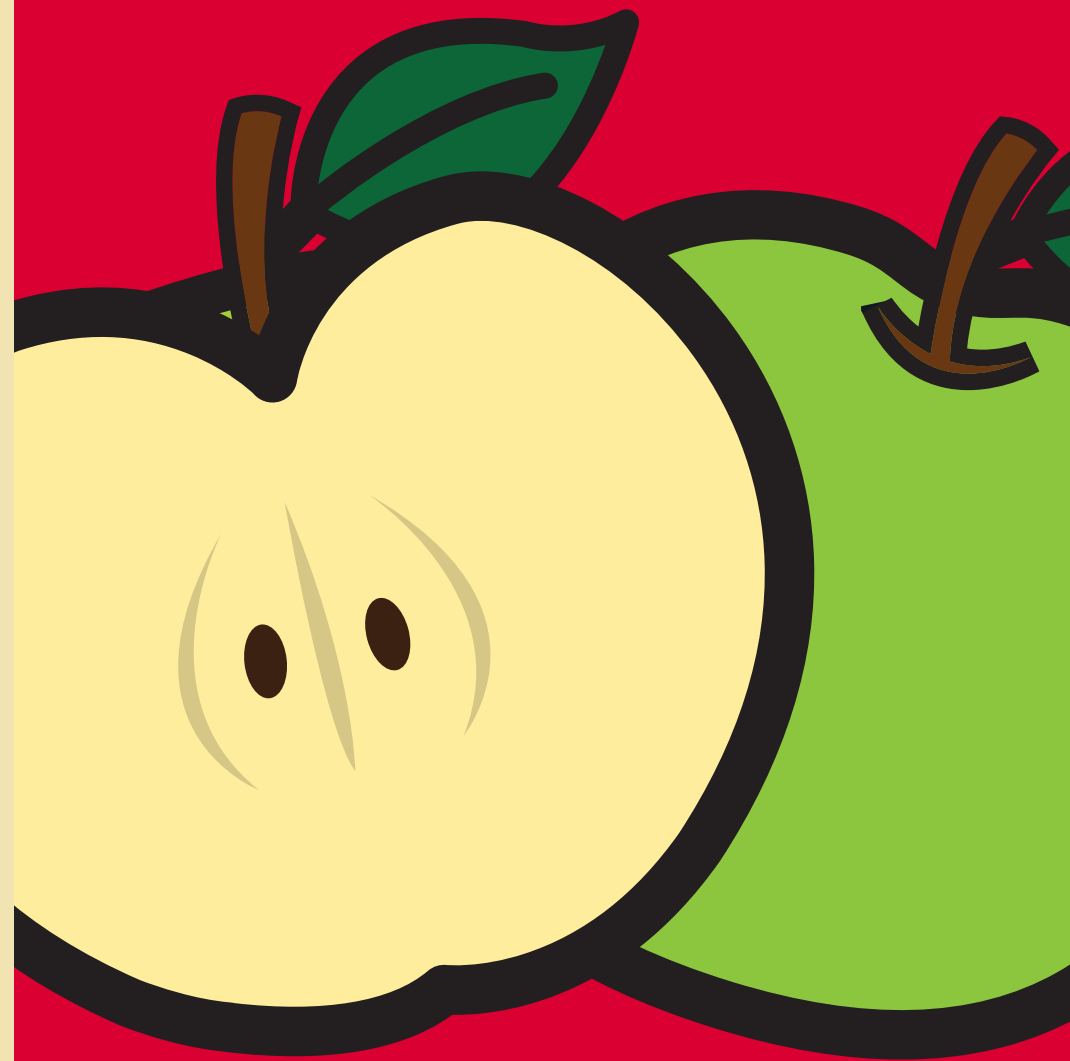


OCTOBER HARVEST OF THE MONTH

LESSON PLANS AND ACTIVITIES



APPLES



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INTRODUCTION

Virginia Harvest of the Month (HOM) is a program that promotes eating seasonal foods, increasing fruit and vegetable consumption, and supporting local economies. Sponsored by the Virginia Department of Education, Office of School Nutrition Programs (VDOE-SNP), Virginia HOM provides ready-to-use materials for classrooms and cafeterias to educate children about the joys of eating seasonal, local foods.



In collaboration with Virginia Agriculture in the Classroom and Virginia Cooperative Extension Agents, VDOE-SNP developed nutrition education lessons for secondary students based on the HOM featured item. Additionally, with a select group of Virginia nutrition directors, VDOE-SNP created and tested recipes for school meals highlighting the Virginia HOM featured item. The recipe development team's culinary knowledge and student input were used to create the recipes that correspond with this lesson. Providing nutrition education with student meals creates an opportunity to engage students with how Virginia foods are grown, connect food and wellness, and promote the consumption of the HOM featured item.

In your school cafeteria this month, the recipe: Sweet Oat Stuffed Apples will be available. As you learn about the Harvest of the Month in the classroom, we encourage you to connect your classroom activities to the cafeteria and try the new student taste tested and approved recipes!

ACKNOWLEDGMENTS

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LESSON ONE:

EXPLORING VIRGINIA'S APPLE VARIETIES

Grade Level: Grades 9-10

Lesson Length: 2-3 hours

Objective:

Students will:

- Understand the journey of an apple from the orchard to the grocery store.
- Be able to identify Virginia grown apple varieties and make recipe choices based on apple characteristics.

Related Competencies:

Introduction to Culinary Arts, 8249:

- Describe the latest advancements in food safety.
- Explain concepts of taste and flavor.
- Identify specialized markets and entrepreneurial opportunities in culinary arts professions and food-related industries.

Culinary Arts I, 8275:

- Outline flow of food from grower to buyer.
- Identify fruits, vegetables, and farinaceous items.
- Describe the role of food and food ways in the history of Virginia.

Foundations Agriculture, Food, and Natural Resources (ANFR) 8006:

- Identify Virginia's major agricultural commodities and products by region.
- Examine the relationship of science and technology to agriculture.
- Identify agricultural commodities.
- Explain the role that food science plays in ensuring a nutritious, safe, and abundant food supply.
- Describe the steps involved in the processing of plant and animal food products.

Applied Agricultural Concepts 8072:

- Explain the importance of pruning.
- List factors that affect the quality of vegetables and fruits.
- Describe techniques for harvesting fruits and vegetables.
- Identify characteristics of ripened vegetables and fruits.
- Identify fruit and vegetable varieties.

Materials:

- Farm to Plate Sort Activity Sheets
- Scissors
- [Map: Apples in Virginia](#)
- White Board
- Samples of Virginia apples (Gala, Golden Delicious, Jonathan, etc.)
- Handwashing station
- Paper Plates
- Toothpicks

Engagement Activity:

- Start by making a list on the board of the different varieties of apples students have tasted and enjoyed.
- Reference the graphic on the next page if needed.
- Ask the class about their favorite type of apple, least favorite, and why.
- Explain to the class that Virginia ranks sixth in apple production.
 - About 75 percent of our apples are processed into value added products like juice, sauce, cider, etc.
 - We also have a growing agritourism industry centered on you-pick orchards and cideries.
- Explain to the class that today they will be learning more about apple varieties in Virginia and how those apples make it from the orchard to their plate.

VIRGINIA GROWN FRESH APPLES



Ginger Gold

Outstanding early season apple, fresh from the orchard. Sweet, juicy and firm.



Gala

Sweet and very flavorful with orange-striped skin and yellow flesh. A new favorite for snacks and salads.



McIntosh

Juicy and slightly tart. Great for eating fresh and baking.

Jonathan

Moderately tart. Delicious for snacking, salads and cooking.



Jonagold

Firm, sweet and great for pies. Offers a unique honey-tart flavor and crispy, juicy, nearly yellow flesh.



Empire

McIntosh apple crossed with Red Delicious for unique taste. Crisp and excellent for snacks, desserts or salads.



Red Delicious

Sweet and juicy. A favorite for snacks and salads. Best for eating fresh out of hand.



Stayman

Firm, rich flavor and mildly tart. Great all-purpose apple.



Golden Delicious

Sweet and mellow. Excellent for snacking, salads and cooking purposes.

Rome

Firm and slightly tart, the Rome is one of the best cooking apples. Perfect for pies, cakes, breads, cookies, stuffing and quiche. Choice apple when making baked apples.



Honeycrisp

A popular pick for eating fresh out-of-hand. These hardy, ultra crisp and juicy apples have a honey sweet and tart flavor. Also good for salads, sauces and baking.



Cripps Pink (Pink Lady®)

Crunchy texture and tart taste with a sweet finish. Ideal for fresh out-of-hand eating. Also delicious in purees, salads and desserts, including pies and tarts.



Fuji

Very firm and unusually sweet. Red and green with stripes. First discovered in Japan - a new favorite here.



Granny Smith

The famous green apple. Very firm, tart and juicy. Excellent for eating fresh and cooking purposes, especially pies.



York

Crisp, firm and tart. Excellent for eating fresh and cooking purposes.



Presented in cooperation by
The Virginia Department of Agriculture and Consumer Services
and the Virginia Apple Growers Association



VirginiaApples.net

ACTIVITY ONE: FARM TO PLATE SORT

Activity Steps:

In this activity, students will be looking at various stages of the apple supply chain. First, cut the facts and category worksheets apart. The bold words indicate a stage in the chain. The lighter text facts represent key information about each stage. Distribute worksheet sets to the students in small groups (2-3 students). Ask the students to put the stages in order and then sort the remaining slips under the correct stage category.

After time is given, read the below passage from usapple.org. Ask students to make corrections and sort slips as you read.

Apples from Farm to Plate:

Apples are an ancient fruit and have been grown by humans for thousands of years. The basics of apple growing haven't changed much over the centuries, although in this century science and technology have become very important tools. Here's a summary of an apple's trip from the tree to your table:

Off-season in the Orchard:

Apples are grown on farms called orchards. Apple growers watch over their apple trees all year, pruning them during the winter, thinning blossoms during the spring to increase remaining fruits' size and color, mowing the grass and continuing to fight pests during the summer, and harvesting during the fall. By fall, the tree is so heavy with fruit that the branches can bend to the ground.

Harvest:

Apples bruise easily, so they must be picked from the tree by hand rather than by machine. Apple pickers use ladders to reach the fruit at the top of the tree and place the picked fruit in cloth buckets worn over their shoulders. When full, these buckets are emptied into a big field bin. These 4'x4' boxes are big enough to be used as a clubhouse by some children!

Packing House:

When the field bin is full, it is loaded on a truck with other bins and taken to a packing house. At the packing house, the fruit is stored in giant refrigerated warehouse rooms until the apples are sold. These warehouse rooms, called controlled atmosphere rooms, keep apples fresh for up to a year after harvest. This storage technology ensures that you can have crispy, crunchy apples all year long.

Whole Fruit Distribution (Sorting, Washing, and Transporting):

Once the apples are sold, they are washed and brushed to remove leaves and dust, and dried. The apples are then sorted into bags or boxes with other apples that are the same variety, size, and color, and packed into cardboard cartons. The cartons are transported by refrigerated truck from the warehouse to a grocery store, school cafeteria, or local restaurant. Some growers sell their apples themselves at small stores on the orchard, at roadside stands, or at your community's farmer's market. You can also go to some orchards to pick and buy your own apples - that is a lot of fun!

Further Processing for Value Added Products:

Some of our apples go from the orchard to food processing plants to be made into applesauce, apple juice, and apple slices for pies, apple chips, and other apple foods. About four of every ten apples grown in the U.S. are made into processed apple foods.

So, U.S. apples can arrive at your table in a number of ways – whether bought at a grocery store, farm stand, or already prepared at a restaurant – and in a number of forms – perhaps simply sliced, cooked into a delicious recipe, or processed into one of many processed apple foods. No matter how you eat your apples, now you can appreciate how they got from the tree to your table.

Source: usapple.org, July 2007.

Extension:

- Find a recipe for a specific Virginia apple variety. Share your apple recipe with the class and report about that apple's journey from farm to plate.
- Create a lesson to teach elementary school students about apple nutrition and share with a local class during the fall.

**Activity One: Farm to Plate Sort
KEY STAGES**

Please cut out the seven stages below. The facts to cut out will be on the next page. NOTE: These are duplicated to print two stage sets per page.

OFF-SEASON AT THE ORCHARD

OFF-SEASON AT THE ORCHARD

HARVEST TIME

HARVEST TIME

PACKING HOUSE

PACKING HOUSE

WHOLE FRUIT DISTRIBUTION

WHOLE FRUIT DISTRIBUTION

GROCERY STORE/RETAIL LOCATIONS

GROCERY STORE/RETAIL LOCATIONS

**PROCESSING FOR VALUE ADDED
PRODUCTS**

**PROCESSING FOR VALUE ADDED
PRODUCTS**

Activity One: Farm to Plate Sort KEY FACTS

Please cut out the twenty facts below so they can be sorted under the six stages.

| | | | |
|--|---|--|--|
| Trees are pruned during winter. | Roadside Stands | U-Pick Orchards | Ladders are used to pick fruit from the top of the tree. |
| Customer purchases their favorite apple products. | Apples are picked from tree by hand. | This storage technology allows us to enjoy crisp apples all year. | The tree is heavy with fruit and the branches are bending to the ground. |
| Apples are collected in cloth bags and then carefully emptied into 4x4 field bins. | Major grocery store chains | Mowing grass and managing pests are important tasks in the summer. | Apples are washed and brushed to remove leaves and dust. |
| Fruit can be stored here for up to a year after harvest. | Full field bins are loaded on a truck and taken to the packing house. | Apples are sorted and boxed or bagged. | Community farmers' market |
| Apples are placed on a refrigerated truck and delivered to stores, restaurants, and schools. | Apple blossoms are thinned out to make remaining fruit brighter and bigger. | Apples are used for sauce, juice, and other food products. | Fruit is stored in giant refrigerated rooms until it is sold. |

ACTIVITY TWO: VIRGINIA GROWN APPLES

Activity Steps:

Explain to students that today they will be learning about apple varieties that are grown in Virginia. Allow students time to access the [Virginia Apple Orchard Map](#) either as a class, in small groups, or on their school issued devices.

Delivery Suggestions:

- Allow pairs of students to research and share information about an assigned apple variety with the class.
- Create a gallery walk around the classroom that will allow students to see color images of each apple or the actual apple itself. Create guided notes about each apple variety for students to fill in as they walk around.
- Create a slideshow that shows images of different types of apples.
- Ask students to guess the types of apples. Reveal the variety and information in the next slide.
- Ask students to create an infographic to teach others about apples in Virginia.

Extension:

How many varieties of apple can you find in your local grocery store? Are any of them grown in Virginia?

Develop a concept for a new apple variety. Create marketing materials and prepare a sales pitch to share with the class.

Potential Processing Questions:

- Where are many of the apple orchards located? Why do you think they are located here?
- Which orchard is closest to your school?
- If the orchard has a website, what can you find out about the types of apples they grow and the services they offer?
- Tell the students that now they will be learning more about apple varieties grown in Virginia.

References:

- What's Growing on in Virginia? Virginia Agriculture in the Classroom. Fall 2008.
- US Apple Association. Usapple.org

Companion Resources:

- Newsletter: [What's Growing on in Virginia? Apples](#)
- Reference: [Apple Tree Planting Guide](#)
- Video: [Farm Life 360 Apple Harvest](#)

Types of Virginia Apples

Fuji — a cross between Red Delicious and Virginia Rawls Jennet apples; bluish color with green and yellow stripes; the best sweet apple available after Nov. 1; good for baking, applesauce, salads, and snacks.



Gala — originally developed in New Zealand; red/orange color with yellow stripes; one of the first Virginia apple varieties available; crunchy, juicy, tart taste; good for snacking.



Ginger Gold — discovered in the foothills of the Blue Ridge Mountains, growing among twisted, uprooted trees; greenish gold skin with a slight blush; available mid-August through October; doesn't discolor when cut.



Golden Delicious — lightly textured green/gold skin; available mid-September through April; has an extended shelf life; sweet taste and crisp texture.



Granny Smith — green with a slight pink blush; available late fall through spring; doesn't brown when cut; tart and crisp, it's ideal for pies or frying.



Jonathan — first red apples available in the fall; light red stripes over yellow or deep red; sweet-and-tart flavor makes them the perfect all-purpose apple.



Red Delicious — striped to solid red; available in mid-September; crisp, sweet flesh; perfect for adding to pancakes, muffins and crisps.



Rome — deep, solid red and perfectly round; available in mid-October; ideal for baking because of its firm texture and mildly sweet taste.



Stayman — discovered in 1866; crimson with a firm texture and sweet-tart taste, it is a perfect all-purpose apple.



Winesap — rich red color that is perfect for holiday eating and decorating; tart, tangy, juicy, and extra firm; perfect cut into salads.



York Imperial — discovered early in the past century near York, PA; deep red with green streaks and a distinctive shape; available mid-October; intense tart-sweet flavor.



Virginia Grown Apples: Taste Test

Your teacher has brought in some Virginia Apples for you to try. Take note of color, size, texture, sweetness, and moisture content of each apple in the space provided.

| TYPE OF APPLE | COLOR | SIZE | TEXTURE | SWEETNESS | MOISTURE |
|---------------|-------|------|---------|-----------|----------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Below is a recipe list of popular dishes using apples. With your new knowledge of Virginia Apples, share what type of Virginia apple would be best suited for each recipe based on its characteristics.

| APPLE RECIPE | TYPE OF APPLE | WHY DOES THIS APPLE WORK? |
|---------------------------------|---------------|---------------------------|
| Apple Coleslaw | | |
| Cinnamon Apple Chips | | |
| Homemade Apple Sauce | | |
| Apple Crumble Coffee Cake | | |
| Kale and Feta Salad with Apples | | |
| Homemade Apple Juice | | |
| Fried Apple Turnover | | |
| Apple Cinnamon Oatmeal Muffins | | |
| Caramel Candy Apple | | |

LESSON TWO: MUMMIFYING APPLES

Objective:

Students will conduct a scientific investigation to validate a hypothesis determining the best mineral for mummifying an apple.

Related Competencies:

Introduction to Culinary Arts:

- Demonstrate techniques for scaling and measuring volume and weight.
- Describe food-science principles in food preparation.

Culinary Arts I:

- Demonstrate scaling and measuring techniques for weight.
- Identify culinary units of measurement and measurement tools.

Materials:

- 2 fresh apples (any variety), each cut into quarters (per group)
- 48 ounce large of box of table salt
- 3 pound bag of Epsom salts
- 4 pound box of baking soda
- knife
- eight 12-oz. disposable plastic cups (per group)
- measuring cup (one per group)
- large mixing bowl
- permanent marker (one per group)
- masking tape (one roll for each group)
- scale
- graph paper

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, such as strawberries, bananas, and cherries.

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.

References:

- https://www.educationworld.com/a_lesson/daily/p/daily/p/daily/p102.shtml
- <https://www.virginiaapples.net/>

Activity Steps:

1. Put students in groups of 3 or 4. Pass out eight apple slices, eight cups, and eight pieces of tape to each group of students.
2. Ask the students to create a table on graphing paper.
3. Write "starting weight" on eight pieces of tape. Leave room to write the weight of the apple slices on the tape. Attach one of piece of tape 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. Complete this step for all apple slices.
6. Ask students to record the data on their data tables. Add $\frac{1}{2}$ cup of baking soda to Cup 1, completely cover the apple slice. Label this cup "baking soda only."
7. Add $\frac{1}{2}$ cup of Epsom salt to Cup 2, completely covering the apple slice. Label this cup "Epsom salt only."
8. Add $\frac{1}{2}$ cup of table salt to Cup 3, completely covering the apple slice. Label this cup "table salt only."
9. Add $\frac{1}{4}$ cup of table salt and $\frac{1}{4}$ cup of Epsom salt to Cup 4, completely covering the apple slice. Label this cup "table and Epsom salt."
10. Add $\frac{1}{4}$ cup of table salt and $\frac{1}{4}$ cup of baking soda to Cup 5, completely covering the apple slice. Label this cup "table salt and baking soda."
11. Add $\frac{1}{4}$ cup of baking soda and $\frac{1}{4}$ cup of Epsom salt to Cup 6, completely covering the apple slice. Label this cup "baking soda and Epsom salt."
12. Add $\frac{1}{3}$ cup baking soda, $\frac{1}{3}$ cup table salt, and $\frac{1}{3}$ cup Epsom salt to Cup 7, completely covering the apple slice. Label this cup as "baking soda, table salt, and Epsom salt."
13. Leave Cup 8 with only the apple slice and label this cup "control".
14. Place all eight cups on a shelf/windowsill in direct sunlight and let them sit for seven days.
15. 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.
16. 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.
17. Weigh each apple slice and ask students to record the data on their data tables.
18. Ask the students to compare the starting weight of each apple slice with its ending weight.
19. Ask the students to record their conclusions in their science notebook and create a graph comparing the different weights of the apple slices.

Virginia Grown Apples: Mummifying Apples

Activity Steps:

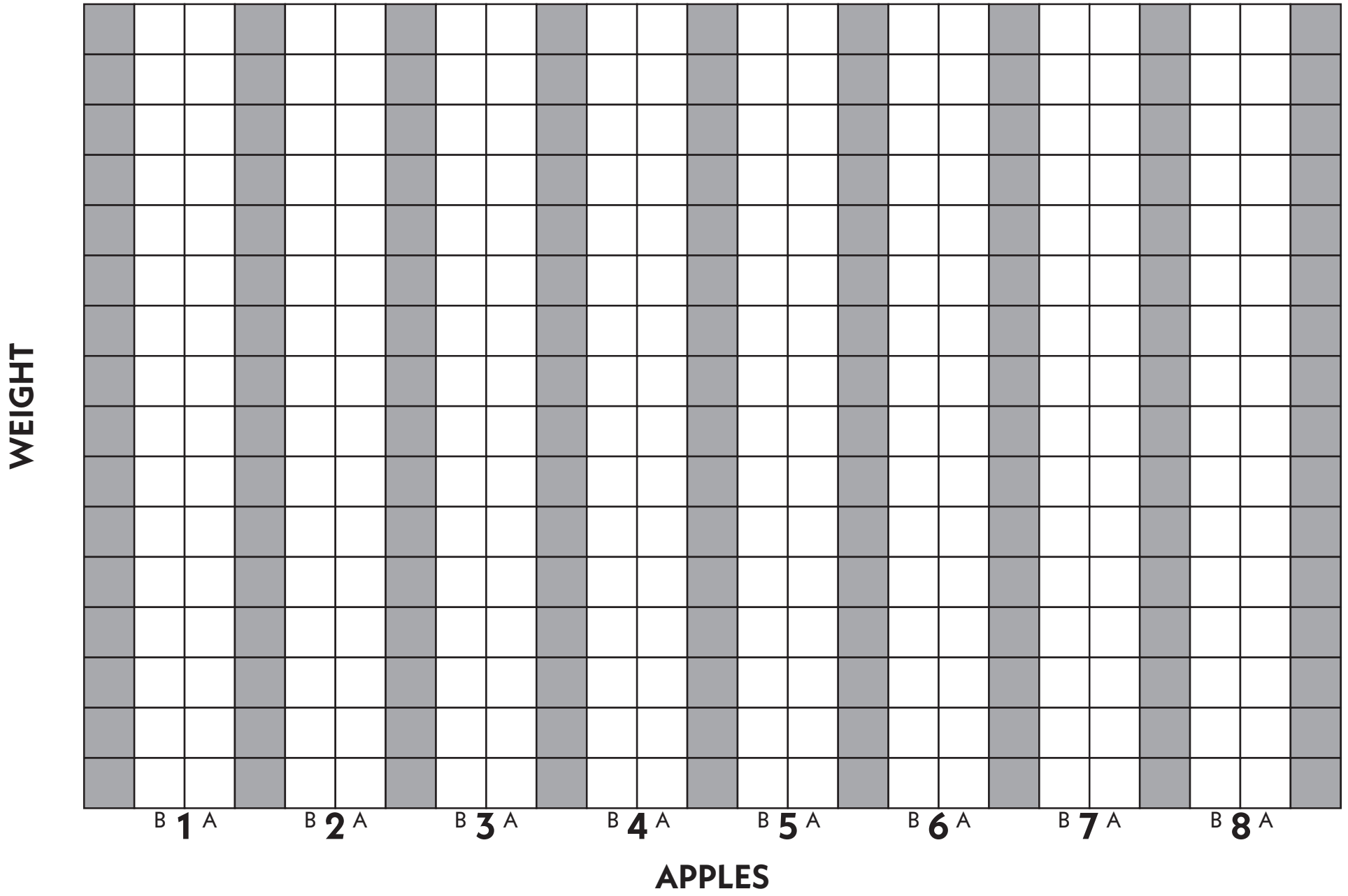
1. Put students in groups of 3 or 4. Pass out eight apple slices, eight cups, and eight pieces of tape to each group of students.
2. Ask the students to create a table on graphing paper.
3. Write "starting weight" on eight pieces of tape. Leave room to write the weight of the apple slices on the tape. Attach one of piece of tape 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. 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. Complete this step for all apple slices.
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7. Add $\frac{1}{2}$ cup of Epsom salt to Cup 2, completely covering the apple slice. Label this cup "Epsom salt only."
8. Add $\frac{1}{2}$ cup of table salt to Cup 3, completely covering the apple slice. Label this cup "table salt only."
9. Add $\frac{1}{4}$ cup of table salt and $\frac{1}{4}$ cup of Epsom salt to Cup 4, completely covering the apple slice. Label this cup "table and Epsom salt."
10. Add $\frac{1}{4}$ cup of table salt and $\frac{1}{4}$ cup of baking soda to Cup 5, completely covering the apple slice. Label this cup "table salt and baking soda."
11. Add $\frac{1}{4}$ cup of baking soda and $\frac{1}{4}$ cup of Epsom salt to Cup 6, completely covering the apple slice. Label this cup "baking soda and Epsom salt."
12. Add $\frac{1}{3}$ cup baking soda, $\frac{1}{3}$ cup table salt, and $\frac{1}{3}$ cup Epsom salt to Cup 7, completely covering the apple slice. Label this cup as "baking soda, table salt, and Epsom salt."
13. Leave Cup 8 with only the apple slice and label this cup "control".
14. Place all eight cups on a shelf/windowsill in direct sunlight and let them sit for seven days.
15. 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.
16. 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.
17. Weigh each apple slice and ask students to record the data on their data tables.
18. Ask the students to compare the starting weight of each apple slice with its ending weight.
19. Ask the students to record their conclusions in their science notebook and create a graph comparing the different weights of the apple slices.

HYPOTHESIS:

| APPLE | BEFORE WEIGHT | AFTER WEIGHT |
|-------|---------------|--------------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |

CONCLUSION:

Virginia Grown Apples: Mummifying Apples



B= Before Weight A= After Weight

Lesson Two: Reflection Questions

After reading the passage, please answer the questions below by writing your response.

1. Which mineral mixture was the most effective? Least effective?
2. What did you observe by completing this experiment?
3. What conclusion did you draw about your hypothesis?

Lesson Two: Application Questions

After reading the passage, please answer the questions below by writing your response.

1. How can we use the information that we gathered from this experiment in our life?
2. What are ways that we use mineral mixtures already?
3. How can you use the information you learned in other ways?