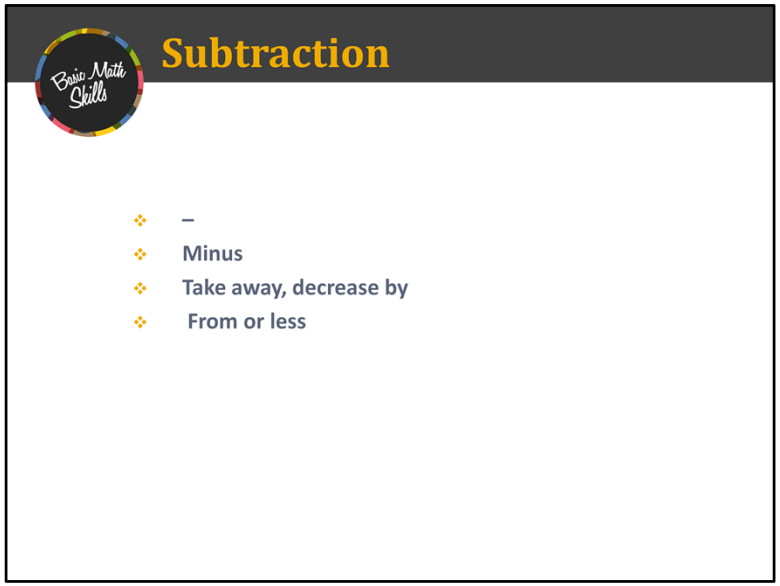


Many times, we do math automatically without even thinking about it.

Let's try a few simple examples with your calculator

1. During morning attendance the estimated lunch count reported was 252, but the office called and said to plan for 12 more adults because of an onsite meeting. 254+12=266 meals.
2. After the meal, Melanie wants to see if enough fruits and vegetables were served. She pulls the completed production record, which shows that 106 servings of broccoli, 75 servings of apples, 101 bananas, and 35 side salads were served. 106+75+101+ 35=317 servings were served. *(You may want to mention that this is how the State agency checks your production records to see if you are serving at least one serving of fruit or vegetable per student meal.)*

(Note to Presenter: Student Manual page 5 has these story problems. Assess the class ability to do simple math using these to determine the need for some later activities or who might need extra help.)



Subtraction is the opposite of addition

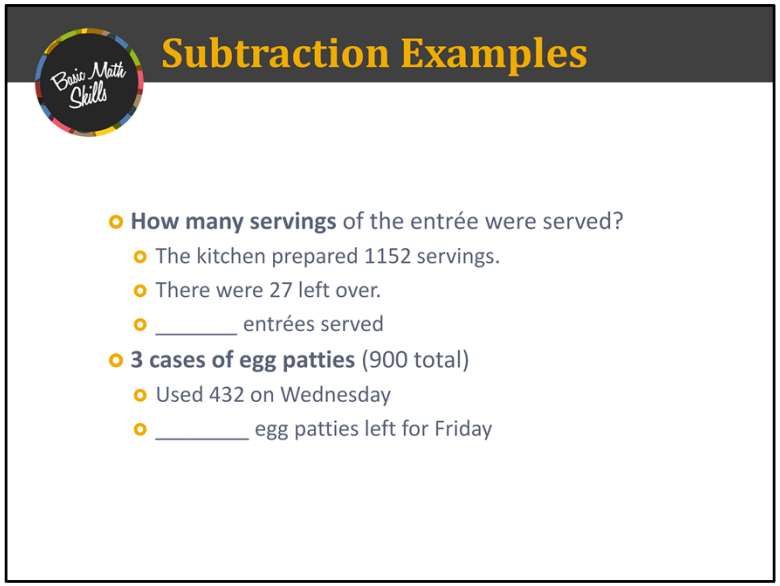
The symbol for subtraction is the – (minus) sign.

When we talk about subtraction, we use the words:

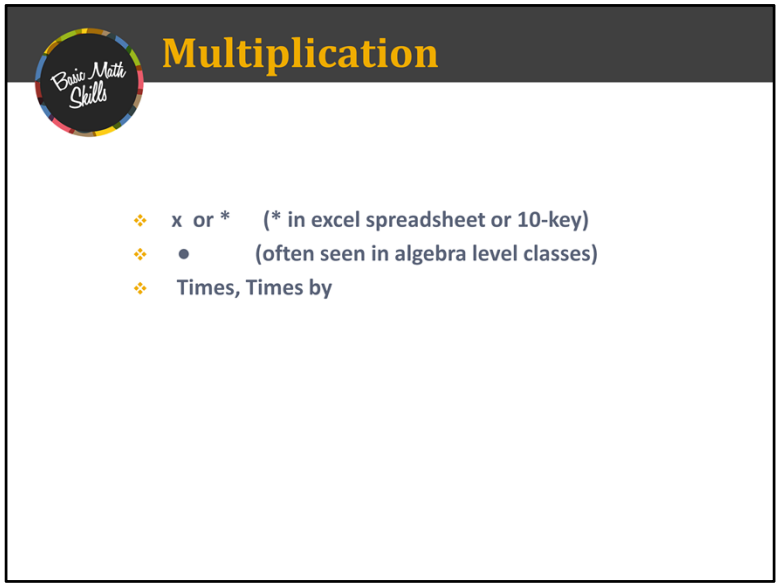
Minus
Take away, decrease by
From or less

The examples shown here are two ways to check your work. If you are adding something, check that when you subtract the answer matches. Or if you are subtracting, add the number to see that it matches.

Note to Cadre: Substitute any of the words for subtraction in place of 'minus' in the examples above to illustrate different ways we describe subtraction.



1. Completing a production record, Maria needs to figure out how many servings of the entrée were served. The kitchen prepared 1152 servings. There were 27 left over. 1152-27=1125 entrees served.
2. Melanie started the week with 3 cases of egg patties, which is a total of 900 egg patties. She used 432 egg patties for Wednesday's breakfast and needs the same amount for Friday. Does she have enough?



- The symbols for multiplication are X or the asterisk symbol (*) – your calculator probably shows an X and if you use a ten key or keyboard at work it might be an *.

- If you use excel spread sheets, the symbol for times is the *.

- If you have children doing algebra, you might see a solid dot used – we won't use that symbol

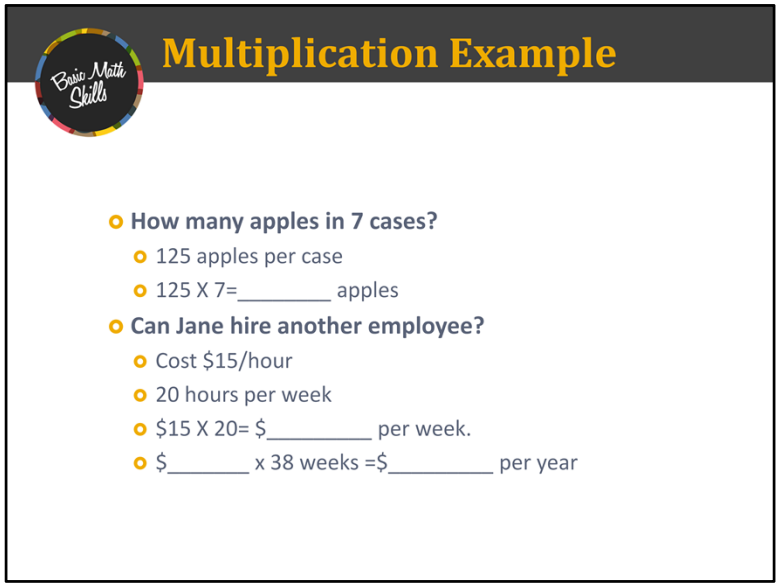
When we talk about multiplication, the words we use include:

- Times or Times by

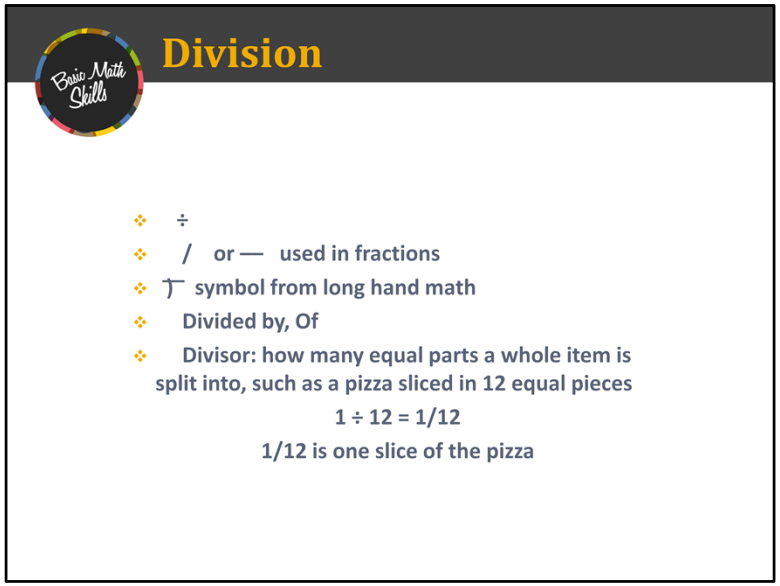
[If you are using the old workbook] If you were able to do the multiplication problems on page 5, your math problems should look like this **Worksheet:**

Lunches: $10 x 5 = $50

Pizza: 16 x 11= 176



1. This is a simple one-- A case of apples has 125. If Mark orders 7 cases, how many apples is that? 125x7=875
2. This is a two part multiplication project. Maria needs more help in the school kitchen. A new kitchen employee costs $15.00 per hour for wages, benefits, and employer costs. How much would it cost per week to hire another person for 20 hours a week? $15 X 20= $300 per week. If there are 38 working weeks in the school year, how much would that cost per school year? $300 X 38= $11, 400 per school year.

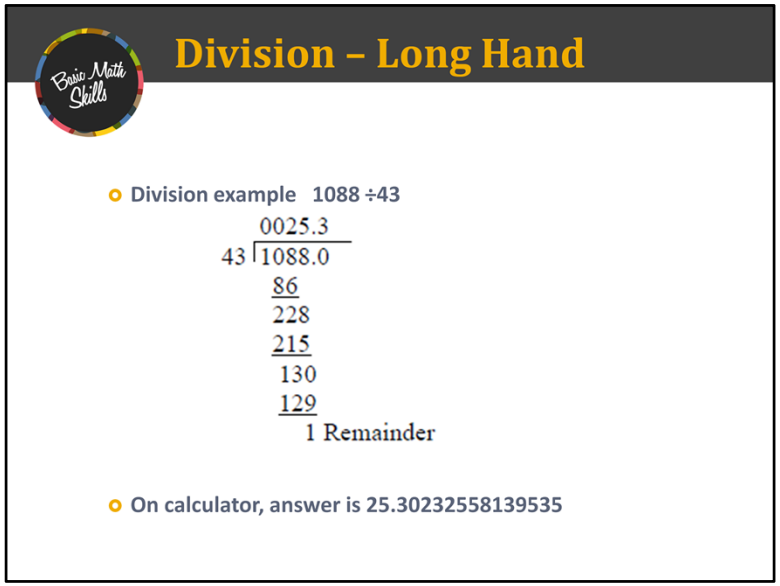


- The symbols for division are the line with a dot above and below or
- A forward slash which we often see in fractions. Sometimes a fraction appears as a horizontal line
- You might remember from your school days two sides of a box – that is how I learned long hand math.

The words we used to describe division include

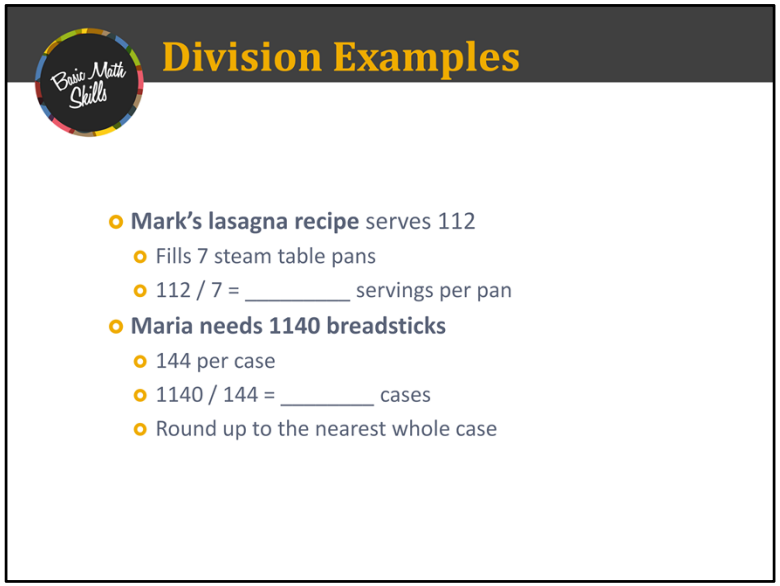
- Divided by or Of

The Divisor determines how many equal parts another number is split into. For example a pizza cut into 12 slices is one divided by twelve or one/twelveth.



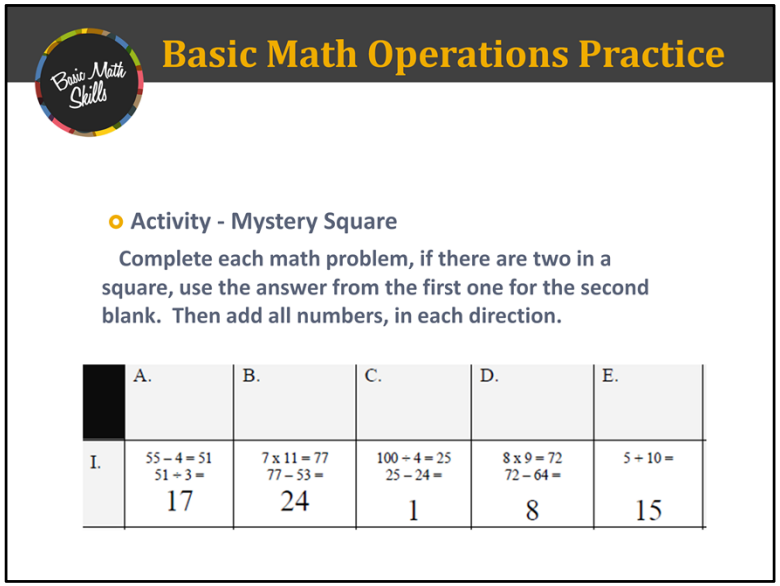
Typically, we use a calculator for a division problem like this, but– if a calculator isn't available, it helps to review how division is done by hand.
This problem is set up "old school" to walk us through every step of the math.
Divide 1088 by 43 on your calculator. Do you get the same answer as shown?

Note: It may be helpful to walk through why the two 00's are before the 25.3 and that the remainder of 1 could be divided out as the calculator does but we would either round to the two places behind the decimal point or round to the hundredths



Use your calculator to quickly work through these examples.

1. Mark is reading a standardized recipe for vegetable lasagna for 112 servings. The original recipe fills 7 large steam table pans. How many servings will Mark need to get from each pan? 16 servings for each pan (Bonus Questions– how do you cut a steam table pan to get 16 equal pieces? 4 x 4)
2. Maria needs to order enough whole grain breadsticks to serve 1150 servings. The breadsticks are in cases of 144 each. What is the minimum number of cases Maria needs to order? 1140/144= 7.91 cases. Maria needs to order 8 cases.



Cadre: Student Manual page 6. If your **entire** group appears to be proficient in addition, subtraction, multiplication and division, then this exercise can be done very quickly.

Now let's give your fingers some exercise.

Find the Mystery Square activity in your work book (page 6). You will notice that there are lines to fill in the answer. For example in the first box,
55 – 4 = 51 51 is then used on the next line 51 Divided by 3 equals 17.

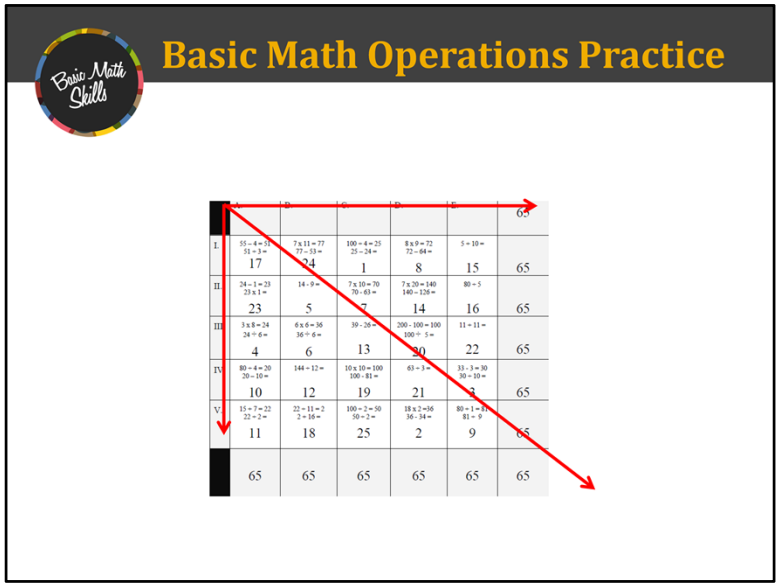
You can see the answers to all the problems in line I. Copy the answers onto your sheet.

After the answers to the problem or problems in each square are found, you will add the numbers up and enter in the box to the right going across the page, the box at the bottom going down the page and the one line that goes diagonally across and down the page.

Work with your partner to solve the problems and add up the numbers. Work quickly – and by having two of you, it will provide a check for the math.

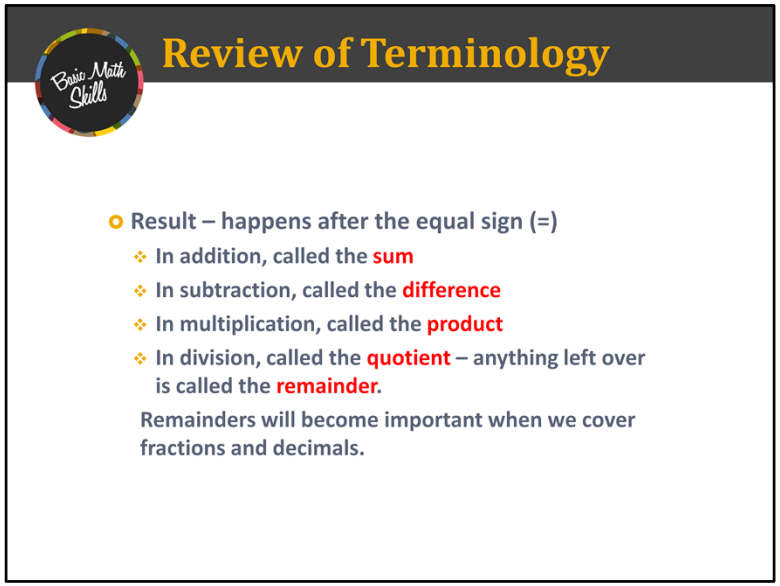
Option: To speed this activity assign a row or column to learning pairs, there are ten sets (4 more rows, 5 columns, and one diagonal). More than one learning pair can work on the same problem.

Allow about 5 for the activity and then have the group return attention to you. If you want to have each group report their row, column or diagonal total (should be 65 for each learning pair), do so before displaying the next slide.



When all of the math problems are done correctly, each row, column or diagonal adds up to 65.

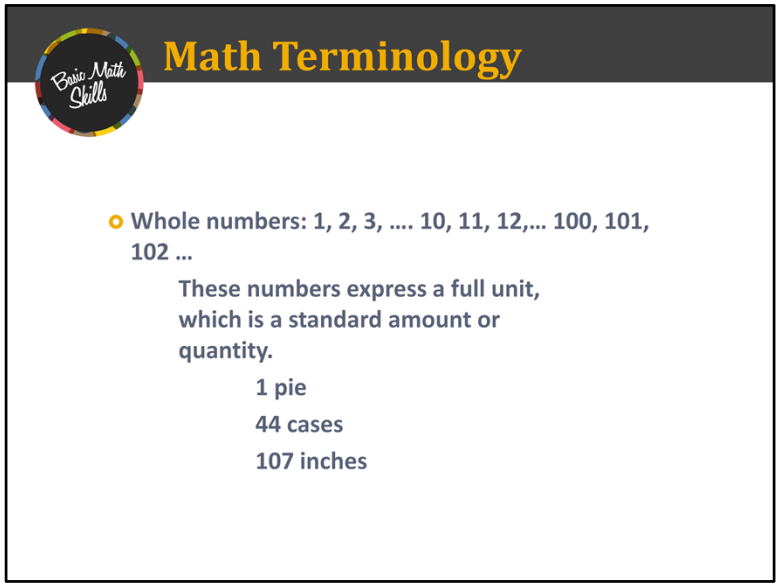
Activity is found in the Basic Kitchen Math Workbook



The result of any math problem is what appears after the equals sign.

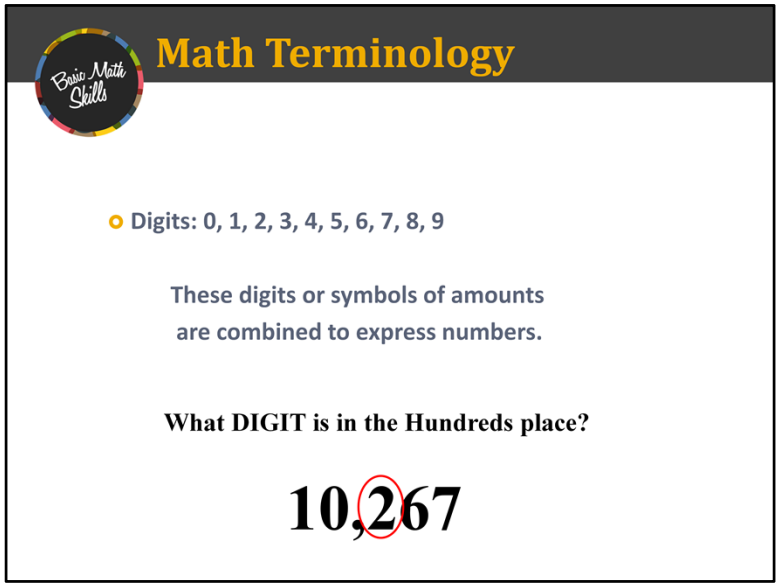
- In addition it is called the sum
- In subtraction it is call the difference
- In multiplication is it called the product
- In division it is called the quotient and if anything is left over that is called the remainder.

Remainder will become important when we cover fractions and decimals.



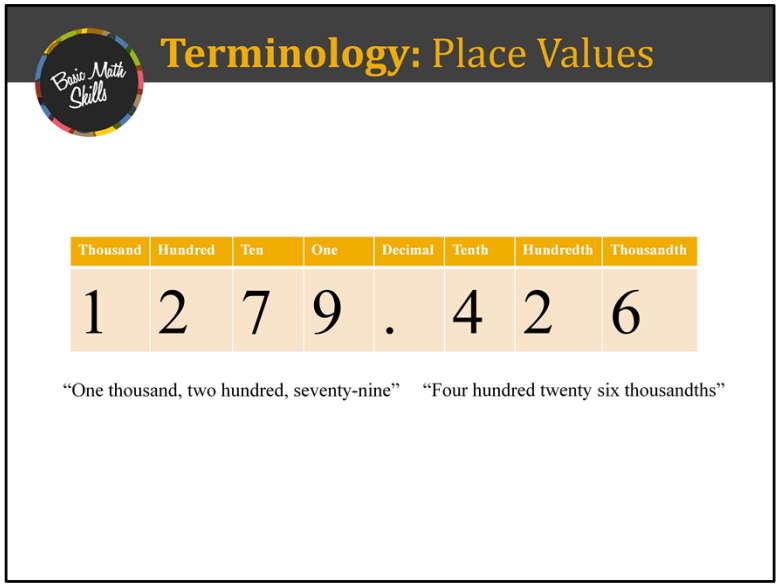
Whole numbers express a full unit of a quantity or standard amount such as

One pie
Forty four cases
One hundred and seven inches



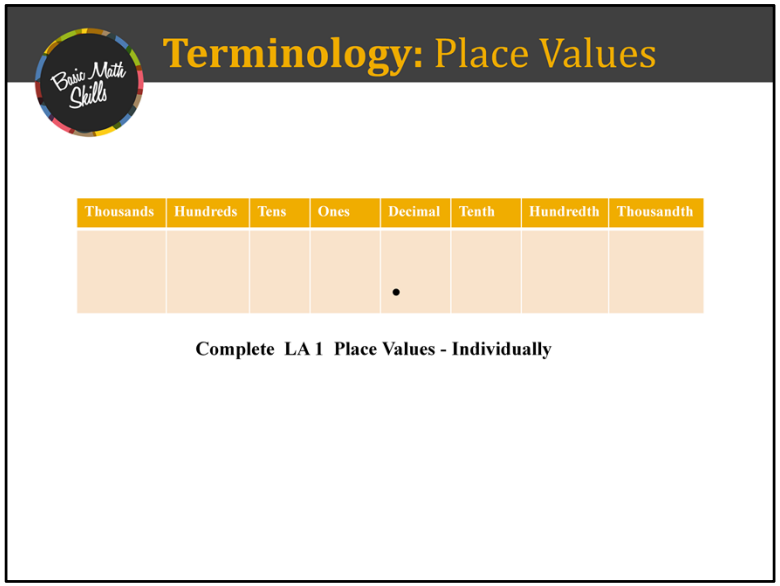
The symbols zero through nine are called digits. We use these to express different numbers

What **digit** is in the HUNDREDS place? If you can say this number out loud, it is easy to find out. (ten thousand TWO HUNDRED and sixty-seven)



This chart shows the place values of numbers. On the left side of the decimal is a whole number. On the right side are decimals, and we'll talk more about them in a moment. that can appear to the right or "behind" the decimal point. After the hundredths place is the thousandths. In kitchen math we usually don't use any more than three places after the decimal point.

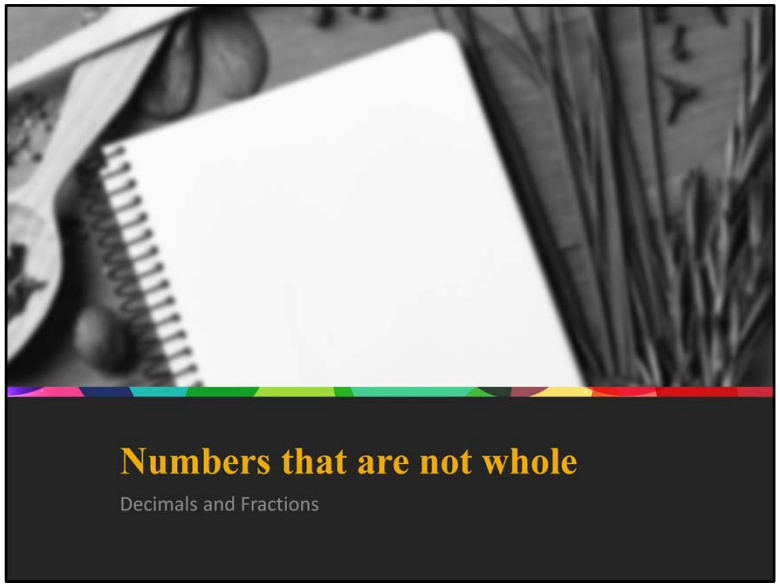
Quick question: Is this number a whole number? (No--- it has a decimal, so it is not whole)



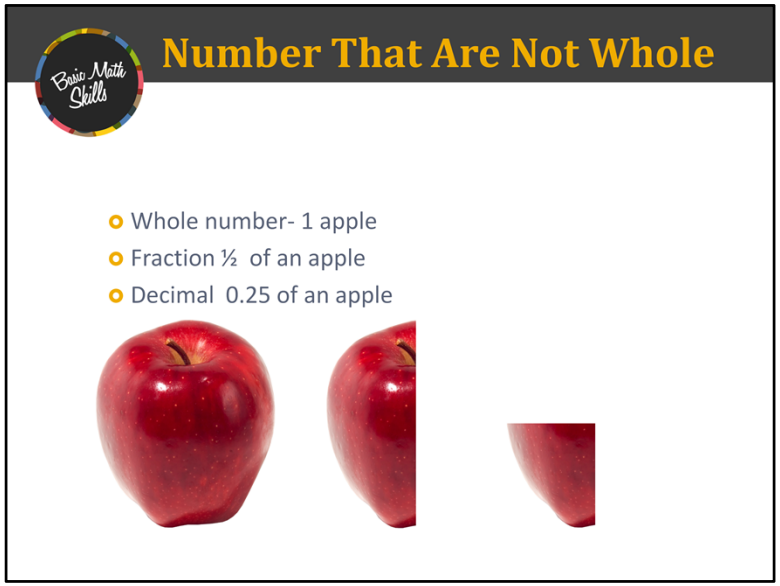
Turn to page __ in the participant workbook and quickly complete the worksheet.

Turn to page 7 in your workbook. Complete Learning Activity 1 to practice place value (digit) identification. (This should take 2 minutes or less)

[Cadre: This should take about 2 minutes. If necessary, an information sheet on place value is on page 9 of the workbook]



When we talk about numbers that are not whole, we're talking about Decimals and fractions.

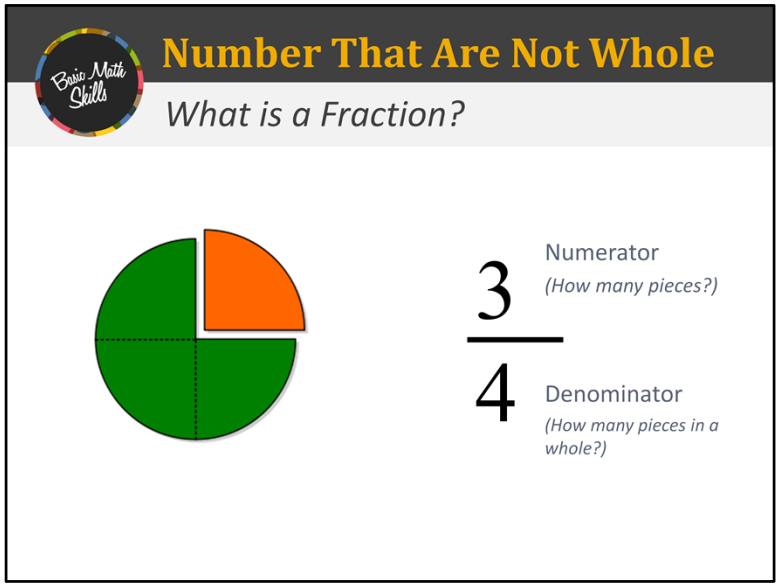


Numbers that are not whole can be expressed as either a fraction or a decimal. In recipes you may see either.

When you see a fraction or a decimal, it is a part of whole.

Turn to page 8 of your student manual, so we can make sure everyone understands this concept. (Choose students who are comfortable with reading out loud read the 1st section, 2nd section, and 3rd section.)

Let's dig deeper.

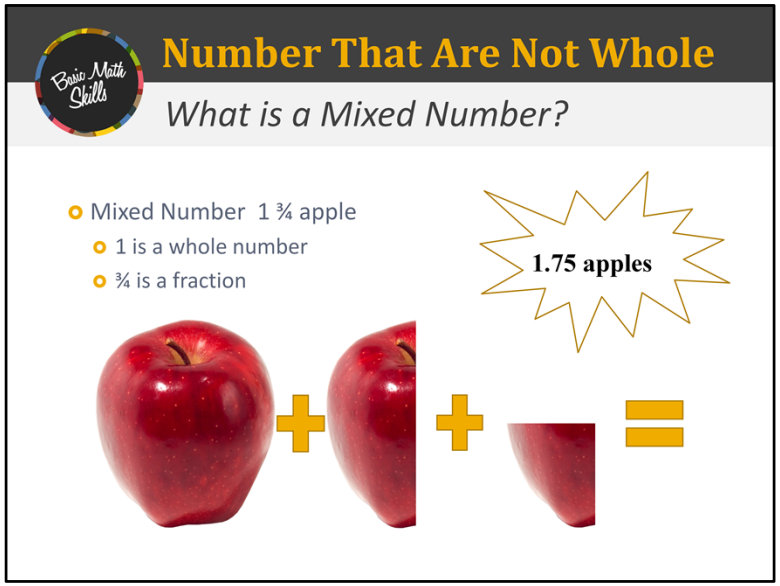


In a fraction, think of cutting a whole into pieces. The top number tells you how many pieces you have, and the bottom number tells you how many pieces you originally cut it into.

In recipes, you may be measuring fractions, like 3/4. To visualize the concept, mentally the item in four equal pieces and take 3 pieces. 3/4.

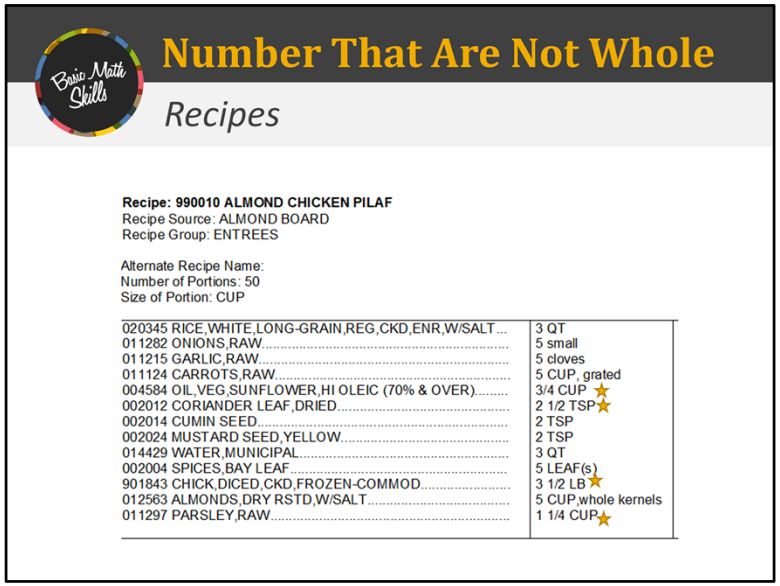
Whole numbers can also be expressed as a fraction. If I cut the circle into 4 equal pieces, and I have all 4 of those pieces, it is 4/4 or 1.

Fractions have two parts, the top number, or the numerator; and the bottom number, or the denominator. Remember the **D**enominator is "**D**OWN" at the bottom of the fraction.



Mixed numbers (also sometimes called Compound Fractions) have a whole number and a fraction, like 1 ¾ apples. You frequently see mixed numbers in recipes. Mixed numbers can also be expressed as decimals.

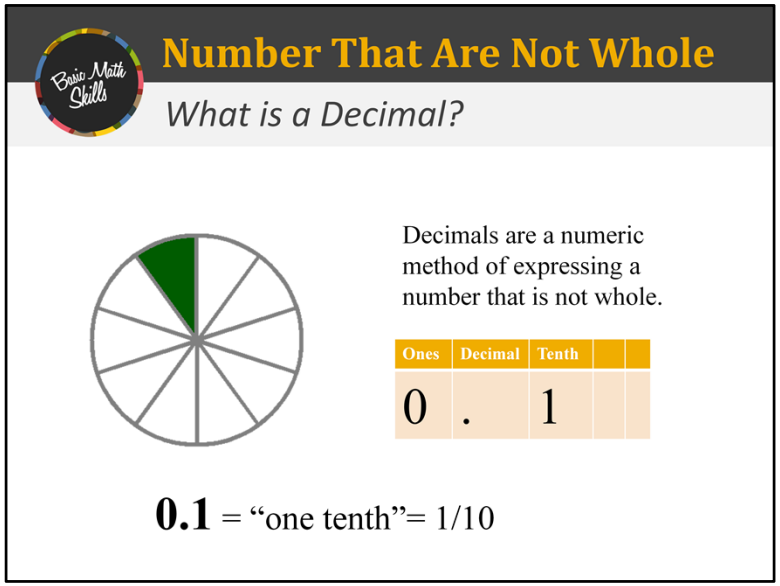
Bonus Question: What would be the decimal equivalent of 1 ¾ apples?
[Ask to assess the current understanding of your group before clicking. This will be covered next, but if you have a group that is confident, it may be a quick review. If some in your group don't know this, take it slow.]



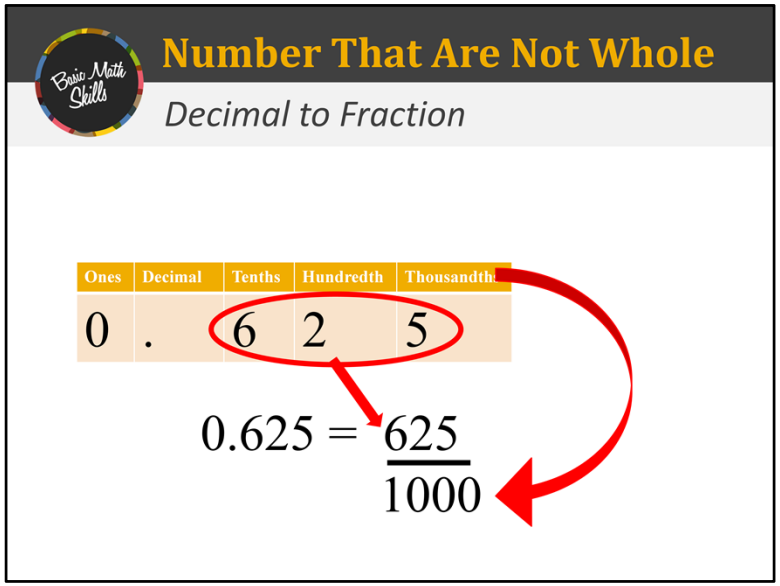
[NOTE TO PRESENTER: THIS SLIDE HAS ANIMATION]

In kitchen math, one of the most common places we see fractions and mixed numbers are recipes.

In this recipe, [stars will appear with animation] there is ¾ cup of vegetable oil, (click) 2 ½ teaspoons of coriander leaf, (click) 3 ½ pounds of diced chicken (click) and 1 ¼ cup of raw parsley.



Fractions are great to visualize, but when you use a calculator, decimals are usually easier to work with. A decimal is just a fraction in number form. Decimals are divided by 10's, 100's, 1000's, so the Denominators will be 10, 100, 1000, etc. This makes it easy to convert any decimal to a fraction by putting the number after the decimal as the numerator (top number) and the furthest place holder number as the denominator (bottom number). With 0.1, the 1 is in the 10^{th} place so we put a 1 over 10 and get $1/10^{th}$. Let's try this with a more complicated decimal



Imagine that you a case of single serve ketchup that has 1000 packets. You need 625 packets, or 625/1000th of a case.

0.625 is a decimal that goes out to the 1000th's place, so the numerator would be 625 (click) and the denominator would be 1000. (click)

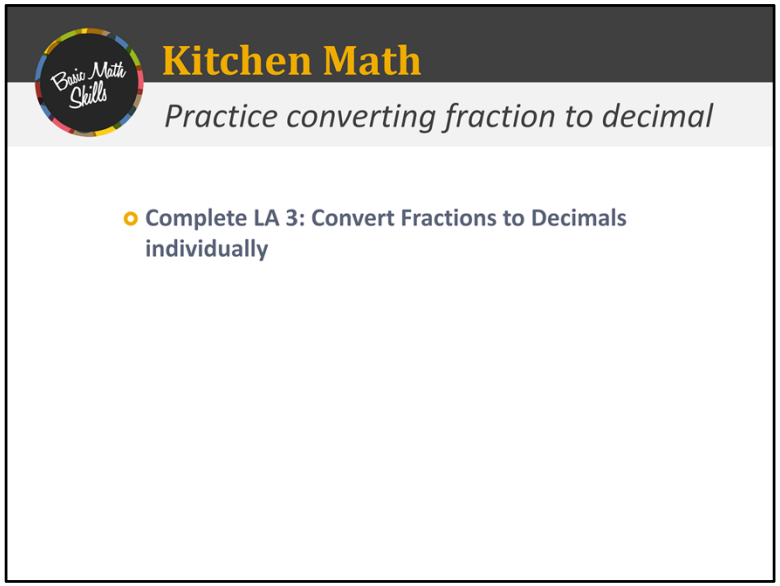
Number That Are Not Whole

Decimal to fraction/Fraction to decimal

An apple	Half of an apple	Quarter of an apple
1/1 apple	½ apple	¼ apple
1.0 apple	0.5 apple	0.25 apple

Numbers that are not whole can be expressed as decimals or fractions. One half of an apple is the same as 0.5 of an apple. One fourth of an apple is the same as 0.25 of an apple. Whole numbers can be expressed as fractions or decimals also. (Student Manual page 9 for reference) Notice that common fractions like ½ and ¼ are expressed verbally as "half" or "quarter", where as less common fractions, like 3/8 are expressed verbally as "three-eighths"

Having a good sense of how to convert fractions and decimals back and forth can help in the kitchen. There may be times that you want to use a calculator to adjust a measurement, but then need to switch it back to a fraction for measuring.



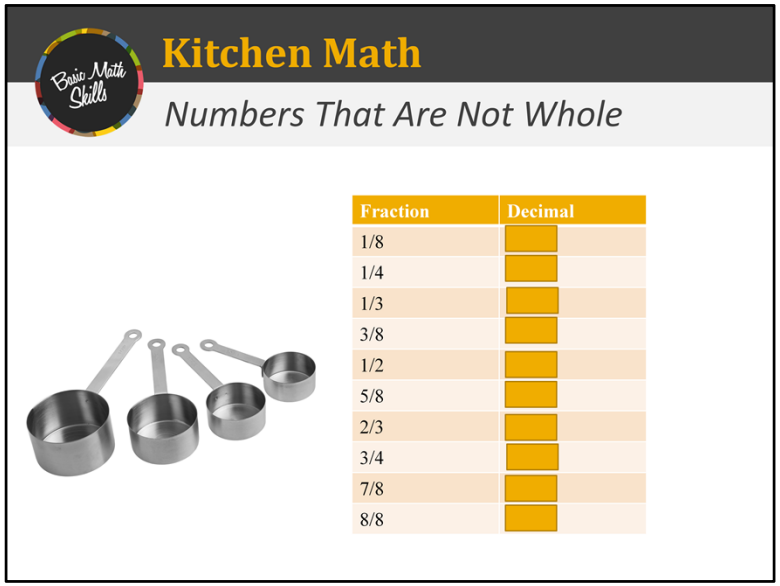
NOTE TO PRESENTER- This slide and next slide achieve the same purpose, but LA3 is individual work, and the animated slide is more whole-class effort that can be used as a review of the individual work .
Now is the time to get more practice with fractions and decimals.

Turn to page 10 in your work book, LA 3: Convert Fractions to Decimals.

You will notice that the fractions on this activity are the ones we commonly use in the kitchen.

Work by yourself to complete all the conversions. When you are finished you will have a useful chart. We'll check your answers on the next slide

[Note: Allow about 5 minutes for participants to complete the chart.]



NOTE TO PRESENTER- THIS SLIDE HAS ANIMATION. Use this slide to check the work done in LA 3 . Please note The 1/8th fraction is not in their workbook.

Let's review some answers. 1/8 is not in your workbook, so quickly use your calculator to find the answer. 1/8= .125 etc. (Each answer appears on click using animation).

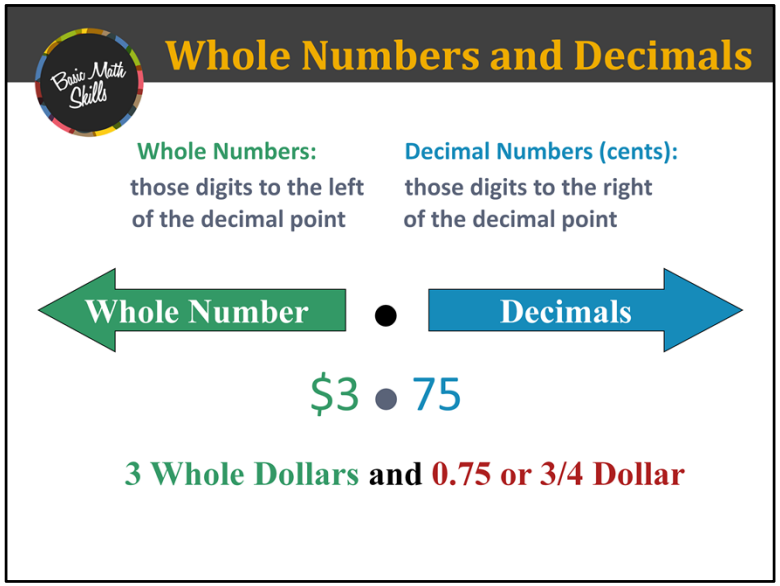
Table 6:

Decimal Equivalents of Commonly Used Fractions

1/8 = 0.125	1/3 = 0.333	2/3 = 0.666
1 ÷ 8 = 0.125	**1 ÷ 3 = 0.333**	**2 ÷ 3 = 0.666**
1/4 =0.25	1/2 = 0.50	3/4 = 0.75
1 ÷ 4 = 0.25	**1 ÷ 2 = 0.50**	**3 ÷ 4 = 0.75**
3/8 = 0.375	5/8 = 0.625	7/8 = 0.875
3 ÷ 8 = 0.375	**5 ÷ 8 = 0.625**	**7 ÷ 8 = 0.875**

Here is the completed chart along with the math equation you would enter on the calculator.

Another easy way to think of decimals is using dollars and cents.



Remember that whole numbers appear to the left of decimal point and

The ‘part’ of the whole number appears to the right of the decimal point.

[Cadre: If necessary, refer back to page 9 “About fractions and decimals” - of participant workbook.]

Rounding and Reducing

- Dollars
- Other numbers
- Measurements
- Reducing Fractions

Rounding Decimals #1:

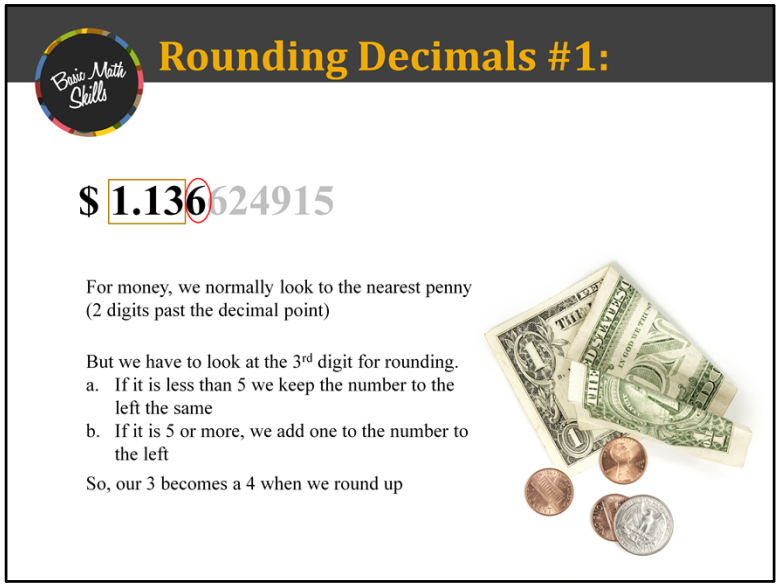
Veronica is calculating meal costs for her menu and this is her number:

$ 1.136624915

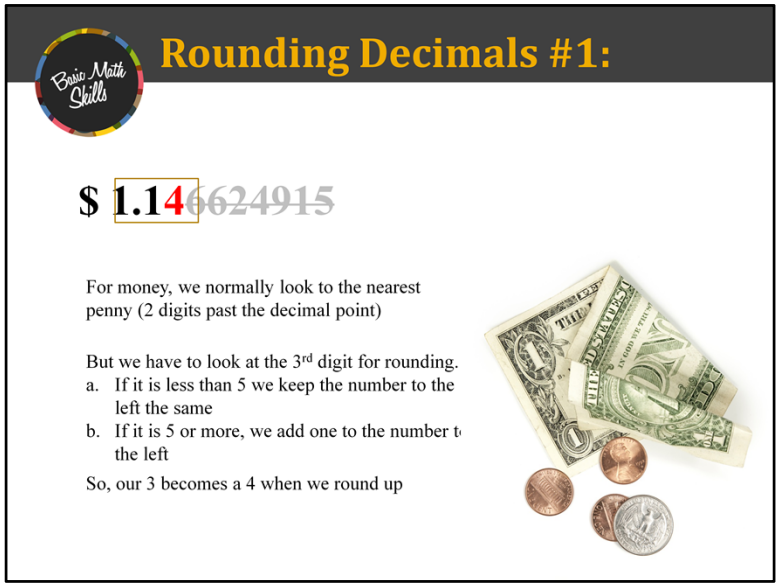
Or $1\frac{136,624,915}{1,000,000,000}$

… that's not a fun number as a fraction OR decimal.

When you are dividing, numbers don't always come out into nice easy decimals. So, if I were calculating my cost per meal, and my calculator gives me a number with a lot of digits past the decimal point, don't panic.



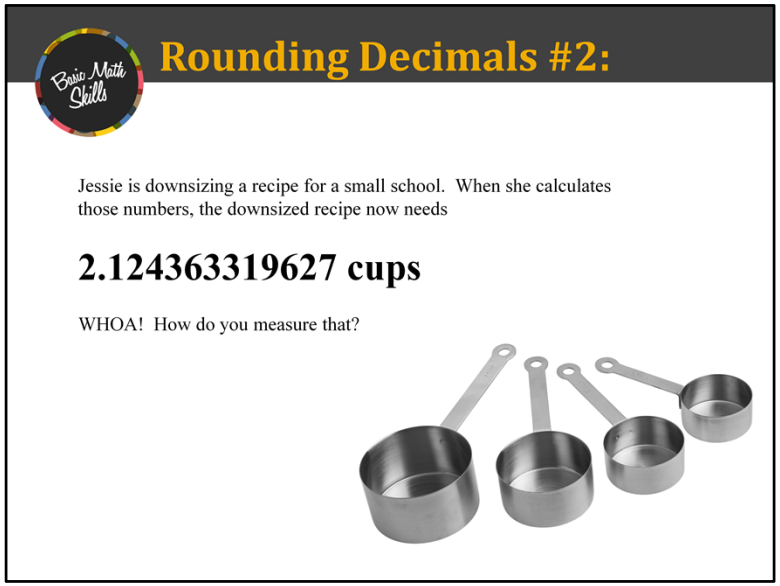
For money, we normally look to the nearest penny– which is two digits past the decimal point. (click for animation) (Click again)
But we have to look at the third digit for rounding (click for animation) If that third digit is less than 5, we round down. If it is 5 or more, we round up. In this case, our digit is 6, so we're going to round up. The three in the hundreths place becomes a 4. (click for next slide)



So our cost per meal is $1.14 .

(Understand that in some very tightly run operations, meal costs may be recorded to the 100th's place as in one dollar and 13.5 cents per meal, but we chose to go to the nearest penny for this example.)

Let's try this again with measurement



Jessie is downsizing the recipe. She is using a calculator to figure out how much of an ingredient she needs. Her calculator shows this number. How does she figure out how to measure this number in cups? Don't let the long number overwhelm you– she can just round.

Rounding Decimals:

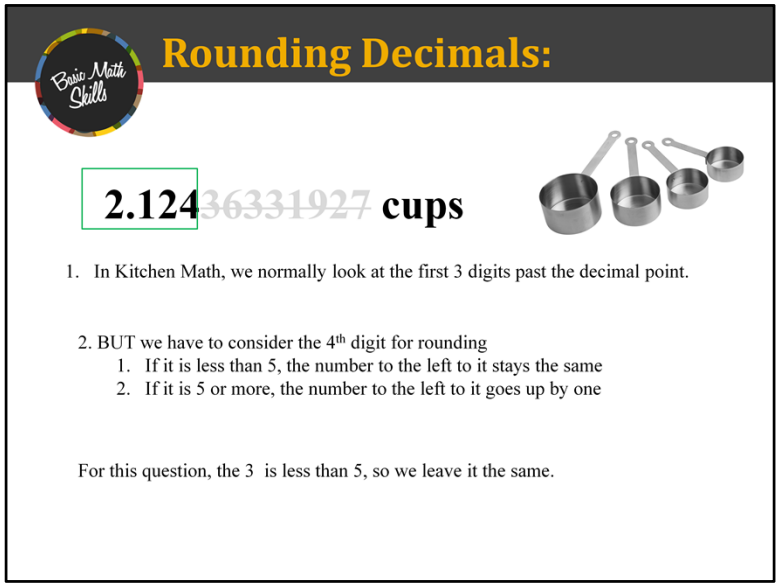
2.12436331927 cups

1. In Kitchen Math, we normally look at the first 3 digits past the decimal point.

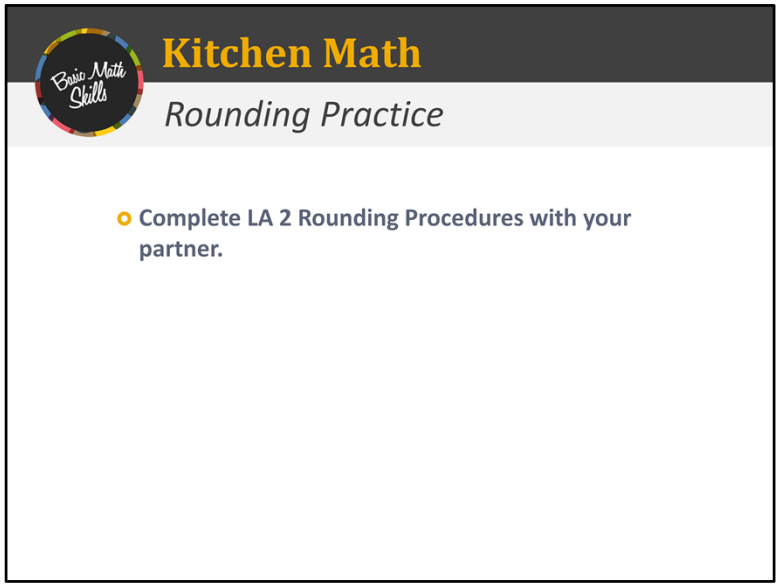
2. BUT we have to consider the 4th digit for rounding
    1. If it is less than 5, the number to the left to it stays the same
    2. If it is 5 or more, the number to the left to it goes up by one

For this question, the 3 is less than 5, so we leave it the same.

For kitchen math, such as in recipes, we normally look at the first 3 digits past the decimal point. (click for animation) click again)
We use the 4th digit for rounding. (click) In this case it is a 3, which is less than 5– so the "4" to its left stays the same.



For kitchen math, such as in recipes, we normally look at the first 3 digits past the decimal point. (click for animation) click again)
We use the 4th digit for rounding. (click) In this case it is a 3, which is less than 5– so the "4" to its left stays the same.



Turn the page in your work book to find LA 2 **(pg 11)** Rounding Procedures. In this activity you will always round using the very last digit that is showing.

- Do the Rounding Procedures activity with your partner.
- When you and your partner have finished the Rounding Procedures activity stand up. When everyone is standing up we will move on in the class. Use this opportunity to stretch in your place and shake out any sitting static and re-energize.

Note: Allow about 5 minutes to complete both activities. Even if participants are not completely done, ask everyone to stand after about 5 minutes a do a quick stretch. Then ask them to be seated and continue the lesson.

LA 2 Answers

103.7359682	2	under 5	round down
103.735968	8	5 or over	round up
103.73597	7	5 or over	round up
103.7360	0	under 5	round down
103.736	6	5 or over	round up
103.74	4	under 5	round down
103.7	7	5 or over	round up
104.0			

Here are the answers to the Rounding Procedures. Check your answers

Decimals #2:

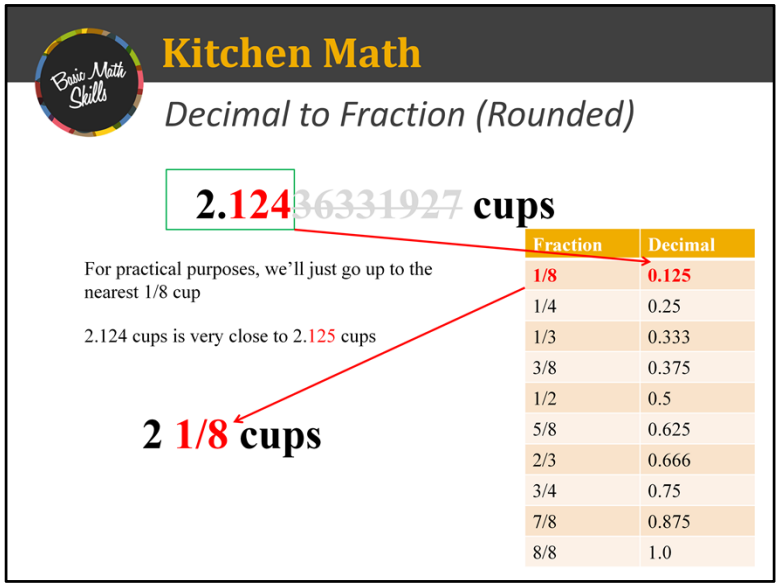
Remember-- Jessie downsizing a recipe for a small school. When calculating those numbers, the downsized recipe now needs

2.124 cups

How does she measure this?

We now have a rounded number, but we don't know which measure to use for the recipe.

So, we've rounded to a nice decimal. How does Jessie use measuring cups to measure a decimal?



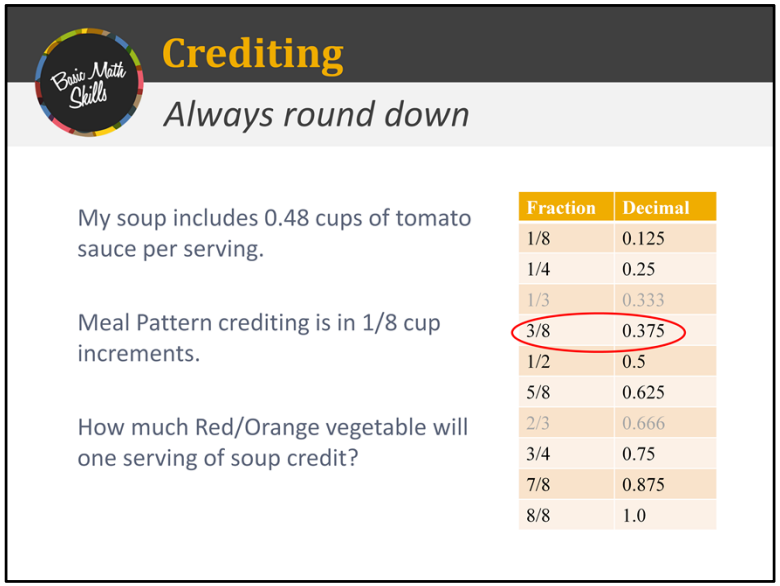
So remember our question-- we've rounded to 2.124 cups, but how does that convert to my measuring cups?

Remember that chart we created on page 10 of your workbook? Here it is again. For practical purposes, 2.124 cups is very close to 2.125 cups…. 0.125 is 1/8. So, although it is not exact– it is very close, so for 2.124 cups, Jesse should use 2 1/8 cups measure.

This method works best when you are changing a recipe and the number is CLOSE, BUT be very careful in using this method. We'll address how to get this EXACT later in the presentation.

Bakers often have very precise measurements for items such as breads, muffins, and other baked goods. You may have a difference in quality if you adjust a recipe and "round" to the nearest fraction. In fact, baking often uses weight in decimals rather than volume measures to get a consistent product every time.

There are times when you cannot round up in Child Nutrition Programs. For example, in the meal patterns, the amount listed is a MINIMUM amount required. If your recipe provides 0.245 cups of tomato sauce per serving, you cannot round up to .25 cup or ¼ cup. It would have to credit at 1/8th of a cup. To credit ¼ cup, your recipe would need to have **at least** .25 cup or more per serving. Let's look at this more closely. [CADRE: This concept is especially important for those who are meal planners, the meal pattern sheet should be provided to all participants in addition to the work book.]

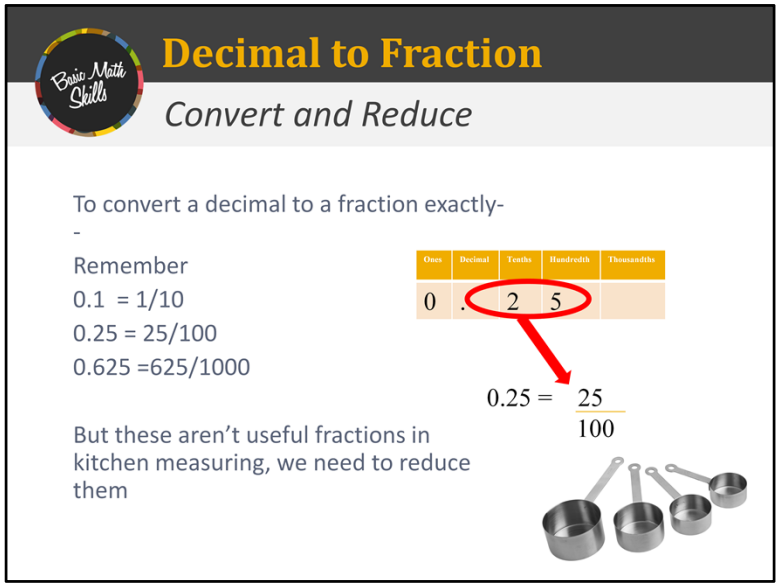


Okay, let's look at rounding for crediting toward the meal pattern. The meal pattern crediting volumes are measured in 1/8 cup increments, so we've grayed out the 1/3 and 2/3 measurements, as they aren't used in crediting. Remember that you have to have a minimum volume of the food to credit, so you cannot round up. So, if I want to credit the red/orange vegetable subgroup, how much does it credit?

(click) 3/8 cup.

Does everyone understand why? It may be closer to .5 c or ½ of a cup, but it doesn't meet the minimum 0.5 cup, so you must round down.

[CADRE: If necessary, stay on this slide and discuss until the class understands this concept that crediting is a MINIMUM amount, and you must hit the minimum amount– you cannot round up. This is especially important for menu planners to understand.]



Remember that to convert a decimal to a fraction, you just put the number beyond the decimal over the number of the furthest place holder. For example, for 0.1, the furthest digit, 1, is in the 10^{th} place, so it is $1/10^{th}$. For .25, the furthest digit, 5, is in the 100ths place, so it is $25/100^{th}$. And 0.625, the furthest digit, 5, is in the thousandths place, so it is 625/1000.

Unfortunately, these aren't practical fractions to use in measuring in the kitchen, so we reduce them.

Decimal to Fraction

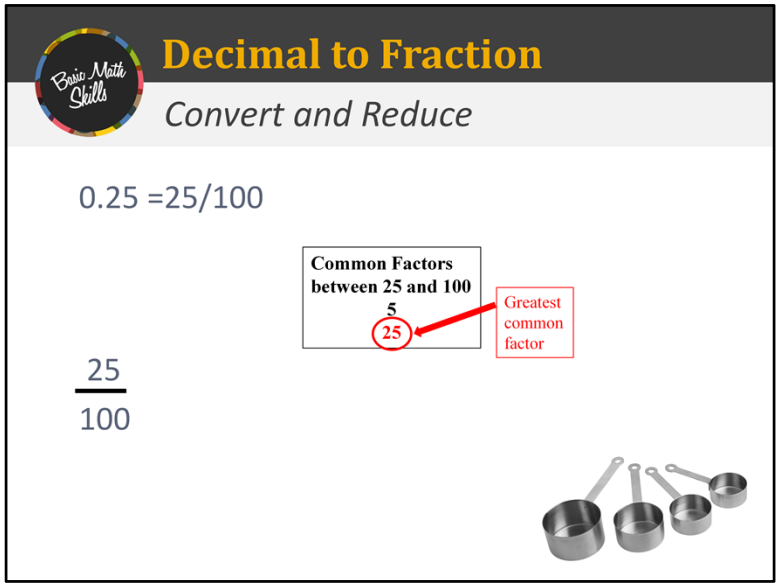
Convert and Reduce

0.25 =25/100

Common Factors between 25 and 100
5
25

$$\frac{25}{100}$$

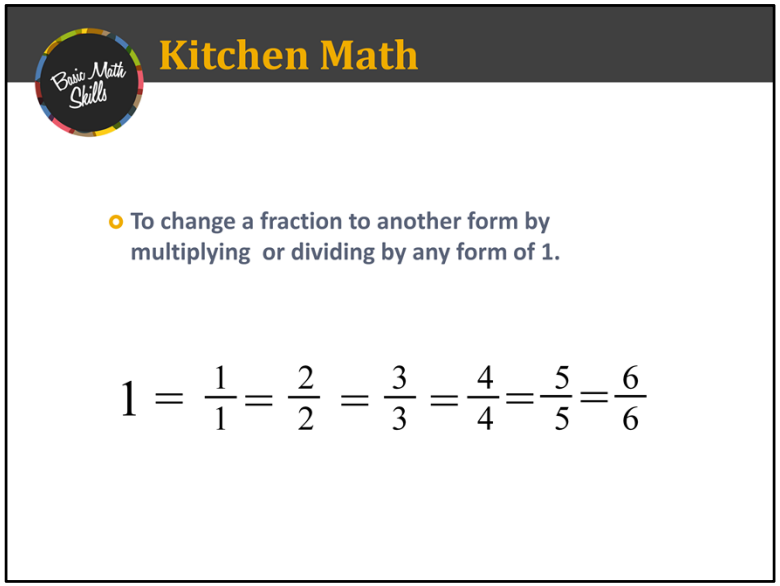
To reduce a fraction, figure out what numbers go evenly into both the top and the bottom number. These are called factors. So, common factors between 25 and 100 are 5 and 25.



When reducing fractions, you want to find the BIGGEST number that goes evenly into both the numerator and denominator, in this case, it is 25, so 25 is known as the Greatest common factor.

To reduce a fraction, figure out what number goes evenly into both the top and the bottom number. In this case, 25 goes evenly into both numbers, so we divide the top and bottom number by 25 (Remember 25/25 = 1, so you're dividing by one) and you get ¼.

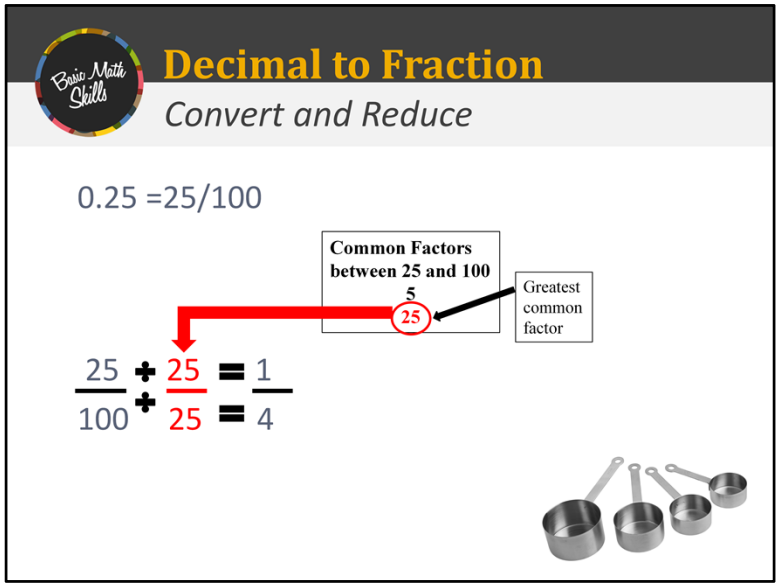
On page 15 of the participant workbook, practice reducing fractions with your partner. (Give class 5 minutes to do this)



As we've learned in reducing fractions, the way to change a fraction to another form is to multiply or divide it by a form of the number 1.

Because any number divided by itself equals 1, we can convert fractions to another form easily. 4/4 equals 1.

Knowing this information is useful when we need to add fractions that in their smallest form don't have the same bottom number or denominator.



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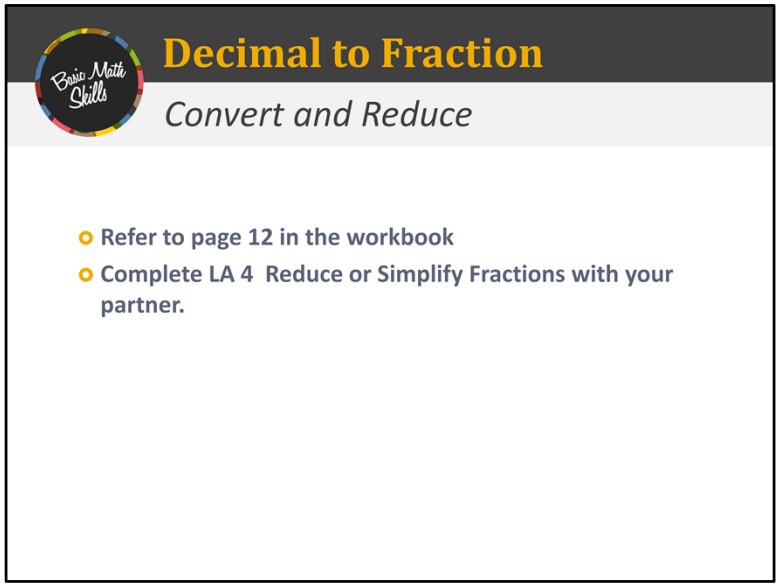
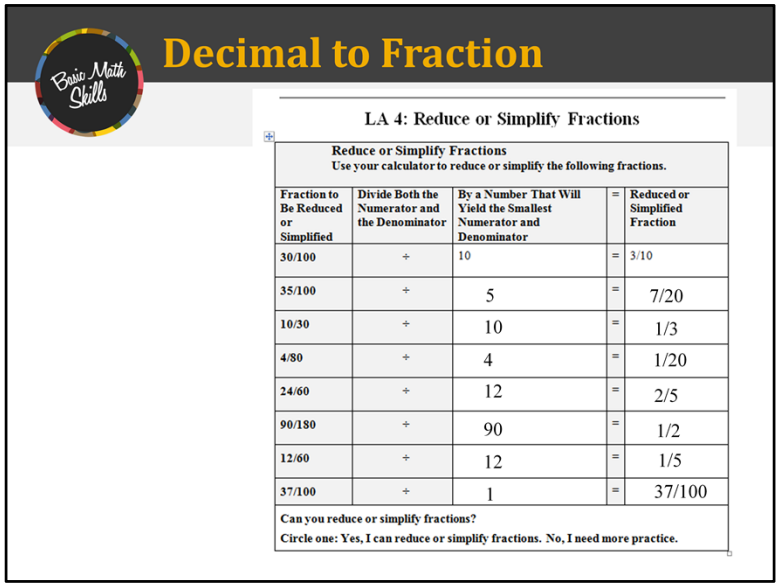
On page 15 of the participant workbook, practice reducing fractions with your partner. (Give class 5 minutes to do this)

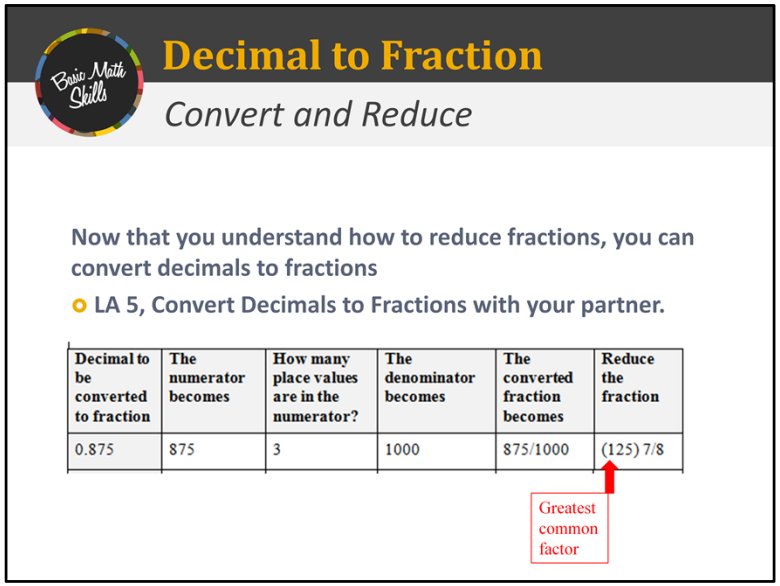


On page 12 of the workbook, there is some explanation and diagrams for reducing fractions. Use it if you find it helpful. On page 13 of the participant workbook, practice reducing fractions with your partner. [CADRE: Give class 5 minutes to do this]



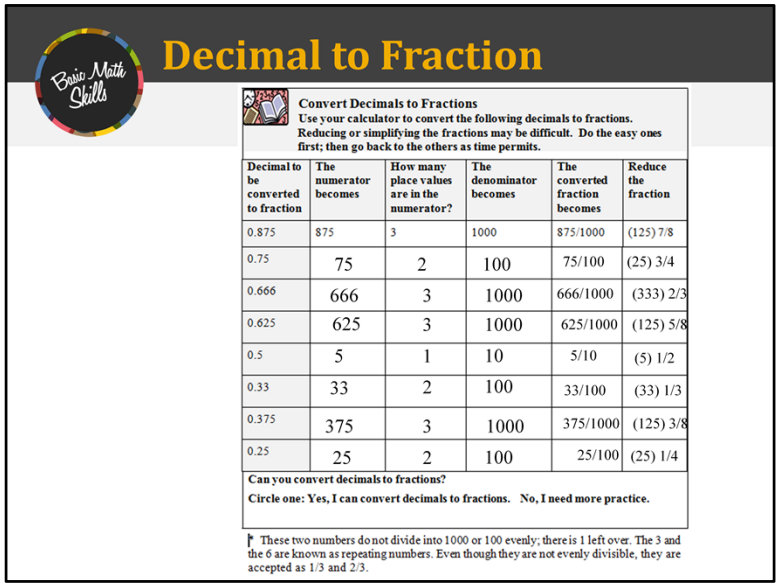
Let's check your answers

[CADRE: Go through each answer. Pay attention to point out that we want to reduce it to the lowest fraction possible. Some of these fractions can be reduced to fractions that can be reduced again. These answers reflect the lowest reduction.]



On page 14 of the participant workbook, there is some explanation of how to convert decimals to fractions. Refer to it if you find it useful. On Page 15, practice reducing fractions with your partner. Identify the numerator and the denominator, and write the new fraction. Find the greatest common factor (you may use trial & error on your calculator to figure that out) and reduce the fraction

[CADRE: Give class 10 minutes to do this. These will all reduce down to usable kitchen fractions If your students struggle with greatest common factor and reducing, it will be reviewed again in the next section as part of multiplying fractions. If they do get it, you can speed through that review again.]



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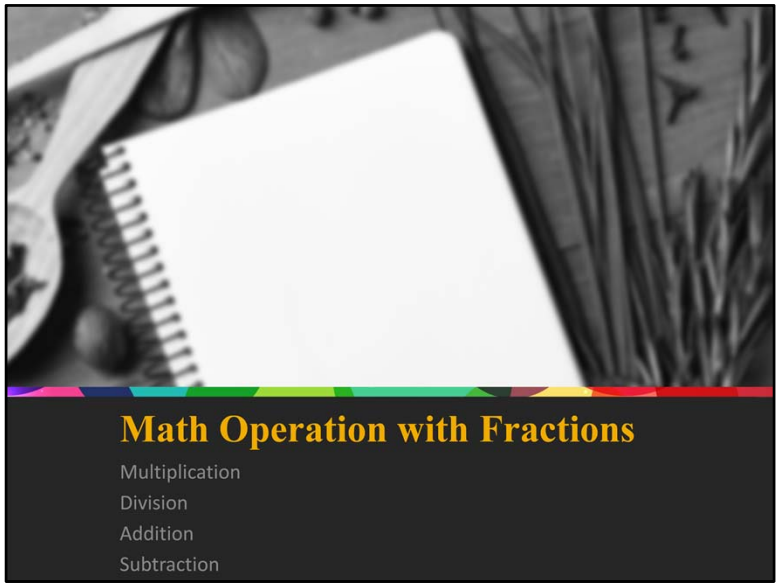
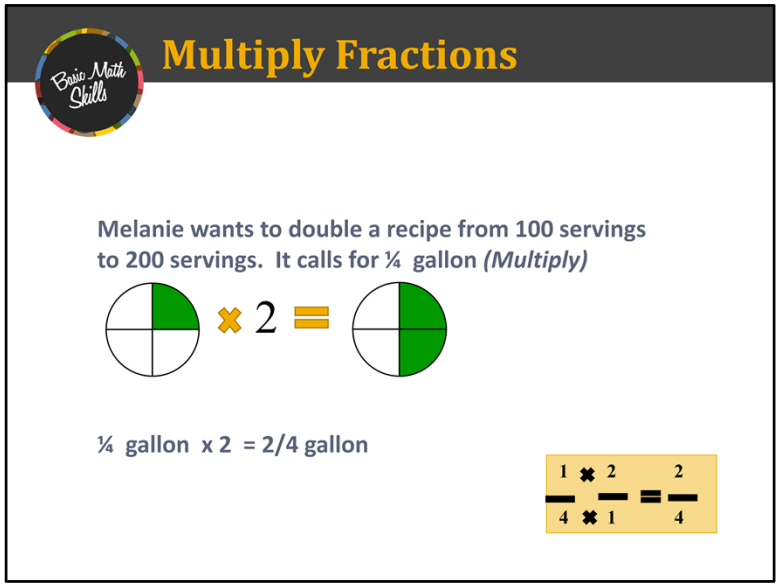


Math Operation with Fractions

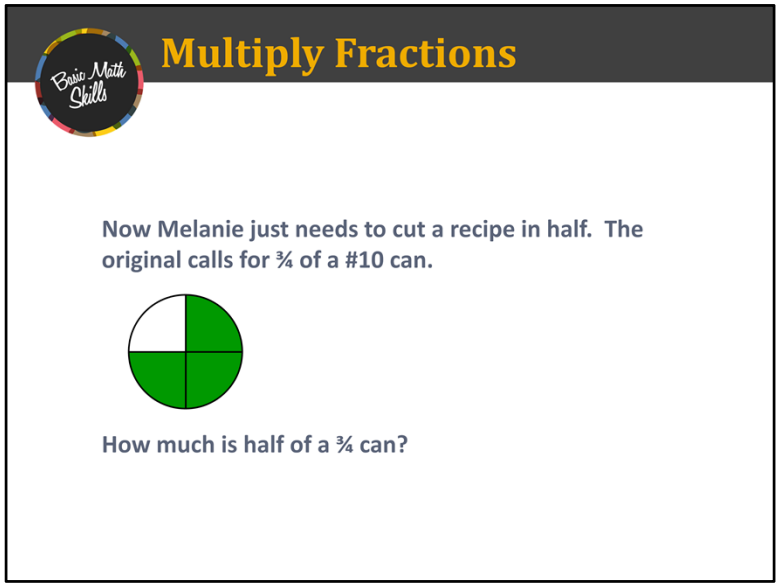
Multiplication
Division
Addition
Subtraction



Sometimes it is easier just to work with the fractions than to pull out a calculator and convert to decimals. Here's an example.

Melanie wants to double a recipe from 100 servings to 200 servings. The original recipe calls for ¼ gallon. We often just do this in our head, but let's look at how this is done mathematically. When you multiply a fraction by a whole number, you multiply the top number of the fraction by the whole number and leave the bottom one along.

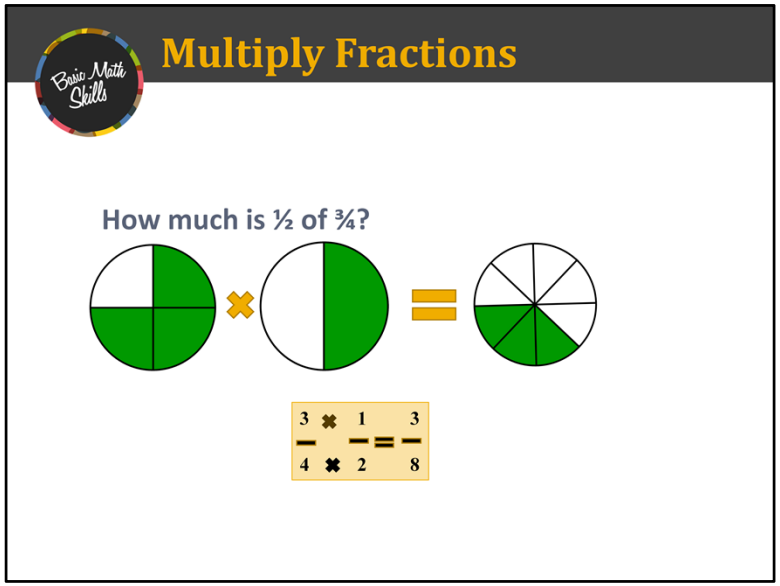
1. If it helps, you can convert the whole number to a fraction, like 2/1 and just multiply the top and the bottom



You may need to adjust a recipe, where you'll have to look at a fraction of a fraction. This isn't as complicated as it sounds. Let's walk Melanie through her math question.

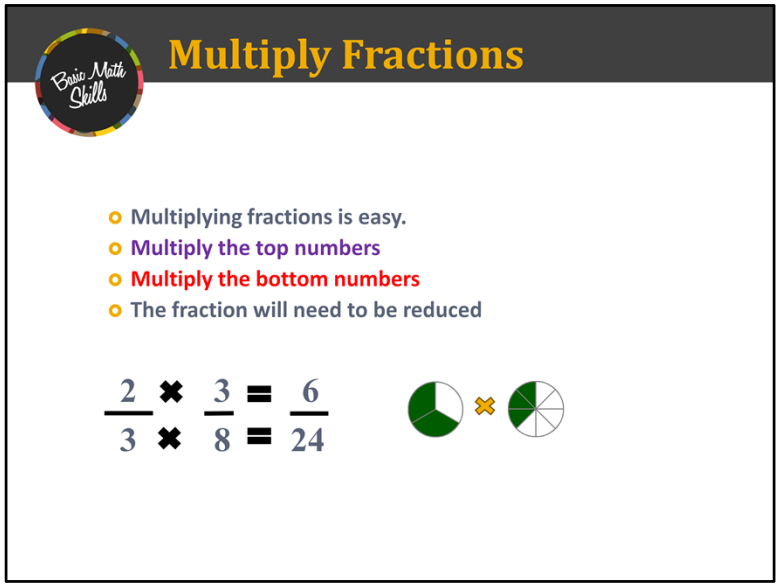
Read scenario on slide

What will this math problem would look like? [¾ X ½ = Assess for understanding.]



Although there are a few ways to approach this, we're going to multiply. If you want ½ of something, you multiply it by half.

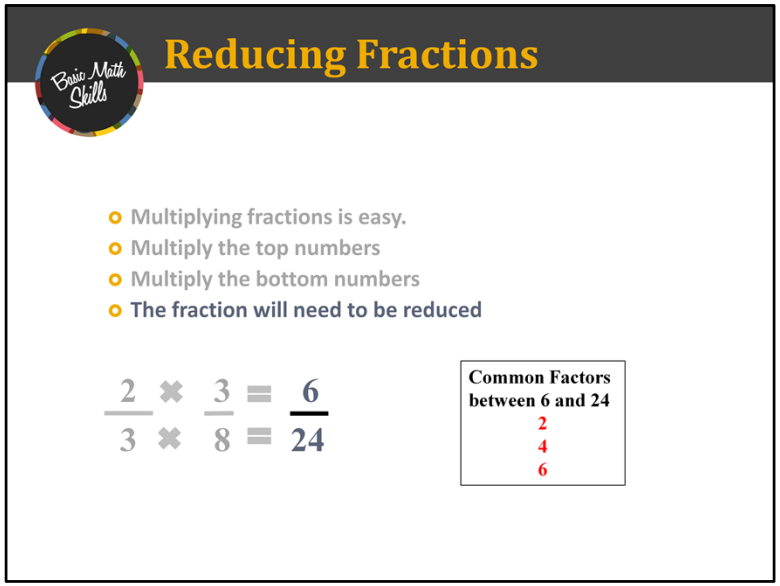
So, ¾ x ½ looks like this. Multiply the top numbers and multiply the bottom numbers



Multiplying fractions is easy.

- Multiple the top numbers.
- Multiple the bottom numbers.

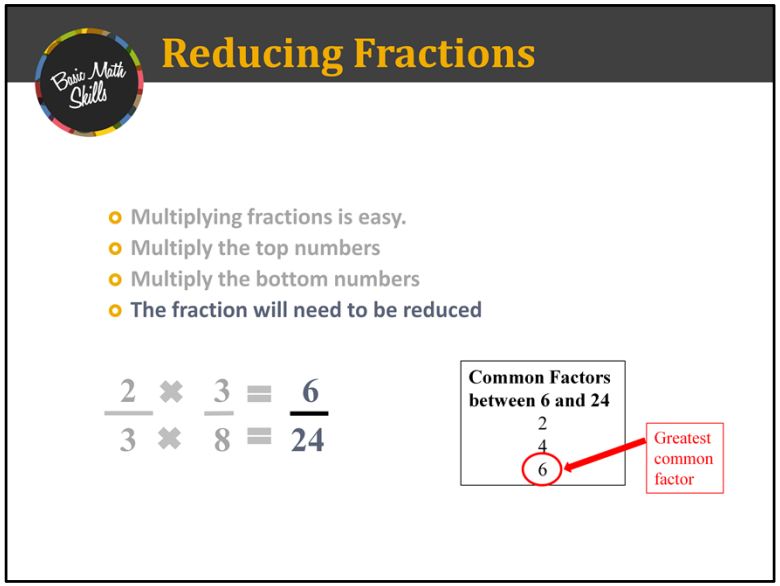
2 times 3 is 6 and 3 times 8 is 24;
6/24 reduces to ¼ which is .25 as a decimal



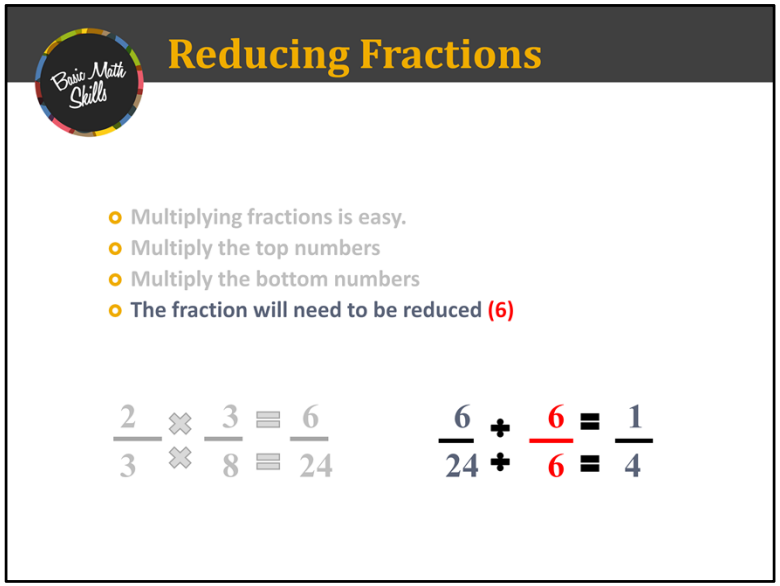
Let's take a minute to look at how to reduce a fraction. Most measuring utensils don't have 6/24th marked on the side– is there an easier reduced fraction?

Remember, to reduce a fraction, look for common factors of both the top and bottom number

In math, a factor is a number that divides into a larger number evenly. (Whole number– no remainder, no fraction/decimal)



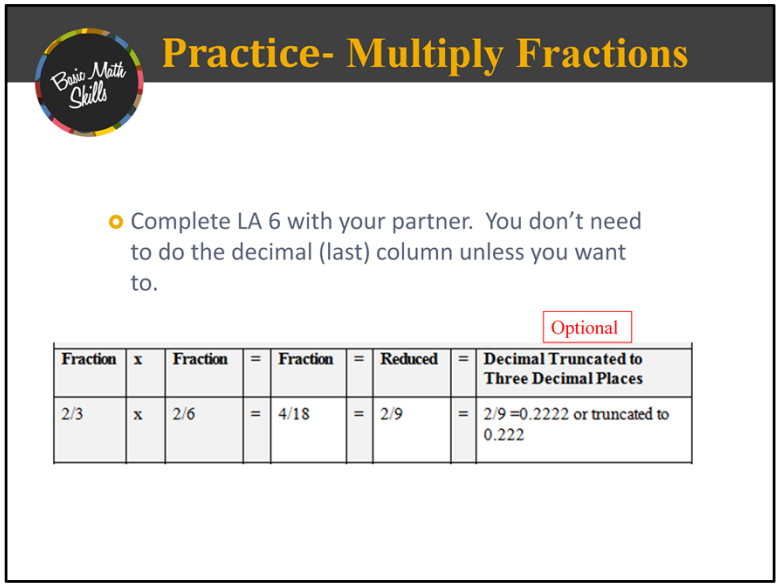
Let's quickly review how to reduce a fraction to get a more useful number.
To reduce a fraction, look for factors of both the top and bottom number and figure out the common factors. Identify the greatest common factor and ….



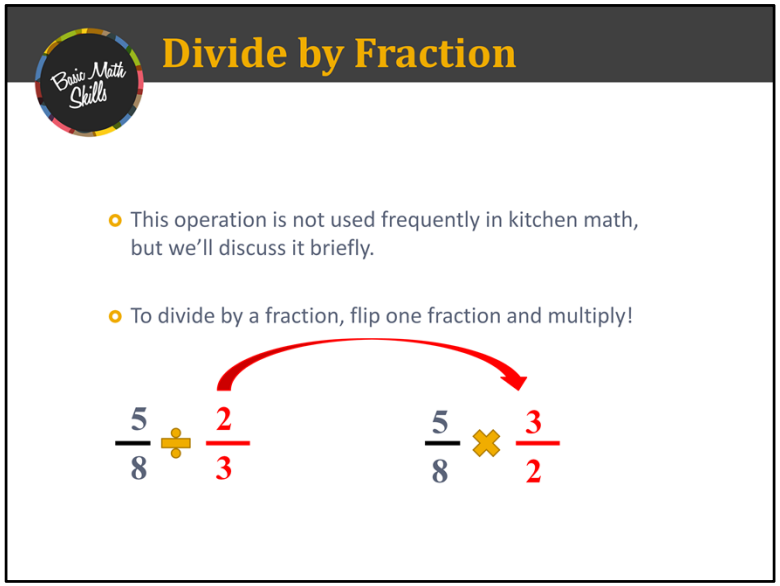
Divide by 6/6 (remember 6/6 equals one, so you are dividing by one)

Now divide your fraction by one in the form of 6 over six.

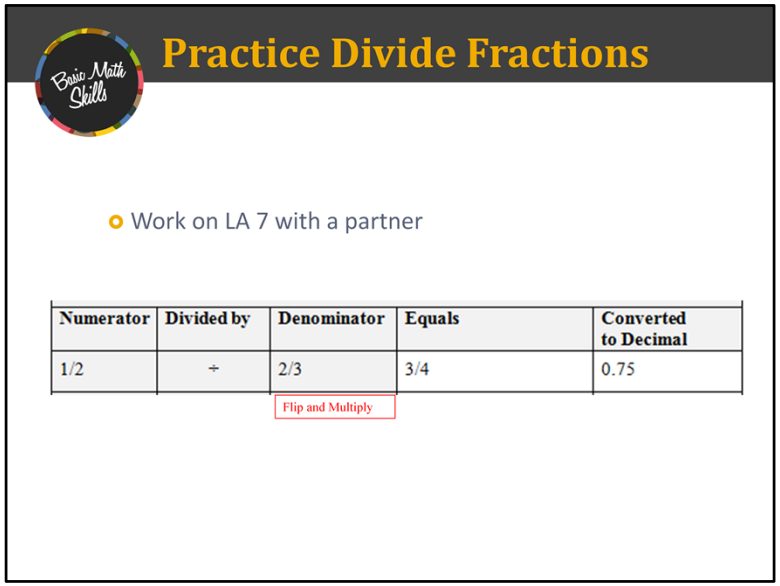
6/24 reduces to ¼ which is .25 as a decimal



Multiply the numerators together, Multiply the denominators together, reduce.

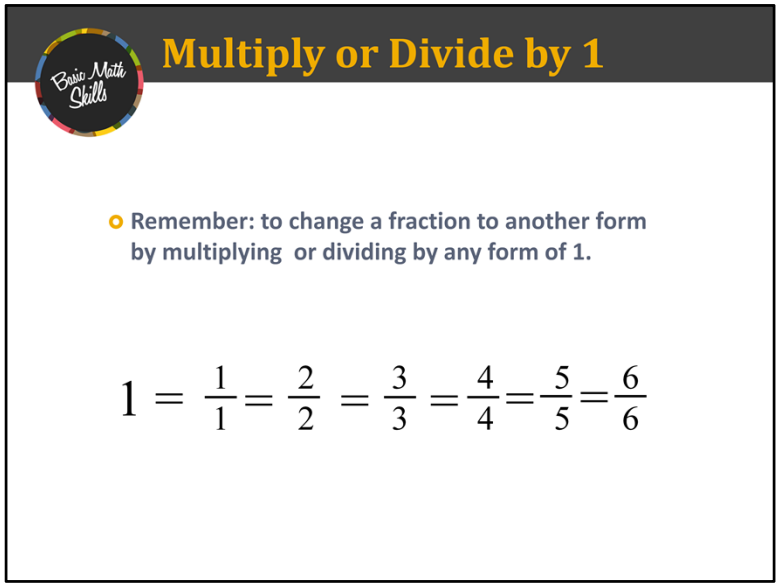


Dividing by a fraction is not commonly used, but we'll discuss it in the event you are curious or ever encounter it.



Remember Flip and multiply. It may be hard to grasp, but when you divide by a fraction less than one, you get a larger number than you started with.

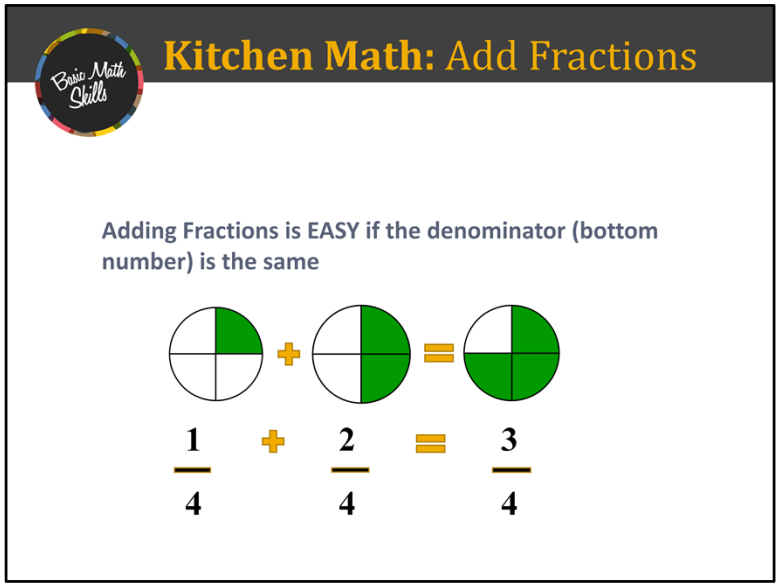
Example: 5 divided by ½ = 10. Multiplying fractions is an easier concept. 5 x 2/1 =10 Flip and multiply.



As we've learned in reducing fractions, the way to change a fraction to another form is to multiply or divide it by a form of the number 1.

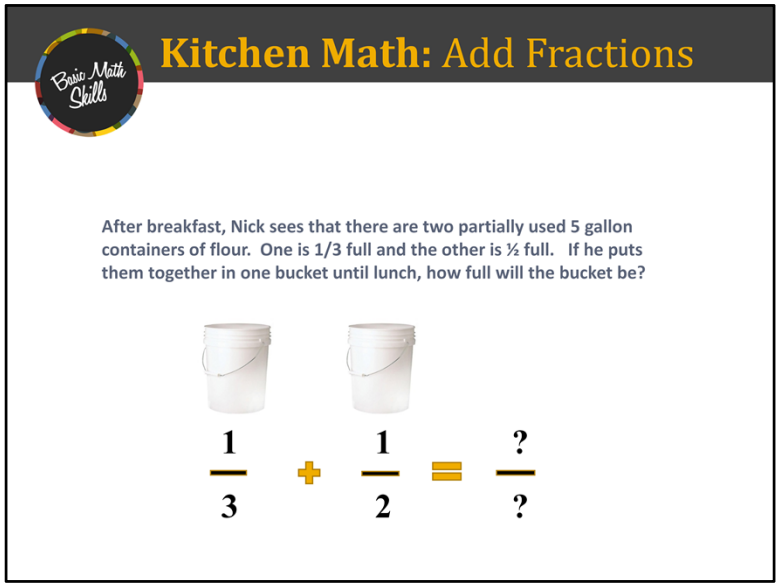
Because any number divided by itself equals 1, we can convert fractions to another form easily. 4/4 equals 1.

Knowing this information is useful when we need to add fractions that in their smallest form don't have the same bottom number or denominator.



When you add fractions, First, you make sure the denominators match. In this case, we're adding fourths. So, because all the pieces are the same size, all we need to do is add the top numbers, so 1 + 2 = 3. 3/4ths.

So in this case, ¼ of a pizza plus 2/4 of a pizza equals ¾ of a pizza.

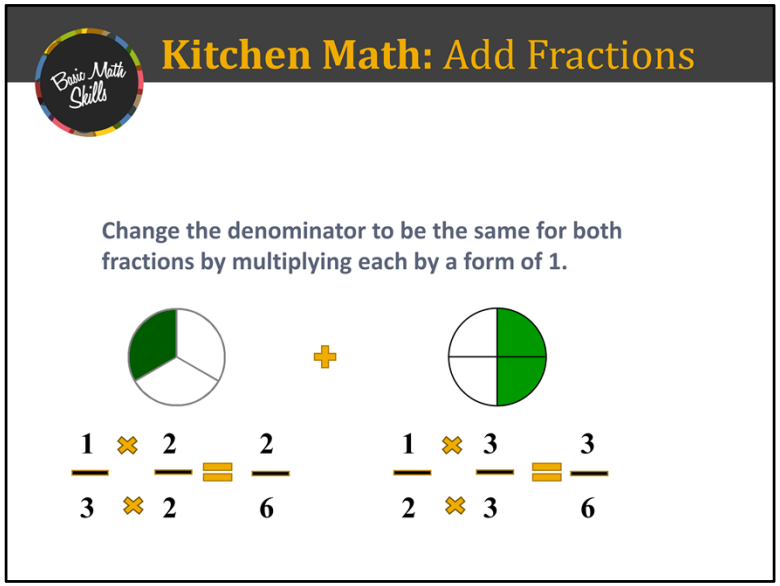


When the denominators are different, it takes a few more steps.

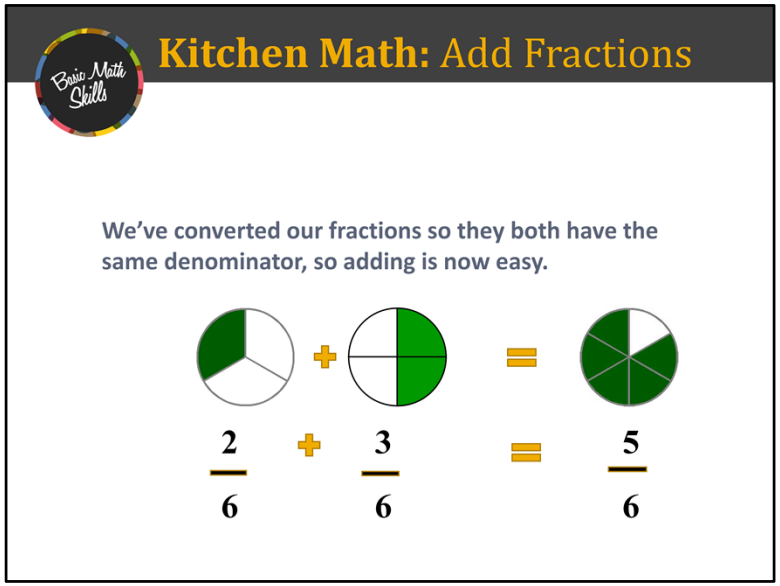
After breakfast, Nick sees that there are two partially used 5 gallon containers of flour. One is 1/3 full and the other is ½ full. If he puts them together in one bucket until lunch, will it overflow?

In this case, the denominators don't match, (the piece sizes are different), so how do we add?

First, we'll multiply each fraction by 1 to make version of each fraction that has the same denominator.

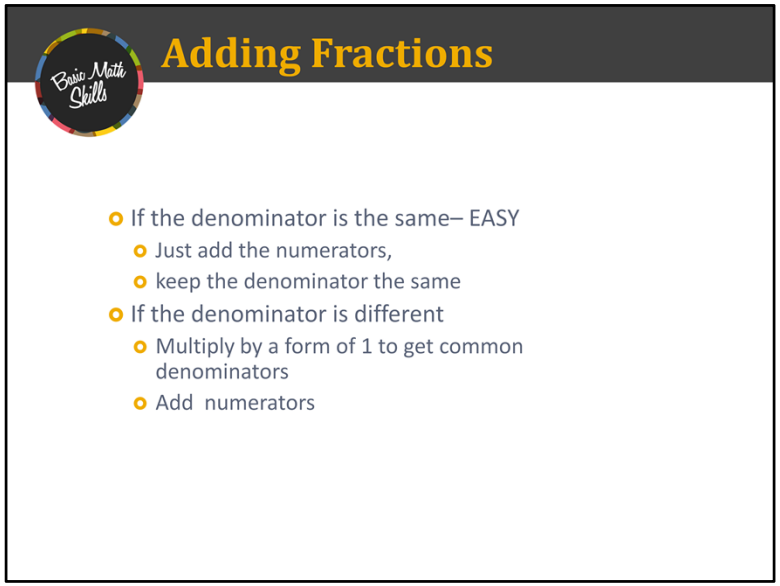


Just to keep it simple, we know that 3 times 2 equals 6, so we'll change them both so the bottom number is 6. The first fraction we'll multiply by 2/2, which is the same as 1. The second fraction we'll multiply by 3/3, which is one. NOW our denominators match.



Now we have the same denominator, or same sized pieces, we can just add the top straight across.
Luckily, in kitchen math we normally work with eighths, fourths, and halves, which makes it easy to convert back and forth. The school meal patterns do crediting in these fractions too. When we use 1/3 measures, it is harder to convert. Ideally, in NSLP, you will find it much easier to work with serving sizes and crediting with eighths, quarters, and halves. Avoid thirds when you can.

So, how full will Nick's bucket be?



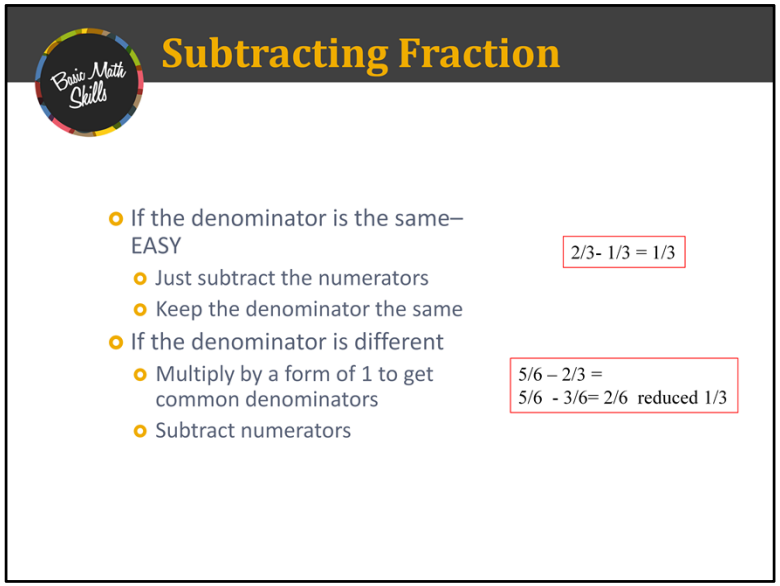
So, before we practice, when adding fractions, if the denominator is the same (or we're working with pieces of the whole that are the same size), we just add the numerators and leave the denominator alone.

If the denominator is different, we need to multiply by a form of one so that both fractions have a common (same) denominator before we add.

Practice - Add Fractions

- LA 6 Adding Fractions with your partner

Add Fractions Using the common denominator, restate the problem, solve it, and convert the fraction to its decimal equivalent.					
Problem	**Common Denominator**	**Problem Restated With Common Denominator**	**Answer**	**Fraction Reduced**	**Decimal Equivalent**
1/8 + 1/24	24	3/24 + 1/24	4/24	1/6	0.166



Subtracting fractions is just like adding. You'll need a common denominator.

When subtracting fractions, if the denominator is already the same (or we're working with pieces of the whole that are the same size), we just subtract the numerators and leave the denominator alone.

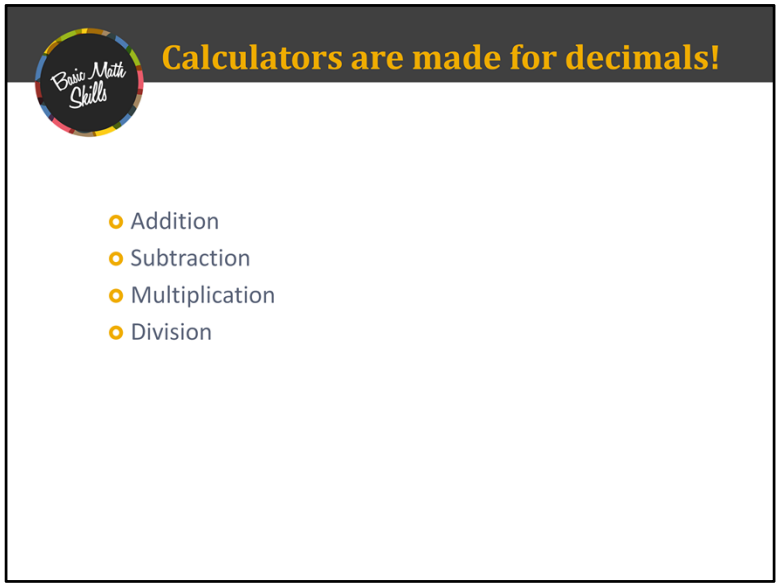
If the denominator is different, we need to multiply by a form of one so that both fractions have a common (same) denominator before we subtract.

Practice - Subtracting Fractions

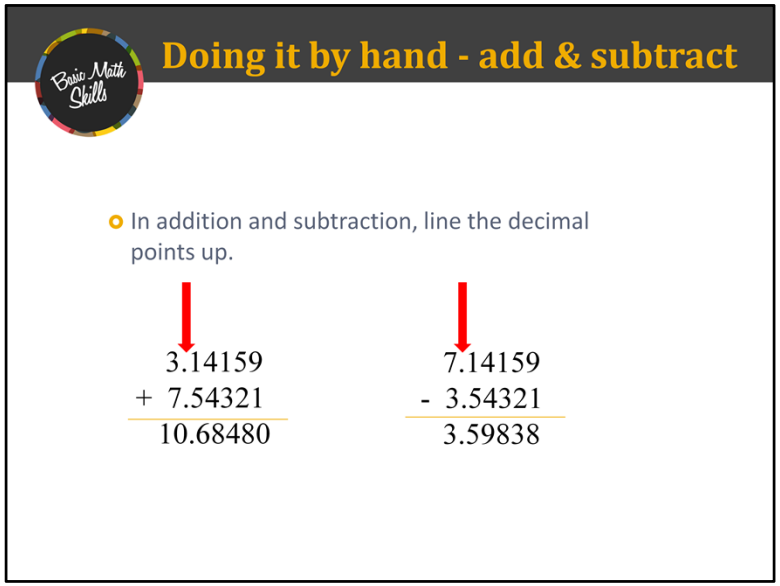
- Work on LA 9 Subtracting Fractions with your partner

Subtract Fractions								
Fraction	**Minus**	**Fraction**	**=**	**Fraction**	**Minus**	**Fraction**	**=**	**Answer**
2/3	_	2/6	=	4/6	_	2/6	=	2/6 or 1/3 or 0.33 in decimals

Math operations with decimals



For decimal calculations, most often, we'll use a calculator. BUT-- Just for review, we'll talk briefly about how to do it without a calculator.



When adding or subtracting decimals by hand, remember to keep the decimals lined up so that you are adding the digits in the same place value, ones to ones, tenths to tenths, hundreths to hundredths… and so on.

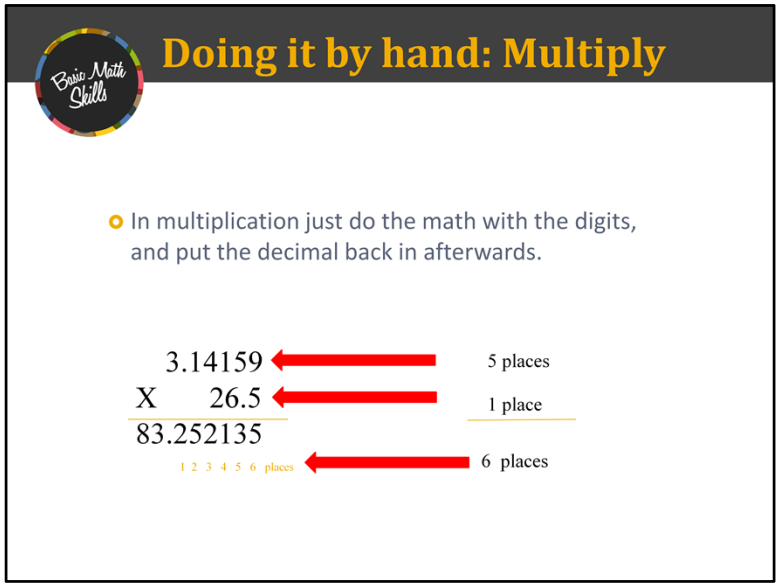
Adding and Subtracting Decimals

Work these two pages quickly with your calculator.
Ignore the fractions.

- LA 10 Add Decimals
- LA 11 Subtract Decimals

Add Decimals
Convert the fraction to a decimal and record in the following row. Use your calculator to add the two decimals.

Fraction	Converted to Decimal	+	Fraction	Converted to Decimal	=	Answer
2/3	0.666	+	2/6 (1/3)	0.333	=	0.999 (1)

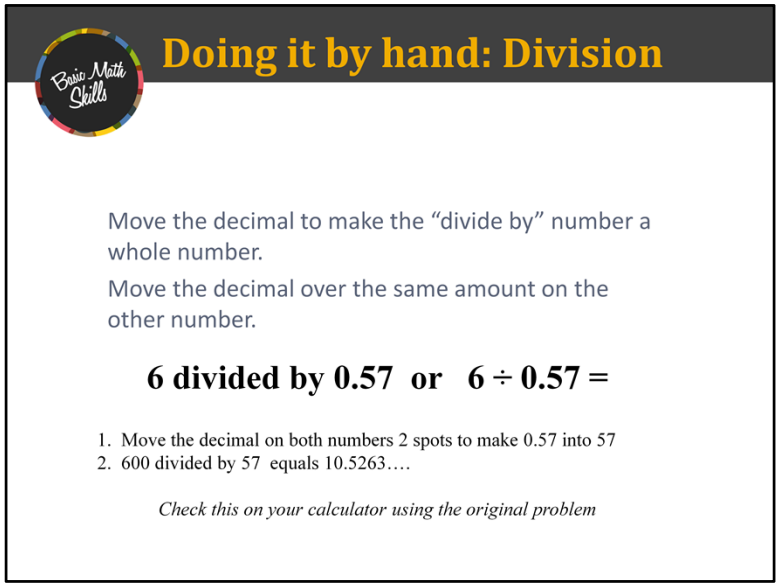


When multiplying, you don't need to keep the decimal points lined up, just do the math and ignore the decimal until the end. Your final answer will have the same number of digits past the decimal as the numbers you are multiplying. So, our first number has 5 places, our second number has 1 place, so the decimal will go 6 places from the last digit in our answer

Practice: Multiply Decimals

- Quickly practice LA 11 with your calculator

Decimal	x	Decimal	=	Decimal Product	=	Rounded Up or Down to 2 Decimal Places
23.5	x	17.35	=	407.725	=	407.73



When dividing by a decimal, move the decimal point all the way to the right to make the "divided by" number a whole number. At the same time, move the decimal over the same number on the number you are dividing. (Another way to look at it is that we are multiplying both sides of the division problem by 100)

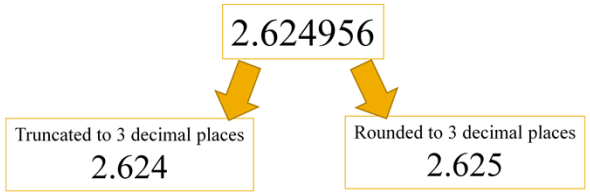
Practice: Decimal Division

- Quickly practice LA 12 Divide Decimals with your calculator

Numerator Convert to Decimal	Divided by	Denominator	Equals	
1/2 = 0.5	÷	2/3 = 0.666	0.750	

Truncate vs Round

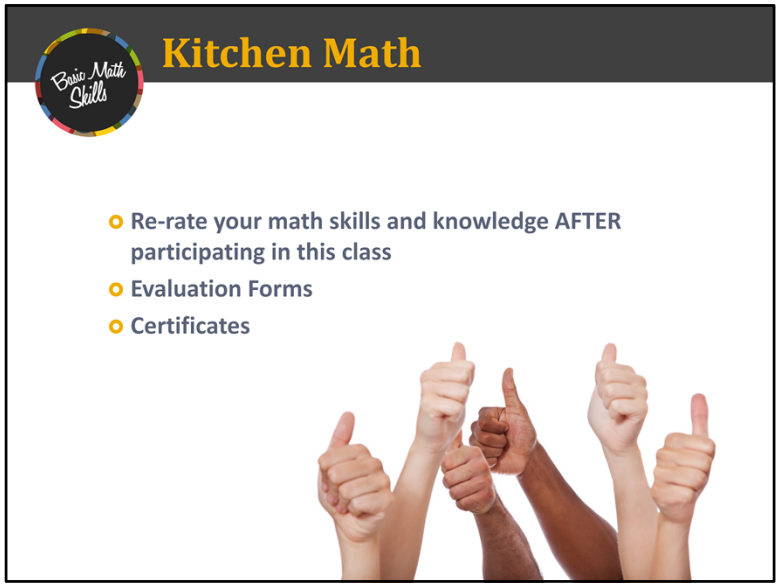
- Truncate means to shorten without rounding
- In kitchen math, it is preferable to round a decimal to 3 digits, not truncate.



Let's just do a quick review of what we covered. First we covered all the basic math operations with whole numbers. We also learned about fractions and decimals, including how to round a decimal, when rounding is not appropriate and how to reduce fractions. We learned how to switch back and forth between fractions and decimals. And we learned how to do all the basic math operations with fractions and decimals.

Putting it all together!

- Work on the word problems.
  - Work independently, but it's OK to check with your partner if you aren't sure.



Please look at your pre-activity rating and rate yourself again, now that you have taken this class. Hopefully you have gained some skill and confidence in the math you need to use in the kitchen.

After you've completed the self assessment, please complete the training evaluation form. I will collect your evaluation forms and hand out your certificates of completion.

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