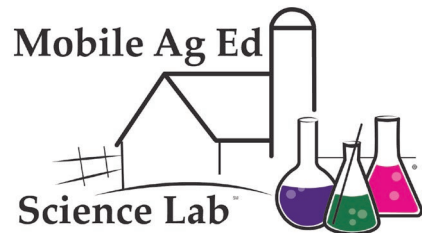


Mobile Ag Ed Science Lab

2024-2025 Curriculum Choices & Descriptions



www.pfbfriends.com

Thank you for considering the Mobile Ag Ed Science Lab program to provide a unique hands-on science experience for your students.

Our goal is to be a valuable resource to assist school districts in meeting the Pennsylvania Department of Education Science Standards. To accomplish this goal, our curriculum is developed to address as many Environment & Ecology Standards and Science & Technology Standards as possible. For a complete listing of the exact standards touched upon by each individual lesson, please visit our website: www.pfbfriends.com

To assist you in selecting a lesson from our curriculum that will best benefit your students, we have created a lesson key that provides you with additional information about the lesson:

E environment/resource conservation and care

FS food safety

G “green” (renewable/nonrenewable)

N nutrition

NR natural resources

P process and production

****** indicates food item consumption

 Not recommended for classes >26

As agriculture IS our food source, we have many lessons that utilize different food products. We do NOT have any peanut products on our labs, however, some products we use may have been produced in a factory where peanuts were present. IF you have students with food allergies and have any questions regarding lesson materials, please contact our Executive Director at cmespenshade@pfb.com.

In order to adequately accommodate the abilities and learning needs of all students at the schools we visit; we offer a lesson specifically designed for Self-Contained Special Needs Classes:

Old MacDonald’s Farm **E** **NR**

An engaging and interactive retelling of “Old MacDonald Had a Farm” helps students discover what farms have and provide to us. The components of a farm are reinforced

as students make a “fan farm” by identifying and placing stickers of each farm item on a fan.

WALK THROUGH CURRICULUM

These curricular options are available for **Kindergarten to 2nd Grade** classes. Instead of a science experiment, they offer a **35 minute hands-on activity** introducing basic agricultural concepts and scientific information.



Can You Dig It? **E** **NR**

Students will investigate the difference between soil and dirt. Students will hear about the process of bedrock becoming top soil. The students will then become soil scientists and dig for samples of things that can be found in the topsoil layer, matching them to pictures and counting what they find.

Farm Charm **E** **G** **NR**

An engaging conversation leads students to decide what makes up a real farm. Samples of these components of a farm are placed in a mini zip lock baggie and worn around the students’ necks as a reminder.

Tops and Bottoms **NR**

Students hear a story of a lazy bear and a smart hare that get involved in a deal that has hilarious consequences. This lively folktale leads to a discussion of plant parts and the parts of a plant that provide our food—tops or bottoms. Students plant seeds of a “tops” or “bottoms” plant to take back to their classroom to observe as it germinates and grows.

Crawly Critters **E**

Students learn how to identify insects, as well as recognize that not all insects are pests. Students simulate the communication methods of insects and learn how farmers can sometimes use this knowledge to control insects in their fields without harmful chemicals.

Little Red Hen’s Pizza **NR** **P**

A popular food, pizza, is traced back to the farm through the telling of a modern version of *The Little Red Hen*. Students interact with the story through the use of

props, then create a pizza charm that traces all the parts of a pizza back to the natural resources from the farm needed to produce them.

The Forest & Me **E** **NR**

Through a sorting activity, the students learn the many uses and benefits of trees in their daily lives...from the clean air they breathe to the food they eat to the homes they live in. Students then create a charm bracelet that reminds them of what trees need, what they provide, and the important role people play in managing this valuable resource.



How Does Your Garden Grow? **E** **NR**

Through a “visit” to a pumpkin patch, the students learn about what plants need to grow and produce food for us to eat. Not only do they discover plants need soil, sun, and water, but also about the importance of nutrients like nitrogen, phosphorous and potassium. Students then create a charm with pumpkin seeds and cotton balls.

PRIMARY CURRICULUM

In response to requests from 1st and 2nd grade teachers, this curriculum offers a full 50-minute, hands-on science experiment designed for students in grades 1-2.

The Colorful Bean (2nd grade ONLY) E G NR P (an investigation and demonstration)

Students are introduced to the scientific method as they experiment to decide if petroleum or soybean based crayons produce the brightest color with the least flakiness and best covering power. Students end the session with a crayon making demonstration where each student receives a soy-based crayon.

Thirsty Stems

In order to answer the problem of how water travels to all parts of a plant, students create a model of a plant, then observe the effects of capillary action. The parts of a plant and their purposes, as well as capillary action, are reinforced with a make & take book.

BEE-utiful Relationship E

Students are introduced to the importance of pollination and pollinators in the development of the fruits they enjoy. As the parts of a flower are identified, students create a model of a flower. The pollination process is simulated by students as the lab is transformed into a flower field and the students into bees.

*****NOT recommended for beginning of year 1st grade*****

Feast Like a Bug E

Students become farmers whose crops have been damaged, who then investigate to determine the guilty insects. The different mouth parts of insects is discussed, then students test each mouth part to determine which parts of a plant, if any, are harmed by each mouth part. A distinction is made between beneficial and harmful insects.

Popcorn Capers NR P G

Students learn about different types of corn and how popcorn is a special type of corn. The properties of popcorn kernels and popped popcorn are compared then used to predict if each item will sink or float. Based on the results, students predict floating ability of other food items, then test their predictions.

ELEMENTARY CURRICULUM

(grades 3-5)

The Magical Bean E G NR P

Soybeans are often referred to as “the magical bean” due to their many uses. Students will learn how soybeans grow and discover the various ways they are used in products they use every day. An interactive discussion takes place on the changing states of matter while producing a usable product. Students end the session with a demonstration, complete with take home samples of lip balm made from soybean products.

Exciting Eggs FS N NR

Students act as egg inspectors after discovering and labeling the parts of an egg. Students make observations of the egg exterior to compare to quality labeling charts, then record data as the eggs are candled, inspected for freshness, weighed, and measured.

No Soil? Now What? E G NR P

With only 1/32 of our earth’s surface available upon which to grow food, how will we feed a world population of 9.2 billion by 2050? Hydroponics, growing without soil, is one possibility. Students will discover the need for alternative growing methods, then create their own hydroponic growing system to test if plants can be grown without soil.

The Colorful Bean (grades 2-5) E G NR P

(an investigation and demonstration)

Students are introduced to the scientific method as they experiment to decide if petroleum or soybean based crayons produce the brightest color with the least flakiness and best covering power. Students end the session with a crayon making demonstration where each student receives a soy-based crayon.

The Mighty Smooth Bean G NR P

(an investigation and demonstration)

The Mighty Bean - The power of a soybean is revealed to students as they “plant” a soybean in plaster of Paris. Observations amaze students as the soybean shows its strength.

The Smooth Bean - Students end the session with a demonstration, complete with take home samples, of lip balm made from soybean products. Interesting discussion on changing states of matter that happen while producing a usable product occurs.

****final observations completed back in the classroom****

Glue from Milk G NR P

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

*****final observations completed back in the classroom*****

*****MUST have full 50 minutes*****

Cream to Butter** N NR P

Students make butter from creams with varying levels of fat content to discover properties necessary for butter production. They will also learn about enzymes (ex. lactase) in dairy foods. Label reading will be employed.

How Well Do You Wash? FS

Students apply "germs" to their hands and then perform several hand washing test to determine which method of washing most effectively removes "germs". Effectiveness of removal is measured with a special "glo-germ" light. The need for clean hands while handling food products and the washing of produce will be stressed.

Snack Attack N

Students test several popular snack food items for the presence of fat within the snack food. Nutritional labels for all the snack foods are read and the nutritional content of the foods examined in order to determine healthy snack foods.

Tree Story E NR

Students are introduced to tree dendrology where they date two tree samples and identify patterns of tree growth. Various parts of the tree and their purposes are identified. Students examine the properties of two similar trees and learn how those properties affect the ways in which the trees can be used.

Where's the Juice? ** N

Students taste test four different fruit beverages to determine the amount of juice and sugar contained within the beverage. Nutritional labels are read and students reach a conclusion about the nutritional value of the different fruit beverages.

Pigment Power **N**

Using different fruit beverages, students test for the presence of Phytochemicals, naturally occurring plant chemicals that give plants their color and provide health benefits. Students are encouraged to include a variety of fruits and vegetables in their diet to ensure healthy bodies and prevent disease.

*****MUST have full 50 minutes*****

Fungi Fun **P**

Students will learn to differentiate living things into different kingdoms as they work as plant botanists to identify the parts and their functions, characteristics, and properties of plants and fungi. Students will conduct an experiment to discover how fungi react, as well as complete a dissection of a mushroom.

*****MUST have full 50 minutes*****

Environmentally Friendly Farmer **E G NR**

This STEM based lesson allows students to discover several of the ways farmers have been, and continue to protect the environment and natural resources upon which they grow our food and fiber. Student teams design their own environmentally friendly farm to put the conservation practices about which they learned into action.

MIDDLE SCHOOL CURRICULUM

(grades 6-8)

Steering Through the Chute **E** **P**

Students identify the needs of beef cattle to provide us with byproducts we use in our everyday lives, as well as the animal care to safely transport cattle. Students will be introduced to Temple Grandin and learn about how she was a pioneer in implementing a design to safely transport cattle. In this STEM based lesson, student teams will create their own cattle chutes using the design practices they learned.

Water Analysis **E** **NR**

An imaginary town is experiencing pollution in some of its wells. Students collect data as they analyze the town's developments, predict the contamination source, consider cost factors, test the wells, and draw conclusions which are to be presented in written form to the town council. Importance of responsible care of natural resources and proper disposal of waste and their impact on our groundwater is discussed.

Corn to Plastic **E** **G** **NR** **P**

Two experiments enable students to better understand the concept of a by-product. One investigation examines the environmental impact of two packing foams: Styrofoam (made from petroleum) and Eco foam (made from corn). The next investigation involves students making plastic from corn and comparing it to plastic made from petroleum.

Genetics

Students will learn about dominant and recessive genes and how genetics can determine the type of plant that is grown by creating models of corn DNA using different colored paper clips to signify genes. Applications of food biotechnology will be used.

Exciting Eggs **FS** **N** **NR**

Students act as egg inspectors after discovering and labeling the parts of an egg. Students make observations of the egg exterior to compare to quality labeling charts, then record data as the eggs are candled, inspected for freshness, weighed, and measured.

Bug Out! **E**

A discussion of insects leads to the knowledge of beneficial and harmful insects. Integrated Pest Management is explained and students apply its methods to an imaginary field sample in order to determine the course of action that should be taken by the farmer.

Super Slurper **E** **G**

Students examine the absorbency of several household products, 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 also served as a precursor to the development of disposable diapers.

Banana DNA

Students delve into biotechnology as they conduct an experiment to extract DNA from a banana. Through the process, they will learn the basic cell parts, observe DNA, identify the role of DNA in plants, as well as discover the possibilities biotechnology can provide to us today and in the future.

*****MUST have full 50 minutes*****

The Science of Chocolate ****** **NR** **P**

Students become food scientists as they conduct various tests to develop an understanding of the properties of chocolate that are essential to chocolate production. The importance of everything in chocolate production from the melting point to ingredient ratios to interaction of ingredients to the viscosity of chocolate are examined.

*****MUST have full 50 minutes****