

Mummifying Apples

Standards of Learning

Math 6.10, 6.18

Science 6.1, 6.5, PS.1, PS.2

Objective

Students will:

- conduct a scientific investigation to validate a hypothesis using a control and variables.

Materials

- 2 fresh apples, each cut into quarters (per group)
- large box of table salt
- large box of Epsom salts
- large box of baking soda
- knife (for the teacher)
- eight 12-oz. disposable plastic cups (per group)
- measuring cup (one per group)
- large mixing bowl
- permanent marker
- masking tape
- scale
- graph paper

Background Knowledge

Throughout history, countries have used mummification as a way to preserve their family members who have passed on. In order for mummification to occur, all the water must be removed from the body. Although the mummification process evolved over time, body preparers used a natural salt, natron (now called baking soda), to help dry out the body. This investigation will allow students to experiment with different minerals to determine which best dries out an apple. This lesson focuses on conducting an experiment using different salt compounds to determine which will best mummify an apple.

Procedure

1. Pass out the apple slices (eight slices), eight cups, and pieces of tape to each group of students.
2. Ask the students to copy the table below into their science notebooks.
3. Write “starting weight” on eight pieces of tape, leaving room to write the weight of the apple slices on the tape. Tape one of these pieces to each cup.
4. Select one apple slice, weigh it, and record the slice’s weight on the piece of tape on the front of cup 1. Place this apple slice in cup 1.
5. Select the other apple slices, one at a time, and weigh them. As each apple is weighed, place it in a cup and write its corresponding weight on the front of the cup. Have the students record the data on their data tables.
6. After all the apple slices have been weighed and the cups labeled appropriately, get out the measuring cup, table salt, Epsom salt, and baking soda.
7. Add $\frac{1}{2}$ cup of baking soda to cup 1, completely covering the apple slice. Label this cup as “baking soda only.”



8. Add ½ cup of Epsom salt to cup 2, completely covering the apple slice. Label this cup as “Epsom salt only.”
9. Add ½ cup of table salt to cup 3, completely covering the apple slice. Label this cup as “table salt only.”
10. Add ¼ cup of table salt and ¼ cup of Epsom salt to cup 4, completely covering the apple slice. Label this cup as “table and Epsom salt.”
11. Add ¼ cup of table salt and ¼ cup of baking soda to cup 5, completely covering the apple slice. Label this cup as “table salt and baking soda.”
12. Add ¼ cup of baking soda and ¼ cup of Epsom salt to cup 6, completely covering the apple slice. Label this cup as “baking soda and Epsom salt.”
13. Add 1/3 cup baking soda, 1/3 cup table salt, and 1/3 cup Epsom salt to cup 7, completely covering the apple slice. Label this cup as “baking soda, table, and Epsom salts.”
14. Leave cup 8 with only the apple slice and label this cup as the control.
15. Place all eight cups on a shelf out in direct sunlight and let them sit for seven days.
16. Ask the students to make a hypothesis about which mineral mixture will work best to dry out (or mummify) the apple slice. Have the students write down their hypothesis in their science notebooks.
17. At the end of the seven days, take down the cups from the shelf. Take each apple slice out of the cup, one at a time, and try to brush off as much salt and baking soda as possible. Do not rinse off the slices, as they will become rehydrated.
18. Weigh each apple slice and record the data on their data tables.
19. Have the students compare the starting weight of each apple slice with its ending weight.
20. Have the students record their conclusions in their science notebook and create a graph comparing the different weights of the apple slices.

Extension

- Put the dried apple slices under a microscope to allow the students to observe the appearance.
- Try this experiment with other types of fruit!

References

- <http://www.newtonsapple.tv/TeacherGuide.php?id=1422>
- <http://www.virginiaapples.org/>

Cup Number	Starting Weight	Mineral Used	Ending Weight
1			
2			
3			
4			
5			
6			
7			
8			

