

Fraction Action

Brief Overview:

Adding and subtracting fractions is a vital skill for real world applications. In this unit students will add and subtract fractions with like denominators. Students will use a variety of hands- on experiments to identify and explain their answers.

NCTM Content Standard/National Science Education Standard:

Number and Operations: Developing an understanding of and fluency with addition and subtraction of fractions and decimals.

Students apply their understandings of fractions and fraction models to represent the addition and subtraction of fractions with like denominators. Students add and subtract fractions to solve problems.

Grade/Level:

Grades 2-3

Duration/Length:

3 days (60 minutes)

Student Outcomes:

Students will

- Read, write, and represent fractions by adding and subtracting
- Read, write and represent fractions using multi- step problems

Materials and Resources:

Lesson One

- Paper clips
- Cake (cut cake prior to lesson)
- Color pencils
- Dry erase boards
- Dry erase pens
- Plastic bags
- Teacher Resource 1 (Answer Key to pre-assessment)
- Teacher Resource 2 (vocabulary sheet)
- Teacher Resource 3 (checklist)
- Student Resource 1 (pre-assessment)

Lesson Two

- Paper clips
- Skittles Fun packs
- Teacher Resource 2 (vocabulary)
- Teacher Resource 3 (checklist)
- Dry erase boards
- Dry erase pens
- Skittles Riddles Math by Barbara Barbieri McGrath

Lesson Three

- Jelly beans
- Teacher Resource 4 (Jelly bean multi-step on transparency)
- Overhead projector
- Dry erase pens
- Bear counters
- Math journal/ paper and pencils
- Solids
- Teacher Resource 3 (checklist)

Development/Procedures:

Lesson 1

Pre-assessment

- Distribute copies of Student Resource 1. Students will have five minutes to complete the five questions on the spaces provided on the sheet.
- Collect and assess current knowledge of the skill. Answer key can be found on Teacher Resource 1.

Launch

- Orally review key vocabulary terms related to fractions (Teacher Resource 2).
- Display a pre-sliced cake cut into the number of students in the class.
- Indicate the total number of slices. Reinforce that the denominator will stay the same regardless of what portion is eaten.
- Select three girls to take one slice each. Direct the three students to stand on one side of the room. Next select two boys to take one slice each. Direct these students to stand on the opposite side of the room.
- Ask students to name the fraction of cake taken by the girls and then by the boys.
- Model and display the algorithm that can be used to find the total fractional part of the cake taken by the girls and boys.

Teacher Facilitation

- Display ten color pencils (4 yellow, 1 blue, 5 red) on a surface that is visible to all students.
- Select a student to pick all of the yellow pencils (4) and display them for the class. Then select one more student to pick all of the blue pencils and display them for the class.
- Ask the students to name the fraction that represents the amount of the groups that is yellow pencils ($\frac{4}{10}$). Then ask students to name the fraction that represents the portion of the group of pencils that is blue ($\frac{1}{10}$). Ask students to name the fraction that represents the fractional part of the group that is blue or yellow pencils. Tell students that if they wanted to combine the fractions that represent yellow and blue pencils, they can add the numerators together. The total number of pencils which is 10 is the denominator and will not change. Write the algorithm on the board which is $\frac{4}{10} + \frac{1}{10} = \frac{5}{10}$.

Student Application

- Divide students into pairs.
- Distribute bags with 6 different colors of paper clips with various amounts (up to 20) to each pair and dry erase boards.
- Students will select two colors of paper clips to make one group. Students will determine the fractional part of the group each chosen color represents. Students will add the two fractions to find the sum. Students will model 5 different color combinations.

Embedded Assessment

- Informally assess students through observation and record skill attainment by using Teacher Resource 3.

Reteaching/Extension

- **Reteaching-** Father the students who displayed difficulty with the activity to review how to add fractions with like denominators in a smaller group setting.
- **Extension-** Students will explore adding fractions with like denominators by accessing the Internet at www.funbrain.com.

Lesson 2

Launch

- Ask students to briefly discuss how to add fractions with like denominators. What do you know about the denominator or the total portion when you add like fractions? (It remains the same.)
- Gather the class to the front of the classroom. The students will role-play a class Halloween party. There were 12 people in costumes. $\frac{5}{12}$ of the partygoers wore goblin costumes.
- Ask what fraction of party goers didn't have goblin costumes. ($\frac{7}{12}$) Challenge students to explain how they found the answer.

Teacher Facilitation

- Display 14 paper clips and call a total of 8 volunteers to select one paper clip at a time. Ask students: "What fractional part of the group of paper clips do I have left?"
- Model and write the subtraction process on the board ($\frac{14}{14} - \frac{8}{14} = \frac{6}{14}$).
- Review when it is appropriate to add and to subtract to find your answer to a problem involving fraction by identify key terms (Teacher Resource #1).

Student Application

- Read aloud Skittle Riddles Math by Barbara Barbieri McGrath
- Distribute bags of Skittle Fun Packs, dry erase boards and pens to each student.
- Explain that each student is responsible for creating five subtraction fraction problems using the Skittle they have available.

Embedded Assessment

- Informally assess students through observation and record skill attainment by using Teacher Resource 3.

Reteaching/Extension

- **Reteaching-** Gather the students who displayed difficulty with the activity to review how to subtract fractions with like denominators in a smaller group setting.
- **Extension-** Have students explore subtraction fractions with like denominators by working with a partner to create (written) story word problems.

Lesson 3

Launch

- Select 2 volunteers to create and demonstrate one addition and one subtraction fraction problem.
- Student volunteers will then select other students to display the corresponding algorithm on the board.

Teacher Facilitation

- Gather the students to the front of the room for a brief review of key fraction terms as discussed from previous days.
- Discuss that some problems involving fractions are multi-step and may require you to add and subtract before you can solve the problem
- Display a bag of jellybeans and count the total amount.
- **Bags will vary in color so adjust problems accordingly**
- Display Teacher Resource 4 on the overhead.
- Model how to count all of the beans to get the denominator (total). (32)
- Remove the pink and green jellybeans from the group.
- Tell students that this is a multi-step problem involving both addition and subtraction
- Remind students that the denominator was already found and that the key word that told us to subtract was the word, “remaining.”
- Tell students to focus on the amount (pink $\frac{6}{32}$ and green $\frac{4}{32}$) that was removed and write $\frac{6}{32} + \frac{4}{32} = \frac{10}{32}$ pink and green
- Write $\frac{30}{32} - \frac{10}{32} = \frac{20}{32}$ of the remaining colors

Student Application

- Students should then return to their seats.
- Distribute various amounts of bear counters to each student. Each set should have yellow, red, blue, and green beans.
- Tell students that they decided to give all of their yellow and blue bears to their mom. What is the fractional part of the group that is remaining. Use your journal to record your steps and answer.
- Give additional scenarios involving multi-step problems similar to the example above.

Embedded Assessment

- Informally assess students through observation and record skill attainment by using Teacher Resource 3.

Reteaching/Extension

- **Reteaching-** Gather the student who displayed difficulty with the activity to review how to solve multi-step fraction problems.
- **Extension-** Students will explore in pairs multi-step fraction problems by using geometry solids and creating fraction problems.

Summative Assessment:

Students will apply knowledge of adding, subtracting and multi-step fraction problems to complete 2 selected responses and 2 brief constructed response questions. Student Resource 2 (given the next day). Answers can be found on Teacher Resource 5.

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Name

Date**What Do You Know About Fractions****Directions: Answer the following questions in the space provided.**

$$1. \frac{4}{12} + \frac{2}{12} = \frac{6}{12}$$

$$2. \frac{5}{8} - \frac{3}{8} = \frac{2}{8}$$

$$3. \frac{1}{5} + \frac{3}{5} = \frac{4}{5}$$

4. Paul had 10 pieces of candy. He ate 3 pieces on Monday and 4 pieces on Tuesday. What fractional part of the group of candy did he eat? **7/8**

5. Shelia brought 9 notebooks. She gave her best friend 3 notebooks. What fractional part of the group of notebooks does Shelia have left? **6/9**

Fraction Vocabulary

1. Fraction- Part of a whole or part of a set.
2. Numerator- The part of the fraction above the fraction bar that represents the part.
3. Denominator- The part of the fraction below the fraction bar that represents the whole portion or the total number in a set.
4. Add- To combine two or more amounts to identify the sum (altogether, combine, in all, sum).
5. Subtract- To identify the difference between two or more numbers (remaining, left, difference, how many more).

Jellybeans Multi-Step Fractions

Samantha purchased a bag of jellybeans. In her bag she had 12 yellow beans, 4 green beans, 6 pink beans, 7 black beans, 1 orange bean, 2 white beans. She shared all of the green beans and pink beans with her best friend. What fractional part of her bag of jellybeans remains?

Name

Date**Fraction Assessment**

1. $\frac{8}{13} - \frac{6}{13} = \frac{2}{13}$

2. $\frac{7}{12} + \frac{2}{12} = \frac{9}{12}$

3. Create one addition and one subtraction fraction problem and show the answer to your problems. Use what you know about adding and subtracting fractions to explain how you solved the problem.

Answers will vary. Accepts any reasonable response.

4. Tina has 7 red marbles, 2 blue marbles, 10 yellow marbles and 6 orange marbles. She lost all her blue and orange marbles. What fractional part of the set of marbles does Tina have remaining? Use words, number, or symbols to explain your answer.

I added $7+2+10+6=25$ marbles total which is the denominator.

Then add the number of orange and blue marbles, $6+2=8$

Then subtract $25- 8= 17$ which is the numerator.

The answer is $17/25$.

Name

Date**What Do You Know About Fractions****Directions: Answer the following questions in the space provided.**

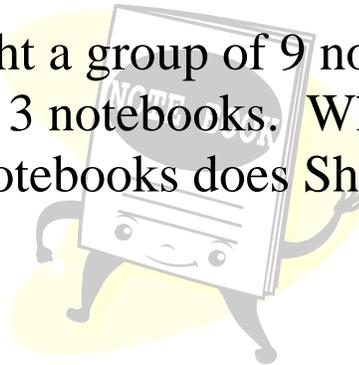
1. $\frac{4}{12} + \frac{2}{12} =$ _____

2. $\frac{5}{8} - \frac{3}{8} =$ _____

3. $\frac{1}{5} + \frac{3}{5} =$ _____

4. Paul had a group of 10 pieces of candy. He ate 3 pieces on Monday and 4 pieces on Tuesday. What fractional part of the group of candy did he eat?

5. Shelia bought a group of 9 notebooks. She gave her best friend 3 notebooks. What fractional part of the group of notebooks does Shelia have left?



Name

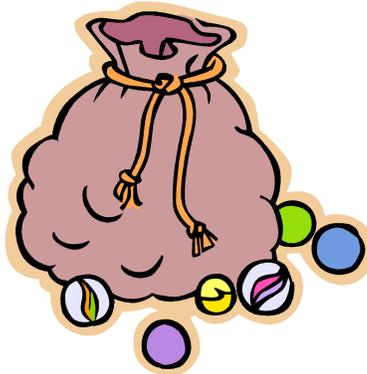
Date**Fraction Assessment**

1. $\frac{8}{13} - \frac{6}{13} =$



2. $\frac{7}{12} + \frac{2}{12} =$

3. Create one addition and one subtraction fraction problem and show the answer to your problems. Use what you know about adding and subtracting fractions to explain how you solved the problem.



4. Tina has 7 red marbles, 2 blue marbles, 10 yellow marbles and 6 orange marbles. She lost all her blue and orange marbles. What fractional part of the set of marbles does Tina have remaining? Use words, numbers, or symbols to explain your answer.
