

Food, Fiber & You Lab Choices

Mobile Science Lab Investigations and the Practices of Science, NGSS, Environmental Literacy, and CORE Curriculum

The investigations on the Mobile Science Labs allow students to explore the NGSS eight practices of science and engineering identified as essential for all students to learn. All investigations address one or more of these practices. To assist in deciding which practices are best addressed in each investigation, the following designation follows each lab choice description – Practices of Science (1,2,3,6.7) *would indicate that the investigation was strongest in those practices of science, adding 5 to the list would indicate there is also a math component in the that investigation.*

Due to time constraints the #7 and #8 Practices of Science will need to be completed back in the classroom. The investigation will provide ample information for a student to “engage in an argument” from the evidence gathered during the investigation. Likewise, Practice #8 “evaluating and communicating information” will need to be done in the classroom as a follow-up activity. Questions are available for each investigation to assist with these practices.

There are many other opportunities for the classroom teacher to expand on the investigation by connecting reading and language arts skills based on the mobile lab investigation.

Practices of Science

- 1. Asking questions and defining problems*
- 2. Developing and using models*
- 3. Planning and carrying out investigations*
- 4. Analyzing and interpreting data*
- 5. Using mathematics and computational thinking*
- 6. Constructing explanations and designing solutions*
- 7. Engaging in argument from back evidence*
- 8. Obtaining, evaluating, and communicating information*

Food, Fiber & You Lab Choices 2016-2017

1.

Farmers Protect the Environment (Env)* (Grades 4-5)

NGSS Practices of Science (1,2,6,7)

ESS3.C Human impacts on Earth systems

Common Core RI.1 Read closely to determine what the text says...

Environmental Literacy Standard 5 Topic A Indicator 1-2

This lesson supports the new Environmental Literacy standards as students discover four of the ways (manure pits, fencing, cover crops, and buffers) farmers protect the environment and the Chesapeake Bay. The team designs its own environmentally friendly farm.



2. **Farmers Protect the Environment (Env Pri)* (Grades 2-3)**

NGSS Practices of Science (1,2,6,7)

ESS3.C Human impacts on Earth systems

Common Core RI.1 Read closely to determine what the text says...

Environmental Literacy Standard 5 Topic A Indicator 1-2

This session is similar to the one above for 4-5th grades but focuses on three practices (manure pits, fencing, buffers). The teams also design an environmentally friendly farm.



3. **The Science of Chocolate (Chocolate)* (Grades 3-5)**

NGSS Practices of Science (1,3,4,5,6,7)

PS1.B Chemical Reactions

Students act as food scientists as they discover the properties of chocolate, investigate the taste and production of chocolate, and explore the concept of viscosity. (Students will be taste-testing less than 1/16 of a teaspoon of cocoa and sugar and a drop of vanilla.)



4. **The Art of Making Cheese (Cheese)* (Grades 3-5)**

NGSS Practices of Science (1,3,6)

PS1.B Chemical Reactions

Milk is used to make familiar products that we eat such as ice cream, yogurt, and cheese. In this experiment, students make cottage cheese using a process that causes the casein in milk to curdle. (With the classroom teacher's permission, students may be allowed to taste a sample of the cottage cheese they make.)



5. **Strawberry DNA (DNA)* (Grades 4-5)**



NGSS Practices of Science (1,3)

PS1.B Chemical Reactions

Students put their scientific skills to work as they create strawberry slurry and extract the DNA from the strawberry in an effort to understand how biotechnology enables scientists to change characteristics in food products.

6. **Fiber Up for a Clean Sweep (Fiber)*** (Grades 3-5)

NGSS Practices of Science (1,3,4,5,6,7)



Nutrition and the fiber content of favorite foods are explored in this scientific investigation as students act as food nutritionists and test 6 different foods in order to determine if fiber is present.



7. **How Well Do You Wash? (Wash)*** (Grades 3-5)

NGSS Practices of Science (1,3,4,5,6,7)

Students apply "germs (glitterbug lotion)" to their hands and then perform several hand washing tests to determine which method most effectively removes the "germs". A special light source helps to detect the "germs" remaining. (Knowledge of percent is beneficial.)



8. **Sugar Sheriffs (Sugar)*** (Grades 3-5)

NGSS Practices of Science (1,3,4,5,6,7)



Students discover the nutritional content of some of their favorite beverages as they experiment with density. The lesson ends with learning how to read nutrition labels on beverages and hopefully selecting drinks that will be good for you.



9. **Snack Attack (Snack)*** (Grades 3-5)

NGSS Practices of Science (1,2,3,4,6,7)



Students discover the nutritional content of some of their favorite foods as they experiment to discover which ones contain fat. The lesson ends with learning how to read nutrition labels and hopefully selecting snacks that are good for you!



10. **Sticky Bean (Sticky)*** (Grades 3-5)

NGSS Practices of Science (1,2,3,4,6,7)

PS1.B Chemical Reactions

Isolated soy protein and calcium hydroxide are used to produce a vegetable based glue made from soybeans. The glue because of its long polymer chains makes a good adhesive. Students test the strength of their glue against Elmer's glue using a peel test, tensile strength test, and shear strength test.

11. **Yeast Action (Yeast)*** (Grades 3-5)

NGSS Practices of Science (1,3,4,6,7)



PS1.B Chemical Reactions

Fungi organisms called yeast are used in bread making. Students set up an experiment to observe the conditions that create the best environment for yeast to grow.

12. Using Genetics to Improve Agriculture (Genetics)* (Grades 3-5)

NGSS Practices of Science (1,2,3,4,6,7)

LS3.B Variation of Traits

Hands-on activities introduce students to the fundamentals of genetics as they develop a basic understanding of the role of chromosomes and how genes are inherited from parent to offspring.



Important Scheduling Information

When planning a schedule, allow a minimum of **50-60 minutes** for scientific investigations. Allow 10 minutes between classes for clean up and set up. If the need arises to change entirely from one experiment to another (this is NOT recommended) an additional 30 minute break must be allotted for the change-over. A 30 minute lunch break for the teacher must be included.

P A parent volunteer is needed for each morning and afternoon (not each class) to help prepare materials, cut yarn, refill containers, and assist with classes.

:h
f

***When listing your selections on the class schedule, just use the shortened (Title)* for lab choice. Our teachers have the option of changing a lab selection when it seems not to be age appropriate.**

New
this
year!

Food, Fiber & You Walk-Through Selections

1. **The Cow in Patrick O'Shanahan's Kitchen** (K-4)

After enjoying a delightful, realistic fiction tale, students discover some amazing cow facts and make and taste real butter.



2. **Football and Agriculture (Foot)*** (Grades K-5)

Students learn how football and agriculture are connected and make their own Football Charm. Super Bowl Ravens' gear is connected to the farm! (offered September to first week in February)



3. **Take Me Out to the Ball Game (Ball)*** (Grades K-5)

Students learn how the world of baseball and agriculture are connected and make a Baseball Charm to take home. (offered 2nd week in February through June)



4. **Forest & Me (F&M)*** (Grades 2-5)

Through interaction with a story, pictures, text and discussion, students will realize the many benefits trees provide. The lesson closes with students making a bracelet to remind them of these benefits.



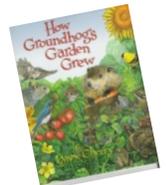
5. **Extra Cheese Please (ExCh)*** (Grades 2-5)

This story line shares mozzarella's journey from calf to pizza and explains how cheese is actually produced. Session includes a cheese making demonstration and a sequencing activity.



6. **How Groundhog's Garden Grew (GGG)*** (Grades K-4)

Students participate in telling a story using props and puppets and culminate the activity as they recall story elements and make a "healthy hand" reminding them to eat more fruits and vegetables each day.



7. **Sheep Surprise (SS)*** (Grades K-4)

A delightful "wordless" tale about a sheep on his motorcycle that help students understand the production process from sheep to sweater. This session ends with students making a colorful sticker bookmark.



8. **Seeds, Seeds, Seeds (Seeds)*** (Grades K-5)

Students examine seeds and match them to the foods they



9. **Beanie Baby (BB)*** (Grades K-5)

Students plant seeds in a new growing medium (soil moist) and watch for the first signs of growth.

When planning walk-throughs, allow **25-30 minutes** per class. Allow **10 minutes** between classes for clean-up and set up time. **Kindergarten classes may only visit the lab one time.** Pre-school classes may "tour" the lab - allow 15-20 minutes.

