PROPER, IMPROPER AND MIXED FRACTIONS

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Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

3

Overview

This lesson plan covers teaching content for;

1. Classify a given set of fractions into proper and improper fractions.
2. Convert an improper fraction to a mixed number and vice versa.
3. Solve conversion problems using fractions.
4. Solve problems using quantitative reasoning.

Objectives

Students should be able to;

1. Properly understand proper and improper fractions
2. Properly understand mixed fractions.
3. Know how to convert improper fractions to mixed fractions
4. Know how to convert mixed fractions to improper fractions.
5. Answer questions involving fractions.

Activity Starter/Instruction

1. List fraction examples on the board
2. Point out to students that there are two numbers that form a fraction
3. Tell students that both numbers are needed to write a fraction
4. Explain that the top number is called the numerator and the bottom is called the denominator
5. Tell students that the denominator describes the number of total objects in the set
6. Ask students what they think the numerator describes
7. Explain that the numerator describes the number of “parts under consideration”
8. Tell students that another way to think of “parts under consideration” is the number of objects that share the similar trait that is being looked at.
9. Prepare drawings of shapes with fractions shaded, for example, a rectangle with 6 out of 12 parts shaded.

Teacher Guide

Day 1/ Lesson 1: 25 Mins

1. The teacher starts by explaining various important terms in the topics.
2. Proper fractions: In a proper fraction, the numerator is smaller than the denominator. Normal fractions are proper.
3. Display an orange or lemon to your class, and tell them that you want to give half of the fruit to a person in the class.
4. Use your knife to cut the citrus in half. Give one of the halves to a student volunteer.
5. Write the fraction 1/2 on the whiteboard.
6. Explain to students that the denominator, or number on the bottom, tells how many equal parts the item is divided into. Tell your class that the numerator, or number on the top, tells how many of those parts are being referred to.
7. Show the students your biscuit, and tell them that you're going to divide that biscuit into three equal pieces.
8. Divide your biscuit into thirds.

Materials Required

- White Board
- Orange/lemon
- Biscuit
- Blank sheets
- Pencils

Additional Resources

- https://www.wccusd.net/cms/lib/CA01001466/Centri
- https://www.turtlediary.com/lesson/proper-and-impr
- https://aida4553.files.wordpress.com/2012/11/lesson
- https://schenkelstudentteaching.weebly.com/uploads

Additional Notes

Guided Practice

Day 2/ Lesson 2: 20 Mins

1. In an improper fraction, the numerator is greater than the denominator.
2. They are called improper because if we illustrate the fraction on model, the number of shaded parts will be more than the total parts which is not practically possible. We cannot distribute something in 13 parts if there are only 10 total parts.
3. Example : Let's take a closer look at the improper fraction $\frac{7}{4}$.
4. If we try to draw a picture of it, we'll start by splitting a box into 4 pieces (remind the students of this step in proper fractions).
5. But when we wish to color in 7 sections (because 7 is the numerator), we don't have enough sections to fill in. That means we actually need to draw a second box to fill in 7 sections.
6. So, $\frac{7}{4}$ is actually bigger than 1.

Guided Practice

Day 3/ Lesson 3: 15 Mins

1. Converting an Improper Fraction to Mixed Fraction
2. For this method I divide the numerator by the denominator using the traditional algorithm. E.g. for $\frac{11}{3}$
3. The remainder then becomes the numerator over the divisor. So three goes into eleven how many times? (answer = 3)
4. And when we subtract nine from eleven, the remainder two becomes the numerator over three as the denominator to make the fraction two-third. We now have our mixed number.

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    3
  ____
3 | 11
  -9
  ---
   2
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Therefore we have $3\frac{2}{3}$

Guided Practice

Day 4/ Lesson 4: 15 Mins

Another Method of converting improper to mixed fraction

1. We will start by writing the improper fraction as an equation.
2. When we decompose the numerator, we want to find a multiple of the denominator. So when I decompose 10, I break it into nine and one because nine is a multiple of three and one is the amount remaining.
9. Tell your class that you just gave away one third of your biscuit. Write 1/3 on the chalkboard.
   Explain once more to students that the denominator tells how many equal parts the item is divided into, and the numerator tells how many parts are being referred to.

Guided Practice

Day 5/ Lesson 5: 20 Mins

Remind the students that A mixed number is a combination of a whole number and a fraction, for example: $2\frac{1}{4}$.

Algorithm for changing mixed numbers into improper fraction

1. Multiply the whole number by the denominator.
2. Add the numerator to the product of the whole number and the denominator.
3. The sum becomes the new numerator.
   The denominator remains the same
   E.g.: Turn $2\frac{1}{4}$ into an improper fraction
   Step 1: 2 x 4= 8
   Step 2: 1 + 8 = 9
   Step 3: 9/
   Step 4: 5/4
4. In pairs assigned by the teacher, the students will work together to solve various problems involving changing mixed numbers into improper fractions.
5. Each pair will come up to the board and demonstrate how they solved one of their assigned problems.

7. This is true for all improper fractions. 8. Explain other examples of improper fractions, e.g. $\frac{9}{7}$, $\frac{6}{5}, \frac{17}{11}, \frac{15}{9}$. 9. Actually, there's nothing improper about them... It's just when the numerator is bigger than the denominator.	3. Then I write the numerator as an addition expression. What expression will I write? [9+1]. 4. Then I decompose my fraction and give both the addends in the numerator the same denominator. 5. When I look at my new fraction I see nine divided by 3, what is the quotient? (ans = 3). 6. Then I add the remaining fraction to give me the mixed number three and one-third. $\frac{10}{3} = \frac{9+1}{3} = \frac{9}{3} + \frac{1}{3} = 3 + \frac{1}{3} = 3\frac{1}{3}$	6. They will have to talk their fellow classmates through their mental process.
Assessment Activity	**Assessment Activity** The teacher distributes assessment questions to the students for them to solve, the questions include: 1. Identify the proper and improper fractions among these numbers: $\frac{5}{7}\ \frac{15}{12}\ \frac{9}{7}\ \frac{27}{30}\ \frac{13}{8}\ \frac{12}{15}$ 2. Convert the following improper fractions to mixed fractions: $\frac{22}{14}\quad \frac{27}{15}\quad \frac{18}{8}\quad \frac{32}{12}$ 3. Convert the following mixed fractions to improper fractions: $3\frac{4}{5}\ \ 7\frac{2}{3}\ \ 5\frac{4}{7}\ \ 9\frac{1}{6}$	**Assessment Activity** The students will be assessed on their completed class work, participation during the lesson and the homework assignment in order to determine if the students have met the objectives of the lesson
Summary	**Review and Closing** 1. In a Proper Fraction, the numerator is smaller than the denominator. 2. Normal fractions are proper fractions. 3. In an Improper Fraction, the numerator is larger than the denominator.	

	4. They are called improper because it is not the proper way to leave your answer. 5. Improper fractions can be written as mixed numbers.	