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# The Pizza Parlor Challenge: A Fraction, Decimal, & Percentage Project

## Materials Needed

- Large sheet of paper (or a paper plate) to be the pizza "crust"
- A compass or a large dinner plate for tracing a perfect circle
- Ruler or protractor
- Colored pencils, markers, or crayons
- Construction paper in various colors (for toppings)
- Scissors
- Glue stick
- Calculator
- A "Recipe Card" (a blank index card or piece of paper)

## Learning Objectives

By the end of this lesson, you will be able to:

- Accurately convert numbers between fractions, decimals, and percentages.
- Apply mathematical conversions to a creative, real-world design project.
- Calculate the fractional part and percentage of a whole.
- Visually represent fractions and percentages on a circle graph (our pizza!).

## Curriculum Alignment (Example: Common Core Standards)

- **6.RP.A.3.c:** Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.
- **7.NS.A.2.d:** Convert a rational number to a decimal.

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## Lesson Activities

### Part 1: The Three-Way Conversion Warm-Up (10 minutes)

Let's get our brains warmed up! We know that fractions, decimals, and percentages are just three different ways of talking about the same number. Let's practice switching between them.

1. **Fraction to Decimal:** Divide the numerator (top number) by the denominator (bottom number). Example: 1/4 = 1 Ã· 4 = 0.25
2. **Decimal to Percent:** Move the decimal point two places to the right and add a '%' sign. Example: 0.25 becomes 25%.
3. **Percent to Fraction:** Put the number over 100 and simplify. Example: 25% = 25/100 = 1/4.

**Quick Challenge:** On a piece of scrap paper, can you convert these?

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- Convert **3/5** to a decimal and a percentage. (Answer: 0.6 and 60%)
- Convert **75%** to a decimal and a simplified fraction. (Answer: 0.75 and 3/4)
- Convert **0.8** to a percentage and a simplified fraction. (Answer: 80% and 4/5)

Great job! Now that we're ready, let's open our pizza parlor.

Part 2: Main Activity - Design The Ultimate Pizza! (35 minutes)

You are the head chef at a brand new pizza parlor, and your job is to create a signature pizza for the menu. Your pizza must follow some specific rules based on what your customers love!

Step-by-Step Instructions:

1. **Create Your Crust:** Trace a large circle on your paper or use a paper plate. This is your canvas. For an easier start, use your ruler to divide the pizza into 8 equal slices (like you're cutting a real pizza). Each slice represents 1/8 of the total.
2. **Review The "Customer Order":** Your signature pizza must have **between 4 and 6 different toppings**. Each topping must cover a specific percentage or fraction of the pizza.
    - **Topping 1:** Must cover **25%** of the pizza. (Hint: How many 1/8 slices is that?)
    - **Topping 2:** Must cover **1/8** of the pizza.
    - **Topping 3:** Must cover **0.375** of the pizza. (Hint: what is this as a fraction?)
    - **Topping 4 (and beyond):** You decide! You must fill the rest of the pizza with one to three more toppings. You will need to calculate the fraction, decimal, and percentage for the remaining space and decide how to divide it up.
3. **Design The Toppings:** Use colored construction paper to cut out your toppings. Will you have green paper for peppers, red circles for pepperoni, or brown squares for sausage? Get creative!
4. **Assemble Your Pizza:** Carefully glue your toppings onto the correct sections of the pizza. For example, if pepperoni covers 25% of the pizza, it should cover 2 of your 8 slices. For 0.375 (which is 3/8), it would cover 3 slices. Make your pizza look delicious!
5. **Create the Recipe Card:** While your glue dries, fill out your "Recipe Card." For EACH topping on your pizza, you must list:
    - The name of the topping.
    - The amount of the pizza it covers, written as a **Fraction**.
    - The amount of the pizza it covers, written as a **Decimal**.
    - The amount of the pizza it covers, written as a **Percentage**.

    Make sure all your fractions add up to 1 (or 8/8) and all your percentages add up to 100%!

Part 3: The Grand Opening - Presentation and Reflection (10 minutes)

It's time to present your signature pizza! Explain your creation by answering these questions:

- What are the toppings on your pizza?
- Show me which part of the pizza represents 25%, which is 1/8, and which is 0.375.
- What was the leftover fraction you had to fill? How did you decide to divide it up for your final toppings?
- Which form (fraction, decimal, or percentage) was easiest for you to work with when designing the pizza? Why?

Differentiation and Inclusivity

- **For Extra Support:** Provide a "cheat sheet" with common conversions (1/8=0.125=12.5%, 1/4=0.25=25%, etc.). Work with a pizza already divided into 8 or 12 slices to make the fractional parts more concrete. Simplify the requirements to just 3 toppings with easier fractions (1/2, 1/4, 1/4).
- **For an Extra Challenge:** Add a budget! Assign a cost to each topping (e.g., Pepperoni = $0.50 per 1/8 slice, Olives = $0.25 per 1/8 slice). The total cost of the pizza cannot exceed $10.00. Another challenge: Do not allow the pizza to be divided into 8ths. Use more difficult fractions like 1/6, 1/12, or 1/5, which requires using a protractor to find the correct angle for each section (e.g., 20% of 360 degrees is 72 degrees).
- **Alternative Theme:** If pizza isn't engaging, this project works perfectly as "Design a Stained Glass Window," "Plan a Community Garden," or "Create a Flag for a New Country."

Assessment

Your understanding will be assessed based on:

1. **The Pizza Design:** Does the visual representation of the toppings correctly match the required fractional/percentage parts?
2. **The Recipe Card:** Is the card complete? Are all conversions between fractions, decimals, and percentages accurate for every topping? Do the totals add up to 1 and 100%?
3. **The Presentation:** Can you clearly explain the mathematical choices you made during your design process?

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