

Estimating with Money

Grade Level: 1-5

OVERVIEW Many of the activities that the students would be involved in would be an extension of the same skills that children in the previous grades would be doing. I chose estimation because it lends to developing many different strategies to arrive at an answer. I also feel that not enough time is spent on this particular skill in the classroom. Another reason for this choice is that sometimes it gives the less mathematically inclined student a chance to shine and this leads to a greater love of math. It is a fun unit and the children enjoy learning the skills. In using this mini-unit I would use a glass container and pennies (or false money made of clay). The amount of pennies would be determined by the grade level of the students. With students in the first grade I would use just one guess (and this would be agreed upon by the team in the cooperative groups.) In the second and third grade I would have a guess and a guesstimate. The guesstimate would be a second guess based on some added information or prompt. The fourth and fifth graders would give a guess, a guesstimate, and an estimate. This would provide additional data for use in the multifaceted activities in these upper grades. This type of unit is non-threatening to the students and everyone feels free to participate and become totally involved. It also involves skills that are needed in real-life situations.

GRADE ONE The first graders would have a glass or plastic jar containing between twenty and thirty pennies. Each group would be told to put heads together and come up with a guess. As the groups report their guess, the group name and guess will be recorded by the teacher. The information will be written down on a chart by the teacher so that it can be used the following days.

ACTIVITIES AND PROCEDURES

- Tell the number that comes before each team's guess
- Tell the number that comes after each team's guess
- Find the guess on the big classroom number line
- Find the guess on your own number line
- Use the number line to show which number is greater or less
- Use the pennies to show different ways to make a number Use pictures of things the children could buy for those pennies and discuss prices

GRADE TWO These students will work in cooperative groups of 8-10 students depending on the class size. The number of pennies will be increased. The amount should not exceed one hundred. The students will first submit a group guess. The guesses will be recorded on the board. Then the pennies will be arranged in piles of about ten. The pennies will not be counted so the number will fluctuate from eight to

twelve. The groups will then take a guesstimate. All this information will be recorded on a large chart for use during the activities.

ACTIVITIES AND PROCEDURES

- a) Order the numbers guessed
- b) Tell if the numbers are odd or even
- c) Use $<$ and $>$ to show comparisons
- d) Tell how many tens and ones in each guess
- e) Add ten to each guess
- f) Discuss the range difference between the guess column and the guesstimate column and discover why the range is not so great
- g) Find the sum of each group's guess and guesstimate
- h) Find out how much the pennies weigh
- i) Discuss what are reasonable and unreasonable guesses not necessarily the groups' guesses
- j) Decide what you could buy with those pennies
- k) Show how you could make that amount with coins other than pennies
- l) Generate simple word problems using the data recorded on the charts (+ and -)

GRADE THREE The third graders could use an amount up to five hundred pennies. They would first take group guesses. Then about half of the pennies would be taken out of the container and counted. It is necessary for the class to decide on what looks like " about half". The groups then make a guesstimate. All information is recorded on a large chart for later use. It would be beneficial at this grade level to make copies of the charts for all the students.

ACTIVITIES AND PROCEDURES

- a) Order the numbers
- b) Round the numbers to the nearest ten or hundred
- c) Identify numbers by using place value
- d) Express the guesses in different forms using the cent sign and dollar sign
- e) Show many ways to express the amounts using bills and all kinds of coins
- f) Find the difference between the guesses and guesstimates
- g) Add 100 to each guess or guesstimate
- h) Discuss what you could buy with that amount
- i) Find the difference between the ranges in both columns
- j) Weigh the coins and discuss pounds and ounces
- k) Generate word problems using the data

GRADE FOUR The fourth graders will use an amount of pennies up to one thousand. The groups will make a guess. Then about half of the pennies will be counted and weighed and a group guesstimate will be given. Then one hundred pennies will be counted and followed by a discussion of the size of the pile. The remainder of the pennies will be divided into piles of ABOUT one hundred. The piles will be made by eyeballing and not counting.

ACTIVITIES AND PROCEDURES

- a) Ordering the numbers in all three columns
- b) Find the range and find the differences in each column
- c) Identify numbers by place value
- d) Round the numbers
- e) Show the numbers in expanded notation
- f) Find the multiples of 2,3,5, and 10
- g) Multiply each guess by 10 or 100
- h) Find the mean in each column
- i) Find items in the newspaper that you could buy for that amount of money
- j) Write the amounts in words
- k) Show half of the exact number of pennies
- l) Tell how much of the real amount each of the six groups would receive
- m) Tell how much each group member would get
- n) Generate problems using all four operations
- o) Decide what you would buy if you had that money

GRADE FIVE The initial activities for the guess, guesstimate and estimate can be the same as those used with the fourth grade classes, but you could increase the amount of pennies being used. All the group activities that are listed for fourth grade can be used and expanded upon for the fifth graders.

ACTIVITIES AND PROCEDURES

- a) Show fractional parts of the whole group
- b) Find the mean, mode and average
- c) Use money to begin the study of decimals
- d) Use scientific notation for expressing numbers
- e) Find out how many quarters you would have with this amount of money
- f) Find out how many dimes you would have
- g) Explain good strategies for estimating.

SUGGESTIONS/MODIFICATIONS

- Pennies can be substituted with local currency or other materials that represent currency such as corn, rice, beans, rocks, bottle caps, etc.
- The concept of estimation is used in daily life, the students may write out or discuss all of the estimations or guesses they make in a day. The teacher may make a list of daily estimations as a warm up exercise.
- The teacher may make a chart of estimations vs. exact answers to enhance the students understanding of the differences. For example $49 + 48 = 100$ (Estimated) and 97 (Exact).

AUTHOR: Louise Murphy, Scott Libby; Litchfield, AZ <http://www.col-ed.org/cur/>

