Understanding Conversion of Decimal Fractions to Base 10 and Back

Introduction (5 minutes)

Welcome to our math adventure! In this worksheet, we will explore the exciting world of decimal fractions and learn how to convert them to base 10 and back. This is a fundamental concept in mathematics that has numerous real-world applications. By the end of this worksheet, you will be able to convert decimal fractions to base 10 and back with confidence and accuracy.

What are Decimal Fractions? (10 minutes)

Decimal fractions are a way of representing part of a whole. They are used to express quantities that are less than one. For example, 0.5 is a decimal fraction that represents half of a whole.

Converting Decimal Fractions to Base 10 (15 minutes)

To convert a decimal fraction to base 10, we divide the numerator by the denominator. For example, to convert 3/4 to base 10, we divide 3 by 4, which equals 0.75.

Exercise 1: Converting Decimal Fractions to Base 10

1. 1/2 = _____
2. 3/4 = _____
3. 2/5 = _____

Converting Base 10 to Decimal Fractions (15 minutes)

To convert a base 10 number to a decimal fraction, we express the number as a fraction with a denominator of the form 10^n, where n is the number of decimal places. For example, to convert 0.25 to a decimal fraction, we express it as 25/100, which simplifies to 1/4.

Exercise 2: Converting Base 10 to Decimal Fractions

1. 0.5 = _____
2. 0.75 = _____
3. 0.25 = _____

Real-World Applications (15 minutes)

Decimal fractions have numerous real-world applications, such as in cooking, science, and finance. For example, in cooking, we use decimal fractions to measure ingredients for a recipe. In science, we use decimal fractions to express quantities such as temperature and pressure.

Exercise 3: Real-World Applications

1. A recipe requires 3/4 cup of sugar. If you only have a 1/4 cup measuring cup, how many times do you need to fill the measuring cup to get 3/4 cup?
2. A water tank can hold 0.5 liters of water. If you want to fill the tank to 3/4 of its capacity, how many liters of water do you need to add?

Practice Exercises (20 minutes)

Now it's your turn to practice! Complete the following exercises to reinforce your understanding of converting decimal fractions to base 10 and back.

Practice Exercises

1. Convert 2/3 to base 10.
2. Convert 0.9 to a decimal fraction.
3. A bookshelf has 5 shelves, and each shelf can hold 0.25 meters of books. If the bookshelf is currently empty, how many meters of books can you add to fill it to 3/4 of its capacity?

Answer Key (5 minutes)

Check your answers with the answer key below.

Answer Key

1. Exercise 1:
    - 1/2 = 0.5
    - 3/4 = 0.75
    - 2/5 = 0.4
2. Exercise 2:
    - 0.5 = 1/2
    - 0.75 = 3/4
    - 0.25 = 1/4
3. Exercise 3:
    - 1. You need to fill the measuring cup 3 times to get 3/4 cup.
    - 2. You need to add 0.375 liters of water to fill the tank to 3/4 of its capacity.
4. Practice Exercises:
    - 1. 2/3 = 0.67
    - 2. 0.9 = 9/10
    - 3. You can add 0.375 meters of books to fill the bookshelf to 3/4 of its capacity.

Conclusion (5 minutes)

In conclusion, converting decimal fractions to base 10 and back is a fundamental concept in mathematics that has numerous real-world applications. By practicing the exercises in this worksheet, you have developed a deep understanding of this concept and can apply it to solve problems in a variety of contexts. Remember to always check your work and use visual aids to help you understand the concept. Happy math adventuring!