

Mathematics: The Language of STEM

Show Me the Money – Part 2

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CONTENT AND TASK DECISIONS

Grade Level(s): 2

Description of the Task:

Students will become deeply familiar with the size and value of particular coins.

Indiana Mathematics Content Standards: Identify (by number) and write the Indiana mathematics content standard(s) that your lesson will target.

2.M.7 - Find the value of a collection of pennies, nickels, dimes, quarters and dollars.

2.NS.1 - Count by ones, twos, fives, tens, and hundreds up to at least 1,000 from any given number.

Indiana Mathematics Process Standards: Identify (by number) the Indiana mathematics process standard(s) that your lesson will address, and describe how students will be engaged in the process(es).

PS1 – Make sense of problems and persevere in solving them.

PS2, - Reason abstractly and quantitatively.

PS3, - Construct viable arguments and critique the reasoning of others.

PS5 – Use appropriate tools strategically.

Mathematics Content Goals: State your specific mathematics goals for students' learning in this lesson.

Each kind of coin has a specific value unrelated to its physical size.

Language Objectives: With English Learners in mind, state your specific language objectives for this the lesson. On what will you intentionally focus?

Penny, Nickel, Dime, Quarter, Half-dollar, Cents

Materials:

Student sets of coins. Each set contains one each of a penny, nickel, dime, quarter, and half-dollar.

Plastic coins should be accurate replicas of real coins. Large scale paper coins that accurately reflect the characteristics of real coins but are also representative of the size differences of regular coins.

THE LESSON

Before: This phase of the lesson should be designed to get students ready for problem solving. It also provides an opportunity for you to find out what they already know about the topic. Describe how you will accomplish each of the following in this phase of the lesson:

- **Activate prior knowledge** (including the specific questions you will ask to raise students' curiosity and activate or determine their prior knowledge),
- **Be sure the problem is understood**, and
- **Establish clear expectations** (including the specific expectations you have for students to record their mathematical thinking in writing or drawing).

Teacher says, “Yesterday we learned great descriptions of five different coins. We know the names of those coins and can tell what they are by looking at them. Today, we are going to learn more about their physical sizes and compare their values. Let’s take a few minutes to reexamine the coins in your bags, look at each of the posted charts, and review all of the things we believe to be important about each coin.”

Students are dismissed to revisit their learning from the previous lesson.

During: This phase of the lesson should be designed for students to explore the focus task. Describe specifically what the students will be doing in this phase. Include a description of how the students will record their mathematical thinking in writing or drawing throughout the investigation. Describe how you will accomplish each of the following in this phase of the lesson:

- **Let go,**
- **Listen actively,**
- **Provide appropriate support** (including the specific questions you will ask to focus students’ thinking on the critical features of the task or to help students who are stuck), and
- **Provide worthwhile extensions.**

“The word “cent,” is a word that simply means one part of a dollar. A dollar is made up of 100 cents. In your Math Notebook, again write the name of each coin. Beside each name, write its value in cents.”

Give students time to complete the task.

“How many “cents” do you have in your bag?”

Allow students time to explore and discuss

“Now that you are more familiar with the value of your coins, please return to your groups from yesterday. Gather around the poster of your favorite coin.”

Work together and determine how many of your favorite coins it will take to make \$1.00.

Be prepared to defend your answer.”

Allow students time to complete the task.

After: In this portion of the lesson, students should work as a community of learners, discussing, justifying, and challenging various solutions to the problem all have just worked on. Here is where much of the learning will occur. It is critical to plan sufficient time for a discussion and make sure the During portion does not go on for too long. Describe how you will accomplish each of the following:

- **Promote a mathematical community of learners** (Describe how the students will present their solution strategies. How will you organize the discussion to accomplish the mathematical goals? Which solutions will be shared and in what order?)
- **Listen actively without evaluation** (How will you respond to students’ presentations of their solutions?)
- **Make connections** (What questions will you ask to help students make sense of the mathematics, make connections, see patterns, and make generalizations?)
- **Summarize main ideas** (How will you formalize the main ideas of the lesson? How will you reinforce appropriate terminology, definitions, or symbols?)

Each group in turn now explains to the class how many of their coins it will take to make \$1:00. Allow for plenty of time for students to discuss, reason, and justify their thinking.

Extension: Ask students, “How many cents is a half-dollar (50)? How many more cents would you need to make \$1.00? (50)

How many pennies do you need to make 50 cents?

How many nickels do you need to make 50 cents?
How many dimes do you need to make 50 cents?
How many quarters do you need to make 50 cents?

ASSESSMENT

Observe: Describe how you will observe students to gather evidence about what they are learning, and describe the specific evidence of mathematical understanding that you will look for in your observations.

Ask: List the specific questions you will ask students to assess their learning.

“Using the coins in your bag, arrange them in value from the least number of cents to the highest number of cents.” Check for understanding.

“Arrange your coins by size from smallest to largest.” Check for understanding.

EXTENSION GAME (As time allows)

Using real coins, put one of each in a dark, cloth bag. Challenge students individually to reach in and select an assigned coin. EX. Find a dime. Pull out a penny. Show me a nickel. Show me a quarter.