



THIS ISSUE

3 Lesson Plan

4 Delicious Activities

7 Book Corner

AGRICULTURE IN THE CLASSROOM

• SPRING 2019 / VOLUME NO. 1

WHAT'S GROWING ON in Virginia

Berry good! Strawberries are nutritious and delicious

Virginians have been growing strawberries for a long time. In fact, the modern strawberry has Virginia in its name, *Fragaria virginiana*, one of two species of strawberry that were hybridized to create the modern domesticated garden strawberry.

"There's nothing quite like a fresh, sun-ripened, juicy strawberry for eating out of hand, in salads or with ice cream or yogurt," said Bettina Ring, Virginia's secretary of agriculture and forestry.

According to the Virginia Department of Agriculture and Consumer Services, strawberry season generates about \$9 million in sales revenue for Virginia growers each year. Nationwide, the annual per capita consumption of fresh and frozen strawberries is 4.85 pounds, per the U.S. Department of Agriculture.

Virginians love strawberries so much that there are more than



Strawberries picked fresh in the field are irresistible.

a dozen annual festivals around the state dedicated to the fruit. Many farms in the commonwealth allow consumers to pick their own strawberries, and local berries also can be found at farmers' markets and grocery stores.

Sweet spring strawberries

The strawberry is a member of the rose family. It is the only fruit with seeds on the outside rather than the inside and typically boasts 200 seeds per berry.

Strawberries are planted in the



Strawberries grow on a vine and turn red as they ripen.

fall and are the first fruit to ripen each spring. Typically, Virginia strawberries will be ready for picking at the end of April, and a season can last well into June or longer—some varieties will bear fruit through the summer and are referred to as everbearing.

Strawberry plants purchased for planting are called crowns. Once the crown is planted it becomes the mother plant, sending out



Picking your own strawberries is a fun activity for families or school groups.

runners, which take root and form new plants. New plants from runners produce fruit the year after they take root.

Seventy percent of a strawberry's roots are in the top 3 inches of soil, and the flavor of a strawberry is influenced by weather, the plant variety and the stage of ripeness when harvested.

Native forms of strawberries adapt to various climates and are indigenous to every major continent except Africa, Australia and New Zealand. They're grown in every state in the United States and every province of Canada.

Berry nutritious!

Not only are strawberries delicious—they're also nutritious! Just eight strawberries a day will provide 140 percent of the recommended daily intake of Vitamin C for children.

Strawberries, like other berries, are a rich source of phenols, especially anthocyanins and ellagitannins. The anthocyanins provide the strawberry with its flush red coloring and also help protect cell structures in the human

body and prevent oxygen damage in all the body's organ systems.

Strawberries' unique phenol content make them a heart-protective, an anti-cancer and anti-inflammatory fruit. Strawberries also protect against macular degeneration and rheumatoid arthritis.

Take your pick

Virginia growers also produce other berries, such as blackberries, blueberries and raspberries.

Blackberries and raspberries consist of clusters of tiny fruits called drupelets, which grow around a core known as the receptacle. They are bramble fruits, which is any of a large genus of usually prickly shrubs related to roses.

Blueberries grow on bushes, not from runners or brambles. Blackberries and blueberries are ripe in the summer—from June to August, and raspberries are typically available June through July, and again in August through October.



Virginia growers produce different types of berries, including blackberries and blueberries.

CONTENT AREA

SOL: Math: Number Sense

Objective: for students to:

- Count and recognize numbers.

Materials

- Red and green construction paper
- Glue
- Black finger paint, small poms or construction paper

LESSON PLAN

Strawberry Counting

Background Knowledge

Strawberries are a popular fruit that is both tasty and nutritious; in fact, just eight strawberries provide 140 percent of your daily recommended vitamin C. Native to North America, strawberries are grown in every state in the United States. The strawberry is unique in that it is the only fruit with seeds on the outside rather than the inside. On average, there are about 200 seeds on a strawberry.

Procedure

1. Prepare the following materials prior to the lesson:

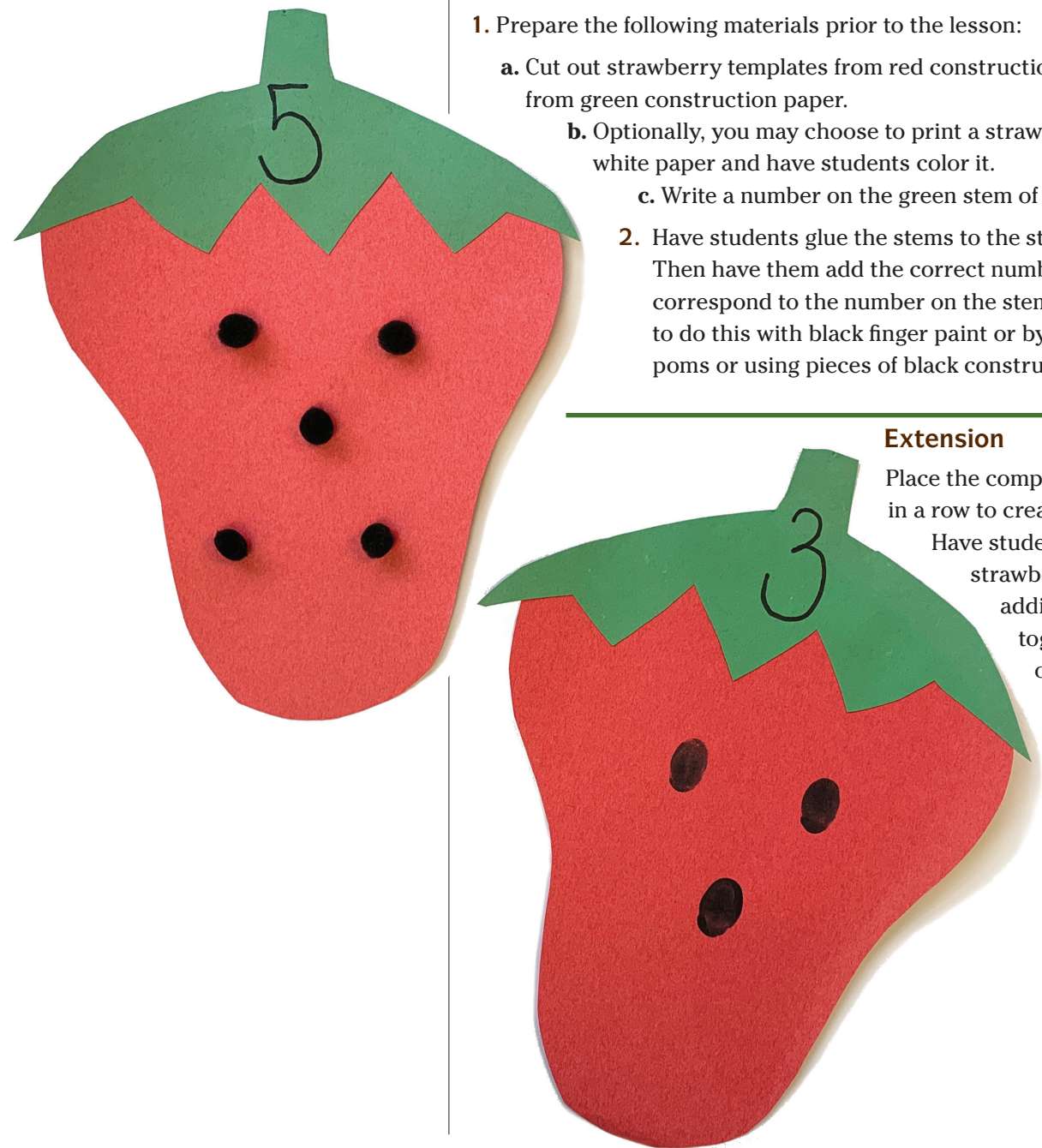
- Cut out strawberry templates from red construction paper and stems from green construction paper.
- Optionally, you may choose to print a strawberry template on white paper and have students color it.
- Write a number on the green stem of each strawberry.

2. Have students glue the stems to the strawberries. Then have them add the correct number of seeds to correspond to the number on the stem. You may choose to do this with black finger paint or by gluing small black poms or using pieces of black construction paper.

Extension

Place the completed strawberries in a row to create a "field."

Have students pick two strawberries and practice adding the numbers together or counting on a number line.



Take a Bite of Strawberry History

Strawberries are native to the Americas, and the Native Americans already were eating strawberries when colonists arrived. They used crushed berries mixed with cornmeal to bake strawberry bread. After trying this bread, colonists developed their own version of the recipe, and strawberry shortcake was created.

Make Your Own Strawberry Bread

Try this easy take on strawberry bread!

Ingredients:

- Frozen strawberries or strawberry preserves
- Cornbread mix
- Strawberry cream cheese and fresh strawberries, optional for serving

Directions

Crush frozen strawberries or strawberry preserves into cornbread mix. Follow directions on the cornbread mix package to bake the cornbread.



Strawberry-licious! This bread is bursting with berry goodness.



These yogurt pops are a delicious cold treat!

Yummy Yogurt Pops

Strawberry yogurt and strawberries make up this easy recipe.

Ingredients:

- 2 8-ounce cartons strawberry yogurt
- 10-ounce package frozen strawberries, thawed
- 10 3-ounce paper cups
- 10 popsicle sticks

Directions

Mix yogurt and strawberries in a small bowl. Fill each paper cup 1/2 to 2/3 full.

Place the cups in the freezer for about one hour. Insert popsicle sticks, then freeze completely.

To serve, peel off the paper cups.
(Makes 10 pops)

Strawberry Math: This recipe makes 10 pops; how will you make enough for your class? How much of each ingredient will you need?

Strawberry Songs

Enjoy these fun strawberry songs with your class!

Pop Go the Berries

(*Tune: Pop Goes the Weasel*)

All around the
strawberry fields,
We picked some juicy
berries.
We brought them home
and washed them off,
Pop! -go the berries!

Picked a Strawberry

(*Tune: Clementine*)

Picked a strawberry,
Picked a strawberry,
That was growing
In the sun.
Then I washed it,
And I ate it,
And I picked another one.

CONTENT AREA

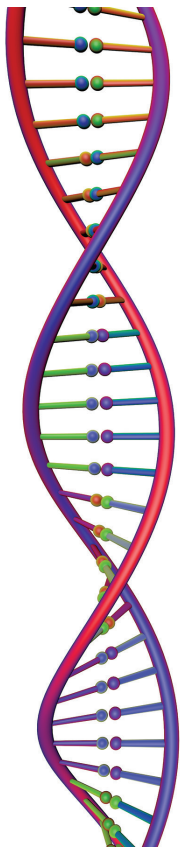
SOL: Science

Objective: for students to:

- follow a process and extract DNA from living tissue.

Materials:

- Strawberries
- Water
- Salt
- Blender
- Coffee filter or sieve
- Detergent
- Meat tenderizer
- Test tube
- Rubbing alcohol
- Wooden stick or hook



LESSON PLAN

Strawberry DNA Extraction

Background Knowledge

In this activity, students will model a process that scientists use to extract DNA strands. Deoxyribonucleic acid (DNA) is a long molecule that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. Yes, DNA is in all your food! The main role of DNA molecules is the long-term storage of information. DNA often is compared to a set of blueprints, a recipe, or a code because it contains the instructions needed to construct other components of cells, such as proteins and RNA molecules.

In this lab, students will extract strands of DNA from the nuclei of strawberry cells. Mashing the strawberries will break the cells' walls, exposing the inner membranes. The DNA extracting solution will disrupt the cell and nuclear membranes. Filtering the mixture gets rid of all the strawberry cell parts that are bigger than DNA. Finally, the alcohol causes the DNA to precipitate and come out of the solution. Participating in the extraction of DNA will help familiarize students with one aspect of the work biotechnologists do.

In terms of careers, a plant scientist or genetic engineer may use biotechnology as a tool; these scientists also may employ biotechnologists. Biotechnologists have diverse and interesting careers. They can be hired to help develop new medicines and medical treatment options, assist in waste treatment or environmental remediation, or develop new characteristics in livestock and plants for agricultural use.

Biotechnologists work in many different sectors, including hospitals and research facilities, private food or animal production companies, pharmaceutical companies, government agencies and food processing plants. They come from backgrounds in science and engineering or a combination of several educational groups, including chemistry, biochemistry, microbiology, life sciences and pharmacy sciences.

Procedure

1. Place the following ingredients into a blender:
 - i. 100 milliliters or 1/2 cup of strawberries
 - ii. 200 milliliters or 1 cup of water
 - iii. 1 gram or 1/8 teaspoon salt
2. Blend on high for 15 seconds.
3. Strain the mixture through a coffee filter or sieve to remove the unblended material.
4. Add 20 milliliters or 2 tablespoons of detergent. Swirl to mix. Let sit for 5-10 minutes.
5. Fill a test tube about 1/3 full with the mixture.

Continued on page 6

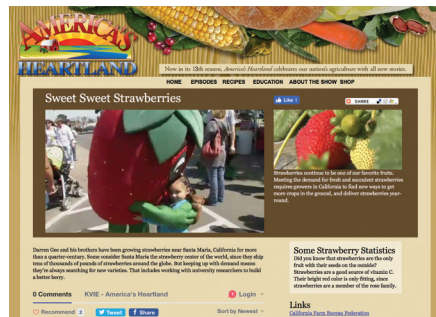
Continued from page 5

6. Add a pinch of enzymes (meat tenderizer) to each test tube, and stir carefully.
7. Tilt the test tube, and slowly pour an equal amount of alcohol down the side of the tube so that it lies on top of the mixture.
8. Stringy DNA should appear at the boundary between the mixture and the alcohol.
9. Use a wooden stick or a hook to gently move the mixture up into the alcohol so that more DNA will precipitate out. You also can let the test tube sit for 30 minutes or more.

You can keep the DNA indefinitely in a sealed container with alcohol or dry it on paper.

Extension

Watch the *America's Heartland* episode "Sweet Sweet Strawberries" (http://www.americaheartland.org/episodes/episode_605/sweet_sweet_strawberries.htm). This 5-minute video highlights strawberry production at a California farm, describes how strawberries are selectively bred for specific traits, and explains how strawberries are packaged for shipping all over the United States.



Strawberry Plant Parts

Label the parts of the strawberry plant below. Include roots, stem, leaves, flower and fruit.



BOOK CORNER

‘BERRY’ Good Books!

The Berry Book, Gail Gibbons, Holiday House, ISBN: 9780823416974

I Like Berries, Jennifer Julius, Childrens Pr, ISBN: 9780516230542

Blueberries Grow on a Bush, Mari Schuh, Capstone Press, ISBN: 9781429661836

Grow Your Own Smoothie, John Malam, Raintree, ISBN: 9781406224887

The Fruits We Eat, Gail Gibbons, Holiday House, ISBN: 9780823432042

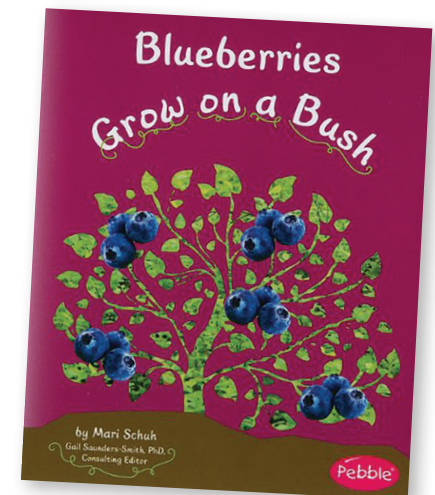
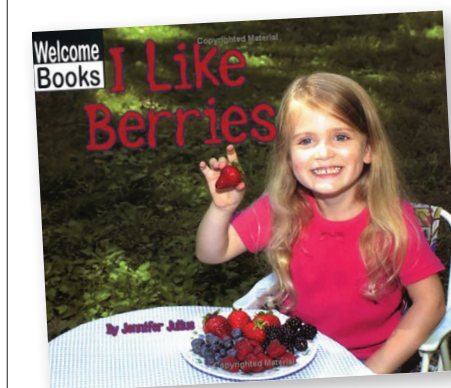
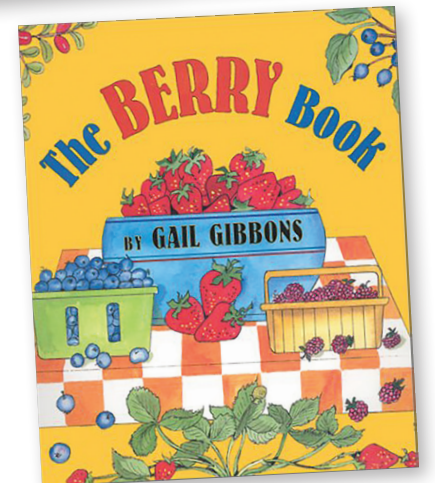
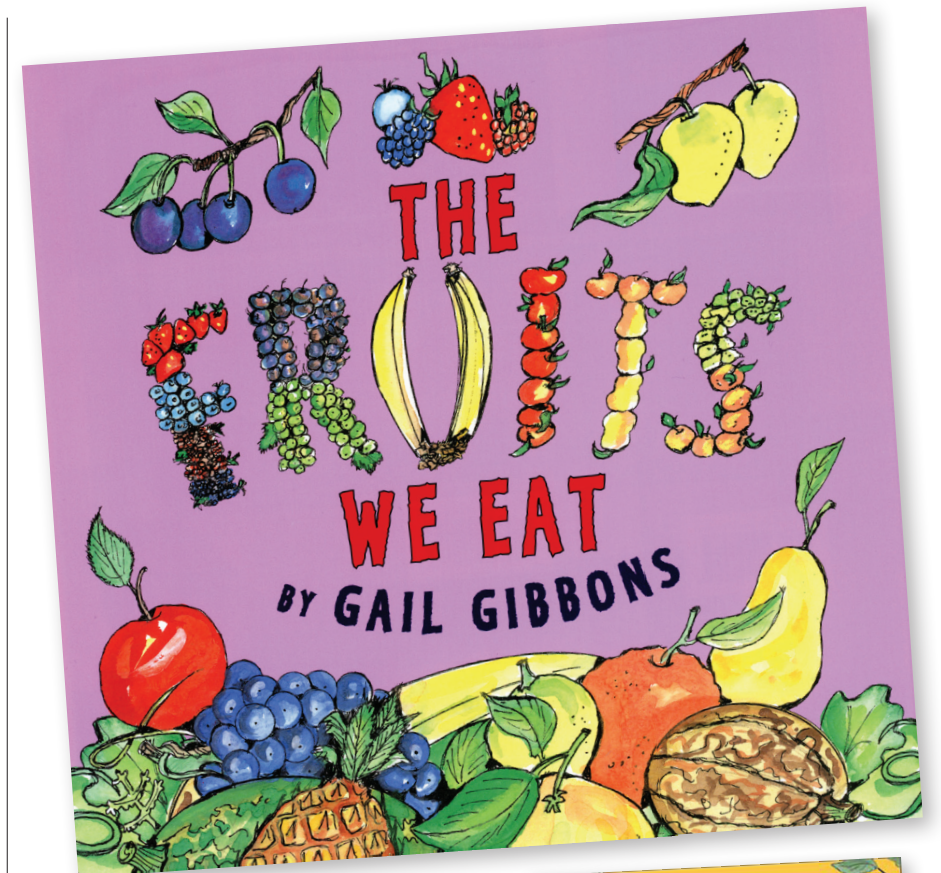
PROGRAM HIGHLIGHTS

Check out Agriculture in the Classroom's grants

Virginia AITC encourages teachers to integrate agriculture into their daily curriculum. To support the educators who do so, grants are available to Virginia teachers each year.

In 2018, Virginia AITC gave out more than \$30,000 in grants.

To apply for a grant or find out more about available garden, agriculture experience and STEM grants, go to **AgInTheClass.org**.





WHAT'S GROWING ON IN VIRGINIA

Virginia Foundation for Agriculture in the Classroom
P.O. Box 27552, Richmond, Virginia 23261

NON-PROFIT ORG.
U.S. POSTAGE PAID
RICHMOND, VA
PERMIT NO. 2162



Strawberries are "What's Growing On" in Virginia this spring!

About the Newsletter

What's Growing On In Virginia? is a semiannual publication for Virginia educators and those who want to connect children with agriculture through education.

Program Coordinators: Tammy Maxey, Lynn Black

Editorial Staff: Sara Owens, Pam Wiley

Graphic Designers: Maria La Lima, Patricia Hooten

For additional information and activities, visit our website at
AqInTheClass.org or call **804-290-1143**

Proudly sponsored by



PUBLIX SUPER MARKETS
CHARITIES