SKILL OR CONCEPT
this is concept

GRADE LEVEL
this is grade

ADDITIONAL CRITERIA
this is criteria

TOTAL PAGE COUNT
5 pages

TOTAL ESTIMATED TIME
40 minutes

Learning Objective

- Add and subtract fractions with unlike denominators using equivalent fractions and common denominators

Essential Understandings

- Fractions with unlike denominators can be added or subtracted by finding equivalent fractions with a common denominator
- The sum or difference of fractions represents a combination or comparison of parts of a whole

Vocabulary

- **Fraction**: A number that represents part of a whole
- **Numerator**: The top number in a fraction, representing the number of parts being considered
- **Denominator**: The bottom number in a fraction, representing the total number of equal parts in the whole
- **Common denominator**: A denominator that is shared by two or more fractions
- **Equivalent fractions**: Fractions that represent the same amount or part of a whole
- **Least common multiple (LCM)**: The smallest positive number that is a multiple of two or more numbers

I Can Statement

- I can add and subtract fractions with unlike denominators by finding equivalent fractions with a common denominator

General Discussion Question

- Why is it necessary to find a common denominator when adding or subtracting fractions with unlike denominators?

Warmup (5 minutes)

Prerequisites: Understanding of equivalent fractions and finding common denominators
Activity: "Fraction Match-Up"

1. Write the following fractions on the board: 1/2, 2/4, 3/6, 4/8

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2. Ask students to identify which fractions are equivalent to 1/2.

3. Have students explain how they determined the equivalent fractions.

4. Next, write these fractions: 1/3, 2/6, 3/9, 4/12

5. Ask students to identify the common denominator for 1/3 and 2/6.

6. Discuss how finding a common denominator relates to creating equivalent fractions.

This warmup activity reviews the concept of equivalent fractions and introduces the idea of finding common denominators, which are crucial for adding and subtracting fractions with unlike denominators.

Whole Class Activity (15 minutes)

Introduction to Adding Fractions with Unlike Denominators

1. Write the problem $\frac{1}{3} + \frac{1}{4}$ on the board.

2. Ask students why we can't simply add the numerators and denominators (addressing the common misconception: $\frac{1}{3} + \frac{1}{4} \neq \frac{2}{7}$).

3. Explain that we need to find equivalent fractions with a common denominator.

4. Demonstrate finding the least common multiple (LCM) of 3 and 4: LCM(3, 4) = 12

5. Show how to create equivalent fractions: $\frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$ $\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$

6. Now add the fractions: $\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

7. Simplify if possible (in this case, it's already in its simplest form).

8. Guided Practice: Have students work through another example together: $\frac{2}{5} + \frac{1}{3}$

   Solution: LCM(5, 3) = 15 $\frac{2}{5} = \frac{2 \times 3}{5 \times 3} = \frac{6}{15}$ $\frac{1}{3} = \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$ $\frac{6}{15} + \frac{5}{15} = \frac{11}{15}$

9. Address another misconception: Remind students that when adding fractions, only the numerators are added, not the denominators.

This activity introduces the concept of adding fractions with unlike denominators, demonstrates the process step-by-step, and addresses common misconceptions.

Independent Practice (15 minutes)

Students will practice adding fractions with unlike denominators independently. They can refer to the steps demonstrated in the whole class activity if needed.

1. Solve the following addition problems:

   a) $\frac{1}{2} + \frac{1}{6}$ b) $\frac{3}{4} + \frac{1}{3}$ c) $\frac{2}{5} + \frac{3}{10}$

2. Word problem: Sarah ate $\frac{1}{4}$ of a pizza, and Tom ate $\frac{1}{3}$ of the same pizza. What fraction of the pizza did they eat together?

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3. Challenge question (optional): Add $\frac{2}{3} + \frac{5}{6} + \frac{1}{2}$

For additional practice, students can complete the Worksheet on fraction addition.
Solutions:

1. a) $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$

   b) $\frac{3}{4} + \frac{1}{3} = \frac{9}{12} + \frac{4}{12} = \frac{13}{12} = 1\frac{1}{12}$

   c) $\frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$

2. Sarah ate $\frac{1}{4}$ and Tom ate $\frac{1}{3}$: $\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$ They ate $\frac{7}{12}$ of the pizza together.

3. Challenge: $\frac{2}{3} + \frac{5}{6} + \frac{1}{2}$ LCM(3, 6, 2) = 6 $\frac{2}{3} = \frac{4}{6}, \frac{5}{6}$ (already has denominator 6), $\frac{1}{2} = \frac{3}{6}$ $\frac{4}{6} + \frac{5}{6} + \frac{3}{6} = \frac{12}{6} = 2$

Small Group Differentiation Remediation (15-20 minutes)

Activity 1: Visual Fraction Addition (5-7 minutes)
   Use fraction strips or circles to visually represent fraction addition.

1. Provide students with fraction strips or circles for 1/2, 1/3, and 1/6.
2. Ask them to show 1/2 + 1/3 using these visual aids.
3. Guide them to see that they need a common unit (1/6) to add these fractions.

Common Misconception: Students might think they can simply add numerators and denominators (1/2 + 1/3 = 2/5).
Solution: Show that 1/2 = 3/6 and 1/3 = 2/6, so 1/2 + 1/3 = 3/6 + 2/6 = 5/6.
Activity 2: Equivalent Fraction Practice (5-7 minutes)

1. Write fractions on index cards: 1/2, 2/4, 3/6, 4/8, 1/3, 2/6, 3/9, 4/12.
2. Have students match equivalent fractions.
3. Discuss how these equivalent fractions can help in adding fractions with unlike denominators.

Example: To add 1/2 + 1/3, we can use 3/6 + 2/6 = 5/6.
Activity 3: Step-by-Step Addition Practice (5-7 minutes)
   Guide students through these steps for adding fractions:

1. Find the LCM of the denominators
2. Create equivalent fractions
3. Add the numerators
4. Simplify if possible

Example: Add $\frac{1}{4} + \frac{1}{6}$

1. LCM(4, 6) = 12 2. $\frac{1}{4} = \frac{3}{12}$ and $\frac{1}{6} = \frac{2}{12}$ 3. $\frac{3}{12} + \frac{2}{12} = \frac{5}{12}$
2. 5/12 is already in its simplest form

Common Misconception: Students might forget to create equivalent fractions before adding.
Solution: Emphasize that we can only add fractions when they have the same denominator, just like we can only add similar objects (e.g., 2 apples + 3 apples, not 2 apples + 3 oranges).

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Small Group Differentiation Additional Practice (15-20 minutes)

Activity 1: Fraction Addition Bingo (7-10 minutes)

1. Create bingo cards with fractions as answers (e.g., 1/2, 3/4, 5/6, 7/12).
2. Call out fraction addition problems (e.g., "1/3 + 1/6").
3. Students solve and mark the answer on their card if they have it.

Example: For "1/3 + 1/6": Solution: $\frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

Common Misconception: Students might add numerators and denominators separately.

Solution: Remind students to find a common denominator first, then only add numerators.

Activity 2: Fraction Addition Dominos (5-7 minutes)

1. Create domino-like cards with a fraction addition problem on one side and an answer on the other.
2. Students match the problem side of one card to the answer side of another.

Example card: Side 1: $\frac{1}{4} + \frac{1}{3}$ Side 2: $\frac{7}{12}$

Solution: $\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$

Activity 3: Real-world Fraction Addition Scenarios (5-7 minutes)

Present real-world scenarios involving fraction addition. Students solve and explain their reasoning.

1. Sarah ate 1/4 of a pizza and Tom ate 1/3 of the same pizza. How much pizza did they eat together?

Solution: $\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$

2. John ran 2/5 of a mile in the morning and 3/10 of a mile in the evening. How far did he run in total?

Solution: $\frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$ mile

Common Misconception: Students might think they need to find common denominators for all fractions in a word problem, even when not adding.

Solution: Emphasize identifying which fractions need to be added before finding common denominators.

Small Group Differentiation Enrichment (20 minutes)

Activity 1: Fraction Addition Puzzle (7-10 minutes)

Create a 3x3 grid with fraction addition problems. Students solve each problem and use the answers to complete a larger fraction addition problem.

Example:

$\frac{1}{3} + \frac{1}{6}$	$\frac{1}{2} + \frac{1}{4}$	$\frac{2}{5} + \frac{1}{10}$
$\frac{3}{8} + \frac{1}{4}$	$\frac{2}{3} + \frac{1}{6}$	$\frac{3}{10} + \frac{1}{5}$
$\frac{1}{4} + \frac{3}{8}$	$\frac{5}{6} + \frac{1}{3}$	$\frac{7}{12} + \frac{1}{6}$

Final problem: Add all nine answers together.

Solution:

$$\frac{1}{2} + \frac{3}{4} + \frac{1}{2} + \frac{5}{8} + \frac{5}{6} + \frac{1}{2} + \frac{5}{8} + \frac{7}{6} + \frac{3}{4} = \frac{37}{6} = 6\frac{1}{6}$$

Common Misconception: Students might forget to simplify fractions before adding them all together.

Solution: Encourage students to simplify each fraction as they go, making the final addition easier.

Activity 2: Fraction Addition Chain (5-7 minutes)

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Start with a fraction and add a series of fractions, each time using the previous sum as part of the new addition problem.

Example: Start with $\frac{1}{2}$ 1. $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$ 2. $\frac{5}{6} + \frac{1}{4} = \frac{13}{12} = 1\frac{1}{12}$ 3. $1\frac{1}{12} + \frac{3}{8} = 1\frac{7}{24}$

Common Misconception: Students might struggle with adding mixed numbers and fractions.

Solution: Teach students to convert mixed numbers to improper fractions before adding.

Activity 3: Fraction Addition Word Problem Creation (5-7 minutes)

Students create their own word problems involving the addition of fractions, then swap with a partner to solve.

Example: "A recipe calls for $\frac{2}{3}$ cup of flour and $\frac{1}{4}$ cup of sugar. How much dry ingredient is needed in total?"

Solution: $\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$ cup

Common Misconception: Students might create problems that don't make sense in real-world contexts.

Solution: Encourage students to think about practical scenarios where fractions are commonly used, such as cooking or measurements.

Review And Close (10 minutes)

Quick Review (5 minutes):

1. Recap the key steps for adding fractions with unlike denominators:

   - Find the least common multiple (LCM) of the denominators
   - Create equivalent fractions using the LCM
   - Add the numerators of the equivalent fractions
   - Simplify the result if possible

2. Class discussion: "What was the most challenging part of today's lesson, and why?"

Exit Ticket (5 minutes):

Students should complete the following questions independently:

1. Add $\frac{1}{3} + \frac{1}{4}$

2. John ate $\frac{1}{2}$ of a pizza, and Mary ate $\frac{1}{6}$ of the same pizza. What fraction of the pizza did they eat together?

3. True or False: When adding fractions with unlike denominators, you always need to find equivalent fractions. Explain your answer.

   Solutions:
   1. $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$
   2. $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$ John and Mary ate $\frac{2}{3}$ of the pizza together.

3. True. When adding fractions with unlike denominators, you need to find equivalent fractions with a common denominator to add them correctly. This ensures that you're adding parts of the same size.

   For additional practice, students can complete the Worksheet on fraction addition.

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