

Conservation of Mass demonstration: (~30-40 min)

Objectives:

This experiment will help students with their understanding of conservation of matter. consists of a series of small demonstrations leading up to realizing that matter is conserved even when some of it may escape into the environment. Provided that all the elements are accounted for will give evidence for conservation of mass. The students will be able to account for loss in mass when the gas is allowed to escape from the system. This will also show them that gas does have mass.

****** REMIND THE STUDENTS NOT TO EAT THE EXPERIMENT ******

Materials Needed:

- 1) Scale (Provided by Dr. Davis)
- 2) 50/50 solution of glue and water
- 3) 4% Solution of Borax with food coloring
- 4) Ziplock bags (1 per student)
- 5) Alka-Seltzer
- 6) Three disposable cups (per classroom)
- 7) Ice
- 8) Cotton
- 9) Nitrated Cotton
- 10) Matches
- 11) Ceramic Tile
- 12) Tongs

Strategy:

Classroom Demonstrations:

- At the very beginning - prepare a cup with ice Measure its weight and record it on the white-board (will be needed for later).

Slime Demo:

Demonstrate the procedure to make the slime. (About 5-7 min) explain the process and bring to their attention how mass is conserved. Remember to write the weights down. Have the kids do the math (addition).

- Weigh glue/water mixture (it is 50% glue / 50% water)
- Weigh Borax (it is a 4% solution) - with added food coloring
- Mix the two together (equal portions of each)
- Weigh the slime to show conservation of mass

For the kids: (about 15-20 min)

Write the directions on the board for them. Encourage them to describe how both solutions change consistency and to discuss among themselves.

- Directions:
- 1. Make a 50% water 50% white glue solution.
- 2. In a ziploc bag, add equal parts of the borax solution to equal parts of the glue solution.
- 3. Add a couple drops of food coloring.
- 4. Seal bag and knead the mixture.
- 5. Dig in and have fun. Remember to wash your hands after playing.
- 6. Keep your slime in the sealed bag in the refrigerator when not playing with it to keep it longer.

Alka-Seltzer Demo:

Time: (~5 min) We have just mentioned that mass should be conserved. Bring their attention back by asking them to predict what will happen when you mix Alka-Seltzer with water.

- Directions:
- 1. Weigh individually half a cup of water and 4 Alka-Seltzer tablets. (record the weights. (Kids should add)
- 2. Weigh them both on the scale (Don't drop the tablets yet). should confirm the number obtained by the students.
- 3. Drop the tablets into the cup.
- 4 The mass difference would suggest that:_____.
- 5. Guide the students to mention that something escaped from the cup, and that the gas that escaped has mass.
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Cotton Demo:

Time About 2 min. The scales may not be sensitive enough for this demo, so feel free to not use them.

- Directions:
- Burn the regular cotton on the ceramic tile
- Using the tongs, grab the gun cotton
- Set it in the remaining smoldering cotton
- Ask the students for an explanation
- Where did the mass go?

Closing:

At the beginning of the class there was a weighted cup of ice. (Should be mostly melted by now). Nothing should have escaped the cup. Ask the students to explain the differences between the beginning state and the final state (Ice vs water). Ask them to predict the weight the scale will read. Verify their prediction. Re-enforce the conservation of mass concept

Performance Assessment:

1. As the demonstration takes place, as the students to verbally communicate the results of their goeey experiment.
2. Ask the student to verbalize in their own words that even though the substance changes, mass is

conserved.

3. Students will be able to account for the loss in mass from the Alka-Seltzer experiment.
4. Ask student to account for the loss of the gun cotton.

Final notes:

*** Depending on supplies and time the Alka-Seltzer part may not be available. ***