

MAEF's Mobile Science Labs

Aquatic Lab Choices

Mobile Science Lab Investigations and Curriculum Connections

The investigations on the Mobile Science Labs are aligned with the NGSS, Environmental Literacy, and Common Core State Standards.

The investigations also allow students to explore the NGSS Science and Engineering Practices as they work as scientists to investigate real world problems. 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, NGSS Practice of Science #8, “evaluating and communicating information”, will need to be completed back in the classroom as a follow-up activity. Questions for each 50-minute lab lesson are provided to the teacher for each investigation to assist with this.

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

NGSS Science and Engineering Practices

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*

Aquatic Lab Choices

50-Minute Lessons

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

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.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,6,7)

NGSS Disciplinary Core Idea:

- **ESS3.C Human impacts on Earth systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.
- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core State Standards Connections (ELA/Literacy/Writing):

- **Grade 4:** RI.4.1, RI.4.3, RI.4.7, W.4.2
- **Grade 5:** RI.5.3, W.5.2

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grade 4:** Describe how people adapt to, modify and impact the natural environment.
- **MSDE 3.0.D.1 (Geography) Grade 5:** Describe why and how people adapt to and modify the natural environment and the impact of those modifications.

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

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



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,6,7)

NGSS Disciplinary Core Idea:

- **ESS3.C Human impacts on Earth systems (K-2):** Things people do can affect the environment, but they can make choices to reduce their impacts.
- **ESS3.C Human impacts on Earth systems (3-5):** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.
- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Grade 2:** RI.2.1, RI.2.3, RI.2.7
- **Grade 3:** RI.3.1, RI.3.3, RI.3.7

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grades 2 and 3:** Explain how people modify, protect, and adapt to their environment.

Aqua Terra Column (Aqua)* (Grades 3-5)

Students build an aqua terra column to investigate the connection and interaction between terrestrial and aquatic ecosystems. (Classroom teacher to provide one clean 2-liter plastic bottle with lid for each team of students or one per student if the teacher wants each student to have his/her own bottle.)

This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,6,7)

NGSS Disciplinary Core Idea:

- **LS4.D Biodiversity and Humans:** Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there.

Environmental Literacy Connections:

- **Standard 4 Topic A Indicator 1:** Explain how organisms are linked by the transfer and transformation of matter and energy at the ecosystem level
- **Standard 4 Topic D Indicator 2:** Use models and provide examples to show how species' interactions may generate ecosystems that are stable for hundreds or thousands of years.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.4
- **Grade 4:** RI.4.1, RI.4.3, RI.4.4
- **Grade 5:** RI.5.1, RI.5.3, RI.5.4



Clear or Cloudy (Cloudy)* (Grades 3-5)

Please schedule a full 15 minutes between this lesson for set-up and clean-up.

Many water problems are caused by mismanagement of our water supply. Untreated sewage and wastes are dumped into lakes and rivers contaminating them. Students complete this investigation to determine the best method to clean a polluted water sample.

This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human impacts on Earth systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.

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- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.4
- **Grade 4:** RI.4.1, RI.4.3, RI.4.4
- **Grade 5:** RI.5.1, RI.5.3, RI.5.4

Salt Water Layers (Salt Water)* (Grades 3-5)

Please schedule a full 15 minutes between this lesson for set-up and clean-up.



Students are challenged as they try to determine which water sample is salt water. A simulated estuary enables students to discover how salt and fresh water mingle to create brackish water. **(This lesson not available from the first week in January through end of February.)**

This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Idea:

- **LS4.D Biodiversity and Humans:** Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there.

Environmental Literacy Connections:

- **Standard 7 Topic A Indicator 1:** Investigate factors that influence environmental quality.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.4, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.4, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.4

Integrated Pest Management (IPM)* (Grades 3-5)

Farmers use a variety of methods to protect their crops. This investigation introduces students to pheromones and insect traps as one method of controlling insects. Students pretend to be an insect and discover how they can communicate with other insects. Math connections allow students to calculate their insect population.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,5,6,7)

NGSS Disciplinary Core Ideas:

- **LS1.A Structure and Function:** Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction
- **LS1.D Information Processing:** Different sense receptors are specialized for particular kinds of information; Animals use their perceptions and memories to guide their actions.
- **ESS3.B Natural Hazards:** A variety of hazards result from natural processes; humans cannot control natural hazards but can reduce their impacts. con't...

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.

- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.4, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.4, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.4

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grade 3:** Explain how people modify, protect, and adapt to their environment.
- **MSDE 3.0.D.1 (Geography) Grade 4:** Describe how people adapt to, modify and impact the natural environment.
- **MSDE 3.0.D.1 (Geography) Grade 5:** Describe why and how people adapt to and modify the natural environment and the impact of those modifications.

The Gulf Oil Spill (Oil)* (Grades 3-5)

The effect of oil spills can be disastrous to aquatic life, wildlife, agriculture, the economy, and recreation. Students use a variety of materials to clean up a simulated oil spill and then draw conclusions as to the most effective clean-up material.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Ideas:

- **ESS3.A Natural Resources:** Energy and fuels humans use are derived from natural sources and their use affects the environment. Some resources are renewable over time, others are not.
- **ETS1.A Defining and Delimiting Engineering Problems:** Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.
- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

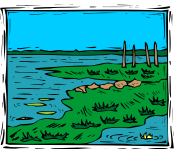
- **Grade 3:** RI.3.1, RI.3.3, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.7

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grade 3:** Explain how people modify, protect, and adapt to their environment.
- **MSDE 3.0.D.1 (Geography) Grade 4:** Describe how people adapt to, modify and impact the natural environment.

Measuring Water Quality (H₂O Qual)* (Grades 3-5)

Chemical tests are performed to determine the water quality of selected water samples. The tests performed measure pH, dissolved oxygen, nitrate and ammonia levels.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human impacts on Earth systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.
- **PS1.B Chemical Reactions:** When two or more different substances are mixed, a new substance with different properties may be formed.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.
- **Standard 7 Topic A Indicator 1:** Investigate factors that influence environmental quality.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.4, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.4, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.4, RI.5.7

Soak It Up (Soak)* (Grades 3-5)

[Please schedule a full 15 minutes between this lesson for set-up and clean-up.](#)



Students act as soil scientists as they try to discover if the water holding capacity of soil can be improved. Data is collected using metric measurements. This investigation promotes careful following of directions and teamwork.

This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Idea:

- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.7

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grade 3:** Explain how people modify, protect, and adapt to their environment.
- **MSDE 3.0.D.1 (Geography) Grade 4:** Describe how people adapt to, modify and impact the natural environment.
- **MSDE 3.0.D.1 (Geography) Grade 5:** Describe why and how people adapt to and modify the natural environment and the impact of those modifications.

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

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.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Idea:

- **PS1.B Chemical Reactions:** When two or more different substances are mixed, a new substance with different properties may be formed.
- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.
- **Standard 7 Topic A Indicator 1:** Investigate factors that influence environmental quality.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.7

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grade 3:** Explain how people modify, protect, and adapt to their environment.
- **MSDE 3.0.D.1 (Geography) Grade 4:** Describe how people adapt to, modify and impact the natural environment.
- **MSDE 3.0.D.1 (Geography) Grade 5:** Describe why and how people adapt to and modify the natural environment and the impact of those modifications.

Wetlands in a Pan (Wetlands)* (Grades 3-5)

Students experiment with a wetland model and discover the benefits wetlands provide as well as the consequences that may arise from their destruction.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,6,7)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.
- **LS2.C Ecosystem Dynamics, Functioning, and Resilience:** When the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.
- **LS4.D Biodiversity and Humans:** Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 1:** Analyze the effects of human activities on earth's natural processes.

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- **Standard 6 Topic B Indicator 1:** Describe and explain that many changes in the environment designed by humans bring benefits to society as well as cause risks.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.1, RI.3.3, RI.3.7
- **Grade 4:** RI.4.1, RI.4.3, RI.4.7
- **Grade 5:** RI.5.1, RI.5.3, RI.5.7

Maryland Social Studies Standards Connections:

- **MSDE 3.0.D.1 (Geography) Grade 3:** Explain how people modify, protect, and adapt to their environment.
- **MSDE 3.0.D.1 (Geography) Grade 4:** Describe how people adapt to, modify and impact the natural environment.
- **MSDE 3.0.D.1 (Geography) Grade 5:** Describe why and how people adapt to and modify the natural environment and the impact of those modifications.

Important Scheduling Information

- When planning a schedule, allow a minimum of 50-60 minutes for each lesson.
- Allow **10 minutes between classes** for clean-up and set up of the same lesson.
- Please allow **15-20 minutes between Clear or Cloudy, Salt Water Layers and Soak It Up** for clean-up and set -up if the same lesson is back to back.
- If the need arises to change entirely from one lesson to a different lesson, **an additional 20-30-minute break must be allotted** for the change-over.
- Please limit lesson changes to no more than 2 per day. This helps maximize your students' time in the lab.
- A **30-minute lunch break for the lab teacher must be included**. The teacher's lunch can NOT be used for a lesson change-over.
- For emergency and safety reasons, classroom teachers must stay with their classes when in the lab.
- A **parent/volunteer** is needed all day, each day on the lab to assist the lab teacher. This is in addition to the classroom teacher. You can have different volunteers during the day, but we ask for no more than one at a time on the lab.
- Prior to coming out to the lab, please divide your class into 12 equal teams for each of the 12 work stations inside the lab.

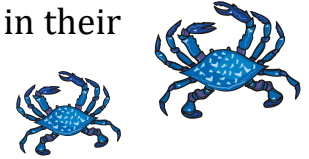
When listing your selections on the class schedule, use the shortened (Title)* for the lab choice. Our teachers have the option of changing a lab selection when it seems not to be age appropriate.

Aquatic Lab Choices

25-Minute Mini-Lessons

Crabs and the Chesapeake Bay (Crabs-int)* (Grades 3-5)

Students examine crab models, describe the appearance and function of their body parts, and discover facts about how they survive in their environment.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,5)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.
- **LS1.A Structure and Function:** Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.
- **LS1.D Information Processing:** Different sense receptors are specialized for particular kinds of information; Animals use their perceptions and memories to guide their actions.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.

Environmental Literacy Connection:

- **Standard 4 Topic B Indicator 1:** Analyze the growth or decline of populations and identify a variety of responsible factors.

Common Core Standards Connections (ELA/Literacy):

- **Grade 3:** RI.3.3, RI.3.7
- **Grade 4:** RI.4.3, RI.4.7
- **Grade 5:** RI.5.3, RI.5.7

Crabs and the Chesapeake Bay (Crabs-pri)* (Grades 1-2)

Students examine crab models, describe the appearance and function of their body parts, and label crab diagrams.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.
- **LS1.A Structure and Function:** Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.

Common Core Standards Connections (ELA/Literacy):

- **Grade 1:** RI.1.3, RI.1.7
- **Grade 2:** RI.2.3, RI.2.7

Oysters and the Chesapeake Bay (Oysters)* (Grades 2-5)

Students examine oyster shells to describe their properties, learn about the oyster's environmental impact on the Chesapeake Bay, and create their habitat.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,5)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.
- **LS1.A Structure and Function:** Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.
- **LS1.B Growth and Development of Organisms:** Reproduction is essential to every kind of organism. Organisms have unique and diverse life cycles.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.
- **LS4.D Biodiversity and Humans:** Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there.

Environmental Literacy Connections:

- **Standard 4 Topic B Indicator 1:** Analyze the growth or decline of populations and identify a variety of responsible factors.
- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Grade 2:** RI.2.3, RI.2.7
- **Grade 3:** RI.3.3, RI.3.7
- **Grade 4:** RI.4.3, RI.4.7
- **Grade 5:** RI.5.3

Who Lives in the Wetlands? (WLW)* (Grades K-4)

Animals and plants living in the wetlands are adapted to their environment in many ways. Students are introduced to these plants and animals and then “stamp” their own wetland environment.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,5)

NGSS Disciplinary Core Ideas:

- **ESS3.C Human Impacts on Earth's Systems:** Things people do can affect the environment, but they can make choices to reduce their impacts.
- **LS1.A Structure and Function:** Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.
- **LS4.D Biodiversity and Humans:** Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there.

Environmental Literacy Connections:

- **Standard 4 Topic B Indicator 1:** Analyze the growth or decline of populations and identify a variety of responsible factors.
- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Kindergarten:** RI.K.3, RI.K.7
- **Grade 1:** RI.1.3, RI.1.7
- **Grade 2:** RI.2.3, RI.2.7
- **Grade 3:** RI.3.3, RI.3.7
- **Grade 4:** RI.4.3, RI.4.7

Wetland Charm (Wet Charm)* (Grades K-3)

After a BIG BOOK experience, students discover the animals and plants that make up a wetland habitat as well as the benefits provided by a wetland when they make a “charm” to take with them.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,7)

NGSS Disciplinary Core Ideas:

- **ESS3.A Natural Resources:** Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.
- **ESS2.C The roles of water in Earth’s surface processes:** Water is found in many types of places and in different forms on Earth.
- **ESS3.C Human Impacts on Earth’s Systems:** Things people do can affect the environment, but they can make choices to reduce their impacts.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.
- **Standard 8 Topic A Indicator 1:** Understand and apply the basic concept of sustainability to natural and human communities.

Common Core Standards Connections (ELA/Literacy):

- **Kindergarten:** RI.K.1, RI.K.2, RI.K.3, RI.K.7
- **Grade 1:** RI.1.1, RI.1.2, RI.1.3, RI.1.7
- **Grade 2:** RI.2.1, RI.2.2, RI.2.3, RI.2.7
- **Grade 3:** RI.3.1, RI.3.2, RI.3.3, RI.3.7

Bug Out (Bugs)* (Grades K-5)

After a “bug” dress up, students group themselves according to their own bug smell or “pheromone”. Session ends with students creating a “bug rubbing.”



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,7)

NGSS Disciplinary Core Ideas:

- **LS1.A Structure and Function (K-2):** All organisms have external parts that they use to perform daily functions.
- **LS1.A Structure and Function (3-5):** Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.
- **LS1.D Information Processing (K-2):** Animals sense and communicate information and respond to inputs with behaviors that help them grow and survive.
- **LS1.D Information Processing (3-5):** Different sense receptors are specialized for particular kinds of information; Animals use their perceptions and memories to guide their actions.

Environmental Literacy Connection:

- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Common Core Standards Connections (ELA/Literacy):

- **Kindergarten:** RI.K.2, RI.K.3, RI.K.7
- **Grade 1:** RI.1.2, RI.1.3, RI.1.7
- **Grade 2:** RI.2.2, RI.2.3, RI.2.7
- **Grade 3:** RI.3.2, RI.3.3, RI.3.7
- **Grade 4:** RI.4.2, RI.4.3, RI.4.7
- **Grade 5:** RI.5.3, RI.5.7

After a Story ~ Crabby & Nabby, Pearlie Oyster, or Harry the Horseshoe Crab ~(C&N, PO, or HHC)* (Grades K-2)

Students listen to a story about one of the important organisms in our Chesapeake Bay. Then, they make a Bay Charm necklace and learn about what the Bay has to offer.



This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2)

NGSS Disciplinary Core Ideas:

- **ESS3.A Natural Resources:** Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.
- **ESS3.C Human Impacts on Earth's Systems:** Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.
- **LS1.A Structure and Function:** All organisms have external parts that they use to perform daily functions.
- **LS4.C Adaptation:** Particular organisms can only survive in particular environments.

Environmental Literacy Connections:

- **Standard 5 Topic A Indicator 2:** Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.
- **Standard 8 Topic A Indicator 1:** Understand and apply the basic concept of sustainability to natural and human communities.

Common Core Standards Connections (ELA/Literacy):

- **Kindergarten:** RI.K.1, RI.K.3, RI.K.7
- **Grade 1:** RI.1.1, RI.1.3, RI.1.7
- **Grade 2:** RI.2.1, RI.2.3, RI.2.7

Popcorn Capers (PC)* (Grades K-3)

A big book experience followed by a mini-experiment to determine what causes certain objects to sink or float.

This lesson supports the following practices and standards:

NGSS Science and Engineering Practices: (1,2,3,4,6,7)

NGSS Disciplinary Core Idea:

- **PS1.A Structure of matter:** Matter exists as different substances that have observable different properties. Different properties are suited to different purposes. Objects can be built up from smaller parts.

Common Core Standards Connections (ELA/Literacy):

- **Kindergarten:** RI.K.1, RI.K.2, RI.K.3, RI.K.7
- **Grade 1:** RI.1.1, RI.1.2, RI.1.3, RI.1.7
- **Grade 2:** RI.2.1, RI.2.2, RI.2.3, RI.2.7
- **Grade 3:** RI.3.1, RI.3.2, RI.3.3, RI.3.7



Important Scheduling Information: Mini-Lessons

- When planning mini-lessons, allow **25-30 minutes** per class.
- Allow **10 minutes between classes** for clean-up and set up of the same lesson.
- **Any time you change to a different lesson or mini-lesson** you must allow 20-30 minutes in the schedule to set up the new lesson.
- Kindergarten classes may only visit the lab one time.
- Pre-school classes may “tour” the lab. Allow 15-20 minutes for a tour and chat about agriculture. They will not participate in a lesson.

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

Appendix

Below are the Common Core Standards addressed in our Aquatic Mobile Lab. Please refer to the lesson descriptions above to see which standards are supported by the individual lessons.

Kindergarten

- *RI.K.1 With prompting and support, ask and answer questions about key details in a text.*
- *RI.K.2 With prompting and support, identify the main topic and retell key details of a text.*
- *RI.K.3 With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.*
- *RI.K.7 With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).*

Grade 1

- *RI.1.1 Ask and answer questions about key details in a text.*
- *RI.1.2 Identify the main topic and retell key details of a text.*
- *RI.1.3 Describe the connection between two individuals, events, ideas, or pieces of information in a text.*
- *RI.1.7 Use the illustrations and details in a text to describe its key ideas.*

Grade 2

- *RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.*
- *RI.2.2 Identify the main topic of a multi-paragraph text as well as the focus of specific paragraphs within the text.*
- *RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.*
- *RI.2.7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.*

Grade 3

- *RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.*
- *RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.*
- *RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.*
- *RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.*
- *RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).*

Grade 4

- *RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.*
- *RI.4.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.*
- *RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.*
- *RI.4.4 Determine the meaning of general academic and domain-specific words and phrases in a text-relevant to a grade 4 topic or subject area.*

- **RI.4.7** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
- **W.4.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Grade 5

- **RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RI.5.3** Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
- **RI.5.4** Determine the meaning of general academic and domain-specific words and phrases in a text-relevant to a grade 5 topic or subject area.
- **RI.5.7** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- **W.5.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.