

Objective 4: The student will demonstrate an understanding of the concepts and uses of measurement.

Knowledge and Skills Statement

(2.9) Measurement: The student directly compares the attributes of length, area, weight/mass, and capacity, and uses comparative language to solve problems and answer questions. The student selects and uses nonstandard units to describe length, area, capacity, and weight/mass. The student recognizes and uses models that approximate standard units (from both SI, also known as metric, and customary systems) of length, weight/mass, capacity, and time.

Student Expectation

(D) The student is expected to select a nonstandard unit of measure such as beans or marbles to determine the weight/mass of a given object.

ACTIVITY

Keep Things in Balance

Materials

Balance scale

Objects of various weights/masses: quarters, beans, marshmallows, pebbles, marbles, rubber erasers, markers, paper clips, Unifix cubes, tissues, calculator, plastic tape dispenser, box of 24 crayons, chalk, paperweight, etc.

Procedure

Show students the balance scale. If students are unfamiliar with how the scale works, explain that the scale's two pans will be at the same height if the objects in each pan have the same weight. Demonstrate this by placing a quarter in each pan. Explain that if the object in one pan is heavier than the object in the other, the pan with the heavier object will be lower than the other pan. Demonstrate this by removing the quarter from one of the pans and replacing it with a marshmallow.

Point out to students that the scale indicates that the quarter is heavier than the marshmallow, and say, "Let's see how many marshmallows are needed to equal the weight of the quarter." Add marshmallows to the pan with the single marshmallow, one at a time and counting aloud each added marshmallow, until the two pans are balanced. Then say, "One quarter weighs the same as _____ marshmallows," and write this information on the chalkboard.

Next, hold up the box of crayons and one of the pebbles. Ask students which they think is heavier and which they think is lighter, and then place each of the objects in a pan of the scale. Ask students to identify which object the scale indicates is heavier. Then ask students how many pebbles they think need to be added to the



pebble pan so that the pebbles' weight equals the weight of the box of crayons. Add this number of pebbles to the pan with the pebble in it. Allow students time to observe whether the two pans are balanced. If the pans are balanced, say "One box of crayons weighs the same as ____ pebbles," and write this information on the chalkboard. If the pans are not balanced, ask students whether it is necessary to add or remove pebbles from the pebble pan to balance the two pans. (Guide students to the correct answer if they have trouble identifying the necessary action.) Add or remove pebbles one at a time, saying aloud the number of pebbles in the pan after each addition or removal, until the two pans of the scale are balanced. Then say, "One box of crayons weighs the same as ____ pebbles," and write the information on the chalkboard.

Repeat this last procedure several times, using different pairs of objects.

Next, show students the box of crayons. Then show students a paper clip and a rubber eraser. Ask students which object it would require more of to equal the weight of the box of crayons and why that is so (it would require more paper clips because a paper clip weighs less than a rubber eraser). Set these items aside, and show students the paperweight. Then show them a marker and a bean. Ask students which object it would require fewer of to equal the weight of the paperweight and why that is so (it would require fewer markers because a marker weighs more than a tissue). Repeat this procedure several times, using different combinations of objects.



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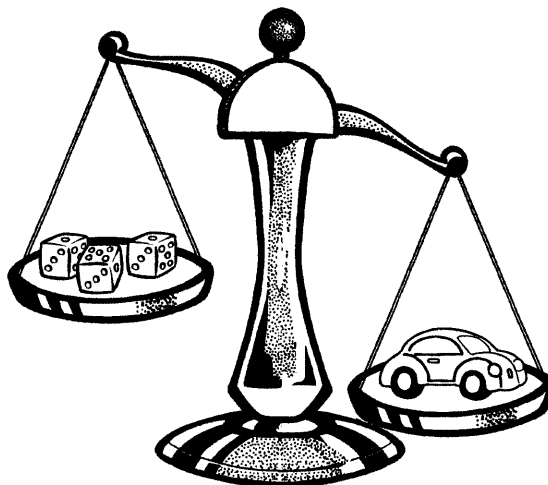
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Student Expectation

(D) The student is expected to select a nonstandard unit of measure such as beans or marbles to determine the weight/mass of a given object.

(Question 1 of 6)

- 1 Look at the balance scale. It has 3 dice in one pan and a toy car in the other.



Which of these is true?

- A The toy car weighs more than the 3 dice weigh.
- B The toy car weighs the same as the 3 dice weigh.
- C The 3 dice weigh more than the toy car.
- D The toy car weighs less than the 3 dice weigh.

