

# **Multiplying Whole Numbers and Proper Fractions – A Co-Teaching Lesson Plan**

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## **Co-Teaching Approaches**

A “(Y)” in front of the following list items indicates the approach is outlined in the lesson. An “(N)” in front of the following list items indicates the approach is not outlined in the lesson.

- (N) Parallel Teaching
- (Y) Team Teaching
- (Y) Station Teaching
- (Y) One Teach/One Observe
- (N) Alternative Teaching
- (Y) One Teach/One Assist

## **Subject**

Grade 5 Mathematics

## **Strand**

Computation and Estimation

## **Topic**

Solving single-step multiplication problems involving fractions

## **SOL**

- 5.6** The student will
- b) solve single-step practical problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction, with models.

## **Outcomes**

When given two single-step practical problems involving multiplication of a whole number limited to 12 or less and a proper fraction, the student will solve the problem.

## **Materials**

- Crayons/colored pencils
- Pencils
- Dry-erase materials (boards, markers, erasers)
- Cake for All homework sheet (attached)
- Independent Group activity sheet (attached)

## Vocabulary

*denominator, factors, fraction, multiplication, numerator, product, proper fraction, whole number*

## Co-Teacher Actions

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
Anticipatory Set	Team Teaching	<p>The GE and SE will each hold up a measuring cup. One will hold up a one-third measuring cup, and the other will hold up a one-cup measuring cup. Explain that Teacher 1 is making a recipe that Teacher 2 gave her. Teacher 1 needs to use one cup of sugar but only has this one-third measuring cup. How could Teacher 1 determine how many of her cups to use?</p> <p>Students will discuss in pairs and share their solutions with the class. What different ways did they use to determine the solution? (repeated addition or multiplication)</p> <p>GE will ask, “When have you heard of a similar type of problem in your life, or when might you?</p> <p>Set Learning Target: I can solve practical problems using multiplication of a whole number and a fraction. So I can (insert real life connections shared by students).</p>	<p>The SE and GE will each hold up a measuring cup. One will hold up a one-third measuring cup, and the other will hold up a one-cup measuring cup. Explain that Teacher 1 is making a recipe that Teacher 2 gave her. Teacher 1 needs to use one cup of sugar but only has this one-third measuring cup. How could she determine how many of her cups to use?</p> <p>Students will discuss in pairs and share their solutions with the class. What different ways did they use to determine the solution? (repeated addition or multiplication)</p> <p>SE will write the learning target on the board.</p> <p>SE will display the mathematics stations for the students on the board. Each student is assigned a group by having the students count off by threes. Explain to students that one of their independent assignments will be to view the videos on Google</p>

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			<p>classroom and practice using the activities that have been assigned on their classroom. A worksheet is attached for the Independent Group. Everyone that is a number 1 will start with SE, number 2 students will start with GE, and number 3 students will start in the independent station. The teacher will display a timer and set it for 30 minutes for station rotations.</p>
<p><b>Lesson Activities/ Procedures</b></p>	<p>Station Teaching</p>	<p>The teacher will present two problems:</p> <p><b>Problem 1</b></p> <p>Jacob is baking chocolate chip cookies. The recipe calls for three-fourths cup of sugar. Jacob wants to make eight batches. How many cups of sugar does he need?</p> <p>_____</p> <p>How can we help Jacob solve his problem using a picture model and numbers?</p> <p>Students will work to solve and model this problem. The GE will monitor student solutions and select at least three students to share their solutions justifying their process (choose one student who used repeated addition, one multiplication, and one with appropriate model/drawing to illustrate the situation). Record the solution strategies on a whiteboard or</p>	<p>The teacher will present two problems:</p> <p><b>Problem 1</b></p> <p>In the fridge, Hannah had five quarts of milk. She used three-fifths of this milk when she made a <i>huge</i> batch of oatmeal. How much milk did she use?</p> <p>Solve this problem using a picture model and numbers.</p> <p>Students will work to solve and model this situation. The SE will monitor student solutions and select at least three students to share their solutions justifying their process (choose one student who used repeated addition, one multiplication, and one with appropriate model/drawing to illustrate the situation). Record the solution strategies on a whiteboard or chart paper, and leave it accessible for students to see.</p>

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		<p>chart paper, and leave it accessible for students to see.</p> <p>Emphasize the vocabulary of “8 of <math>\frac{3}{4}</math> cup sugar” as the number expression is written.</p> <p><b>Problem 2</b></p> <p>The GE teacher needs 10 banners made. Each one takes two-fifths of a yard of red material. How much material is needed for the banners? Students must solve this two different ways. Have three students explain their solution strategies. Record for all students to see.</p> <p>Emphasize the vocabulary of “10 of <math>\frac{2}{5}</math> yard of material” as the number expression is recorded.</p>	<p>Emphasize the language of “<math>\frac{3}{5}</math> of 5 quarts were used” as the number expression is recorded.</p> <p><b>Problem 2</b></p> <p>The art teacher has 12 students in her fourth-grade class. One-third are girls. How many students are girls? Students must solve this <b>two</b> different ways. Have three students explain their solution strategies. Record for all students to see.</p> <p>Emphasize the language of “<math>\frac{1}{3}</math> of 12 students are girls” as the number expression is recorded.</p>
<b>Guided/ Independent Practice</b>	Team Teaching	<p>Throughout this activity, the GE will monitor the students while they work. Listen for the language they use, ask the “Why?” questions, refocus students, assist those who need additional help, and select students to share their thinking and solution process after each problem.</p> <p>Student pairs will discuss and solve the following by drawing a model/picture and showing the mathematical expressions:</p> <ol style="list-style-type: none"> <li>1. Mary is making 12 costumes for the</li> </ol>	<p>Throughout this activity, the SE will monitor the students while they work. Listen for the language they use, ask the “Why?” questions, refocus students, assist those who need additional help, and select students to share their thinking and solution process after each problem.</p> <p>Student pairs will discuss and solve the following by drawing a model/picture and showing the mathematical expressions:</p>

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		<p>school play. She needs <math>\frac{1}{3}</math> of a yard for each costume. How much fabric will she need for all 12 costumes?</p> <p>3. Miguel has 20 kilograms of cheese of which <math>\frac{2}{5}</math> is cheddar. How many kilograms of cheddar does Miguel have</p> <p>Have student pairs complete the remaining problems on the handout given at the independent station. Allow pairs to work through these problems.</p>	<p>2. Mrs. Hoyt is making 10 ornaments to decorate her tree. For each ornament she will need <math>\frac{1}{5}</math> of a toilet paper roll. How many toilet paper rolls will she need to make the ornaments?</p> <p>4. Mrs. Winn is preparing for a bike race. She rode her bike, making laps around her neighborhood. She biked a total of 20 miles this week. If a lap around her neighborhood is <math>\frac{2}{5}</math> of her full ride, how many miles is it around her neighborhood?</p>
<b>Closure</b>	Team Teaching	<p>Ask students, “What was our learning target for the day?”</p> <p>Students will indicate whether they believe they mastered the target (yes,</p>	<p>Ask students, “What strategies have you learned to find a fraction of a whole number?”</p>

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		thumbs-up; maybe, sideways; no, thumbs-down).	“Which do you think is easier to use?” “Why?” “Where can we use this skill in real life?”
<b>Formative Assessment Strategies</b>	Team Teaching	<b>Exit Ticket</b> Display for all to solve: The class has 40 bottles of glue. Of the bottles, $\frac{1}{8}$ are dried out. How many bottles of glue are dried out? Solve two different ways.	The SE will read the exit ticket to students.
<b>Homework</b>	Team Teaching	Cake For All (attached)	Same as GE.

### **Specially Designed Instruction**

- A flipped classroom approach will be used to pre-teach vocabulary and review fractions with students. The SE will videotape reviewing fraction vocabulary and showing models. Students with IEPs will view the lesson before the mathematics class begins. The video is viewed during intervention time or at the beginning of mathematics while other students may be working on other projects.
- All students are grouped randomly, so there is a mixture of skill levels in all groups. If a student seems to be struggling during the lesson, the teacher will decide whether to keep the student for the next group rotation.
- The vocabulary LINCing routine, while not used in this lesson, could help students develop a better understanding of the vocabulary words if they continue to struggle while recalling fraction vocabulary.
- Teachers could use manipulatives such as fraction strips to also help to teach this concept more explicitly.

### **Accommodations**

- Follow student’s IEP accommodations.
- Read aloud the exit ticket for some students.
- Have a copy of the exit ticket to display on the student’s desk.
- Allow students to use a calculator.
- Allow students to use manipulatives when working together or independently.

## Modifications

- Content could be modified to include multiplying whole numbers, but not fractions.

## Notes

- “Special educator” as noted in this lesson plan might be an EL teacher, speech pathologist, or other specialist co-teaching with a general educator.
- The co-teachers who developed this lesson plan received required professional development in the use of specialized instructional techniques which combine an explicit instructional routine with the co-construction of a visual device (graphic organizer). The *Vocabulary LINCing Routine* and its “LINC Tables” help students learn and remember terms and vocabulary through auditory and visual memory devices. These Content Enhancement Routines were developed at the Center for Research on Learning at the University of Kansas. Link: <http://www.kucri.org/sim/brochures/CEoverview.pdf>
- Other graphic organizers should be used by teachers who have not received professional development in the *LINCing Routine*. If Virginia teachers would like to learn the Content Enhancement Routines, contact your regional TTAC.
- Of the notes above, the first should be used in all plans. The next two should be used when one or more SIM content enhancement routines are incorporated into the lesson, both adjusted as appropriate to the routines used in this lesson.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

# Cake for All

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Miss Menke decided to make a cake for her brothers' birthday party. While making a guest list, Miss Menke realized she would need more than one cake! She will need four cakes to make sure all of the guests get a slice of cake.

Luckily, Miss Menke's granny shared her secret cake recipe. She is headed to the grocery store tonight. Your task: Can you help Miss Menke calculate the amount of ingredients needed for four birthday cakes?

Show your work. Explain using pictures and words.

## Granny's Secret Cake Recipe

2 eggs

$\frac{1}{2}$  cup of sugar

$\frac{1}{4}$  cup of brown sugar

$\frac{3}{4}$  cup of flour

$\frac{2}{3}$  cup of milk





