Evaluating Observations and Measurements
3rd Grade
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Benchmarks:
        SLC 6: Students will participate in experiments and identify one thing that changes (variable) and the things that should stay the same (constants).
        SLC 8: Students will identify and provide written facts about an observation (i.e., measurements, attributes, etc.) and discuss how they can be used to draw conclusions (inference).

Objectives:
        For the students to get a better feel for using the scientific method to answer a question as well as get hands-on experience with group work and the scientific method. Further, to help the students understand the meanings of observations, measurement, and data taking.

Materials:
- At least 3 ramps of different angles (one 45 degrees)
- One pull-back car for each group
- One meter stick for each group
- Paper (or worksheets)
- Pencils

Procedure:
        Before class, buy or assemble at least 3 ramps of varying angles. Make one of them 45 degrees, one or two smaller angles and one or two greater angles. Make the ramps small enough that a pullback car will be able to jump the ramp.
        Begin the lesson by briefly reviewing the scientific method and how and in which step(s) scientists use observations and measurements. As a class, come up with a question to ask, such as "which ramp will send the car the farthest?" Split the class into as many groups as there are ramps. Have each group come up with a hypothesis to answer the question. Each group starts out with one ramp and one pullback car (only after you or the teacher has checked to see that they have a hypothesis). Also remember to check each group's experiment to be sure they have only one variable and everything else remains constant. Depending on the class, it may be easier to come up with one uniform experiment for each group to do, such as:
-Make sure the car is started at the same point every time
-Pull back the car so that it runs over the ramp
-Measure with the meter stick how far away from the ramp the car lands
-Repeat with the same ramp then pass the ramp to the next group
-Repeat twice with each ramp

When every group has done completed their experiments and recorded all data (as checked by you or the teacher), come back as a class and discuss the results. Point out how important observations and measurements are in the scientific method.

Target Observations:
- When the whole class did the experiment the same, we could compare our experiments
- The car lands at different distances for different ramps
- Sometimes we didn't get the same answer when we measured twice

Target Model:
-Science experiments can help us answer questions
-Controlling the number of variables changed (only 1!) makes comparing experiments easier
-Measurements need to be done several times because they may not always give the same answer
-The ramp with a medium angle (45 degrees) sent the car the furthest

NAME:_____   **GROUP:**_____

What question are you asking? _____

_____

_____

What is your hypothesis? _____

_____

_____

RECORDING DATA: **(**remember to use units!)

<u>Ramp 1</u>

How far did the car go the first time? _____

How far did the car go the second time? _____

<u>Ramp 2</u>

How far did the car go the first time? _____

How far did the car go the second time? _____

<u>Ramp 3</u>

How far did the car go the first time? _____

How far did the car go the second time? _____

<u>Ramp 4</u>

How far did the car go the first time? _____

How far did the car go the second time? _____

<u>Ramp 5</u>

How far did the car go the first time? _____

How far did the car go the second time? _____

QUESTIONS:

1. Which ramp made the car go the longest distance? _____

2. Which ramp made the car go the shortest distance? _____

3. Was your hypothesis right? How was it different?

_____

_____

_____