How Many Pennies?

Subject: Math
Grade Level: K-2nd grade
Summary: Students will estimate the number of pennies it takes to fill outlines of various basic shapes.

BIG QUESTION

How many pennies will fill up different sized shapes?

TIMING

0 to 45 minutes

LEARNING OBJECTIVES

- Student will identify different shapes.
- Students will estimate based on a penny as being a standard unit.
- Students will record and test their estimates.

MATERIALS

- Math Journals or dedicated paper for this lesson
- 20 to 30 pennies for each group of 3 or 4 students
- Sheets of paper with large outlines of different shapes (circle, triangle, square, rectangle, etc.) for each group. See example included on the last page.

PROCEDURE

1. Have your students fold a page in their math journal or paper into 3 columns, then label the columns “Shape,” “My estimate,” and “Actual number.”
2. Form groups of 3 or 4 students and give each group a set of supplies. Each group needs a set of pennies. Each student needs a copy of the papers with the outlines of different shapes.
3. Have your students write in their math journals or paper the name (or draw a picture) of their shape (in the first column) followed by their estimate of how many pennies they think it will

take to fill up the shape (column 2). Students can look at the pennies and the shapes to help decide how many they think might fill each shape.

4. Each student should create an estimate for each shape, and then the students should compare their estimates. Each group can discuss how they arrived at their estimates, and if any of the estimates seem far off.
5. Have each student take one of the shape outlines and see how many pennies will fill each shape. Each student in the group can record the actual amount in their math journals.
6. Together the class can discuss the results. Students can share how they came up with their estimations.

ASSESSMENT

Students can be evaluated on the information they recorded in their math journals andtheir participation in the group discussion.

DIFFERENTIATE

After each group has determined the number of coins that fill the first shape (decide on a common shape for each group to test), you may wish to review the estimates made earlier. Do any of the groups believe that their estimates were far off? Can they make a better estimate now that they have a stronger knowledge of the amount of space filled by a penny?

RELATED

- Circulating Coins information for kids

STANDARDS

Common Core Standards

CCSS.Math.Content.K.CC.A.3
Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

CCSS.MATH.CONTENT.K.CC.C.6

Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies

CCSS.MATH.CONTENT.K.CC.C.7

Compare two numbers between 1 and 10 presented as written numerals

CCSS.Math.Content.K.CC.B.4
Understand the relationship between numbers and quantities; connect counting to cardinality.

CCSS.Math.Content.K.CC.B.5
Count to answer "how many?" questions about as many as 20 things arranged in a line, a

rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

CCSS.MATH.CONTENT.1.MD.C.4

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

CCSS.Math.Content.1.G.A.1
Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

CCSS.Math.Content.1.G.A.2
Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.[1]

CCSS.Math.Content.1.G.A.3
Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

Shape Worksheet