

Which Is Closer?

Reporting Category Computation and Estimation

Topic Adding fractions

Primary SOL 4.5 The student will

b) add and subtract fractions having like and unlike denominators that are limited to 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fractions, using common multiples and factors.

Related SOL 4.2a, b, 4.3d, 4.5a, d

Materials

- Fraction Cards (attached)
- Sum Cards (attached)
- Scissors
- Fraction strips or other fraction manipulatives

Vocabulary

fraction, mixed number, like denominators, unlike denominators, estimation, simplify, simplest form, factor, least common denominator, common factors, common multiples, greatest common factor (GCF), least common multiple (LCM), sum, difference

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Note: This game should follow introductory work with fraction strips or other fraction manipulatives. By the time the students undertake this activity, they should have a working knowledge of common fractions, such as $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{3}$, and should know how to represent them as parts of a whole.

1. Pose a sample question such as, “Is the sum of $\frac{1}{4}$ and $\frac{7}{8}$ greater than or less than 1?” Ask the students to estimate the answer. Students may respond with the thought process that there are two $\frac{1}{8}$ in $\frac{1}{4}$, so $\frac{7}{8}$ and one more $\frac{1}{8}$ would be 1, and thus the answer is greater than 1. They may also say that $\frac{1}{4}$ is closer to $\frac{1}{2}$ and $\frac{7}{8}$ is closer to 1. Once they have determined that the sum is greater than 1, ask whether it is closer to 1 or to $1\frac{1}{2}$. Do not introduce rules or algorithms; you are trying to get students to make these discoveries on their own. Instead, encourage students to use fraction manipulatives, common benchmarks (0, $\frac{1}{2}$, or 1), and/or drawings to explore and reason.
2. Put students into groups of two-to-four players. Distribute copies of the Sum Cards handout and scissors to each student, and give each group a copy of the Fraction Cards

handout. Ask students to cut out all their sum and fraction cards. Assign one player per group to be the Calculator who determines the sums for the game.

3. Instruct all players to hold their personal sum cards in their hands and to place their group's fraction cards face down in a pile in the center of the table. Have students play the "Which Is Closer?" game according to the following rules:
 - Any player draws two cards from the fraction cards pile and turns them up in the center of the table. Each player estimates the sum of the two fractions shown on these cards, using fraction strips if necessary, and decides whether the sum is closer to 0, 1, or 2. Each player then places the corresponding sum card face-down on the table.
 - The Calculator determines the actual sum and announces whether it is closer to 0, 1, or 2.
 - Players then turn their sum cards face-up. If only one player put down the correct sum card, he/she collects the two fraction cards that are face-up. If two players put down the correct sum card, each player gets one fraction card. If three players put down the correct sum cards, the third player takes a fraction card from the pile, and so forth.
 - Each player who put down the wrong sum card must return one of his/her fraction cards to the bottom of the pile if he/she has any fraction cards.
 - Play continues with another player turning over two more fraction cards from the pile.
 - When all the fraction cards have been used, or there is only one left, the game ends. The player with the most fraction cards wins.
4. After the game, have each player describe the estimation strategy that worked best. You might have each group confer and then describe one of its best strategies.

Assessment

- **Questions**
 - How would creating and using a number line with the benchmarks of 0, 1, and 2 be helpful when estimating the sums/differences of fractions and/or decimals?
 - What are some clue words or phrases to look for within a word problem that will help you determine whether or not you add or subtract to solve the problem?
- **Journal/Writing Prompts**
 - Draw a picture to explain the answer to the following problem: Marcia baked 2 pans of brownies. She and her friends ate $\frac{5}{8}$ of each pan of brownies. What part of the two pans of brownies were left?
 - Draw a number line in your journal, and mark it from 0 to 2. Then, select two fraction cards, determine their sum, and explain the position of the sum on the number line. Justify your answer.

Extensions and Connections (for all students)

- Have students draw two or three fraction cards and create a word problem using those fractions. Then, have students exchange word problems and solve them, using a variety of strategies.

Fraction Cards

$\frac{1}{5}$	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{2}{5}$
$\frac{3}{8}$	$\frac{1}{8}$	$\frac{3}{10}$	$\frac{1}{2}$	$\frac{7}{8}$
$\frac{7}{10}$	$\frac{1}{10}$	$\frac{3}{8}$	$\frac{9}{10}$	$\frac{3}{2}$
$\frac{5}{3}$	1	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{5}{8}$
$\frac{4}{3}$	$\frac{7}{5}$	$\frac{3}{5}$	$\frac{5}{4}$	$\frac{7}{4}$

Sum Cards

0	1	2
0	1	2
0	1	2
0	1	2
0	1	2
0	1	2
0	1	2