|  |  |  |
| --- | --- | --- |
| Mummy Experiment Egyptian mummyThe earliest Egyptian mummies date back to around 3200 B.C. Hieroglyphics from tombs describe how the mummification process evolved over time.  In the beginning, preparers would simply treat the body by covering it with a natural salt, called natron (baking soda), to help dry it out, and then wrap it in bandages soaked in a type of resin.  Around 1500 B.C., the art of mummification reached its peak. Before treating the body, morticians would remove the brain and many vital organs. Then they would pack the abdominal cavity with natron, sand, or sawdust and immerse the body in more natron for about 40 days. After that, the body was washed, repacked with spices and more natron, and wrapped in bandages. The whole process took about 70 days. |  |  |

|  |  |  |
| --- | --- | --- |
|  |  | Mummy Experiment Have you ever wondered why every time you eat salty foods, you get thirsty? Or why fresh vegetables tend to shrivel up when you sprinkle salt on them? The answer is simple. Salt is a desiccant - it helps remove water from things, including human bodies. Which is why the Ancient Egyptians used salts when they were mummifying bodies.  In this experiment, you can test different salt compounds and to find out which makes the best mummified apple.  **Materials**  2 fresh apples large box of table salt large box of Epsom salts large box of baking soda knife eight 12-oz disposable plastic cups measuring cup large mixing bowl pen masking tape sensitive balance or food scale (optional) paper and pencil   1. Slice the two apples into quarters so that you have eight slices similar in size. Place a piece of tape on each cup and write the words "starting weight." Select one slice, weigh it, and record the weight on the outside of cup 1. Follow the same procedure with the other seven apple slices until each cup has been labeled with the appropriate starting weight.  If you don't have a scale, try to cut all the apple pieces to the same size. 2. Put 1/2 cup of baking soda into cup 1, making sure to completely cover the apple. Write the words "baking soda only" on the outside label. 3. Fill cup 2 with 1/2 cup Epsom salts and label. 4. Fill cup 3 with 1/2 cup table salt and label. 5. Fill cup 4 with 50:50 mix of Epsom and table salt then label. 6. Fill cup 5 with 50:50 mix of table salt and baking soda and label. 7. Fill cup 6 with 50:50 mix of baking soda and Epsom salts and label. 8. Fill cup 7 with a mixture of 1/3 baking soda, 1/3 Epsom salts, and 1/3 table salt and label. 9. At this point, seven cups should have an apple piece and 1/2 cup of salt mixture. Cup 8 should have just a piece of apple as control for the experiment. 10. Place the cups on a shelf out of direct sunlight and let them sit for seven days. 11. After a week has gone by, take out each apple slice, brush off as much salt as possible, and reweigh. (Do not rinse the apple off because that will rehydrate it.). 12. Compare the starting and ending weights of each slice and calculate the percentage of weight which is moisture lost for each by dividing the difference in weight by the starting weight. 13. If you don't have a weigh scale, put the apple pieces in order of size (make sure to keep track of which piece was in which cup!   **Questions**   1. Which salt would seem to work best at making an apple mummy? 2. Would you have achieved the same results if you used a whole, un-peeled apple? Try it and find out. 3. What was the point of leaving one of the apple slices in a cup without any salt at all? 4. Where did the moisture in the slices go? How could you confirm this?   jars for holding salt to make a Egyptian mummySalts and special drying solutions played important roles in preserving mummies, but they also served another purpose. Before refrigerators and freezers, people had to preserve food by pickling, drying, salting, and smoking. Visit a local food store and see how many foods you can find that have been preserved the same way as mummies. Try your hand at drying different fruits. How do the textures and tastes compare?  This idea comes from the [Newton's Apple](http://www.ktca.org/newtons/index.html) website.  Looking for gift ideas for someone who is fascinated by [Ancient Egypt](http://www.creativekidsathome.com/egypt_gifts.shtml).  Find more [Science Experiments](http://www.sciencekidsathome.com/science_experiments/)  More information and science experiments about: |

### Lesson 1:Mummify a tomato!

Mummies are fascinating relics of the Egyptian civilization and a great place to start investigating – not with a real body, of course, but with a tomato!

The ancient Egyptians believed that the body of a dead person needed to be preserved in order that the spirit of the deceased could live on in the afterlife. To begin with, Egyptians probably noticed that bodies buried in the dry, hot sand of the desert tended to dry out naturally and become mummified. As their civilisation became more developed, complicated rituals and processes evolved to produce more sophisticated mummies.

**The first step** in mummification is to get rid of the wet and gooey stuff; dry materials are less likely to rot and decay than damp ones. Unfortunately for budding embalmers, tomatoes, like us, contain a huge amount of water. The drier we can get our tomato the less likely it will rot.

**Step 2 - Stop the rot**

Children can test this idea by sealing slices of bread in two separate Ziploc bags - or closed pop bottles. They’ll also need to place a 1cm layer of dry sand in one container and a similar layer of damp sand in the other. After a few days, observe which conditions are best for mould to grow on the bread. Imagine this on your mummy. Yuck!

**Step 3 - Watch and learn**

Before you start – observe your tomato really carefully. What does it feel like, smell like, what colours can you see, what about the texture of the skin? Keep an un-mummified tomato as a control to provide a comparison.

To dry out our tomato we need to make a small incision in the fruit and scoop out the seeds inside. You can throw these inside bits away. The Egyptians did the same with the internal organs. They kept the heart, which they placed inside the mummy, and the lungs, liver, stomach and guts which were kept inside canopic jars for protection.

The body cavity was then washed with wine; the alcohol was supposed to kill germs. Children can carefully rub their tomato inside and out with a dilute anti bacterial solution like ‘Milton’ then dry the excess with kitchen paper.

Now weigh your mummy. This is the premummification weight with water.

Next we need to pack the body with a type of naturally occurring salt called natron. We can’t easily get real natron, but we can make it from a mixture of table salt and bicarbonate of soda; epsom salts work well too. More able children can explore the different combinations and proportions of chemicals that work best in mummification, but equal quantities of each is a good mix to start with.

Pack your tomato cavity with your natron and then place it in a container so it is completely covered with the salt and bicarbonate of soda mix. Check its progress every few days; you may need to replenish the natron to keep it dry.

The Egyptian embalmers had to wait 70 days to complete their mummy, yours should be ready in a couple of weeks. What does it look like now? How has the colour changed, the texture? Weigh your tomato again – the difference is the weight of the water that has now been removed. If you want, now you can make and decorate a sarcophagus for your mummified fruit!