Lab Framework

Text: CORD

Unit number and title: Unit B – Naming Numbers in Different Ways

Short Description: This lab will require students to correctly identify ratios of ingredients in order to bake cookies. It will explore real life applications of decimals, percents, and ratios.

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Lab Title

The Cookie Test

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

  Are ratios, decimals and percentages really important to know and understand? The objective of this lab is to use what we know about the different ways to write numbers to determine the correct amounts of ingredients in chocolate chip cookies.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

  To understand this lab, students will need to know:
  - Vocabulary (listed below)
  - Special measuring tools for measuring out ingredients.

- **Vocabulary**
  - Ratio
  - Percent
  - Decimal

- **Materials List**

  Each group of three students will need the following ingredients in the proportions laid out for them in their recipe card:
  - 2 1/4 cups all-purpose flour
  - 1 teaspoon baking soda
  - 1 teaspoon salt
  - 1 cup (2 sticks) butter, softened
  - 3/4 cup granulated sugar
  - 3/4 cup packed brown sugar
  - 1 teaspoon vanilla extract
  - 2 large eggs
  - 2 cups (12-oz. pkg.) Semi-Sweet Chocolate chips
  - 1 cup chopped nuts

NOTE: Depending on who is in your class and what food allergies need to be addressed, certain ingredients (nuts, wheat flour) can be excluded or supplemented with a substitutionary ingredient.

- Each table will need a recipe card with different proportions of each ingredients (for example, one team will have a recipe with too much salt, another a recipe with too little baking soda, etc.). These will need to be prepared ahead of time.
- Baking materials
- Lab worksheet

- **State Standards addressed**
  Math:
  6.3.A Identify and write ratios as comparisons of part-to-part and part-to-whole relationships.
  6.3.C Represent percents visually and numerically, and convert between the fractional, decimal, and percent representations of a number.
  6.3.D Solve single- and multi-step word problems involving ratios, rates, and percents, and verify the solutions.
  Reading:
  1.2 Use vocabulary (word meaning) strategies to comprehend text.
  3.2.2 Apply understanding of complex information, including functional documents, to perform a task.

- **Leadership Skills**
  Each student will have the opportunity to lead in this lab. There will be a recorder, a card reader, and each student will be responsible for collaborating to figure out the numbers on the card.
- **SCAN Skills/Workplace Skills**
  Reasoning! A, B, C, and D.
- **Set-up information**
  Lab will be set up with recipe cards at each desk grouping. Depending on the number of students, there could be anywhere from 8 to 12 groups of 3. Each student needs also a copy of the lab worksheet. The home ec room will also need to be set up, so that when the students have decided, as a class, which recipe they think is the correct one, with the correct ratio of each ingredient to the whole, they can bake the cookies and test whether or not they were correct.
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**
  - Students will be grouped in threes – three desks per group.
  - Students will be assigned a position as a scribe, a measurer. Each student will be responsible for his or her own work on the lab sheets.
- **Teacher Assessment of student learning** (scoring guide, rubric)
  Assessment of student learning will take place during the conversation, and the lab sheets will be graded according to accuracy.
- **Summary of learning** (to be finished after student completes lab)
  -discuss real world application of learning from lab
  -opportunity for students to share/present learning

- **Career Applications**

  As we discovered, people who make any kind of food that doesn't come in a box have to consider the percentage of the whole each item takes up. If you add too high a percentage of salt to the cookies, they taste horrible! Also, chemists (and many scientists in general) combine chemicals with recipes – you just can't eat the end result.

LAB TITLE: The Cookie Test
STUDENT INSTRUCTIONS:

Guiding Question: Are ratios, percentages and decimals really important? How do we use them in real life? What happens if we incorrectly calculate them?

Set-up Directions:

1. Tables are set so that you can sit in groups of three. Find a table.
2. Each student has the responsibility of recording the ratios of each ingredient to the total (based on the ingredients cards) on this paper.
3. Nominate one member of your group to record your numbers on the overhead sheet when you come to a conclusion with your ratios.

Procedure:

1. On your table, you will find a recipe card. Each card has different numbers of different ingredients written on it. On this worksheet, write out the ratio of each ingredient to the total number of ingredients.

For example, if the following was all that was on your cards:

5 units Chocolate chips
12 units flour
3 units baking soda

you could write that

$$\frac{\text{Number of units of chocolate chips}}{\text{Total number of units in the cookies}} = \frac{5}{(5+12+3)} = \frac{5}{20} = 5{:}20.$$

Ratios:

2. Now that you have recorded your ratios, convert them to decimals below.

3. Now change these decimals to percentages.

4. Rewrite the numbers that you have calculated in this table below.

		Ingredient		
	Flour	Baking Soda	Salt	Butter
Ratio				
Decimal				
Percent				
	Sugar	Brown Sugar	Vanilla	Eggs
Ratio				
Decimal				
Percent				
	Chocolate Chips	Nuts		
Ratio				
Decimal				
Percent				

5. Based on the different numbers you have above, do you think that your recipe is the correct one? Write your hypothesis before we discuss.

6. Now that each group has shared their tables, which recipe sounds to you like it is the correct one? Tell me *why* you think so.

7. Now that we have made the cookies from the recipe that the group voted on, was your hypothesis correct? What did you notice about the cookies we made? What ratios were correct? Were there any that were not correct? Which would you have changed?