

Activity 5

Banquet Meal

Concepts/Skills

- ◆ Fractions
- ◆ Proportional reasoning
- ◆ Problem solving

Materials

For each set of four students:

- ◆ TI-15
- ◆ Student activity pages (pp. 33 - 36)
- ◆ Recipe: Parmesan Macaroni Casserole
- ◆ Chart paper
- ◆ Markers

For the teacher:

- ◆ One 16-ounce jar of peanuts
- ◆ One 15-ounce box of raisins
- ◆ Using the TI-15 (p. 37)

Overview

Students will use proportional reasoning skills to increase a family-size recipe to a banquet-size recipe.

Focus

- ◆ Show students a jar of peanuts. Have a student read how many servings are in the container. Ask students, “If I want to serve 40 people peanuts, how many containers do I need?” Have students work with a partner to determine the answer. Possible strategies include using an organized list or table, computation, etc. Let students share their methods for finding the answer.
- ◆ Show students a box of raisins. Have another student read how many servings are in the container. Ask students, “If I want to serve 40 people raisins, how many containers do I need?” Have students work with a partner to determine the answer. Have the students share their methods for finding the answer.
- ◆ Have students discuss the size of the jar of peanuts and the size of the box of raisins and the capacity of each. Discuss how they can use this information to determine the size of the container they need to mix the peanuts and raisins. Have students calculate the combined amount.
- ◆ Combine the peanuts and raisins in a large container such as a large measuring cup or mixing bowl with capacity marked. After noting the actual capacity, discuss how the actual amount differs from the capacity they calculated. Have students determine how large servings should be

and how many servings there are of the combined peanuts and raisins. Measure out the servings to check the calculations.

- ◆ Discuss with the students what is needed to feed more people peanuts and raisins. What if they needed to feed two classrooms? The whole school? How many containers of peanuts and raisins would be needed?

First Things First

For students not ready for the open-ended problem, start with the *First Things First* activity page.

Presenting the Problem

Present the problem from the *Banquet Meal* activity page. Students should work in groups to solve this problem. Discuss with students the similarities and differences between this problem and the peanuts and raisins problem.

Discuss with students the final products they will create. Make sure the parameters of the final products are clear before the students begin work.

If needed, use the *First Things First* activity page as a whole group activity.

Evaluating the Results

When students have finished solving the problem, have them present their results to the class.

After the presentations, have students discuss the various approaches used. Discuss the similarities and differences between the various groups' solutions. Have students verify that calculations used were done correctly and evaluate how the TI-15 was used to help solve this problem.



Name _____

Date _____

Activity 5

Banquet Meal: First Things First

The Problem

A family reunion is coming up. You are in charge of making your favorite casserole for the reunion. The recipe you have makes enough to feed 6 people, but you need to make enough for 20 people.

Working the Problem

How many family-size recipes will it take to feed 20 people? One way to calculate this is to divide 20 by 6. This will tell you how many “families of 6” there are in a group of 20 people.

Enter 20 6 . What answer is displayed?

What do you think you should do with the remainder?

Should you multiply each ingredient amount by 3 or by 4? Why do you think so?

How many people could you feed if you multiplied each ingredient by 4? Multiply each ingredient in Parmesan Macaroni Casserole by 4. Write your answers in the table.

Ingredient list	Ingredient amounts x 4
12 ounces cream cheese	
$\frac{3}{4}$ teaspoon garlic salt	
$1\frac{1}{2}$ cups milk	
$\frac{3}{4}$ cup Parmesan cheese, shredded	
6 ounces elbow macaroni, cooked, drained and rinsed	
$1\frac{1}{4}$ pounds ham, diced	
$\frac{3}{4}$ cup celery, sliced	
$\frac{1}{3}$ cup green pepper, finely chopped	

What would happen to the amounts in the recipe if you multiplied them by a fraction? Suppose there are 12 people who want to have the casserole and the recipe makes enough for 6 people. You can make a fraction of the two numbers. 12 people want the casserole and the recipe is for 6 people.

Multiply one ingredient, $\frac{1}{3}$ cup green pepper, by $\frac{12}{6}$. Enter 12 $\frac{\square}{\square}$ 6 $\frac{\square}{\square}$ \times 1 $\frac{\square}{\square}$ 3 $\frac{\square}{\square}$ $\frac{\square}{\square}$. What is the answer?

What do you suppose would happen to the other amounts if you multiplied them by $\frac{12}{6}$? Why do you think so?

What fraction do you use to calculate the amount of each ingredient to make the casserole for the reunion? Since there are 20 people coming and the recipe makes enough for 6, you can multiply each number by $\frac{20}{6}$. Calculate these amounts. Write them in the table below.

Ingredient list	Ingredient amounts $\times \frac{20}{6}$
12 ounces cream cheese	
$\frac{3}{4}$ teaspoon garlic salt	
1 $\frac{1}{2}$ cups milk	
$\frac{3}{4}$ cup Parmesan cheese, shredded	
6 ounces elbow macaroni, cooked, drained and rinsed	
1 $\frac{1}{4}$ pounds ham, diced	
$\frac{3}{4}$ cup celery, sliced	
$\frac{1}{3}$ cup green pepper, finely chopped	

How do these amounts compare to the amounts you multiplied by 4? Which way of calculating seems easier? Why do you suppose that is true?

Which way is more accurate? Why do you suppose that is true?

If your goal is to not have any left over, but still feed everyone, which numbers should you use to multiply the ingredient amounts? Why do you think so?



Name _____

Date _____

Activity 5

Banquet Meal

The Problem: What will you need to make a banquet-size casserole from a family-size recipe?

Your team is in charge of the awards banquet for your school. The principal would like her favorite casserole served at the banquet. Unfortunately, her recipe only makes enough to feed 6 people. There will be 200 people at the banquet. Your group has to calculate how much of each ingredient you need to make enough for 200 people.

The Facts

Here are some measurement conversions you may need:

- ◆ 3 teaspoons = 1 tablespoon
- ◆ 16 tablespoons = 1 cup
- ◆ 4 cups = 1 quart
- ◆ 4 quarts = 1 gallon
- ◆ 16 ounces = 1 pound

Your school cafeteria has large rectangular pans to cook the casserole. Each pan holds 3 gallons.

The Task

1. Your team will create a chart showing the following information:
 - The recipe for Parmesan Macaroni Casserole for 6 people.
 - The recipe for Parmesan Macaroni Casserole for 200 people.
 - A list of ingredients indicating the amounts needed.
 - The number of cafeteria pans needed to cook enough to feed 200 people.

2. Each person on the team will write an explanation of the chart. The explanation will answer these questions:
 - How did your group calculate the amount of each ingredient? Were there other ways the calculations could have been done? Were there other ways the problem could have been solved? How do you know?
 - Did the other groups solve the problem in the same way? How were your calculations like calculations of the other groups? How were they different?
 - Suppose 250 signed up to attend the banquet. How would you need to adjust the recipe for 50 more people?
3. Your group will present your chart to the class.

Parmesan Macaroni Casserole

12 ounces cream cheese

$\frac{3}{4}$ teaspoon garlic salt

$1\frac{1}{2}$ cups milk

$\frac{3}{4}$ cup Parmesan cheese, shredded

6 ounces elbow macaroni, cooked, drained and rinsed

$1\frac{1}{3}$ pounds ham, diced

$\frac{3}{4}$ cup celery, sliced

$\frac{1}{3}$ cup green pepper, finely chopped

salt and pepper, to taste

Put cream cheese in a heavy saucepan over low heat and soften with a spoon. Add garlic salt, then add the milk gradually, stirring constantly. Continue to stir and heat thoroughly. Remove from heat. Mix in Parmesan cheese and add to a large bowl with the hot macaroni, ham, celery, and green pepper. Place mixture in a greased 2-quart casserole. Generously sprinkle top with Parmesan cheese. Bake for 25 minutes in 350°F oven. Garnish with green pepper strips. Serves 6.



Using the TI-15

Activity 5

Banquet Meal

20 $\boxed{\text{Int}\div}$ 6 $\boxed{\text{Enter}}$

$$20 \div 6 = 3 \text{ r } 2$$

12 $\boxed{\frac{n}{d}}$ 6 $\boxed{\frac{d}{d}}$ $\boxed{\times}$
1 $\boxed{\frac{n}{d}}$ 3 $\boxed{\frac{d}{d}}$ $\boxed{\text{Enter}}$

$$\frac{12}{6} \times \frac{1}{3} = \frac{12}{18}$$

$\boxed{\text{Simp}}$ $\boxed{\text{Enter}}$

$$\frac{12}{18} \rightarrow \frac{2}{3}$$

$\boxed{\text{Simp}}$ $\boxed{\text{Enter}}$

$$\frac{2}{3} \rightarrow \frac{2}{3}$$