

Ag Products 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*

Ag Products Lab Choices 2016-2017

The Ag Products lab has 12 work stations. Please divide your class into 12 teams prior to arriving at the lab.



- 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, 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) used by farmers. The teams also design an environmentally friendly farm.
- 3. CSI: Candy Science Investigators (CSI)* (Grades 3-5)**
NGSS Practices of Science (1,3,4,6)
PS1.B Chemical Reactions
Students act as food scientists as they discover the properties of some of their favorite candies using a chemical test that bubbles and fizzes. Ingredient cards are used to inform them if their predictions are correct!

- 4. From Pod to Candy Bar (Pod)* (Grades 1-3)**
NGSS Practices of Science (1,3,4,6,7)
Students explore how many candy bar ingredients begin in PODS and then perform an experiment to determine which candy will sink or float because of its ingredients/properties. Students make a candy bar charm. The lesson can end with a simple taste test to determine the class favorite on a bar graph. (Students will taste-test one milk chocolate chip, one semi-sweet chocolate chip, and a white chocolate chip. The lesson can be done without the taste test.)


5. **Colorful Bean (Colorful)*** (Grades 2-5) (An investigation and demonstration)
NGSS Practices of Science (1,3,4,6,7)

PS1.B Chemical Reactions

ESS3.A Natural Resources

Students experiment to decide whether petroleum based or soybean based crayons produce the brightest color, best coverage and least flakiness. Lesson ends with a soybean crayon making demonstration. Students take home a soybean crayon.



6. **Corn: the Environmentally Friendly Crop (Corn)*** (Grades 3-5)

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

ESS3.C Human impacts on Earth systems

ESS3.A Natural Resources

PS1.B Chemical Reactions

This two-fold lab experience has students examine the environmental impact of a packing foam made from petroleum with one made from corn. Then, students create a plastic made from cornstarch and corn oil.



7. **Cream to Butter (Cream)*** (Grades 3-5)

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

PS1.B Chemical Reactions

Students are given the task of testing various milk products to determine which one will produce butter and to discover why it produces butter. Session ends with students sampling their product.



8. **Egg-citing Eggs (Eggs)*** (Grades 3-5)

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

LS1.A Structure and Function

Students act as egg inspectors after discovering and labeling the parts of an egg. Eggs are candled, weighed and measured, and inspected for freshness.



9. **Fabric Scientists (Fabric)*** (Grades 3-5)

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

PS1.B Chemical Reactions

Students explore every day fabrics such as cotton, wool, and polyester as they conduct tests (stretch, ravel, absorption, wrinkle, snag, flammability) to decide which fabrics are best for different uses. It becomes apparent that their jeans and t-shirts are agricultural products.

10. **Glue from Milk (Glue)*** (Grades 3-5)

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

PS1.B Chemical Reactions

Students act as chemists and laboratory technicians as they produce glue from milk and then test the strength of their glue against Elmer's glue using a peel test, tensile strength test, and shear strength test.



11. **Mighty Smooth Bean (Mighty)*** (Grades 3-5)

(An investigation and demonstration)

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

PS1.B Chemical Reactions

ESS3.A Natural Resources

The power of a soybean is revealed to students as they plant seeds in plaster of Paris and watch this bean show its strength. A demonstration follows with lip balm being made from beeswax and soybean oil. Students take home a sample.



12. **Thirsty Stems (Thirsty)*** (Grades 2-5)

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

LS1.A Structure and Function

Students discover the parts of a plant and their function as they assemble a working model and watch the process of capillary action occur right before their eyes.



13. **Super Slurper (Slurper)*** (Grades 3-5)

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

PS1.B Chemical Reactions

Students examine the absorbency of several household products and then investigate the water holding properties of a commercial agricultural product and a pure chemical. The results of this experiment are related to new developments in the agricultural industry and served as a precursor to the development of disposable diapers.



14. **Well Contamination ~ From Where to Where? (Well)*** (Grades 3-5)

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



ESS3.C Human impacts on Earth systems

PS1.B Chemical Reactions

An imaginary town is experiencing pollution in some of its wells.

Students collect data as they analyze potentially contaminated wells and the possible source of contamination. Conclusions are drawn as students report to the town council their findings.

Important Scheduling Information

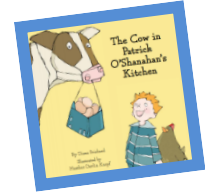
When planning a schedule, allow a minimum of **50-60 minutes** for scientific investigations. **Allow 10 minutes between classes** for clean up and set up. If the need arises to change entirely from one experiment to another (this is NOT recommended) an additional 30 minute break must be allotted for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

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. **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.**



Ag Products Walk-Through Selections

New
this
year!



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 (with the classroom teacher's permission) real butter.



2. **The Little Red Hen Makes a Pizza (Pizza)* (Grades K-3)** Students participate in a story using props and puppets and then make a **Pizza Charm** which shows that pizza comes from the farm not the pizza store.



3. **Who Lives on the Farm? (Farm)* (Grades K-4)** Students share what they know about farm animals and then learn new facts and "roll" and "stamp" their own barnyard



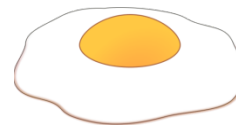
4. **Here, There and Everywhere (HTE)* (Grades K-5)** - Students connect selected farm crops and animals to the products they produce and then use map skills to highlight counties that are the highest producers.

5. **Tops and Bottoms (T-B)* (Grades 1-4)** - A delightful tale about a lazy bear and clever hare is following by a unique sorting activity.



6. **Seeds, Seeds, Seeds (Seeds)* (Grades 1-5)** - Students examine seeds and match them to the foods they eat.

7. **Egg Model (Model)* (Grades 1-5)** - Students discover some interesting facts about eggs and then build a model.



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-K classes may visit the lab for a "tour" - allow 15-20 minutes.



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