Basic Math Review

Add, Subtract, Multiply, and Divide

Addition (+): Whole Numbers, Fractions, and Decimals
Subtraction (-): Whole Numbers, Fractions, and Decimals
Multiplication (x): Whole Numbers, Fractions, and Decimals
Division (÷): Whole Numbers, Fractions, and Decimals

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Lesson Plan:  Basic Math Review

Goals
This lesson will

- refresh and improve the participants’ math skills and knowledge in an effort to encourage the accurate and efficient use of the FBG calculations as a planning tool and encourage the use of handheld calculators.

Objectives
The successful participant will demonstrate the ability to

- operate a handheld calculator (scientific or regular pocket size);
- add, subtract, multiply, and divide whole numbers, fractions, and decimals, using a calculator whenever possible;
- convert fractions to decimals;
- convert decimals to fractions; and
- convert fractions and decimals to measurable units.

Instructor Notes

- This unit is designed to refresh the participant’s skills and knowledge of basic math principles (addition, subtraction, multiplication, and division) using a handheld calculator.
- Effective use of the FBG is dependent on a participant’s ability to perform simple math calculations.
- Use of a calculator is wise in that it is quick, efficient, and accurate, assuming that the information is entered correctly.
Instructor Notes
(continued)

- There may be too many calculations for some classes to complete. Try to assess the needs of the class as you move through the calculations, limiting them to what is necessary to accommodate the majority of the class. Do at least one calculation in each section as a class, aloud.
- Accept that there may be some participants who will have difficulty doing these calculations, even with the use of a calculator and the support of the instructor and other class members.
- Emphasize that most FBG calculations are simple formulas and may be done on a worksheet that will direct the participant as to what to do.
- Allow participants to decide whether to work as individuals or with others in small groups.
- The instructor should move about the room as participants work in an effort to identify those who may be having difficulty.
- Those participants having difficulty should be called upon to work through the class problems aloud as you coach them in this process to guarantee success. Some people have a fear of doing math problems, which makes the calculations more difficult to them than they really are.

Equipment

- Flip chart, whiteboard or blackboard, and markers or chalk
- Calculators for each participant

Time

6 hours 15 minutes

Time indicated refers to teaching points. The actual time necessary to complete the lesson will vary dependent on the learning activities and/or evaluation selected by the instructor, as well as the skills and knowledge of the participants.
### Overview of Lesson Plan: Basic Math Review

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Basic Math  | **1. Basic Math Review**  
*Time: 5 min.*  
- This unit of the course is designed to help participants review basic math calculations and to re-enforce the use of the calculator.  
- It is recommended that the initial emphasis be put on following the directions as to what to do, rather than trying to identify the rationale behind each calculation. It is hoped that participants will begin to understand the calculations once they have practiced them in class and in their kitchens. Regardless of whether or not they understand the theory behind a calculation, they can be successful if they can read and follow the directions.  
- Participants should keep this section of the course with the FBG in the area where calculations are performed. They may use it to coach themselves when performing calculations in their kitchens.  
- It is recommended that it be the participants’ choice as to whether to do the calculations as individuals or in small groups.  
- After each section, participants should answer “yes” or “no” to the question of whether or not they feel they can perform the calculations described. Ask them to identify areas in which they are having difficulty and focus on those areas.  
- The math functions to be practiced are addition, subtraction, multiplication, and division, using whole numbers, fractions, and decimals. |
| Self-Evaluation | **2. Self-Evaluation**  
*Time: 5 min. each at the beginning and end of the course*  
- The survey on the next page and on page 3 of the participant workbook asks participants to score themselves regarding their comfort level in performing various math calculations. When participants are finished, ask them to tally their score and place it on the survey on page 33 of the participant workbook in the space labeled “Beginning Total Score.” Collect the surveys and use them as an indicator of areas of the lesson where more focus may be needed.  
- At the end of this presentation participants will score themselves again. Collect the surveys and match the numbers of the two. This will give the instructor a measurement of what participants perceive they have learned.  
- Use this information to identify areas in which the participants had difficulty. This may influence the time spent on other sections of this course.  
- There is a similar activity at the beginning of the course, pages 1–8 of both the instructor manual and the participant workbook. Use one or the other, depending on whether this section is taught independently or in conjunction with the entire course. |
Self-Evaluation of Your Math Skills and Knowledge
Please complete this self-evaluation prior to training.
This self-evaluation may be found on page 3 of the participant workbook.

This section is designed to gather information from the participants at the beginning and end of the Basic Math Review presentation. Following the direction of the instructor, place an identification number in the square in the upper right-hand corner of this page and also on page 33 of the participant workbook.

Please evaluate your math skills using the following chart. Circle the number that best describes your comfort level for each math function and write it in the last column. Add scores to determine total score. Instruct participant to record the total in the space provided and on page 33 of the participant manual in the space labeled “Beginning Total Score.”

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Very Comfortable</th>
<th>Comfortable</th>
<th>Somewhat Comfortable</th>
<th>Not at All Comfortable</th>
<th>Score Yourself</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add, subtract, multiply, and divide whole numbers.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Add, subtract, multiply, and divide fractions.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Add, subtract, multiply, and divide decimals.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Convert decimals to fractions.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Convert fractions to decimals.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Convert fractions or decimals to measurable purchase units.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Reduce or simplify fractions.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Round decimals up or down.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Total Score
<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Time: 5 min.</em></td>
</tr>
<tr>
<td></td>
<td>▪ Ensure that each participant has a calculator.</td>
</tr>
<tr>
<td></td>
<td>▪ Ask each to identify whether or not the calculator is scientific.</td>
</tr>
<tr>
<td></td>
<td>▪ Direct participants to go to the picture of the type of calculator they have, review the list of parts, and identify those parts on the calculator they are using.</td>
</tr>
<tr>
<td></td>
<td>▪ These two pictures of the calculators may be found in the instructor manual on pages 6 and 7 and in the participant workbook on pages 5 and 6.</td>
</tr>
<tr>
<td></td>
<td>▪ Invite questions.</td>
</tr>
<tr>
<td>Examples of Addition, Subtraction, Multiplication and Division</td>
<td>4. Examples of Addition, Subtraction, Multiplication, and Division</td>
</tr>
<tr>
<td></td>
<td><em>Time: 5 min.</em></td>
</tr>
<tr>
<td></td>
<td>▪ In order to introduce the unit, review the examples of calculations emphasizing that these are the four categories of problems that will follow. Do not perform the calculations; simply identify them with the math function being discussed.</td>
</tr>
<tr>
<td></td>
<td>▪ Invite participants to quickly list some of the situations in which they use each type of calculation in their daily work.</td>
</tr>
<tr>
<td></td>
<td>▪ These word problems are repeated in each corresponding section of the presentation, and the answers may be found there.</td>
</tr>
<tr>
<td></td>
<td>▪ This activity may be found in the instructor manual on page 8 and in the participant workbook on page 7.</td>
</tr>
</tbody>
</table>
Identify the Parts of a Basic Calculator

If you have a scientific calculator, move to the next page. Find the following parts of the calculator on the picture and on the calculator you are using. If you have difficulty finding any of the keys, ask the instructor or another participant to help you find it.

Solar Panel:
Many calculators are solar-powered. When light shines on the solar panel, the calculator has the energy to work. If the solar panel is covered and protected from the light, it has no energy. After a period of inactivity, even in the light, the calculator turns off.

Display: There is a 0. (0 and decimal point) in the display until a number key is touched.

The Command Keys are:
+ Add
- Subtract
x Multiply
÷ Divide
= Equals
% Percent
M Memory Keys.

Number Keys: The keys are numbered 0–9. When you press one of these keys, the number appears on the display.

The ON/C key turns the calculator on and clears the display.
Identify the Parts of a Scientific Calculator

Function Keys:
- \( a \) Integer Input (whole number)
- \( b/c \) Numerator Input (fractions)
- \( \sqrt{ } \) Square Root
- \( x^2 \) Square
- \( \frac{ }{ } \) Fraction
- \( \% \) Percent
- \( \div \) Divide
- \( \times \) Multiply
- \( + \) Add
- \( - \) Subtract
- \( \rightarrow \) Convert Fraction \( \frac{ }{ } \) to Decimal
- \( \left( \right) \) Parentheses
- \( = \) Equals
- \( \pm \) Positive/Negative
- \( \text{MC} \) Memory Clear
- \( \text{MR} \) Memory Recall
- \( \text{M} + \) Memory Add
- \( \text{M} - \) Memory Subtract
- \( \text{X} \) Multiply
- \( \text{RND} \) Round
- \( \text{X} \rightarrow \text{Y} \) X to Y
- \( \text{Y} \rightarrow \text{X} \) Y to X
- \( \text{SIM} \) Simulate

Display:
- There is a 0. (0 and decimal point) in the display until a number key is touched.

ON KEY:
- The ON/C key turns the calculator on and clears the display.

Number Keys:
The keys are numbered 0–9. When you press one of these keys, the number appears on the display.

Solar Panel: Many calculators are solar-powered. When light shines on the solar panel, the calculator has the energy to work. If the solar panel is covered and protected from the light, it has no energy. After a period of inactivity, even in the light, the calculator turns off.
Learning to perform the calculations presented in the FBG is as simple as being able to read and follow directions and add, subtract, multiply, and divide whole numbers, fractions, and decimals. This activity may be found in the participant workbook on page 7.

**Add**

This breakfast line always has a basket of fresh fruit available. This morning there are 77 apples, 16 oranges, 23 bananas, and 12 peaches. Add the numbers together to determine how many children will be able to select fresh fruit.

The fixed labor cost for the day is $336.80. Today there were two substitutes paid $35.00 each. Add the $70.00 substitute cost to the fixed cost of labor per day to determine the total cost of labor today.

**Subtract**

150 servings of peaches were prepared. 123 students selected peaches. Subtract 123 from 150 to get the remainder of peaches left over.

Three-quarters (3/4) of a pan of brownies were left over from yesterday. One-quarter (1/4) of a pan was served today. Subtract the amount used today from the amount left over from yesterday to determine what portion of the pan is left.

**Multiply**

Mother pre-pays $10.00 for meals for each of her five children. Multiply 5 times $10.00 to find the total amount Mother paid.

There are 16 pieces of pizza on each sheet pan. You have 11 full sheet pans. Multiply 16 times 11 to determine the total number of pieces of pizza.

**Divide**

The food cost of a recipe of 100 peanut butter cookies is $12.63. What is the food cost for one cookie? Divide $12.63 by 100 cookies to find the food cost per cookie.

The children will have a CN labeled frozen fruit bar on Birthday Monday. There are 4 flavors they like equally, and 16 boxes are needed. How many of each flavor should be ordered? Divide 16 by 4 to determine the order.
### Fractions and Decimals

**Fractions and Decimals**

Whole numbers represent whole items, not parts of an item. Below is a picture of 3 apples. Three is a whole number describing the apples. None of the apples are cut into pieces; they are whole. Whole numbers are to the left of the decimal point.

3 is a whole number
3/1 apples written as a fraction
3.00 apples written as a decimal

Fractions and decimals are simply two ways to say the same thing. Fractions and decimals describe parts of something. They are used with and without whole numbers. Decimals are the numbers to the right of the decimal point. Below is a picture of one-half of an apple written in a fraction and a decimal. Both the fraction and the decimal say the same thing, one-half of an apple.

Fraction: 1/2 apple
Decimal: 0.5 apple

Sometimes whole numbers and fractions are used together to describe an item. This is called a compound fraction. “Compound” means putting 2 or more things together. Below is a picture of one and one-half apples. This is described with a whole number and a fraction or a decimal. Both the fraction and the decimal describe the same thing, one and one-half apples.

Whole Number: 1 apple
Fraction: 1/2 apple
Compound Fraction: 1-1/2 apples
Decimal: 1.5 apples
About Fractions and Decimals

Place value: Each number to the left and to the right of the decimal point has a place value. Those numbers to the left of the decimal point are whole numbers; those to the right of the decimal point are decimals or portions of the whole number.

Whether you realize it or not, you use decimals very well every day. United States currency is written in decimals. You already know how to add, subtract, multiply, and divide decimals. For example, if the number below were dollars, you would read it as “six hundred seventy-nine dollars and thirty-seven and one-half cents.” If you look below the numbers, you will see that the place values of these numbers are very familiar.

Whole Numbers  Decimals

<table>
<thead>
<tr>
<th>Whole Numbers</th>
<th>Decimals</th>
</tr>
</thead>
<tbody>
<tr>
<td>679.375</td>
<td></td>
</tr>
<tr>
<td>6 is spoken as six hundred and written as the whole number 600. As a fraction, 600 is represented as 600/1; as currency, six hundred dollars might be counted out using six one hundred dollar bills.</td>
<td></td>
</tr>
<tr>
<td>7 is spoken as seventy and written as the whole number 70. As a fraction, 70 is written as 70/1; as currency, seventy dollars might be counted out using seven ten dollar bills.</td>
<td></td>
</tr>
<tr>
<td>9 is spoken as nine and written as the whole number 9. As a fraction, 9 is written as 9/1; as currency, nine dollars might be counted out using nine one dollar bills.</td>
<td></td>
</tr>
<tr>
<td>Together the whole numbers become six hundred seventy-nine.</td>
<td></td>
</tr>
<tr>
<td>0.3 is spoken three-tenths. As a fraction, 0.3 is written as 3/10. As currency, 0.3 might be counted out using 3 dimes (3/10 of a dollar).</td>
<td></td>
</tr>
<tr>
<td>0.37 is spoken thirty-seven hundredths. As a fraction, 0.37 is written as 37/100; as currency, 0.37 might be counted out using three dimes and seven pennies (37/100 of a dollar) or using 37 pennies (37/100 of a dollar).</td>
<td></td>
</tr>
<tr>
<td>0.375 is spoken three hundred and seventy-five thousandths. As a fraction, 0.375 is written as 375/1000. 0.375 might be counted out using 37 pennies plus 1/2 penny (375/1000).</td>
<td></td>
</tr>
</tbody>
</table>
Basic Math Review

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Place Value of Whole Numbers and Decimals | 6. Place Value of Whole Numbers and Decimals  
*Time: 20 min.*  
- Emphasize that each position in a whole and/or decimal number has a place value.  
- Write some random numbers on the flip chart or board and ask participants to identify the place value of each number. If they hesitate, remind them that dollars and cents are written in whole numbers and decimals. |

LA 1: Place Values  
*Time: Variable*  
Participants should use the example number with the place values identified while performing this activity. Ask for volunteers to identify the correct answers to the class. Direct volunteers to emphasize the ending of their answers, i.e., ten(s) versus ten(th)s, hundred(s) versus hundred(th)s, etc.

This learning activity may be found in the participant workbook on page 10.

### Place Values

**Identify the place value of the number that is underlined in each of the following examples.**

This learning activity may be found in the participant workbook on page 10.

<table>
<thead>
<tr>
<th>Number</th>
<th>Place Value</th>
<th>Number</th>
<th>Place Value</th>
<th>Number</th>
<th>Place Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>73.88</td>
<td>Tens</td>
<td>8.888</td>
<td>Thousandths</td>
<td>65.01</td>
<td>Tens</td>
</tr>
<tr>
<td>152.1</td>
<td>Tenth(s)</td>
<td>204.9</td>
<td>Hundreds</td>
<td>733.737</td>
<td>Units</td>
</tr>
<tr>
<td>36723</td>
<td>Units</td>
<td>15769</td>
<td>Hundredths</td>
<td>1110</td>
<td>Hundreds</td>
</tr>
<tr>
<td>0.55</td>
<td>Hundredths</td>
<td>3.1</td>
<td>Units</td>
<td>113311</td>
<td>Thousandths</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Calculations| 7. Calculations  
*Time: 5 min.*  
- Emphasize the ease with which the math functions that follow may be performed.  
- Remind participants to keep this participant workbook in the area of their kitchen where they do calculations. |
### Convert Fractions to Decimals

If you have a scientific calculator, practice the use of the function keys that allow you to enter fractions and convert fractions to decimals.

**Example: To enter 1-1/2** (1 a 1 b/c 2 = 1-1/2)
- Numerator b/c Denominator
- 2 b/c 3 = 2/3

**Example: To convert the fraction to a decimal**
- Enter fraction.
- F D (Convert Fraction to Decimal)
- Fraction value is converted into a decimal value. (1/2 to 0.5)

It will be necessary to use fractions and decimals in many FBG calculations. It is simple to convert fractions to decimals and vice versa using *Table 6, Decimal Equivalents of Commonly Used Fractions*, in the Introduction section of the FBG, or you may choose to do this simple calculation.

To convert a fraction to a decimal is very simple. Divide the numerator (number on top) by the denominator (number on the bottom). For example, 1/8 = 1 divided by 8 = 0.125
## LA 2: Convert Fractions to Decimals

To convert a fraction to a decimal is very simple. Divide the numerator (number on top) by the denominator (number on the bottom).

This learning activity may be found in the participant workbook on page 11.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Numerator</th>
<th>Divided by (+)</th>
<th>Denominator</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>1</td>
<td>Divided by (+)</td>
<td>4</td>
<td>0.250</td>
</tr>
<tr>
<td>3/8</td>
<td>3</td>
<td>Divided by (+)</td>
<td>8</td>
<td>0.375</td>
</tr>
<tr>
<td>1/3</td>
<td>1</td>
<td>Divided by (+)</td>
<td>3</td>
<td>0.333</td>
</tr>
<tr>
<td>1/2</td>
<td>1</td>
<td>Divided by (+)</td>
<td>2</td>
<td>0.500</td>
</tr>
<tr>
<td>5/8</td>
<td>5</td>
<td>Divided by (+)</td>
<td>8</td>
<td>0.625</td>
</tr>
<tr>
<td>2/3</td>
<td>2</td>
<td>Divided by (+)</td>
<td>3</td>
<td>0.666</td>
</tr>
<tr>
<td>3/4</td>
<td>3</td>
<td>Divided by (+)</td>
<td>4</td>
<td>0.750</td>
</tr>
<tr>
<td>7/8</td>
<td>7</td>
<td>Divided by (+)</td>
<td>8</td>
<td>0.875</td>
</tr>
<tr>
<td>25/100</td>
<td>25</td>
<td>Divided by (+)</td>
<td>100</td>
<td>0.250</td>
</tr>
</tbody>
</table>

Check your answers using Table 6 on FBG page I-37.

Can you convert fractions to decimals?
Circle one: Yes, I can convert fractions to decimals. No, I need more practice.

### Topic Teaching Points

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Reduce or Simplify Fractions | 9. Reduce or Simplify Fractions  
*Time: 15 min.*  
This topic may be found on page 14 of the instructor manual and on page 12 of the participant workbook. |
Reduce or Simplify Fractions

The last two answers in the previous exercise are represented in Table 6, but the fractions are not. Why is the decimal for 25/100 the same as for 1/4, and the decimal for 75/100 the same as for 3/4? The answer is simple! When the numerator (the number on top) and the denominator (the number on the bottom) are both evenly divisible by the same number, the fraction may be reduced, or simplified.

We reduce or simplify a fraction to its lowest terms by finding the equivalent fraction in which the numerator and denominator are as small as possible.

- 50/100 is reduced or simplified to 1/2 by dividing both the numerator (50) and the denominator (100) by 50.
- To reduce or simplify a fraction to its lowest terms, divide the numerator and denominator by their greatest common factor.

Examples:

- For the fraction 25/100, 25 is the greatest common factor. Both numbers may be evenly divided by 25, so 25/100 is reduced or simplified to 1/4, the smallest numerator and denominator. \((25 \div 25) / (100 \div 25) = 1/4\)
- For the fraction 75/100, 25 is also the greatest common factor. Both numbers may be evenly divided by 25, so 75/100 is reduced or simplified to 3/4, the smallest numerator and denominator. \((75 \div 25) / (100 \div 25) = 3/4\)
- Let’s take a closer look at reducing fractions. When you look at the color-coded chart below, you see a row demonstrating each of the following fractions:
  A. 1 part of 3 parts (1/3)
  B. 2 parts of 6 parts (2/6)
  C. 3 parts of 9 parts (3/9)
  D. 4 parts of 12 parts (4/12)
  E. 5 parts of 15 parts (5/15)

- All of the fractions are the same size; they are all equal. Each can be reduced or simplified to 1/3 by dividing the numerator and denominator by the same number. You will note that 1 part of 3, 2 parts of 6, 3 parts of 9, 4 parts of 12, and 5 parts of 15 are all the same size, 1/3 of the whole.

| Each Fraction in the Left Column Can Be Reduced to 1/3: All Are Equal |
|--------------------------|---|---|---|---|---|---|
| 1/3                      | 1 | 2 | 3 |
| 2/6                      | 1 | 2 | 3 | 4 | 5 | 6 |
| 3/9                      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4/12                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 5/15                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

### LA 3: Reduce or Simplify Fractions

**Reduce or Simplify Fractions**

Use your calculator to reduce or simplify the following fractions.

This learning activity may be found in the participant workbook on page 13.

<table>
<thead>
<tr>
<th>Fraction to Be Reduced or Simplified</th>
<th>Divide Both the Numerator and the Denominator</th>
<th>By a Number That Will Yield the Smallest Numerator and Denominator</th>
<th>=</th>
<th>Reduced or Simplified Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>30/100</td>
<td>÷ 10</td>
<td></td>
<td>=</td>
<td>3/10</td>
</tr>
<tr>
<td>35/100</td>
<td>÷ 5</td>
<td></td>
<td>=</td>
<td>7/20</td>
</tr>
<tr>
<td>10/30</td>
<td>÷ 10</td>
<td></td>
<td>=</td>
<td>1/3</td>
</tr>
<tr>
<td>4/80</td>
<td>÷ 4</td>
<td></td>
<td>=</td>
<td>1/20</td>
</tr>
<tr>
<td>24/60</td>
<td>÷ 12</td>
<td></td>
<td>=</td>
<td>2/5</td>
</tr>
<tr>
<td>90/180</td>
<td>÷ 90</td>
<td></td>
<td>=</td>
<td>1/2</td>
</tr>
<tr>
<td>12/60</td>
<td>÷ 12</td>
<td></td>
<td>=</td>
<td>1/5</td>
</tr>
<tr>
<td>37/100</td>
<td>÷ There is no whole number that is evenly divisible into both the numerator and denominator.</td>
<td>= 37/100 This fraction cannot be reduced or simplified.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Can you reduce or simplify fractions?

Circle one: Yes, I can reduce or simplify fractions. No, I need more practice.

---

### LA 4: Convert Decimals to Fractions

**Convert Decimals to Fractions**

When you convert a decimal to a fraction,

- the decimal portion of the number becomes the numerator, and
- the denominator becomes 1, 10, 100, 1000, etc., depending on the place values in the decimal.

This learning activity may be found in the participant workbook on page 14.
Convert Decimals to Fractions

When you convert a decimal to a fraction, the decimal portion of the number becomes the numerator and the denominator becomes 1, 10, 100, 1000, etc., depending on the place values in the decimal.

Decimals Review:

- The first place to the right of the decimal is tenths place value. (0.1 is one-tenth or 1/10)
- The second place to the right of the decimal is hundredths place value. (0.01 is one-hundredth or 1/100)
- The third place to the right of the decimal is thousandths place value. (0.001 is one-thousandth or 1/1000)

Example: 0.125 becomes 125 over 1000, or 125/1000

- Notice that there are three place values in 0.125, which indicates thousandths.
- When the numerator and the denominator are both divided by 125, the reduced or simplified fraction becomes 1/8.

LA 4: Convert Decimals to Fractions

Use your calculator to convert the following decimals to fractions. Reducing or simplifying the fractions may be difficult. Do the easy ones first; then go back to the others as time permits.

This learning activity may be found in the participant workbook on page 14.

<table>
<thead>
<tr>
<th>Decimal to be converted to fraction</th>
<th>The numerator becomes</th>
<th>How many place values are in the numerator?</th>
<th>The denominator becomes</th>
<th>The converted fraction becomes</th>
<th>Reduce the fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.875</td>
<td>875</td>
<td>3</td>
<td>1000</td>
<td>875/1000</td>
<td>(125) 7/8</td>
</tr>
<tr>
<td>0.75</td>
<td>75</td>
<td>2</td>
<td>100</td>
<td>75/100</td>
<td>(25) 3/4</td>
</tr>
<tr>
<td>0.666</td>
<td>666</td>
<td>3</td>
<td>1000</td>
<td>666/1000</td>
<td>(333) 2/3*</td>
</tr>
<tr>
<td>0.625</td>
<td>625</td>
<td>3</td>
<td>1000</td>
<td>625/1000</td>
<td>(125) 5/8</td>
</tr>
<tr>
<td>0.5</td>
<td>5</td>
<td>1</td>
<td>10</td>
<td>5/10</td>
<td>(5) 1/2</td>
</tr>
<tr>
<td>0.33</td>
<td>33</td>
<td>2</td>
<td>100</td>
<td>33/100</td>
<td>(33) 1/3*</td>
</tr>
<tr>
<td>0.375</td>
<td>375</td>
<td>3</td>
<td>1000</td>
<td>375/1000</td>
<td>(125) 3/8</td>
</tr>
<tr>
<td>0.25</td>
<td>25</td>
<td>2</td>
<td>100</td>
<td>25/100</td>
<td>(25) 1/4</td>
</tr>
</tbody>
</table>

Check your answers using Table 6 on FBG page I-37.

Can you convert decimals to fractions?
Circle one: Yes, I can convert decimals to fractions. No, I need more practice.

* These two numbers do not divide into 1000 or 100 evenly; there is 1 left over. The 3 and the 6 are known as repeating numbers. Even though they are not evenly divisible, they are accepted as 1/3 and 2/3.
Addition (+): Whole Numbers, Fractions, and Decimals

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Addition: Whole Numbers, Fractions, and Decimals | 11. Add Whole Numbers, Fractions, and Decimals  
This topic may be found in the instructor manual on pages 17–20 and in the participant workbook on pages 15–17.  
LA 5–8, Addition: Whole Numbers, Fractions, and Decimals  
**Time: 1 hour**  
- Review the introduction of each specific calculation: whole numbers, fractions, or decimals.  
- Allow participants to perform the learning activity as individuals or in small groups, as you move about the room answering questions and helping individual participants who appear to need support.  
If participants seem confused, stop and work a calculation on the board, or direct participants as to what should be entered into the calculator. These learning activities begin in the participant workbook on page 15. |

LA 5: Add (+) Whole Numbers

This learning activity may be found in the participant workbook on page 15.

1. 435 + 15  
2. 375 + 60  
3. 2030 + 45  
4. 179 + 16

| 450 | 485 | 1720 | 19,090 |
| 920 | 3795 | 19,285 |

Can you add whole numbers?  
Circle one: Yes, I can add whole numbers. No, I need more practice.

Add (+) Fractions

When adding fractions with a **common denominator**, simply add the numerators (numbers on top) and put the answer over the denominator (number on the bottom). If you want to convert to decimals, divide the numerator by the denominator to get the decimal equivalent.

- 1/16 plus 7/16 plus 4/16 equals 12/16 or 3/4 reduced or 0.75 converted to decimals
- 1/2 plus 3/2 plus 2/2 equals 6/2 or 3/1 reduced or 3.00 converted to whole numbers and decimals
Add (+) Fractions
(continued)

When the fractions do not have a common denominator, it is not possible to add them until they are converted to the (lowest) common denominator. It is not possible to add 1/2 plus 1/4 plus 1/8 because the denominators in each fraction are different. In order to add these fractions, first we must convert them so they have a common denominator.

Since one of the denominators is 8, and 8 is divisible by 2 and by 4, the other denominators, we must convert each of the fractions to the common denominator 8.

- To convert 1/2 to a fraction having a denominator of 8, do the following:
  A. Divide the new denominator, 8, by the old denominator, 2. (8 ÷ 2 = 4)
  B. Multiply both the old numerator and denominator (1/2) by 4 to get the new fraction.

\[
\frac{4 \times 1}{4 \times 2} = \frac{4}{8}
\]

therefore 1/2 equals 4/8

- To convert 1/4 to a fraction having a denominator of 8, do the following:
  A. Divide the new denominator, 8, by the old denominator, 4. (8 ÷ 4 = 2)
  B. Multiply both the old numerator and denominator (1/4) by 2 to get the new fraction.

\[
\frac{2 \times 1}{2 \times 4} = \frac{2}{8}
\]

therefore 1/4 equals 2/8

- Now that these three fractions have a common denominator (8), we can simply add the numerators together.

4/8 plus 2/8 plus 1/8 equals 7/8 or 0.875 converted to decimals
# LA 6: Add (+) Fractions

Add Fractions
Using the common denominator, restate the problem, solve it, and convert the fraction to its decimal equivalent.
This learning activity may be found in the participant workbook on page 16.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Common Denominator</th>
<th>Problem Restated With Common Denominator</th>
<th>Answer</th>
<th>Fraction Reduced</th>
<th>Decimal Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8 + 1/24</td>
<td>24</td>
<td>3/24 + 1/24</td>
<td>4/24</td>
<td>1/6</td>
<td>0.166</td>
</tr>
<tr>
<td>1/3 + 1/4</td>
<td>12</td>
<td>4/12 + 3/12</td>
<td>7/12</td>
<td>NA</td>
<td>0.583</td>
</tr>
<tr>
<td>3/15 + 4/10</td>
<td>30</td>
<td>6/30 + 12/30</td>
<td>18/30</td>
<td>3/5</td>
<td>0.6</td>
</tr>
<tr>
<td>2/3 + 2/6</td>
<td>6</td>
<td>4/6 + 2/6</td>
<td>6/6</td>
<td>1/1</td>
<td>1</td>
</tr>
<tr>
<td>3/25 + 73/100</td>
<td>100</td>
<td>12/100 + 73/100</td>
<td>85/100</td>
<td>17/20</td>
<td>0.85</td>
</tr>
<tr>
<td>1/10 + 15/100</td>
<td>100</td>
<td>10/100 + 15/100</td>
<td>25/100</td>
<td>1/4</td>
<td>0.25</td>
</tr>
<tr>
<td>7/8 + 6/16</td>
<td>16</td>
<td>14/16 + 6/16</td>
<td>20/16</td>
<td>1-1/4</td>
<td>1.25</td>
</tr>
</tbody>
</table>

**Can you add fractions?**
**Circle one:** Yes, I can add fractions.  No, I need more practice.
LA 7: Add (+) Decimals

Another way to do the same calculations is with decimals. When you add decimals with paper and pencil, it is important to line up the decimal points before adding columns. When you add decimals on a calculator, it is important to enter the decimal point in the proper place.

### Add Decimals

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

This learning activity may be found in the participant workbook on page 17.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Converted to Decimal</th>
<th>+</th>
<th>Fraction</th>
<th>Converted to Decimal</th>
<th>=</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3</td>
<td>0.666</td>
<td>+</td>
<td>2/6 (1/3)</td>
<td>0.333</td>
<td>=</td>
<td>0.999 (1)</td>
</tr>
<tr>
<td>3/25</td>
<td>0.12</td>
<td>+</td>
<td>73/100</td>
<td>0.73</td>
<td>=</td>
<td>0.85</td>
</tr>
<tr>
<td>1/10</td>
<td>0.10</td>
<td>+</td>
<td>15/100</td>
<td>0.15</td>
<td>=</td>
<td>0.25</td>
</tr>
<tr>
<td>7/8</td>
<td>0.875</td>
<td>+</td>
<td>3/8</td>
<td>0.375</td>
<td>=</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Can you add decimals?

Circle one: Yes, I can add decimals. No, I need more practice.

### LA 8: Word Problems, Addition (+)

1. The fixed labor cost for the day is $336.80. Today there were two substitutes paid $35.00 each. Add the $70.00 substitute cost to the fixed cost of labor per day to determine the total cost of labor today.

   Sum total cost of labor today: $336.80 + $70.00 (2 x $35.00) = $406.80

2. This breakfast line always has a basket of fresh fruit available. This morning there are 77 apples, 16 oranges, 23 bananas, and 12 peaches. Add the numbers together to determine how many children will be able to select fresh fruit.

   Sum total pieces of fresh fruit: 77 + 16 + 23 + 12 = 128

3. In the storeroom there are 1/2 case of peaches, 1/3 case of pears, and 1/6 case of applesauce. Add the fractions of a case to determine the total number of cases of fruit.

   Sum total cases of fruit: 3/6 + 2/6 + 1/6 = 6/6 = 1 case

Can you add whole numbers, fractions, and decimals?

Do you need additional practice?
<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Subtraction: Whole Numbers, Fractions, and Decimals | 12. Subtract Whole Numbers, Fractions, and Decimals
This topic may be found in the instructor manual on pages 21–24 and in the participant workbook on pages 18–20. |

LA 9–12, Subtraction: Whole Numbers, Fractions, and Decimals

Time: 1 hour

- Review the introduction of each specific calculation: whole numbers, fractions, or decimals.
- Allow participants to perform the learning activity as individuals or in small groups, as you move about the room answering questions and helping individual participants who appear to need support.
- If participants seem confused, stop and work a calculation on the board, or direct participants as to what should be entered into the calculator.

These learning activities begin in the participant workbook on page 18.
Subtraction (-): Whole Numbers, Fractions, and Decimals

LA 9: Subtract (-) Whole Numbers

This learning activity may be found in the participant workbook on page 18.

1. 3600  2. 8007  3. 189  4. 1500
   -2850  -300  -15  -126
   750  7707  174  1374

Can you subtract whole numbers?
Circle one: Yes, I can subtract whole numbers.   No, I need more practice.

Subtract (-) Fractions

When subtracting fractions with a common denominator, simply subtract one numerator (number on top) from the other and put the answer over the common denominator (number on the bottom). If you want to convert to the decimal equivalent, divide the numerator by the denominator.

- 14/16 minus 7/16 equals 7/16 or 0.4375 converted to decimals
  14 - 7 = 7
  16  16
  7 ÷ 16 = 0.4375

- 3/4 minus 1/4 equals 2/4 or 1/2 or 0.50 converted to decimals
  3 - 1 = 2
  4  4
  2 ÷ 4 = 0.50

When the fractions do not have a common denominator, it is not possible to subtract one from the other until they are converted to a common denominator. It is not possible to subtract 1/8 from 1/4 because the denominator in each fraction is different. In order to subtract one from the other, convert both fractions to the (lowest) common denominator.

Since one of the denominators is 8, and 8 is divisible by 4, the other denominator, we must convert 1/4 to a fraction with a denominator of 8.

To convert 1/4 to a fraction having a denominator of 8, do the following:
- Divide the new denominator, 8, by the old denominator, 4. (8 ÷ 4 = 2)
- Multiply both the old numerator and denominator (1/4) by 2 to get the new fraction.
  \[ \frac{1 \times 2}{4 \times 2} = \frac{2}{8} \]
  1/4 equals 2/8

- Subtract 1/4 minus 1/8, which is the same as 2/8 minus 1/8, which equals 1/8 or 0.125 decimal equivalent.
  \[ \frac{2 - 1}{8} = \frac{1}{8} \]
  1 ÷ 8 = 0.125
### LA 10: Subtract (-) Fractions

**Subtract Fractions**
This learning activity may be found in the participant workbook on page 19.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Minus</th>
<th>Fraction</th>
<th>=</th>
<th>Fraction</th>
<th>Minus</th>
<th>Fraction</th>
<th>=</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3</td>
<td>-</td>
<td>2/6</td>
<td>=</td>
<td>4/6</td>
<td>-</td>
<td>2/6</td>
<td>=</td>
<td>2/6 or 1/3 or 0.33 in decimals</td>
</tr>
<tr>
<td>112/200</td>
<td>-</td>
<td>14/100</td>
<td>=</td>
<td>56/100</td>
<td>-</td>
<td>14/100</td>
<td>=</td>
<td>42/100 or 0.42 in decimals</td>
</tr>
<tr>
<td>8/10</td>
<td>-</td>
<td>15/100</td>
<td>=</td>
<td>80/100</td>
<td>-</td>
<td>15/100</td>
<td>=</td>
<td>65/100 or 0.65 in decimals</td>
</tr>
<tr>
<td>7/8</td>
<td>-</td>
<td>6/16</td>
<td>=</td>
<td>7/8</td>
<td>-</td>
<td>3/8</td>
<td>=</td>
<td>4/8 or 1/2 or 0.5 in decimals</td>
</tr>
</tbody>
</table>

Can you subtract fractions?
Circle one: Yes, I can subtract fractions. No, I need more practice.

### LA 11: Subtract (-) Decimals

Another way to do the same calculations is with decimals. Convert the fractions to decimals by dividing the numerator by the denominator and then subtract. When you subtract decimals, it is important to line up the decimal points. When you subtract on a calculator, it is important to enter the decimal point in the proper place. Compare the answers in this exercise to the answers in the exercise above.

**Subtract Decimals**
Use your calculator to subtract decimals.
This learning activity may be found in the participant workbook on page 20.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Divide Numerator by Denominator</th>
<th>Minus</th>
<th>Fraction</th>
<th>Divide Numerator by Denominator</th>
<th>=</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3</td>
<td>2 ÷ 3 = 0.66</td>
<td>-</td>
<td>2/6</td>
<td>2 ÷ 6 = 0.33</td>
<td>=</td>
<td>0.33</td>
</tr>
<tr>
<td>112/200</td>
<td>112 ÷ 200 = 0.56</td>
<td>-</td>
<td>14/100</td>
<td>14 ÷ 100 = 0.14</td>
<td>=</td>
<td>0.42</td>
</tr>
<tr>
<td>8/10</td>
<td>8 ÷ 10 = 0.80</td>
<td>-</td>
<td>15/100</td>
<td>15 ÷ 100 = 0.15</td>
<td>=</td>
<td>0.65</td>
</tr>
<tr>
<td>7/8</td>
<td>7 ÷ 8 = 0.875</td>
<td>-</td>
<td>6/16</td>
<td>6 ÷ 16 = 0.375</td>
<td>=</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Can you subtract decimals?
Circle one: Yes, I can subtract decimals. No, I need more practice.
LA 12: Word Problems, Subtraction (-)

1. The total cash receipts for the day were $105.00. A student moving from the district requires a refund of $20.00 for unused prepaid meals. Subtract $20.00 from $105.00 to get the remainder of the day’s cash receipts.

Remainder of the cash receipts: ___$105.00 - $20.00 = $85.00

2. 150 servings of peaches were prepared. 123 students selected peaches. Subtract 123 from 150 to get the remainder of peaches left over.

Remainder of the peaches: ___150 – 123 = 27 peaches

3. Three-quarters (3/4) of a pan of brownies were left over from yesterday. One-quarter (1/4) of a pan was served today. Subtract the amount used today from the amount left over from yesterday to determine what portion of the pan is left.

Remainder of a pan of brownies: ___3/4 – 1/4 = 1/2 pan left

Can you subtract whole numbers, fractions, and decimals?
Do you need additional practice?

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Rounding Procedures Versus Truncating | 13. Rounding Procedures Versus Truncating  

*Time: 15 min.*

This topic may be found in the instructor manual on page 24 and in the participant workbook on page 21. |

LA 13: Rounding Procedures Versus Truncating  

*Time: Variable*  

- Explain rounding procedures.  
  A. When the number is 5 or over, round up.  
  B. When the number is under 5, round down.  
- Remind participants that the above are the general rules for rounding decimals up and down. There are exceptions:  
  A. When determining the amount of food to buy or order, you always round the final answer up.  
  B. When determining how much to credit a portion of food, you always round the final answer down.  
- Truncating: For calculations with multiple steps, only the final answer should be rounded. The results for the intermediate steps should be truncated or "cut off." For example, in a multiple-step calculation, the result was 125.7418571234. To truncate to the third decimal place (thousandths), "cut off" all numbers after the third decimal place to yield the answer of 125.741. If you are using a calculator, truncated numbers will be automatically used for intermediate steps.  
- Truncating will be practiced in LA 15 and LA 16. |
# LA 13: Rounding Procedures

## Rounding Procedures

<table>
<thead>
<tr>
<th>Rounded to</th>
<th>End #</th>
<th>5 or Over or Under 5?</th>
<th>Round Up or Round Down?</th>
</tr>
</thead>
<tbody>
<tr>
<td>103.7359682</td>
<td>2</td>
<td>Under 5</td>
<td>Round Down</td>
</tr>
<tr>
<td>103.735968</td>
<td>8</td>
<td>5 or Over</td>
<td>Round Up</td>
</tr>
<tr>
<td>103.73597</td>
<td>7</td>
<td>5 or Over</td>
<td>Round Up</td>
</tr>
<tr>
<td>103.7360</td>
<td>0</td>
<td>Under 5</td>
<td>Rounding Not Required</td>
</tr>
<tr>
<td>103.736</td>
<td>6</td>
<td>5 or Over</td>
<td>Round Up</td>
</tr>
<tr>
<td>103.74</td>
<td>4</td>
<td>Under 5</td>
<td>Round Down</td>
</tr>
<tr>
<td>103.7</td>
<td>7</td>
<td>5 or Over</td>
<td>Round Up</td>
</tr>
<tr>
<td>104.0</td>
<td>0</td>
<td>Under 5</td>
<td>Rounding Not Required</td>
</tr>
</tbody>
</table>

## Multiplication (x): Whole Numbers, Fractions, and Decimals

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Multiplication of Whole Numbers, Fractions, and Decimals | 14. Multiply Whole Numbers, Fractions, and Decimals
|                                             | This topic may be found in the instructor manual on pages 25–28 and in the participant workbook on pages 22–25. |
|                                             | **LA 14 –17, Multiplication: Whole Numbers, Fractions, and Decimals**            |
|                                             | **Time: 1 hour**                                                                |
|                                             | - Review the introduction of each specific calculation: whole numbers, fractions, or decimals. |
|                                             | - Allow participants to perform the learning activity as individuals or in small groups, as you move about the room answering questions and helping individual participants who appear to need support. |
|                                             | - If participants seem confused, stop and work a calculation on the board, or direct participants as to what should be entered into the calculator. |
|                                             | These learning activities begin on page 22 of the participant workbook.           |
**LA 14: Multiply (x) Whole Numbers**

1. 816 x 9 = 7344
2. 443 x 18 = 7974
3. 2030 x 485 = 984,550
4. 179 x 1720 = 307,880

Can you multiply whole numbers?

Circle one: Yes, I can multiply whole numbers. No, I need more practice.

**Multiply (x) Fractions**

When you multiply fractions, simply multiply the numerators (numbers on top) and put the answer over the multiplied denominators (numbers on the bottom). If you want to convert to decimals, divide the numerator by the denominator to get the decimal equivalent.

- 1/2 times 1/4 equals (1 times 1) over (2 times 4) equals 1/8 converted to decimals is 0.125

\[
\frac{1}{2} \times \frac{1}{4} = \frac{1}{8} = 0.125
\]

- 1/3 times 4/10 equals (1 times 4) over (3 times 10) equals 4/30 converted to decimals is 0.133

\[
\frac{1}{3} \times \frac{4}{10} = \frac{4}{30} = 0.133
\]

**LA 15: Multiply (x) Fractions**

<table>
<thead>
<tr>
<th>Fraction</th>
<th>x</th>
<th>Fraction</th>
<th>=</th>
<th>Fraction</th>
<th>Reduced</th>
<th>= Decimal Truncated to Three Decimal Places</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3</td>
<td>x</td>
<td>2/6</td>
<td>=</td>
<td>4/18</td>
<td>2/9</td>
<td>2/9 = 0.2222 or truncated to 0.222</td>
</tr>
<tr>
<td>56/100</td>
<td>x</td>
<td>1/3</td>
<td>=</td>
<td>56/300</td>
<td>14/75</td>
<td>14/75 = 0.1866 or truncated to 0.186</td>
</tr>
<tr>
<td>8/10</td>
<td>x</td>
<td>15/100</td>
<td>=</td>
<td>120/1000</td>
<td>6/50</td>
<td>6/50 = 0.120</td>
</tr>
<tr>
<td>7/8</td>
<td>x</td>
<td>1/2</td>
<td>=</td>
<td>7/16</td>
<td>NA</td>
<td>0.4375 or truncated to 0.437</td>
</tr>
</tbody>
</table>

Can you multiply fractions?

Circle one: Yes, I can multiply fractions. No, I need more practice.
Multiply (x) Decimals

Another way to do the same calculations is with decimals. Convert the fractions to decimals by dividing the numerator by the denominator and then multiply.

When you multiply decimals, treat the numbers just as if they were whole numbers.

- Line up the numbers on the right; it is not necessary to line up the decimal points.
- Start on the right, and multiply each digit in the top number by each digit in the bottom number, just as with whole numbers.
- Add the products.
- Place the decimal point in the answer by starting at the right and moving a number of places equal to the sum of the decimal places in both numbers multiplied.

\[
\begin{array}{c}
237.44 \quad 2 \text{ decimal places} \\
\times 19.5 \quad 1 \text{ decimal place} \\
118720 \\
213696 \\
23744 \\
4630080 = 4,630.080 \ (3 \text{ decimal places})
\end{array}
\]

LA 16: Multiply (x) Decimals

Multiply Decimals
Convert each fraction to the decimal equivalent; then multiply and truncate to three decimal places. Compare each answer to the answer from the previous learning activity “Multiply Fractions.” Find these answers in the last column of the table below. The purpose of including these answers is to demonstrate that both methods yield the same answers.

This learning activity may be found in the participant workbook on page 24.

<table>
<thead>
<tr>
<th>Fraction Converted to Decimal</th>
<th>x</th>
<th>Fraction Converted to Decimal</th>
<th>=</th>
<th>Product</th>
<th>=</th>
<th>Truncate to Three Decimal Places</th>
<th>=</th>
<th>Answers From the Previous Learning Activity, Multiply Fractions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3 to 0.666</td>
<td>x</td>
<td>2/6 to 0.333</td>
<td>=</td>
<td>0.221778</td>
<td>=</td>
<td>0.221</td>
<td>=</td>
<td>2/9 = 0.2222 or truncated to 0.222</td>
</tr>
<tr>
<td>56/100 to 0.56</td>
<td>x</td>
<td>1/3 to 0.333</td>
<td>=</td>
<td>0.18648</td>
<td>=</td>
<td>0.186</td>
<td>=</td>
<td>14/75 = 0.1866 or truncated to 0.186</td>
</tr>
<tr>
<td>8/10 to 0.8</td>
<td>x</td>
<td>15/100 to 0.15</td>
<td>=</td>
<td>0.12</td>
<td>=</td>
<td>NA</td>
<td>=</td>
<td>6/50 = 0.120</td>
</tr>
<tr>
<td>7/8 to 0.875</td>
<td>x</td>
<td>1/2 to 0.5</td>
<td>=</td>
<td>0.4375</td>
<td>=</td>
<td>0.437</td>
<td>=</td>
<td>0.4375 or truncated to 0.437</td>
</tr>
</tbody>
</table>

Can you multiply decimals?
Circle one: Yes, I can multiply decimals.   No, I need more practice.
LA 16: Multiply Decimals
(continued)

Multiply Decimals
Let’s try a few more with whole numbers. Instead of truncating these, 
round them up or down based on the general rules of rounding. 
This learning activity may be found in the participant workbook on page 24.

<table>
<thead>
<tr>
<th>Decimal</th>
<th>x</th>
<th>Decimal</th>
<th>=</th>
<th>Decimal Product</th>
<th>=</th>
<th>Rounded Up or Down to 2 Decimal Places</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.5</td>
<td>x</td>
<td>17.35</td>
<td>=</td>
<td>407.725</td>
<td>=</td>
<td>407.73</td>
</tr>
<tr>
<td>114.56</td>
<td>x</td>
<td>2.333</td>
<td>=</td>
<td>267.26848</td>
<td>=</td>
<td>267.27</td>
</tr>
<tr>
<td>8.8</td>
<td>x</td>
<td>44.15</td>
<td>=</td>
<td>388.52</td>
<td>=</td>
<td>388.52</td>
</tr>
<tr>
<td>1703.875</td>
<td>x</td>
<td>3.5</td>
<td>=</td>
<td>5963.5625</td>
<td>=</td>
<td>5963.56</td>
</tr>
</tbody>
</table>

LA 17: Word Problems, Multiplication (X)

1. Mother pre-pays $10.00 for meals for each of her five children. Multiply 5 times $10.00 to find the total amount Mother paid.
   Mother paid: ______$50.00________________________________________________

2. There are 16 pieces of pizza on each sheet pan. You have 11 full sheet pans. Multiply 16 times 11 to determine the total number of pieces of pizza.
   Total number of pieces of pizza: ____176 pieces of pizza____________________

3. Four cases of six No. 10 cans of yams were delivered. Multiply 4 cases times 6 cans per case to determine the number of cans of yams delivered.
   Total cans of yams: ____24 No. 10 cans _________________________________

4. The recipe calls for 1/2 c of sugar. You are making half of the recipe. How much sugar do you need? (1/2 x 1/2 c)
   Sugar needed: _______1/4 c ___________________________________________

5. The recipe calls for 0.5 c of sugar. You are making half of the recipe. How much sugar do you need? (0.50 x 0.50 c)
   Sugar needed: _______0.25 c __________________________________________

Can you multiply whole numbers, fractions, and decimals? 
Do you need additional practice?
# Division (÷): Whole Numbers, Fractions, and Decimals

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
</table>
| Division: Whole Numbers, Fractions, and Decimals | 15. Divide Whole Numbers, Fractions, and Decimals  
*Time: 1 hour*  
This topic may be found in the instructor manual on pages 29–33 and in the participant workbook on page 26. |
|                            | LA 18–21, Division: Whole Numbers, Fractions, and Decimals  
*Time: Variable*  
- Review the introduction of each specific calculation: whole numbers, fractions, or decimals.  
- Allow participants to perform the learning activity as individuals or in small groups, as you move about the room answering questions and helping individual participants who appear to need support.  
- If participants seem confused, stop and work a calculation on the board, or direct participants as to what should be entered into the calculator.  
These learning activities begin in the participant workbook on page 26. |

## LA 18: Divide Whole Numbers (÷)

\[
\begin{array}{cccc}
1 & 35 & 14035 & 2 & 137 \div 3151 & 3 & 45 \div 9 = 5 & 4 & 672 \div 12 = 56
\end{array}
\]

### Adding Decimal Points to Complete the Calculation

In the calculations you just completed, the dividend was equally divisible by the divisor. This is not always true. Sometimes the quotient (answer) will have a decimal and/or a remainder. To continue a division problem beyond whole numbers, place a decimal point and one or more zeros after the whole number. Place a decimal point in the quotient directly above the one in the dividend. When you divide using a calculator, the calculator will take the division to the decimal point automatically until the numbers terminate or repeat.

\[
\begin{array}{c}
0.0253 \\
0.00253
\end{array}
\]

**Can you divide whole numbers?**  
Circle one:  
Yes, I can divide whole numbers.  
No, I need more practice.
LA 18: Divide Whole Numbers
(continued)

Divide Whole Numbers
This learning activity may be found in the participant workbook on page 27.

<table>
<thead>
<tr>
<th>Dividend</th>
<th>Divided by</th>
<th>Divisor</th>
<th>Equals</th>
<th>Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>÷</td>
<td>4</td>
<td>=</td>
<td>16.75</td>
</tr>
<tr>
<td>929</td>
<td>÷</td>
<td>8</td>
<td>=</td>
<td>116.125</td>
</tr>
<tr>
<td>1,074</td>
<td>÷</td>
<td>112</td>
<td>=</td>
<td>9.5892857 rounded to 9.589</td>
</tr>
<tr>
<td>1</td>
<td>÷</td>
<td>5</td>
<td>=</td>
<td>0.2</td>
</tr>
<tr>
<td>3,000*</td>
<td>÷</td>
<td>4,000*</td>
<td>=</td>
<td>0.75</td>
</tr>
<tr>
<td>(3)</td>
<td>(÷)</td>
<td>(4)</td>
<td>(=)</td>
<td>(0.75)</td>
</tr>
</tbody>
</table>

Can you divide whole numbers?
Circle one: Yes, I can divide whole numbers. No, I need more practice.

*When both the dividend and the divisor end in zero(s), the calculation may be simplified by removing equal numbers of zeros from each.

Divide (÷) Fractions
Dividing a fraction by a fraction may be done in one of two ways. Use the method easiest for you. Both methods yield the same answer.

1. To divide 1/2 (the dividend) by 3/4 (the divisor), multiply diagonally.

   \[
   \frac{1}{2} \times \frac{3}{4} = \frac{3}{8} \text{ or } \frac{2}{3}
   \]

   The numerator is the product of (1 x 4) and the denominator is the product of (2 x 3). The answer (quotient) becomes 4/6, reduced to 2/3.

2. Or invert the divisor fraction and multiply both numbers going across.

   \[
   \frac{1}{2} \times \frac{4}{3} = \frac{1 \times 4}{2 \times 3} = \frac{4}{6} \text{ or } \frac{2}{3}
   \]

   The divisor fraction has been inverted (turned upside down); 3/4 becomes 4/3. The numerator multiplied by the numerator (1 x 4 = 4) becomes the numerator of the quotient. The denominator multiplied by the denominator becomes the denominator of the quotient (2 x 3 = 6). The quotient becomes 4/6, which may be reduced to 2/3.
LA 19: Divide (÷) Fractions

**Divide Fractions**

Divide the following fractions and convert the answer to a decimal.
This learning activity may be found in the participant workbook on page 28.

<table>
<thead>
<tr>
<th>Numerator</th>
<th>Divided by</th>
<th>Denominator</th>
<th>Equals</th>
<th>Converted to Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>÷</td>
<td>2/3</td>
<td>3/4</td>
<td>0.75</td>
</tr>
<tr>
<td>25/100</td>
<td>÷</td>
<td>1/4</td>
<td>100/100</td>
<td>1</td>
</tr>
<tr>
<td>6/13</td>
<td>÷</td>
<td>1/2</td>
<td>12/13</td>
<td>0.923</td>
</tr>
<tr>
<td>4/10</td>
<td>÷</td>
<td>1/8</td>
<td>32/10</td>
<td>3.2</td>
</tr>
<tr>
<td>16/36</td>
<td>÷</td>
<td>3/4</td>
<td>64/108 or 16/27 reduced</td>
<td>0.593</td>
</tr>
</tbody>
</table>

Can you divide fractions?
Circle one: Yes, I can divide fractions. No, I need more practice.

**Divide (÷) Decimals**

When you divide decimals without a calculator, the divisor must always be changed to a whole number. Move the decimal points in the dividend and the divisor the same number of places to the right in order to do this. If there are not sufficient places in the dividend, zeros must be added.

1.395 divided by .05 becomes 139.5 divided by 5

1.3000 divided by .0556 becomes 13,000 divided by 556
## LA 20: Divide (÷) Decimals

### Divide Decimals

This learning activity may be found in the participant workbook on page 29.

<table>
<thead>
<tr>
<th>Dividend</th>
<th>Divisor</th>
<th>Dividend With Adjusted Decimal Point</th>
<th>÷</th>
<th>Divisor With Adjusted Decimal Point</th>
<th>Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.57</td>
<td>600</td>
<td>÷</td>
<td>57</td>
<td>10.53</td>
</tr>
<tr>
<td>439.53</td>
<td>1.88</td>
<td>43953</td>
<td>÷</td>
<td>188</td>
<td>233.79</td>
</tr>
<tr>
<td>0.495</td>
<td>5</td>
<td>No change, the divisor is a whole number.</td>
<td>÷</td>
<td>No change, the divisor is a whole number.</td>
<td>0.099</td>
</tr>
<tr>
<td>10.1</td>
<td>0.089</td>
<td>10,100</td>
<td>÷</td>
<td>89</td>
<td>113.48</td>
</tr>
<tr>
<td>87</td>
<td>6.3</td>
<td>870</td>
<td>÷</td>
<td>63</td>
<td>13.81</td>
</tr>
</tbody>
</table>

### Convert Fractions to Decimals and Divide

Below are the same problems you did in LA 19, Divide Fractions. Try converting the fractions to decimals and then do the division. Do you get the same answers as are listed in the far right column below? The reason for this activity is to demonstrate that the same answer will be achieved using fractions or decimals.

This learning activity may be found in the participant workbook on page 29.

<table>
<thead>
<tr>
<th>Numerator Convert to Decimal</th>
<th>Divided by</th>
<th>Denominator</th>
<th>Equals</th>
<th>Answers From LA 19 Fraction Converted to Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 = 0.5</td>
<td>÷</td>
<td>2/3 = 0.666</td>
<td>0.750</td>
<td>0.75</td>
</tr>
<tr>
<td>25/100 = 0.25</td>
<td>÷</td>
<td>1/4 = 0.25</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6/13 = 0.462</td>
<td>÷</td>
<td>1/2 = 0.5</td>
<td>0.924*</td>
<td>0.923*</td>
</tr>
<tr>
<td>4/10 = 0.4</td>
<td>÷</td>
<td>1/8 = 0.125</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>16/36 = 0.444</td>
<td>÷</td>
<td>3/4 = 0.75</td>
<td>.592*</td>
<td>0.593*</td>
</tr>
</tbody>
</table>

Can you divide decimals?

Circle one: Yes, I can divide decimals.  No, I need more practice.

*Rounding in the numerator and/or denominator results in small variances.
LA 21: Word Problems: Division (÷)

1. The food cost of a recipe of 100 peanut butter cookies is $12.63. What is the food cost for one cookie? Divide $12.63 by 100 cookies to find the food cost per cookie.

   Food cost per cookie: $0.1263

2. Lunch is over and there are 24 carrot curls left. Four staff members have not yet eaten. How many carrot curls may each staff member have? Divide 24 carrot curls by four to determine how many each will have for lunch.

   Carrot curls for each staff member: 6 carrot curls

3. The children will have a CN labeled frozen fruit bar on Birthday Monday. There are 4 flavors they like equally, and 16 boxes are needed. How many of each flavor should be ordered? Divide 16 by 4 to determine the order.

   Number of boxes of each flavor: 4 boxes

Can you divide whole numbers, fractions, and decimals?
Do you need additional practice?

<table>
<thead>
<tr>
<th>Topic</th>
<th>Teaching Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mystery Square</td>
<td>16. Mystery Square</td>
</tr>
<tr>
<td></td>
<td>This topic may be found in the instructor manual on page 33 and in the participant workbook on page 30.</td>
</tr>
<tr>
<td></td>
<td>LA 22: Mystery Square</td>
</tr>
<tr>
<td></td>
<td>Time: Variable</td>
</tr>
<tr>
<td></td>
<td>This section is focused on following directions. The calculations are simple. When the Mystery Square is done properly, the vertical, horizontal, and diagonal lines will all add up to 65.</td>
</tr>
<tr>
<td></td>
<td>This learning activity may be found in the participant workbook on page 31.</td>
</tr>
</tbody>
</table>

LA 22: Mystery Square

Step 1: Know how to use a calculator.
Knowing how to do the calculations is one important part of using the FBG. You have just reviewed many math calculations. Not all of them will be used in the FBG; however, if you were able to follow the directions and do the calculations, you will have no trouble with any of the examples in the FBG. Use of a calculator is encouraged. Even if you think you do not do well in math, if you enter the correct numbers using a calculator, you will get the answers right!

Step 2: Know how to follow directions.
The second important step is knowing how to follow directions. This course is built on worksheets that tell you exactly what to do. Read, enter numbers into the calculator, take your time, and you will be very comfortable with your answers.
The following activity is just for fun. Once you finish the 25 calculations, which are very simple, add the answers left to right, up and down, and diagonally. If all of your calculations are correct, each line will add up to the same number.

Practice math using a calculator to solve the problems. Put the answer below each calculation. When there are multiple calculations, complete the first and then complete the second, using the answer from the first.

Example: (55 - 4) ÷ 3 includes two calculations, (55 - 4 = 51) and (51 ÷ 3 = 17)
The answer to I-A is 17.

This learning activity may be found in the participant workbook on page 31.

<table>
<thead>
<tr>
<th></th>
<th>A.</th>
<th>B.</th>
<th>C.</th>
<th>D.</th>
<th>E.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>55 - 4 = 51</td>
<td>7 x 11 = 77</td>
<td>100 ÷ 4 = 25</td>
<td>8 x 9 = 72</td>
<td>5 ÷ 10 =</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>77 - 53 =</td>
<td>25 - 24 =</td>
<td>72 - 64 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.</td>
<td>24 - 1 = 23</td>
<td>14 - 9 =</td>
<td>7 x 10 = 70</td>
<td>7 x 20 = 140</td>
<td>80 ÷ 5</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>23 x 1 =</td>
<td>70 - 63 =</td>
<td>140 - 126 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.</td>
<td>3 x 8 = 24</td>
<td>6 x 6 = 36</td>
<td>39 - 26 =</td>
<td>200 - 100 = 100</td>
<td>11 + 11 =</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>24 ÷ 6 =</td>
<td>36 ÷ 6 =</td>
<td>100 ÷ 5 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV.</td>
<td>80 ÷ 4 = 20</td>
<td>144 ÷ 12 =</td>
<td>10 x 10 = 100</td>
<td>63 ÷ 3 =</td>
<td>33 - 3 = 30</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>20 - 10 =</td>
<td>100 - 81 =</td>
<td>30 ÷ 10 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V.</td>
<td>15 + 7 = 22</td>
<td>22 ÷ 11 = 2</td>
<td>100 ÷ 2 = 50</td>
<td>18 x 2 = 36</td>
<td>80 + 1 = 81</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>2 + 16 =</td>
<td>50 ÷ 2 =</td>
<td>36 ÷ 34 =</td>
<td>81 ÷ 9 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>18</td>
<td>25</td>
<td>2</td>
<td>9</td>
<td>65</td>
</tr>
</tbody>
</table>
Self-Evaluation of Your Math Skills and Knowledge
Please complete this self-evaluation once training has CONCLUDED.

Please re-evaluate your math skills using the following chart. Circle the number that best describes your comfort level for each math function and write it in the last column. Add scores to determine total score.

This self-evaluation may be found in the participant workbook on page 33.

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Very Comfortable</th>
<th>Comfortable</th>
<th>Somewhat Comfortable</th>
<th>Not at All Comfortable</th>
<th>Score Yourself</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add, subtract, multiply, and divide whole numbers.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Add, subtract, multiply, and divide fractions.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Add, subtract, multiply, and divide decimals.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Convert decimals to fractions.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Convert fractions to decimals.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Convert fractions or decimals to measurable purchase units.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Reduce or simplify fractions.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Round decimals up or down.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Ending Total Score

Beginning Total Score

Difference

Instructor Manual ■ 35
Self-Evaluation
(continued)

1. Do you feel comfortable with your math skills?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

2. Are there any areas in which you feel you need more help?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3. Do you think this was an important section of the course?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Additional Comments: