Mummy Magic

1. Objective
   Discover how the Ancient Egyptians used drying as one step in the mummification process.

2. What You Need
   1/2 apple
   1 popsicle or craft stick
   1 medium-sized plastic bag that seals
   Natron Solution: 1/4 cup table salt, 1/2 cup sodium carbonate (washing soda, sometimes called powder bleach - check the ingredients), and 1/2 cup baking soda. Stir together--this makes enough to do one apple. You may maximize this recipe as necessary.

3. To Do and Observe
   1. Make the Natron solution (recipe above) in the plastic bag.
   2. Carve a face into the apple with the popsicle stick then stick the popsicle stick into the apple so you have a handle (like you were making a candy apple).
   3. Dip the apple into the Natron Solution until the face is covered, and leave the apple in the bag.

Safety precautions: do NOT eat the apple or the Natron Solution; wash your hands after the activity and don't touch your eyes or mouth until you wash your hands. You might want to wear plastic safety goggles.
4. Leave the bag open in an upright position to allow air to flow.
5. Record your observations as your apple mummifies. What happens to the apple once it is covered with the Natron Solution? How much time does it take for the apple to turn into a "mummy"?

**What's Going On**
The Natron Solution dries the apple just as it would dry a human body to make a mummy. By eliminating moisture, you have eliminated the source of decay. Natron is made up of four salts: sodium carbonate, sodium bicarbonate, sodium chloride, and sodium sulfate. The sodium carbonate works as a drying agent, drawing the water out of the body. At the same time the bicarbonate, when subjected to moisture, increases the pH that creates a hostile environment for bacteria.

**Parent/Teacher Tips**
The mummification of the apple may take up to two weeks. Other suggestions for the mummification process: try using chickens or game hens. Adjustments would have to be made to the amount of Natron Solution used and the time allotted for the experiment. The Ancient Egyptians believed that mummification was necessary for eternal life. The soul needed a body to which to return. Challenge your children to research the afterlife beliefs of the Ancient Egyptians. Also challenge your children to research other cultures that practiced mummification. What other substances did the Ancient Egyptians use to make mummies? How did the Ancient Egyptians discover Natron? How long does it take for your apple to be mummified? What changes to the apple did you observe during the mummification process?
Without the spools on the balloon car, do you think the car would move? It probably would, but not as far. That is because much more of the bottom surface of the car would make contact with the surface that it is moving on. This increased amount of contact would lead to lots of friction, the force of two surfaces in rubbing against each other. By adding the spools to the car, we decrease the amount of friction because only the spools – acting as wheels - are making contact with the surface, and they are spinning rather than rubbing. The wheel and axle are one of the six types of simple machines, which are tools that allow us to do a certain amount of work (like use air to push a car a certain distance) by applying a smaller force than would be needed without the simple machine. We find examples of simple machines around us all the time. Some examples of a wheel and axle that help us every day are doorknobs and the gears in a clock. Can you think of some others?

Parent/Teacher Tips
For Younger Children
Before the children attach the wheels and axles, have them blow up the balloons and let their cars go. How far does the car travel? Does it go very fast? Have the children hypothesize as to what modifications might make the car travel farther and faster.
For Older Children
Have the children test their balloon cars on different surfaces. Ask them to observe or measure how far and how fast the car travels on a carpet. Then have the children do the same thing on a smooth, flat table. Were there any differences in the cars’ speed or distance traveled on the different surfaces? On the textured surface of the carpet there will be more friction and the balloon car should not be able to travel as fast or as far as it will on a smooth surface. The children can make hypotheses about additional types of surfaces and other variables, perform tests and observe the results.