Math Game: Money Toss

MATH SKILLS REINFORCED:
Addition; understanding the value of U.S. coins; decimals; converting cents to dollars

AGE: 6 years and up; game can be adapted for a variety of levels

MATERIALS NEEDED:
❍ One bucket (or plastic bowl) for each player or team
❍ Sets of U.S. coins (pennies, nickels, dimes, quarters) for each player/team, totalling an equal monetary value
❍ Masking tape or string
❍ Tally sheet (optional, see page 3)

NUMBER OF PLAYERS: 2 or more, or teams

OBJECTIVE: To toss more money into one's bucket/bowl than opponents toss into theirs. "More money" means the highest total value of the coins--in dollars and cents--NOT the number of coins.

HOW TO PLAY:

PREGAME: Adults should introduce students to the value of each U.S. coin, and show older students how to convert cents to dollars and add dollar amounts using decimals. (See "Teaching Tips" on page 2.)

1. Count out an equal amount of money for each player or team using U.S. coins; e.g., if each team started with $2 in coins, the breakdown of coins for each player/team could be: **4 quarters, 6 dimes, 6 nickels, and 10 pennies. Adults can adjust the amount of money students use for the game based on the students' levels.**
2. Create a line on the floor using masking tape or string.
3. Put the buckets--one for each player of team--six to eight feet from the line. Players stand behind the line.
4. Players/teams take turns tossing coins, one at a time, into their bucket/bowl.
5. After all the coins have been tossed, players/teams add up the value of the coins in their own bucket/bowl. The player/team with the highest value of money in their bucket/bowl wins the round.

Younger students can stop here. Older students looking to practice higher level skills can continue with steps 6-8.

6. Players write their totals for the round on the tally sheet.
7. Students gather all of the coins and sort them so that everyone starts the next round with an equal amount of money.
8. Players determine which player/team has the highest total amount of money by adding the totals from all five rounds. The player/team with the highest total wins the game.

RULES:
1. If a coin does not land in the bucket/bowl, players can not pick it up and toss it again during the round.
2. Coins that land in the bucket/bowl, but bounce out do not count.
3. If a player accidentally tosses a coin into another player's bucket/bowl, that other player counts that coin toward his/her total.

How does this game reinforce some of the skills students need to learn, as outlined in the Massachusetts Mathematics Curriculum Framework?

NUMBER SENSE AND OPERATIONS STRAND (PreK to Kindergarten)
Learning Standard K.N.6: *"Identify U.S. coins by name." (Massachusetts Mathematics Curriculum Framework, 2000; page 18.)*

(Grades 1-2)
Learning Standards 2.N.6: *"Identify the value of all U.S. coins, and $1, $5, $10, and $20 bills. Find the value of a collection of coins and dollar bills and different ways to represent an amount of money up to $5. Use appropriate notation, e.g., 69¢, $1.35." (Massachusetts Mathematics Curriculum Framework, 2000; page 20.)*

(Grade 4)
Learning Standard 4.N.6: *"Exhibit an understanding of the base ten number system by reading, naming, and writing decimals between 0 and 1 up to the hundredths." (Massachusetts Mathematics Curriculum Framework, 2000; page 28.)*

MEASUREMENT STRAND (Grade 3)
Learning Standard 3.M.2: *"Carry out simple unit conversions within a system of measurement, e.g. hours to minutes, **cents to dollars**, yards to feet or inches, etc." (Supplement to the Massachusetts Mathematics Curriculum Framework, 2004; page 5.)*

PATTERNS, RELATIONS, AND ALGEBRA STRAND (GRADE 2)
Learning Standard 2.P.7: *"Describe functions related to trading, including coin trades and measurement trades, e.g., **five pennies make one nickel** or four cups make one quart." (Massachusetts Mathematics Curriculum Framework, 2000; page 36.)*

*The strands and learning standards listed were excerpted from the Massachusetts Mathematics Curriculum Framework (2000) and the Supplement to the Mathematics Curriculum Framework (2004). The strands and learning standards represented are a few of the benchmarks students must achieve. To view the complete Frameworks with all of the skills students are expected to acquire by each grade, visit the Massachusetts Department of Education Website at **www.doe.mass.edu.***

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Sample 2-Player Game (using the optional tally sheet)

	Player 1	Player 2
Round 1	$ 0.54	75 ¢
Round 2	$1.25	$ 1.95
Round 3	$1.81	$ 0.84
Round 4	$ 1.70	$1.49
Round 5	99 ¢	$1.56

Total value of money tossed into the bucket/ bowl over 5 rounds.	$6.29	$6.59

In this sample game, each player/team started with $2 in coins at the beginning of each Round. Each player received **4 quarters, 6 dimes, 6 nickels, and 10 pennies.**

In Round 1, Player 1 got a total of 54 cents in the bucket/bowl, but $1.46 worth of coins landed on the floor, outside of the bucket/bowl. Player 2 got $ 0.75 (75 cents) in the bowl, but $1.25 worth of coins landed outside of it. Player #2 won Round 1.

After counting their totals and recording them on the tally sheet at the end of Round 1, players gathered all of the coins from the floor and bucket/bowl, then resorted them so that both players had $2 in coins to use at the beginning of Round 2. In Round 2, both players improved their game, with Player 1 getting a total of $1.25 inside the bowl and Player 2 getting a total of $1.95 in the bucket/bowl.

The game continued until 5 Rounds were played.

Player 1 had a final total value of $6.29, but Player 2 won the entire game with a total of $6.59.

TEACHING TIPS

Adults should introduce children to the following concepts before playing the Money Toss game.

Value of coins: one quarter = 25 cents (25/100 = 1/4, hence the term "quarter")
one dime = 10 cents   one nickel = 5 cents   one penny = 1 cent
Introduce simple trades, e.g., five pennies = one nickel; two nickels = 1 dime; etc. Practice trading coins with students.

Converting cents to dollars and writing monetary amounts:

100 cents = $1.00 (one dollar); therefore, 250 cents = 250/100 = 2.5 = $2.50 (two dollars and fifty cents)

$0.54 = 54 hundredths of one dollar = 54/100 = 54 cents, and can be written *54¢*
NOTE: If one were to place a decimal point before the number AND add the "¢" sign after the number, for example, ".54¢" , this would represent *54 hundredths of a cent*--NOT 54 cents. Be careful!

Of these amounts -- **$23.00, $0.23, 23¢, and 0.23¢** -- which one has the greatest value? Which one has the least value?
    A) $23.00 = 23 dollars
    B) $0.23 = 23/100 = 23 hundredths of one dollar = 23 cents (23 ¢)
    C) 23¢ = 23 cents
    D) 0.23¢ = 23 hundredths of one cent
A has the greatest value, D has the least value, B and C are equal.

Adding money and using decimal points:
Line up the decimal points, then add.

What is the sum of 99 cents and 82 cents?
Answer: 181 cents = 181/100 = $1.81

.99
+.82
$1.81

What is the sum of $2.01 and $0.23?
Answer: 224 cents, or $2.24

$2.01
$0.23
$2.24

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Tally Sheet

	Player/Team 1	**Player/Team 2**	**Player/Team 3**	**Player/Team 4**
Round 1				
Round 2				
Round 3				
Round 4				
Round 5				
Totals (Rounds 1-5)				