

Estimating with Rational Numbers

6683

Introduction

In this activity, students will round fractions and mixed numbers, and then use their rounding skills to estimate sums, differences, products, and quotients.

Grades 6-8

NCTM Number and Operations Standards

- Compute fluently and make reasonable estimates
- Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results

Files/Materials Needed

Estimate.act, Sum_Difference.act, Multiply and Divide.edc

PART 1 FINDING BENCHMARKS

1

- Launch TI-Navigator™ on the computer and start the session.
- Have each student log into NavNet on their calculator.

2

- Load the *Estimate.act* activity settings file into Activity Center. This sets up the Activity Center so that students will have a number line (from -4 to 4) on their calculator. You may choose to click **Configure** and type a number that will appear as a prompt on the student calculators. You can also change the length of the number line as you see fit as well as the step size.
- Call out a fraction (proper or mixed), such as $1\frac{3}{8}$, and instruct students to estimate the fraction's value to the nearest $\frac{1}{2}$. Then instruct them to mark this location just above the number line.
- Once all students have marked their position, instruct them to send it. Discuss the results and use this opportunity to let students know that rounding fractions to the nearest $\frac{1}{2}$ can help them estimate operations on fractions.
- You can redo this activity several times (clear the activity data each time) using a variety of proper and mixed fractions.

PART 2 ESTIMATING SUMS AND DIFFERENCES

3

- Load the *Sum_Difference.act* activity settings file into Activity Center. This sets up the Activity Center so that students will have a number line (from -9 to 9) on their calculator.
- Call out the sum or difference of two fractions (proper or mixed), such as $3\frac{6}{7} + 1\frac{2}{3}$, and instruct students to estimate the value of the sum or difference using the benchmarks used in Part I. For example, students should be encouraged to think of $3\frac{6}{7}$ as 4, and $1\frac{2}{3}$ as $1\frac{1}{2}$, giving a sum of $5\frac{1}{2}$. Have students mark and send this location as they did in Part I.
- Depending on the ability level of your students, you may want to work with signed numbers as well. You can redo this activity several times (clear the activity data each time) using a variety of proper and mixed fractions.

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PART 3 ESTIMATING PRODUCTS AND QUOTIENTS

4

Tell students that it is usually helpful to round fractions to the nearest whole number before multiplying and dividing. For example, $4\frac{2}{5} \cdot 6\frac{3}{4}$ can be thought of as $4 \cdot 7 = 28$. In division, students may need to find compatible numbers that are close to the rounded numbers. For example, $39\frac{4}{5} \div 5\frac{3}{5}$ can be rounded to $40 \div 6$, but the result is a fraction. However, the problem can be rewritten as $40 \div 5$, giving an estimated quotient of 8.

5

Send students the LearningCheck™ file ***Multiply and Divide.edc***. They will have five products and five quotients to estimate. Collect their answers and use Class Analysis to review the results and provide additional clarification.