

# RAFT IDEAS

**Topics:** Whole Numbers, Decimals, Estimation, Rounding

## Materials List

- ✓ Blank playing cards
- ✓ Permanent marker or pen
- ✓ 10 sided die (0-9 die values)
- ✓ Coin
- ✓ Scratch paper and/or 1 copy of record sheet (page 2) per student
- ✓ Pencils
- ✓ Timer or watch with second hand

This activity can be used to teach:

Common Core Math Standards:

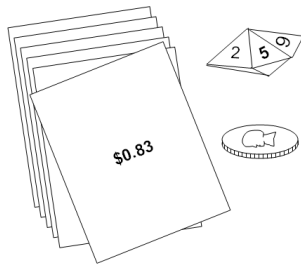
- Comparing, Rounding, and Operation with decimals (Grade 4, Number & Operations - Fractions, 7; Grade 4, Measurement and Data, 2; Grade 6, Number System, 3)
- Place Value with decimals (Grade 5, Number and Operations in Base Ten, 1-4)



Written by Gus Liu (RAFT)

# Easy Piecy Decimals

Adding, Subtracting, and Rounding Simple Decimals



## Example:

Die value with 2 place-holding zeros:	\$5.00
Heads on coin flip: use addition operation +	
Decimal value on card:	\$0.83
Value after adding 2 numbers:	\$5.83
Rounded to whole number:	\$6

Picking a card, rolling a die, and tossing a coin are part of this fun activity for students to practice simple math operations, rounding, and estimating with decimals.

## Assembly

1. With permanent marker or pen, write various monetary decimal values, between \$0.00 and \$1.00 to 2 decimal places on 20 or more blank playing cards.
2. Shuffle the deck of cards and place in the middle of the table game.

## To Do and Notice (Students work in pairs)

1. One student rolls the die, draws a card from the deck, and flips the coin.
2. On the record sheet or scratch paper, record the number from the die and the decimal value from the card. If the coin flip is heads, add the card value to the die value and if the flip is tails, subtract the card value from the die value. Record the resultant decimal and also round the decimal to the closest whole number.
3. Take turns repeating steps 1 and 2 to create 5 sets of number values per student.
4. Measure the time it takes for one student to add the rounded numbers.
5. Next measure the time it takes for that student to add the unrounded numbers.
6. Compare the results and the times for step 4 and step 5. How do they differ?
7. Switch roles and repeat steps 4 through 6. Switch papers and check math.
8. Repeat steps 1 through 7 for 3 more trials. How do the times & totals vary?

## The Math Behind the Activity

Decimal numbers are the basis of our monetary system and our system of scientific notation. A decimal is a base ten real number that contains a decimal point. Each digit in a decimal number has a value which depends on the place of the digit relative to the decimal point. For example, the number 4.25 has the expanded form of its whole number and decimal place values:  $4 + 0.2 + 0.05$ . Using money to teach decimals: \$4.25 can be expressed in expanded form as 4 dollars, 2 dimes and 5 pennies. To add and subtract decimals, write the numbers in a column with the decimal points aligned. It is often faster and easier to work with rounded numbers. In this activity, students experience the trade off between the speed of using rounded numbers and the precision of working with decimal values. In a number of situations, such as estimating the cost of a cart of groceries, the rounded numbers give a reasonable answer. In other cases a more precise answer is needed.

## Taking it Further

- Use positive and negative real numbers to 3 decimal places between -10 and +10.

**Web Resources** (Visit [www.raft.net/raft-idea?isid=593](http://www.raft.net/raft-idea?isid=593) for more resources!)

- Decimal games - <http://www.coolmath.com/prealgebra/02-decimals>
- Teaching decimals - [www.decimalsquares.com/NCTMstands.html](http://www.decimalsquares.com/NCTMstands.html)
- Operations with decimals - <http://www.aaamath.com/dec.html>
- Teacher designed math courses—<https://njctl.org/courses/math>

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### Easy Piecy Decimals – record sheet

Turn	Die roll	Coin toss (heads + /tails - )	Card Value	Result	Rounded value
1					
2					
3					
4					
5					
<b>Total</b>					

### Easy Piecy Decimals – record sheet

Turn	Die roll	Coin toss (heads + /tails - )	Card Value	Result	Rounded value
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4					
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<b>Total</b>					

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