Constructing Task: A Pound of What?

STANDARDS FOR MATHEMATICAL CONTENT

MCC4.MD.1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36)

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Students should know how to use a scale and have heard the term pound as a unit of weight measurement. You may want to begin with a brainstorming session of when they have heard the term "pound" used in real life.

ESSENTIAL QUESTIONS

- Why are units important in measurement?
- What units are appropriate to measure weight?
- How heavy does one pound feel?

MATERIALS

- "A Pound of What?, Part 1 – How Much Is a Pound?" student recording sheet
- "A Pound of What?, Part 2 – What Weighs a Pound?" student recording sheet
- One pound (1 lb) weight
- 1 cloth or paper bag for each student
- Sand, aquarium gravel, blocks, cubes, beans, etc. for students to fill bags
- Items in the classroom that weigh about one pound
- Spring scale

GROUPING

Partner Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

In this task, students will be involved in a kinesthetic activity that helps them experience how heavy a pound is and develop a conceptual understanding of a pound. Students will then use that experience to estimate the weight of everyday items.

Comments

This task can be broken into two parts or the class can be broken into groups and the students can rotate through each part of the task.

You will need a lot of material (sand, aquarium gravel, blocks, cubes, and/or beans) if every student is going to create their own pound. You will need at least 25 pounds of material for 20 students. In order to allow students to experiment when creating one pound, there should be more than one pound of material per student. If you do not have enough material, students may work in pairs to create a pound.

Part 1 – How Much is a Pound?

To introduce this task, pass a one pound weight around to the students. Ask each student to hold the one pound and to try to remember how heavy it feels. Bags of materials can be made ahead of time and be used as referents for this task. (Bags may contain sand, aquarium gravel, blocks, cubes, beans, etc.)

Students should empty and refill their bags at least three times, even if they were very close to one pound on their first or second attempt. Also, using mathematical words to describe whether the bag weighs more than, less than, or equal to a pound is an important part of this activity. Make sure the students don't skip this step.

Part 2 – What Weighs a Pound?

To introduce this part of the task, while the pound referents are being passed around to the students, ask the class for a few suggestions of classroom items for which pounds would be an appropriate unit of measure.

For each item on their chart, students should first hold the item to estimate its weight (more than, less than, or about 1 pound), measure its weight using a spring scale, and write down the actual weight of each item.

When students are finished, hold a class discussion about what objects weigh approximately one pound and what students learned from this part of the task. Use the results from the students' work to generate a list of items in the classroom that weigh approximately one pound. One of the most important goals in teaching and learning measurement skills is for students to have some familiar referents for common units; therefore, a poster with items that weigh about one pound would be a good reference list to post for use throughout the year.

Task Directions
Part 1 – How Much is a Pound?

Students will follow the directions below from the "A Pound of What? Part 1 – How Much is a Pound?" student recording sheet.

> Think about how heavy the pound your teacher gave you felt. Now create a bag that you think will weigh about 1 pound. Do not use a scale to create your bag! After you have made your 1 pound bag, weigh your bag using the scale provided.
>
> - Does your bag weigh less than a pound?
> - More than a pound?
> - Exactly one pound?
>
> 1. Determine if your bag weighs more than, less than, or equal to one pound. Record your results in the chart below.
> 2. List common items from school or home that could be measured using pounds.
> 3. Think, could the same items be measured using kilograms? Record your thinking below.

Part 2 – What Weighs a Pound?

Students will follow the directions below from the "A Pound of What? Part 2 – What Weighs a Pound?" student recording sheet.

> You and your partner are going on a pound scavenger hunt! Use one of the reference weights to get an idea of how heavy one pound is. Then find items around the room that weigh less than, about, and more than one pound.
>
> 1. List the items in the table below.
> 2. Predict whether each item is more than, less than, or about 1 pound.
> 3. Weigh each item with a spring scale.
> 4. Record the weight in the last column.
>
> Remember: 1 kg = 1,000 grams
>
> Look at the table. Write what you found about your understanding of a pound? Be prepared to discuss your findings with the class.

FORMATIVE ASSESSMENT QUESTIONS

- When could you use a pound in your everyday routines?
- How could you estimate and/or measure an item without using a scale?

DIFFERENTIATION

Extension

- Sometimes it is helpful to have some referents for weights. For example, a bag of sugar or flour is about 5 pounds; a bag of potatoes may weigh 10 pounds, etc. Ask students to create a poster of common everyday objects that weigh a specific amount. (Be careful about weights indicated on a product package as that will *not* include the

weight of the container, which may be significant in some situations. This would be a good discussion to have with students.)

Intervention

- Create picture cards of items and separate cards with corresponding weights in pounds. Have students match the items with their weights and use a self-checking system on the back of the cards. Understanding how much items in their own world weigh will assist in the overall understanding of the unit.

Name _____ Date _____

A Pound of What?

Part 1 – How Much is a Pound?

Think about how heavy the pound your teacher gave you felt. Now create a bag that you think will weigh about 1 pound. Do not use a scale to create your bag! After you have made your 1 pound bag, weigh your bag using the scale provided.

- Does your bag weigh less than a pound?
- More than a pound?
- Exactly one pound?

1. Determine if your bag weighs more than, less than, or equal to one pound. Record your results in the chart below.

	Actual Weight of My Bag	**More Than**, **Less Than**, or **Equal to** one Pound
Attempt #1		My bag weighs _____ a pound.
Attempt #2		My bag weighs _____ a pound.
Attempt #3		My bag weighs _____ a pound.

2. List common items from school or home that could be measured using pounds.

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

3. Think, could the same items be measured using kilograms? Record your thinking below.

_____

_____

_____

Name _____ Date _____

A Pound of What?

Part 2 – What Weighs a Pound?

You and your partner are going on a pound scavenger hunt! Use one of the reference weights to get an idea of how heavy one pound is. Then find items around the room that weigh less than, about, and more than one pound.

1. List the items in the table below.
2. Predict whether each item is more than, less than, or about 1 pound.
3. Weigh each item with a spring scale.
4. Record the weight in the last column.

Remember: 1 lb = 16 ounces

Object	**Prediction** (check the correct box below)			**Actual Weight (oz or lbs)**
	Less Than 1 Pound	More Than 1 Pound	About 1 Pound	
1.				
2.				
3.				
4.				
5.				
6.				

Look at the table. Write what you found about your understanding of a pound? Be prepared to discuss your findings with the class.

_____

_____

_____

_____

_____

_____