4th Grade Math: Fractions and Decimals

Lesson Objective:

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

- Understand the relationship between fractions and decimals.
- Convert fractions to decimals and vice versa.
- Identify fractions and decimals on a number line.

1. Introduction to Fractions and Decimals

What Are Fractions?

- A fraction represents a part of a whole and is written as two numbers separated by a line (e.g., $\frac{3}{4}$).
  - The **numerator** (top number) represents how many parts you have.
  - The **denominator** (bottom number) represents how many equal parts make up a whole.

What Are Decimals?

- Decimals also represent parts of a whole but are written using a decimal point.
  - The first digit to the right of the decimal point is the **tenths** place.
  - The second digit is the **hundredths** place.

How Are Fractions and Decimals Related?

- Fractions and decimals are different ways of representing the same value.
  - Example: $\frac{1}{2} = 0.5$

2. Converting Fractions to Decimals

To convert a fraction to a decimal, **divide** the numerator by the denominator.

Examples:

1. **Convert $\frac{1}{4}$ to a decimal:**
   - Divide 1 by 4.
   - 1 ÷ 4 = 0.25
   - So, $\frac{1}{4} = 0.25$
2. **Convert $\frac{3}{5}$ to a decimal:**
   - Divide 3 by 5.
   - 3 ÷ 5 = 0.6
   - So, $\frac{3}{5} = 0.6$

Key Point: If the denominator is a factor of 10, 100, 1000, etc., the fraction is easy to convert into a decimal.

Practice:

- Convert the following fractions to decimals:
  1. $\frac{3}{4}$
  2. $\frac{2}{5}$
  3. $\frac{5}{8}$

3. Converting Decimals to Fractions

To convert a decimal to a fraction:

1. Write the decimal as a fraction with a denominator of 10, 100, 1000, etc., depending on the decimal place.
2. Simplify the fraction if necessary.

Examples:

1. **Convert 0.75 to a fraction:**
   - 0.75 means 75 hundredths, so write it as $\frac{75}{100}$.
   - Simplify: $\frac{75}{100} = \frac{3}{4}$.
2. **Convert 0.6 to a fraction:**
   - 0.6 means 6 tenths, so write it as $\frac{6}{10}$.
   - Simplify: $\frac{6}{10} = \frac{3}{5}$.

Practice:

- Convert the following decimals to fractions and simplify:
  1. 0.25
  2. 0.9
  3. 0.45

4. Using Number Lines to Understand Fractions and Decimals

Number Line Example:

- Both fractions and decimals can be placed on a number line to show their value.
- For example, $\frac{1}{2}$ and 0.5 are located at the same point on a number line.

$| 0 | | 0.25 | | 0.5 = \frac{1}{2} | | 0.75 | | 1 |$

Practice:

1. Place the following decimals and fractions on a number line:
    - 0.25, $\frac{1}{4}$, 0.5, $\frac{3}{4}$, 1

5. Real-World Connections Between Fractions and Decimals

- **Money:** Dollars and cents are commonly written in decimal form. For example, $0.75 means 75 cents, which is the same as $\frac{75}{100}$ or $\frac{3}{4}$ of a dollar.
- **Measurements:** Recipes often use fractions, like $\frac{1}{2}$ cup or 0.5 cup, to show the same amount.

6. Practice Problems

1. **Convert the following fractions to decimals:**
   - $\frac{2}{5}$
   - $\frac{7}{10}$
   - $\frac{3}{8}$
2. **Convert the following decimals to fractions:**
   - 0.2
   - 0.75
   - 0.62
3. **Place the following fractions and decimals on a number line:**
   - 0.25, $\frac{1}{4}$, 0.75, $\frac{3}{4}$, 1

7. Class Discussion

- How do you use fractions and decimals in everyday life?
- Can you think of other examples where fractions and decimals are interchangeable?

8. Review and Wrap-Up

Key Points:

- Fractions and decimals both represent parts of a whole.
- To convert a fraction to a decimal, divide the numerator by the denominator.
- To convert a decimal to a fraction, write the decimal as a fraction with a denominator of 10, 100, or 1000, and simplify.

Exit Question: Convert $\frac{3}{8}$ to a decimal and explain the process.