



GARDEN AND KITCHEN MATH

Garden

EST. TIME 45 minutes SEASON spring 

GRADE 4 | LESSON #14

? ESSENTIAL QUESTION(S)

- How can we multiply a recipe to serve many?
- How can we calculate how much produce to grow to accommodate a recipe?

MATERIALS

- Minnie's Diner: A Multiplying Menu* by Dayle Ann Dodds
- Clipboards (1 per every student)
- Pencils (1 per every student)
- Simple Salsa, There's a Chef in My Soup!**
- Handout: *Garden and Kitchen Math Worksheet*

Abc VOCABULARY

- Multiply, multiplier

ASSESSMENT

- Observational checklist



Use the lesson template to create your own and share with us!

PREPARATION (15 MINUTES)

To prepare for this lesson, gather materials and read *Minnie's Diner: A Multiplying Menu* by Dayle Ann Dodds to develop comprehension questions for read aloud.

TEACHER BACKGROUND

Farmers, gardeners, and chefs use math every day as they make crop plans, measure ingredients, scale orders up and down, and the like. Therefore, growing and cooking food provides students with meaningful opportunities to apply the mathematical practices they're learning in school, and to enjoy the results! To make more or less of a recipe (to adjust the yield), you need to know what the recipe conversion factor is. To do this, divide the original recipe yield by the desired yield. The desired yield and the original yield must be expressed the same unit of measurement.

LESSON DESCRIPTION

In this lesson, students will read *Minnie's Diner: A Multiplying Menu* to introduce the scenario of multiplying recipes. Then, students will use the recipe for Simple Salsa from *There's a Chef in My Soup!* and walk step-by-step through determining how much they will need to multiply the recipe by to serve all of the students in the class and how much of each ingredient they will need. Finally, students will estimate how many of each plant they will need to grow in order to make the recipe to serve all of the students in the class.

LEARNING OBJECTIVES

Content Learning Objectives

GPM.4.2 Calculate amounts of produce to grow in school garden.

Life Skills Learning Objectives

CLS.1 Students demonstrate problem solving and resolve conflict as a team.

ACADEMIC STANDARD CONNECTIONS

CCSS.MATH.CONTENT.4.OA.A.3

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCSS.ELA-LITERACY.W.4.2.D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

CULTIVATE CURIOSITY (10 MINUTES) *engage*

1. Read aloud *Minnie's Diner: A Multiplying Menu* to introduce the scenario of doubling the amount of food to prepare.
2. Explain to students that they are going to use a recipe for Simple Salsa and work together to **multiply** the quantities of the ingredients to accommodate the full class.


ROOT AROUND (10 MINUTES) *explore*

1. First, demonstrate for students how to determine what the **multiplier** should be for the recipe in order to provide a serving for each student.
2. Direct students to the first section of the Garden and Kitchen Math Worksheet handout to guide their thinking.

GROW UNDERSTANDING (10 MINUTES) *explain*

1. Next, challenge students to work in small groups at their tables to multiply each ingredient amount by the multiplier.
2. Direct students to the second section of the handout to guide their thinking.

OBSERVE THE FRUITS (10 MINUTES) *elaborate*

1. Lastly, challenge students to work independently to determine how much produce will be needed to create the recipe to serve all of the students.
2. Direct students to third section of the handout to guide their thinking.
3. When they have finished their calculations independently, provide time for students to share as a group and compare responses. Encourage a group dialogue to come to a final conclusion as a group.
4.  As students work together, acknowledge observed behaviors that align with the life skills learning objectives, such as demonstrating problem solving as a team. Also, use the observational checklist to assess students' current development of the life skills.

REFLECT (5 MINUTES) *evaluate*

1. Recognize specific students' behaviors that aligned with the community and personal life skills. Specifically, ask students to reflect on how they solved problems as a team.
2. Review with students:
 - What strategies did you use to figure out how many tomatoes we would need? Did anyone else use a different strategy?
 - What strategies did you use to figure out how many tomato plants we would need to plant? Did anyone else use a different strategy?



ADAPTING FOR INDOORS

In the case of inclement weather, this lesson in its entirety can occur inside the classroom.

CONNECTIONS TO KITCHEN LESSONS

In **Lesson #16: Planting for a Feast**, students will plant the produce planned for in this lesson. Then in **Grade 5 Kitchen Lesson #5: Fiesta Quesadillas with Simple Salsa and Holy Moly Guacamole** students use the produce they planted together. At this time, they can reflect on how accurately they estimated the yields when they planted.

POSSIBLE EXTENSIONS

Classroom: Have students write word problems about farmers and chefs calculating produce amounts.

GARDEN AND KITCHEN MATH WORKSHEET STUDENT NAME: _____ DATE: _____

Use this handout with the recipe *Simple Salsa* from *There's a Chef in My Soup!*

How much should we multiply the recipe by to serve all of the students in the class?

1. Look at your recipe. What is the approximate yield? _____ cup(s)
2. If one serving is 2 tablespoons and there are 16 tablespoons in a cup, how many servings are there in one cup? _____ servings

Show your work here:

3. How many servings does the recipe yield? _____ servings

Show your work here:

4. How many students are in the class? _____ students
5. What would you have to multiply the recipe by to ensure that there are at least enough servings for each student in the class? Round up to the nearest whole number _____

Show your work here:

How much of each ingredient will we need to create this recipe to serve all of the students? Simplify any measurements to larger units if possible. For example, 9 teaspoons can be simplified to 3 Tablespoons.

ORIGINAL RECIPE: MAKES _____ CUP(S). SERVES _____	X _____	MULTIPLIED RECIPE: MAKES _____ CUP(S). SERVES _____	SIMPLIFIED MEASUREMENT
• 2 medium tomatoes	X _____	_____ medium tomatoes	_____
• ½ teaspoon of salt	X _____	_____ teaspoons of salt	_____
• ½ teaspoon of minced garlic	X _____	_____ teaspoons of minced garlic	_____
• 1 tablespoon minced yellow onion	X _____	_____ tablespoons of minced yellow onion	_____
• 1 tablespoon minced green bell pepper	X _____	_____ tablespoons of minced green bell pepper	_____
• 1 tablespoon lime juice	X _____	_____ tablespoons of lime juice	_____
• ½ teaspoon of hot-pepper sauce	X _____	_____ teaspoons of hot-pepper sauce	_____

GARDEN AND KITCHEN MATH WORKSHEET CONTINUED

How much produce will we need to grow to create this recipe to serve all of the students?

1. If we assume that 1 garlic clove yields approximately $\frac{1}{2}$ teaspoon of minced garlic,
how many garlic cloves will we need? _____

Show your work here:

2. If we assume that 1 onion yields approximately 16 tablespoons of minced onion,
how many onions will we need? _____

Show your work here:

3. If we assume that 1 bell pepper yield approximately 8 tablespoons of minced bell pepper,
how many bell peppers will we need? _____

Show your work here:

4. Collect all of your answers on the list below.

Produce List:

_____ tomatoes

_____ garlic cloves (assuming 1 teaspoon minced = 1 fresh garlic clove)

_____ onions (assuming 1 tablespoon minced = $\frac{1}{16}$ of an onion)

_____ green bell peppers (assuming 1 tablespoon minced = $\frac{1}{8}$ bell pepper)

How many of each plant do you think we would need to plant to yield enough produce to create this recipe for all of the students in the class?

_____ tomato plants

_____ garlic plants

_____ onion plants

_____ green bell pepper plants