

Science Standard(s): Students will gain an understanding of Physical Science through the study of the forces of motion and the properties of materials.

Objective(s): Compare and contrast the differences in how different materials respond to change.

Indicator(s): Model physical changes of various materials.

Investigate provide evidence that matter is not destroyed or created through changes.

Content Objective(s):

kid friendly objective. Will be posted on the board.

Language Objective(s):

Kid friendly. Posted on the board. May include listening, speaking, reading, writing. See list of possible verbs.

Essential Questions: What can we learn about non-living things?

Academic Vocabulary:

物质, 物理变化, 密度 (重量)

Materials:

- apple (food item)
- kitchen scale or balance scale
- smarties (tablet candy)
- plastic sandwich bags (1 for each group)

Language References and Word Wall:

Required: 物质, 物理变化, 密度 (重量)

Additional: 表明, 结论, 调查, 数据, 味道, 颜色, 大小, 气味

Sentence Frames:

A whole _____ has the same **mass** as a crushed/cut up _____.

一 (Classifier) 全的 _____ 和切片的 _____, 有一羊的密度。

A whole *apple* has the same *color* as a cut up *apple*.

一颗全的苹果和切片的苹果, 颜色是一样的。

Lesson: Physical Changes

Instructional time:
30 minutes

Opening: (5 minutes)

Bring a student to the front of the class and describe them – eye color, hair color, clothes, height, weight, ... (repeat with a couple of students)

Introduction to New Material (Direct Instruction): (5 minutes)

1. Tell the students that we usually describe items based on characteristics such as weight, color, shape, size, taste and smell. (have these words represented with pictures on the board – write the words underneath the pictures as you say them)

2. APPLE:

- a. Hold up an apple (or any type of food) and ask students to describe it, write it underneath the appropriate word.
- b. Place apple on scale. How much does it weigh? It has this much **matter**. That is its **mass**. Record weight.
- c. Cut the apple in half and hold it up. Ask students to describe the ½ apple (should come up with the same description)
- d. Ask the students to predict how much the 2 parts of the apple will weigh on the scale. Why? How much matter? (This is a formative assessment for you to discover any misconceptions about conservation of matter).
- e. Place both parts of the apple on the scale and weigh again. The weight is the same! So, cutting the apple did not change the way it tasted or how much it weighed.

Language Building:

Explain – Physical changes means that you change the shape or the look of an object but that won't change the amount of matter or weight or mass of the object. Tell the students that they are going to do an EXPERIMENT to find this out for themselves.

Experiment and Record: (10 minutes)

- Each group of 3 will be given a sandwich bag with 2 packages of smarties in it. They will describe the candy (they are small, round, hard, colorful, sweet, ...) and then weigh the smarties (supervised by the teacher).
- When finished weighing the candy they will stomp on the candy in order to crush them.
- *As the students stomp the candies have them chant: Stomp the matter make it change. Will the mass remain the same?*
- They will describe the candy again and then weigh it.
- Each student will have a responsibility – recording description the first time, recording description the second time (drawing or writing), weighing, and each student will stomp on the candies.

Use the modeling cycle:

Teacher Does:

Teacher will demonstrate step by step what is expected of the group.

Teacher Does with Students:

Teacher will demonstrate again with the help of 2 students.

3 Students Do:

3 students come up and perform the experiment. Teacher watches for misunderstanding among the students.

All Students Practice:

Students will separate into groups of 3 and perform the activity.

Discussion and Report: (minutes)

Questions:

What change did you notice?

有什么改变?

What did not change?

什么没有改变?

Did the matter change?

物质有改变吗?

Did the mass change?

密度有改变吗?

Closing: (7 minutes)

What are other physical changes you can think of?

还有什么物理变化?

Example: food (pizza cut into pieces), smoothie, cutting down a tree, blocks/legos (breakdown and setup), making bead bracelets,

Whole Class: Use the sentence frame to show that mass does not change.

Example: *A whole pizza has the same mass as a cut up pizza*

As the class does this several times have them pair share using the sentence frame.

Assessment:

Lab: How has it changed? Worksheet.