Facilitator's Guide to MWEE Training

A companion text to the *Educator's Guide to the Meaningful Watershed Educational Experience* to support effective MWEE professional learning experiences for teachers and educators in Delaware.

Chesapeake Bay Program
Science. Restoration. Partnership.

Acknowledgements

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To learn more about B-WET visit: www.noaa.gov/office-education/bwet

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How to Use this Facilitator's Guide

This facilitators guide has been designed for practitioners who are deeply familiar with the Meaningful Watershed Educational Experience (MWEE) and will be training other educators on how to apply the tools and resources found in the Educator's Guide to the Meaningful Watershed Educational Experience (MWEE Guide) to their own classrooms and programs. This guide provides guidance, easy-to-use training resources, and provides consistency in MWEE professional development across the region. The following activities are modular and can be adapted to support your local context.

Let's Get Started

Whether this is your first time hosting a MWEE Professional Development Workshop, or you are looking to incorporate new activities to support your existing MWEE workshop, you should start by considering the workshop logistics. Read through the entirety of this guide before hosting your workshop. You will notice there is some pre-planning you will need to complete, such as creating a driving question for the workshop or scoping out field site(s) to visit with your workshop participants. There are 'Call out' boxes throughout the guide that highlight this pre-workshop planning and there are areas in the slide deck for you to insert the appropriate information.

Below are some ideas of how you might approach some of the workshop logistics:

- **Length of Workshop**: This guide includes activities for about three days (18 hours) of programming. There are many different ways of structuring professional development workshops. You might have educators for 3 or 4 consecutive days in the summer, during which you can use much of what is included in this guide plus additional components of your existing programming. Or you might have educators for a single day followed by shorter, after-school meetings. The time between meetings can create an opportunity for participants to process and reflect on how they're introducing elements into their practice. No matter how you structure your workshop, use this guide to cover the fundamental components of the MWEE. The guide is designed to be modular so you can choose to apply the entire suite of activities or pick and choose activities that best support the needs of your participants. Each activity has an estimated time listed.

◊ **Workshop Location**: It is ideal for your MWEE Professional Development Workshop to take place in a location that has easily accessible outdoor space where you can model what an outdoor field experience looks like with your participants. It is highly recommended that you, the facilitator, visit this space beforehand so you know what some of the opportunities are for talking about local environmental issues. You'll also want to make sure that there is a sheltered or indoor space to bring participants back together to reflect on experiences and engage in other activities outlined in this guide. Other considerations when selecting a workshop location include access to restrooms/wash stations, internet connectivity, handicap accessibility, and projectors/screens/technology.

◊ **Workshop Partners**: Parts of this guide (particularly Parts 2 and 3) recommend bringing participants outdoors to explore local issues and engage in hands-on investigations. Consider bringing in a partner or expert in environmental education if you, the facilitator, are not comfortable leading these components. In addition to providing expertise, partners can also help with access to field sites, equipment/tools, and much more. Alternatively, in Part 1 there is a significant focus on standards, curriculum, and environmental literacy plans. If you are not as familiar with these elements, consider bringing in the subject supervisor or curriculum writer to speak to these aspects. It is recommended to involve partners in the planning process, so they fully understand your goals and objectives for the workshop.

◊ **Other Considerations**: There is an abundance of research and information on best practices for professional learning. The conceptual framework below demonstrates how this guide includes components of developing shared understanding of tools and resources, models the MWEE experience that is expected for students, and provides ample time for reflecting from both a student and educator perspective, in addition to dedicated time for implementation planning. You might also consider methods for supporting educators in their professional development journey by encouraging the use of journals, story maps, or collective bulletin boards to easily track and reflect on the experience. All professional development workshops should have a strong evaluation component that will help you, the facilitator, know if concepts, practices, and content are understood. This can be a combination of both formative and summative evaluation. You can use the objectives and outputs outlined in each part to help create these benchmarks.

Because this workshop includes aspects where participants are planning a new MWEE or refining an existing one, it's highly recommended that they bring any pertinent curriculum documents or unit plans to work from during the Plan It sections.

Conceptual Framework of this Guide

This guide is modular so facilitators can use the parts or activities that are most beneficial and relevant to their participants. You will notice that each part follows the same basic structure:

1. BACKGROUND: This section provides the facilitator with pertinent background details, like definitions or rationale, that are essential for carrying out the associated activity. Facilitators might find it helpful to share the information with participants during the introduction of the activity.
2. MODEL IT: This is where you as a facilitator will lead participants through the elements of a model MWEE. For the most part, your workshop participants should be wearing their student hat during the model MWEE; however, there are *engagement questions* that ask participants to reflect on their experience to consider how they might approach the investigation with their own students. Throughout the process of modeling, participants will participate in activities and engage with tools and resources specific to Delaware.
3. EXAMPLE: A MWEE case study from Frederick County Public Schools and Blandy Experimental Farm is threaded throughout this guide. The example includes all of the completed MWEE Toolbox worksheets and ELM pages. If you have these tools developed for a project that is more relevant to your participants, we encourage you to use those. It is important that the tools model what you hope to see in your participants' work.
4. ADDITIONAL RESOURCES: Most additional resources are extensions for activities. These components are not included in the estimated time for the activities and overall parts but are helpful if participants need more practice.
5. PLAN IT: Each part concludes with a Plan It section, where workshop participants apply what they have learned to design their own MWEE using the MWEE Toolbox worksheets and pages from the Environmental Literacy Model (ELM). If there is already a MWEE in place that you are training participants on, this might be an opportunity for reflection and fine-tuning rather than development.
6. SLIDES: Each part has a corresponding slide deck. The slides highlight the activities and engagement questions and use the icons below to cue the facilitator and participants on

whether the focus is on the workshop model MWEE, the example MWEE, or the MWEE that participants are developing. Adjust the slides based on the specific needs of your workshop.

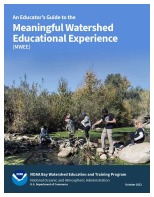
Slide Deck Icons

This icon is used for *Engagement Questions* when participants have on their "educator-hat" and reflect on what the activity or experience might be like for their students.

This icon is used when participants are wearing their "student-hat" engaging in the workshop's modeled MWEE. Participants will engage in all aspects of the MWEE - from issue definition and outdoor field experiences to synthesis and conclusions and environmental action projects.

This icon is used when participants have on their "educator-hat" and are reviewing an example MWEE. The example provided in this guide is from Talbot and Dorchester County Public Schools and ShoreRivers.

This icon is used when participants are working on their own MWEE that they will eventually implement in their classroom/program with students.



This icon is used when referencing text and worksheets in *An Educator's Guide to the Meaningful Watershed Educational Experience*.

Keep in mind that during your workshop participants should wear both the student-hat and the educator-hat at various points. You should be intentional and explicit with your participants about which role they are playing at different points in your workshop so they can recognize, understand, and appreciate the importance of each of these roles in teaching and learning using the MWEE model.

MWEE 101

This guide presupposes that participants in your workshop have completed the MWEE 101 online course (another free resource accessible via BayBackpack). MWEE 101 is a self-guided course that introduces educators to the basics of the MWEE through a series of case studies. By the end of the course participants have a basic understanding of the essential elements, supporting practices, the MWEE Toolbox, the Environmental Literacy Model, and the research that supports the MWEE as an effective educational approach. When participants complete the course, they receive a certificate of completion (15 clock hours) that they may be able to use for CEU credit. As the facilitator, you can request your participants to turn in their certificate and course reflection document to you in advance of the workshop.

Below are the step-by-step instructions that you may send out to your workshop participants to have them enroll in the MWEE 101 course:

Taking the eeLEARN MWEE 101 course

1. Navigate to: https://eepro.naaee.org/learning/eelearn/eelearn-6-mwee-101
2. Click "**Log in**" located at the top right of the window and log in or create a free account.
3. Complete the three lessons. Having an account allows you to save your progress so you don't need to complete the course in one sitting.
4. Throughout the course, complete the Reflection Questions and submit your answers at the completion of the course.
5. After submission, download a copy of your Reflection answers and Certificate of Completion and share both with your workshop instructor.

If it is not possible for your participants to complete the MWEE 101 course before your workshop, you should engage them in an activity to create a shared understanding of each of the essential elements and supporting practices at the start of the workshop. For example, many facilitators have had success leading a MWEE review by first splitting participants into four groups and assigning each group one of the essential elements. Ask participants to become "experts" in this element by reading pages 7-9 in the

MWEE Guide. Have participants consider why their element is called out as essential, what it looks like from a student perspective, what it looks like from a teacher/educator perspective, and how the supporting practices (pages 12-13 in the MWEE Guide) fit within the element. Bring the four groups back together and ask them to present on each element and have their peers ask questions and challenge their understanding. You might also consider showing some of the videos that were created by the Bay Program to demonstrate how teachers across grade bands and geographies have approached the MWEE in their classroom. Those videos can be found on the Chesapeake Bay Program's MWEE Playlist.

Glossary

MWEE	Meaningful Watershed Educational Experience
Facilitator	Training Professional hosting the workshop
NGO	Non-government Organization
SOL	Standard of Learning
IHEs	Institution of Higher Learning
ELM	Environmental Literacy Model
DCIN	Delaware Communities in Nature (formerly Delaware Children in Nature)
DDOE	Delaware Department of Education
NGSS	Next Generation Science Standards

Part 1: Framing the MWEE

This part aligns with slides in Part 1 Slide Deck.

Summary

Activities:

1.1 Reflection on MWEE 101 Online Course

1.2 State Policies & State Education Standards

1.3 Environmental Literacy Plans

Objectives:

- Participants will reflect on their work in the MWEE 101 Online Course.
- Participants will develop an understanding of Delaware state policies, education standards, and planning efforts that support MWEEs.

Estimated Time for Activity: 45 minutes

Suggested location: Indoors

Activity 1.1: Reflection on MWEE 101 Online Course

(15 minutes / Slides 1-2)

(This activity is designed to recall participants' experience completing the MWEE 101 online course.)

Print sheets of paper with one of the essential elements and supporting practices written in big font on each page. Ask participants to work in small groups to organize the sheets and use arrows to illustrate how they imagine the MWEE "flow" to happen. Ask participants to reflect on any experience they have with MWEEs and how the elements and practices worked together, perhaps in a non-linear way, to create a comprehensive learning experience for students. Use this time and space to ensure that the whole group has the foundational understanding of each of the essential elements and supporting practices necessary for meaningfully engaging with the rest of the workshop. This is also an appropriate time to remind participants about the importance of supporting youth voice throughout the MWEE and to consider introducing the idea of action early in the process.

Activity 1.1: Output/Deliverables

- Participants will recall their knowledge and understanding of the MWEE essential elements and supporting practices and how they work together to create a comprehensive learning experience for students.

Activity 1.2: State Policies & State Education Standards

(20 minutes / Slides 3-13)

Meaningful Watershed Educational Experiences (MWEE) can be supported by a number of Delaware Policies and standards. Educators often come with mixed background knowledge of the policies and standards that support and guide their work. Some might be most familiar with their district curriculum guidelines while others only know of the state-wide standards. This activity provides a brief background on what Delaware has in place to support environmental literacy efforts, and how they relate to each other, so that all workshop participants are starting with the same background knowledge.

Engagement Question*: *What are the core elements (policies, standards, efforts, etc.) that guide the way you approach teaching environmental literacy in Delaware?

Activity 1.2: Background Information

Key Drivers for Environmental Literacy

- Chesapeake Bay Watershed Agreement
- Delaware Environmental Literacy Plan
- Portrait of an Environmentally Literate Citizen
- State Education Standards in Delaware

Chesapeake Bay Watershed Agreement

The MWEE is a key part of the Student Outcome of the Chesapeake Bay Watershed Agreement's Environmental Literacy Goal. This is a commitment that every student will graduate environmentally literate. The goal includes three outcomes focused on students, sustainable schools, and environmental literacy planning. Specifically, the Environmental Literacy Goal acknowledges that "the future well-being of the Chesapeake Bay Watershed will soon rest in the hands of its youngest citizens—more than three million students in grades K-12. Establishing a strong, targeted environmental education program now provides a vital foundation for those future watershed stewards." The Agreement recommends that

every student have a Meaningful Watershed Educational Experience (MWEE) at least once in each elementary, middle, and high school.

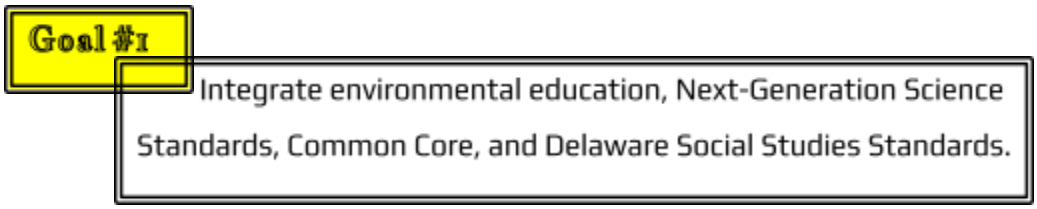
Chesapeake Bay Program partners envision an environmentally and economically sustainable Chesapeake Bay watershed with clean water, abundant life, conserved lands and access to the water, a vibrant cultural heritage, and a diversity of engaged citizens and stakeholders.

Delaware Environmental Literacy Plan

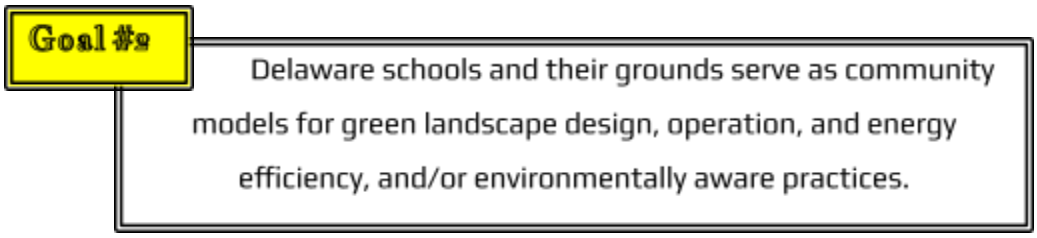
The **Delaware Environmental Literacy Plan** (DELP) was written in 2015 by Delaware Children in Nature Coalition (DCIN). The plan addresses three major issues:

1. Defining meaningful outdoor experiences for students, children, families, and community members.
2. Defining the need for an environmentally literate community in Delaware.
3. Establishes goals for environmental literacy at home, work, school, and at leisure.

The plan recommends two specific goals for schools.



- Identify where environmental education already exists within these standards.
- Identify ways environmental education can be integrated more effectively across the curriculum.
- Provide meaningful outdoor experiences for students that:
    - Occur at least once in each grade ban: K-2, 3-5, 6-8, 9-12
    - Promote Delaware's unique history, culture, environment, economy, literature, and/or art.
    - Engage practice-based investigative or project-oriented activities in the natural environment.
    - Develop sustainable experiences that continue through students' academic careers. Enhance the experience with natural resources personnel to add expertise and promote career opportunities.



- All schools are enrolled either in the Federal Green Schools Program or the Pathways to Green Schools Program.
- Each school will choose a "Green" focus to increase environmental literacy:
    - Option 1: Schoolyard Habitat
    - Option 2: School Garden
    - Option 3: NATURE STEM School (NATURE STEM projects conducted during each grade level)

The Delaware Environmental Literacy Plan also states:

- Education programming should be relevant to the educational and developmental levels of all students and inclusive of all learners.
- In-school instruction and meaningful outdoor experiences that support environmental literacy can promote the critical thinking skills needed to academic achievement in all subject areas.
- Professional development opportunities should be made available for formal and non-formal teacher training that infuses environmental education in all grade levels.

Portrait of an Environmentally Literate Citizen

An environmentally literate Delaware Citizen…

- Is prepared for success in college, career, and life. (1)
- Has had access to a rigorous course of study that met education standards in elementary, middle, and high school. (1)
- Has participated in authentic inquiry-based learning outside at least once in elementary, middle, and high school. (2)
- Has been involved in environmental stewardship at the classroom, school, and/or community level.
- Can analyze local and global environmental issues from a variety of viewpoints including social, cultural, political, and economic. (3)
- Can understand environmental processes and systems including the dynamics of human interaction. (3)
- Understands local, regional, and global environmental issues and strategies for addressing them. (3)
- Can use this understanding to make responsible decisions about environmental, economic, and social issues. (3)
- Is aware of careers in the environmental field.

Notes:

(1) Delaware Department of Education Mission, Vision, and Priorities

(2) Chesapeake Bay Agreement

(3) Delaware State Environmental Literacy Plan

State Education Standards in Delaware

The Delaware Department of Education believes every learner should be ready for success in college, career, and life. The mission is to empower every learner with the highest quality education through shared leadership, innovative practices, and exemplary services. The Next Generation Science Standards (NGSS) and Common Core reflect what a student should understand and accomplish by high school graduation. Environmental Education is embedded in the NGSS and Common Core.

The Next Generation Science Standards (NGSS) are designed to provide foundational knowledge and skills for all students to develop proficiency in science. The Project 2061's Benchmarks for Science Literacy and the follow up work, A Framework for K-12 Science Education were used as the core of the standards to determine appropriate content and process skills for students. The integration of rigorous content and application reflects how science and engineering are practiced in the real world. Science and engineering practices (SEPs) and crosscutting concepts (CCs) are designed to be taught in context, not in a vacuum. The Next Generation Science Standards encourage integration with multiple core concepts throughout each year. Science concepts build coherently across K-12. The emphasis of the NGSS is a focused and coherent progression of knowledge from grade band to grade band, allowing for a dynamic process of building knowledge throughout a student's entire K-12 science education.

Delaware NGSS K-12 Alignment: Science / Next Generation Science Standards

Delaware Social Studies Standards prepares young people to become informed and active citizens who accept their responsibilities, understand their rights, and actively participate in society and government. Effective citizens must be able to research issues, form reasoned opinions, support their positions, and engage in the political process.

- Social Studies / Standards for Social Studies (doe.k12.de.us)
- Culturally Responsive Education (doe.k12.de.us)

The Science Standards of Learning provide a focused treatment of key physical, biological, and planetary science concepts from kindergarten through the high-school grades. These concepts build sequentially and create a comprehensive foundation for the post-secondary world students will enter upon graduation.

Understanding *sustainability* requires the application of many facets of science including…

- Energy
- Natural Resources
- Ecological and Physical Science Principles
- Time
- Management

All of this must be further integrated with an understanding of complex systems interactions**.** For this reason, virtually every standard in the *Science Standards of Learning* document has some direct or indirect connection to *sustainability*. *Sustainability* also has social and economic dimensions, and certain science standards incorporate these ideas where they are key to the application of the standard (e.g., 6.9). These dimensions generally focus on two key areas of ***management*** and ***economics***.

In addition to the expectations for students outlined in the NGSS, MWEE lessons should be constructed to address learning across disciplines and there are clear connections with the Delaware Social Studies Standards and Common Core-ELA among others. As an environmentally literate citizen, students should have a foundation in science concepts, be able to analyze and interpret environmental studies and data, reflect on the historical development and implementation of environmental practices to determine how policies have impacted the environment, and be able to communicate these findings to others. Communication can occur through a variety of means including written, verbal, and artistic products. Environmental literacy goes beyond a single discipline; opportunities should be provided to allow students to look at environmental issues and data holistically and communicate their learning through a variety of products. Action projects, a critical component of MWEEs, allows students to build and demonstrate an understanding of a local environmental issue and provides opportunities to apply multiple discipline concepts and practices.

Environmental Literacy and CTE in Delaware

Delaware Department of Education have partnered with Advance CTE to develop (1) environmental literacy competencies for Career Technical Education (CTE); (2) an environmental literacy framework expanding on these competencies; and (3) a technical assistance and professional learning plan for implementation in related CTE programs of study. The environmental literacy framework will provide an opportunity for educators, employers, and community members to align knowledge, skills, and action planning strategies. In addition, it will support meaningful connections between academic content and

technical learning for educators and learners, as well as an integrated model of CTE and academic content professional learning. To view the environmental literacy competencies for Career Technical Education (CTE) and learn more about the project visit the Delaware Pathways website.

Additional Support for Environmental Literacy

Green Ribbon Schools

The aim of U.S. Department of Education (National) Green Ribbon Schools is to inspire schools (both public and private), districts, early learning centers (OLCs), and institutions of high education (IHEs) to strive for 21st-century excellence by highlighting promising school sustainability practices and resources that all can employ. To that end, the award recognizes schools, districts, OLCs, and IHEs that:

- Reduce environmental impacts and costs
- Improve the health and wellness of schools, students, and staff
- Provide effective environmental and sustainability education

Each spring the Delaware Department of Education (DDOE) recognizes national and state finalists in an award ceremony held at one of Delaware's schools. All national winners are recognized in Washington, D.C., in the summer. Learn more about Green Ribbon Schools in Delaware here.

**A printable copy of 'Activity 1.2: Background Information' is located in the appendix.*

Activity 1.2 Continued…

After reviewing Delaware policies and standards that support Meaningful Watershed Educational Experiences (MWEE), complete the following activity. Keep in mind the Engagement Question.

Engagement Questions: *What are the core elements (policies, standards, efforts, etc.) that guide the way you approach teaching environmental literacy in Delaware? How can MWEEs help to meet multiple state policies and standards.*

1. Divide participants into three groups and assign them one of the following three drivers that support environmental literacy in Delaware: the Chesapeake Bay Watershed Agreement,

Delaware State Standards, or Profile of a Delaware Graduate. Ask each group to familiarize themselves with the policy by using the information in the background section and/or the associated web pages.

2. Each group will report out on what the policy is and any initial impressions or experiences with the policy.
3. Engage all groups in a discussion around these questions:
    a. To what extent are the educators that you work with aware of these policies?
    b. What sort of learning experiences are supported by these policies?
    c. How do these initiatives build on each other to provide a structure for helping students become environmentally literate?
4. Review the state education standards in Delaware.
5. Engage workshop participants in a discussion around how MWEEs can help to meet multiple standards and what that could look like at the grade band in which they work.

Activity 1.2: Output/Deliverables

- Participants will view Delaware State policies and education standards and discuss how they will support MWEEs.

Activity 1.3: Environmental Literacy Plans

(10 minutes / Slides 14-16)

Some school divisions in Delaware have been conducting planning efforts to determine where MWEEs, among other things like annual outdoor field experiences, service learning, etc., happen across a students' academic career. We call these efforts Environmental Literacy Plans.

CALL OUT BOX

Environmental Literacy Plans are a relatively new resource that divisions are using to articulate where environmental literacy is happening across grade bands. Before the workshop, determine the school divisions your participants work in and research whether there is an Environmental Literacy Plan. Every school system is different so if you are unsure of where to find this information, you might be able to contact the person who oversees all curriculum in the district, and they can point you in the direction of the person who oversees environmental literacy. If the plan is available, you'll want to share it with participants during this activity.

Engagement Question: *How do you see a division or country-wide Environmental Literacy Plan helping the implementation and continuation of a MWEE?*

1. If the division has an Environmental Literacy Plan, include it on your slides. Engage participants in a discussion around their familiarity with this plan, what they currently do to support activities or experiences identified on this plan, and how the plan supports MWEEs.
2. If the district/county does not have a plan available, use the example from Arlington County below. Ask participants what they think should be a part of the plan and how it connects to MWEEs.

   Arlington County Public School's Environmental Literacy Plan

   Sample template for school divisions to create their own EL Plan. Developed by a workgroup through Delaware Association for Environmental Education.

Activity 1.3: Output/Deliverables

- Participants will examine a division-wide Environmental Literacy Plan and discuss how one of these plans could support the implementation and continuation of a MWEE.

Part 2: Curriculum Anchor

This part aligns with slides in Part 2 Slide Deck.

Summary

Activities:

2.1 Exploring Local Issues
2.2 Connecting Issues with Questions and Standards
2.3 Introducing Early Action
2.4 MWEE Planning Tools
2.5 Plan It

Objectives:

- Participants will identify and describe one or more local issues affecting environments and communities in Delaware.
- Participants will explain ways in which one or more local issues affecting environments and societies in Delaware can be contextualized for classroom learning.
- Participants will explain why informed student action is critical to the MWEE and, ultimately, to their student's future stewardship.
- Participants will identify resources available for information on issues and learning standards.

Estimated Time for Activity: 4 hours

Suggested location: Combination of indoors and outdoors

Activity 2.1: Exploring Local Issues

(30 minutes / Slides 1-4)

This activity is designed to engage teachers in thinking about Chesapeake Bay issues that are connected to learning objectives and suitable to explore through a MWEE.

The Chesapeake Bay Program is a partnership among federal, state, and local governments as well as non-governmental organizations (NGOs) that guides the restoration of the nation's largest estuary and its watershed. The Chesapeake Bay Program works to address issues ranging from water quality to the ways in which society uses the land throughout the watershed.

In this activity, participants will use the Chesapeake Bay Program's Learn the Issues webpage to explore key issues in the region and consider the human and natural systems connected to these issues.

1. Using big pads, whiteboards, magnets, etc., place the CBP Issue Cards in a space with enough room for the participants to connect with the Issue Descriptor Cards.
2. Provide each participant with one or more Issue Descriptor Cards. The cards are split into three categories: Natural Systems, Human Systems, and Value Descriptors. You can hand out all the cards at once or go through three rounds doing one category at a time. Ask participants to place their descriptors next to an issue and defend why they associated these descriptors with the issue.
3. Facilitate a group discussion considering the following questions:
    a. What issue(s) are particularly relevant to where you work/live?
    b. Were you surprised by any of the issues?
    c. Are there any major issues missing that are important in your community?
    d. How else might you identify locally relevant issues?
    e. Can you take a couple of the issues, natural systems, human systems, and values to create a driving question that is locally relevant? **If practical, note that the environmental issues are often the result of tensions between groups and/or natural and human/social systems.*

Activity 2.1: Additional Resource

(slides 23 - 25)

Identifying Public Policies, Private Policies, and Community Practices

All environmental issues are affected by some combination of public policies, private policies, and/or community practices. This Earth Force resource defines the difference between policy and practice and provides examples of each. A public policy is created by a government (federal, state, tribal, or local). Private policies are written by a business, organization, or other groups. Community practices are the habits and behaviors of people. An important early step to understanding the environmental issue covered in a MWEE is defining how policies and practices impact the issue. This knowledge will be especially helpful when students start brainstorming effective action projects – will the project support a policy or practice change?

Engagement Question: *Why is it important for students to understand the policies and practices that underpin the issue they are investigating?*

Activity 2.1: Output/Deliverables

- Participants will create a conceptual diagram illustrating the connections between Chesapeake Bay issues and systems, both human and natural.

Activity 2.2: Connecting Issues with Questions and Standards

(60 minutes / slides 5-15)

Workshop MWEE

This activity takes a deeper, interactive look at a single issue and how driving and supporting questions can be used to connect issues to standards and learning objectives.

CALL OUT BOX

Before the workshop, determine a single issue from the Learn the Issues webpage that you will use throughout the rest of the workshop. You'll want to choose one that is locally relevant and can be explored at the outdoor field location you've chosen for this workshop. It's also important to pre-identify which standards will support the inquiry throughout the workshop.

1. Break participants into groups to read the associated CBP issue articles (these are the pages you get to when you click on one of the issues, for example: https://www.chesapeakebay.net/issues/threats-to-the-bay/agricultural-runoff), Watch the associated video, and discuss the questions below around the issue you select for this workshop. You may also provide additional resources to consider the issue such as relevant articles or social media posts. Consider capturing notes on a whiteboard or big pad.

   NOTE: You may have participants use the Chesapeake Bay Program website to do readings or print the one-pagers that you can download directly from the page. Watching the videos will require internet connectivity.

Discussion Questions:

- Why is this issue important and how does it affect the health of the Chesapeake Bay and the watershed?
- How might this issue connect to your teaching standards? Where does it fit into the scope and sequence? The existing curriculum? Are there opportunities for cross curricular learning (social studies, language arts, mathematics, art, reading?) See page 15 of the MWEE Guide for ideas.

- Does this issue provide an actionable opportunity for students? How can students help advance some of the solutions you explored on the issue page?

2. Take participants to your outdoor field location, whether it's right outside, or not, plan time for travel. Ask participants to explore the ecosystem or community and consider what problems or issues they can observe or imagine that relates back to the larger issue they just examined. This can be done through a brief walkabout where participants informally explore an area for a set period of time and reflect on the experience via journaling or peer-to-peer dialogue. *Remember that during this investigation teachers are wearing the student hat and will be going through the process as a learner.*

If more time is available, you may model a schoolyard report card or another environmental inventory which are more structured approaches to identifying issues. The Chesapeake Bay Foundation shares its Schoolyard Report Card and Eco-Schools USA offers a variety of Environmental Audits.. This is also an opportunity to collect some baseline data about the environment or to examine other resources like maps, management plans, etc.

Engagement Questions: *How did your perceptions of the local issue/phenomena change after you went outside? How do you see this difference benefiting your students?*

3. After participants have engaged with the local issue through background research and hands-on experience, introduce the workshop's driving question. Remind participants that the driving question is often pre-determined by the teacher so they can ensure the MWEE supports and satisfies standards and fits their curriculum. At this point be prepared to articulate which standards/learning objectives the question can support.

CALL OUT BOX

This driving question should be created in advance of the workshop and should align with the local issue you had participants investigate. Remember that the driving questions should be open-ended, provoke further inquiry, and provide opportunities for environmental action.

4. Using a whiteboard, chart paper or sticky notes, ask participants what sort of supporting questions they can generate from the driving question after their outdoor field experience.

Alternatively, participants can start brainstorming questions by completing the **Asking Questions and Planning Investigations** student worksheet as "students" before sharing with the larger group. Supporting questions are typically more focused and help to provide context and understanding around the pieces of knowledge needed to answer or address the driving question. If using sticky notes, you can easily sort and organize questions that students "need to know" and begin to chart out the timeline or arch of the MWEE. Keep these supporting questions hanging up in the room throughout the workshop so participants can refer back to them as needed.

5. Engage participants in a discussion around these questions:
    - What standards/learning objectives can be addressed with these supporting questions?
    - What sort of investigations might you do to answer these questions?
    - Which questions are best explored indoors? Which are best explored outdoors?

Activity 2.2: Output/Deliverables

- Participants practice identifying issues in a place (schoolyard, park, or location of workshop).
- Participants will investigate an issue and develop supporting questions that will guide the inquiry for this workshop which will serve as a model for what MWEEs can look like in their given classes/programs.

Activity 2.3: Introducing Action Early

(30 minutes / slides 16-18)

Activity 2.3: Background Information

There are several factors that can have positive or negative influences over an individual's choices and actions regarding environmental stewardship. These include internal factors such as environmental knowledge, motivation, values, attitudes, sense of the locus of control, perceived responsibilities, and priorities. They also include external factors such as institutional and cultural factors. If MWEEs are to have lasting impacts on the stewardship behaviors of students, they must go beyond simply engaging students in restoration activities and attempt to access some of the other factors that may influence "behavior change." It is important to empower students throughout the MWEE to give voice to their thoughts about, feelings toward, and understandings of the core ideas underpinning the environmental topics under investigation as they define "the issues" for themselves and each other. These thoughts, feelings, and understandings should directly connect to and guide the process of developing action plans. Furthermore, students should be actively engaged in identifying and evaluating strategies and solutions that they can influence and/or implement.

Authentic, student-driven engagement is critical for supporting students' perceptions that they, themselves, can bring about change through their own actions. In other words, it is important for helping students develop a strong internal locus of control. When students only learn about the actions of others or participate in stewardship activities developed by someone else, they are at risk for developing a sense that the locus of control for affecting environmental change resides exclusively with external sources (particularly adults). Furthermore, it risks the assumption that the students, themselves, have little personal responsibility for affecting change.

(Source: Designing Effective MWEEs: Common Challenges and How to Address Them, Amy Green)

**A printable copy of 'Activity 2.3 Background Information' is located in the Appendix.*

Activity 2.3: Continued…

MWEEs are learner-centered experiences that focus on investigations into local environmental issues that lead to informed actions and civic engagement. This activity is designed to engage participants in thinking about their own experience taking action, stewardship or civic, and what motivated them to do so and the importance of considering action throughout the MWEE.

Ask participants to think about examples where they have been involved in either environmental or social action. It could be back during their childhood, during college, or in their adult life. Ask a few participants to describe what the action was, how they became involved in it, what it meant to them at the time, and what it means to them now. Or, what would motivate them now to take action? Common themes that people often describe when recalling their experiences with action include: having an understanding of the issue at hand and using that knowledge as motivation to act. Perhaps there is a personal or emotional connection that might have inspired it. Sometimes an opportunity to act presents itself - maybe one that has already been created (like an organized climate march or a community event) or you saw a gap that needed to be filled and created something yourself. Social networks oftentimes are important support systems that encourage us to participate in action. These empowerment themes line up well with some of the essential elements and supporting practices of the MWEE - ultimately what we are trying to do through the MWEE is facilitate these authentic experiences right in our own classrooms and programs.

While action is most effective when taken after students engage in in-depth inquiry, it is often helpful to get them thinking about the action piece well before they actually do it. By foreshadowing the action, learners are primed to be thinking in a solutions-oriented way.

Engagement Questions: *When have you been involved in environmental or social action? How did you get involved? What did it mean to you then? Now? What are the benefits to engaging students in action? What are some successes and/or challenges to engaging students in action?*

Activity 2.3: Outputs/Deliverables

- Participants develop a collective understanding of some of the motivators behind action.
- Participants acknowledge their own experience engaging in action and can identify how those experiences line up with aspects of the MWEE.

Activity 2.4: MWEE Planning Tools

(60 minutes / slides 19-20)

Example **MWEE**

This activity provides participants with an example of how others have contextualized an issue within a MWEE for their students. This example models how to use the planning tools including the **Curriculum Anchor** page of the **ELM**.

CALL OUT BOX

If there is an existing MWEE that you would prefer to use in place of the Frederick County Public Schools and Blandy Experimental Farm examples, you'll want to compile and ensure that all of the pages of the MWEE Toolbox and ELM are completed.

Frederick County Public Schools and Blandy Experimental Farm partnered to develop a MWEE for 6th grade students. The MWEE uses a real-world problem of identifying an appropriate space to build a new education center and engages students in considering the historical, ecological, and logistical implications along the way. In this activity participants will explore this example MWEE, the **Environmental Literacy Model (ELM)** describing the MWEE, and the **Asking Questions and Planning Investigations** student worksheet in the MWEE Student Worksheet Toolbox as resources to support the development of driving and supporting questions.

1. Distribute the **Curriculum Anchor** page of the FCPS/Blandy ELM (digitally or printed), the **Asking Questions and Planning Investigations** worksheet and the first three sections of the **MWEE**

Audit Tool (Classroom Integration, Issue Definition, and Local Context). All of these tools should already be familiar to participants from the MWEE 101 online course but you might refresh their memory by telling them that the MWEE Toolkit worksheets are tools to help educators think about the different aspects of the ELM; that the ELM is a planning tool for articulating the arch of the MWEE itself; and the MWEE Audit Tool helps educators evaluate their MWEE. Ask participants to review these materials and consider the following questions:

- How does this MWEE provide opportunities to explore the impacts of local environmental issue(s)?
- Which characteristics of an effective driving question are embodied in this example? (For more information about criteria for effective driving questions, see page 8 in the MWEE Guide).
- How are core ideas and practices of multiple disciplines defined and integrated into the MWEE?
- Could exploration of this issue culminate in a meaningful and relevant environmental action project?

2. In pairs, ask participants to apply the three sections of the MWEE Audit Tool to the Curriculum Anchor page of the FCPS/Blandy ELM.
3. Engage the group in a discussion around what is working really well in the Curriculum Anchor page of the ELM and where there are opportunities for improvement.

Activity 2.4: Output/Deliverables

- Participants will become familiar with the **ELM**, the worksheets in the **MWEE Student Worksheet Toolbox**, and the **MWEE Audit Tool**.

Activity 2.5: Plan It

(60 minutes / slides 21-22)

Your **MWEE**

Participants will identify a local environmental issue that is relevant to the community they serve and connect it with learning objectives. This can be as specific as an NGSS standard, or as basic as "understand cause and effect." The product of this activity is to develop driving and supporting questions that connect the two by situating the learning of the objective in the context of the issue.

Ask participants to complete the **Curriculum Anchor** page of the **ELM**. Invite them to reference the **MWEE Audit Tool** as appropriate and take advantage of the in-person setting to share their ideas.

CALL OUT BOX

If this professional development is specifically for teachers in a single district that already have an existing MWEE, use this time for the participants to explore the existing ELM and engage them in a more specific planning around what this looks like in their classroom. You'll want to have the ELM ready and available for participants to review.

Activity 2. 5: Output/Deliverable

- Participants will complete the Curriculum Anchor page of the ELM.

Part 3: Issue Investigation

This part aligns with slides in the Part 3 Slide Deck.

Summary

Activities:

3.1 Youth Voice
3.2 Modeling an Investigation
3.3 Outdoor Field Experiences in Delaware
3.4 Issue Investigation – More Than Outdoor Field Experiences
3.5 Plan It

Objectives:

1. Participants will identify and describe a variety of outdoor field experiences and supporting question investigations used to identify, explore, define, and draw conclusions about local issues.
2. Participants will identify opportunities to support students in synthesizing evidence gathered during the outdoor field experiences and supporting question investigations.
3. Participants will make connections between the local issues, the outdoor field experiences, and the educational standards.
4. Participants will identify resources available in Virginia to support the planning and implementation of outdoor field experiences.

Estimated time for this part: 6 hours

Note: additional time may be needed to travel to your outdoor field experience location

Suggested location: Outdoors or combination of outdoors and indoors.

Activity 3.1: Youth Voice

(15 minutes / slides 1-4)

Activity 3.1: Background Information

Youth voice (also sometimes referred to as student voice) is supporting young people in taking a leading role in their own education through inquiry and applied learning. Youth voice may be considered a continuum where "student choice" is on one end and "student-led" is on the other. Encouraging youth voice during a MWEE is important for both increasing student engagement and fostering a lasting environmental stewardship ethic in students. Giving students the opportunity to make decisions throughout the MWEE helps them to foster a belief in their own abilities, realize that their voices matter in the community, and apply innovation and creativity to tackle real issues. There are many instructional methods that help to support youth voice. Page 11 of the **MWEE Guide** outlines a few ways that youth voice can be supported in each of the essential elements. The action component is particularly suited to supporting youth voice, as actions are ideally developed, selected, and implemented by students with the support from teachers and/or partners. This reframing of power dynamics in the classroom is called Youth-Adult-Partnerships, where young people are valued partners in shared decision-making.

**A printable copy of 'Activity 3.1 Background Information' is located in the Appendix.*

Activity 3.1: Continued…

This activity is designed to engage participants in thinking about what youth voice is, in what spaces it is supported, and how they are/can support it in their own classrooms and programs. Use the background information above to introduce the topic of youth voice. Engage participants in a conversation about youth voice to describe their experience supporting it in their classrooms and programs.

Engagement Questions: *When you hear the phrase "youth voice" or "student voice" what does it make you think of? What does it mean to support youth voice? In what spaces is youth voice supported? In what spaces is it not supported? What are you doing in your classroom or programs to support youth voice (instructional methods, activities, framing, etc)? What are the biggest benefits for supporting youth voice? What are the biggest challenges in supporting youth voice?*

As a group, review the supporting questions from Part 2 (they should be displayed in the room) and discuss how you could best support youth voice in the development of these questions. If there are other questions that participants make the case for, add them to the list now.

Activity 3.1: Outputs/Deliverables

- Participants recognize spaces where youth voice is supported and the benefits and challenges to supporting it.
- Participants reflect on their own practice to identify places where they are already supporting youth voice and areas where they can improve.

Activity 3.2: Modeling an Investigation

(3 hours + travel time if needed / slides 5-11)

Activity 3.2: Background Information

Outdoor field experiences are an essential element of the MWEE. It's important to recognize that these experiences can be an integral part of many aspects of the MWEE from supporting the identification of an issue, to completing background research and data collection, to taking action. Engaging students in meaningful outdoor investigations is critical to developing the foundation of future stewardship of our natural resources. Outdoor field experiences, whether they occur on the sidewalks or schoolyard in downtown Wilmington, in the tidal marshes of Kent County, or a state park on the Delaware Coast, provide the critical context that drives meaning for the questions, investigations, and student actions that comprise the MWEE.

**A printable copy of 'Activity 3.2 Background Information' is available in the Appendix.*

Workshop
MWEE

This activity is intended to engage participants in a way that allows them to explore the idea of how outdoor field experiences are employed to investigate and draw conclusions about local issues, phenomena, or problems in order to make claims that inform action.

As explored in Part 2, outdoor field experiences can be used to support the identification of issues in a number of ways including community walkabouts, schoolyard report cards, and other environmental inventories. During this activity we will build off of the supporting questions created in Part 2 to dive into another field investigation. *Remember that during this issue investigation participants are in the "student" seat and will be going through the process as a learner.*

1. <u>Initiate Investigation:</u>

   Remind the group of the driving question for the workshop and the supporting questions previously developed. As a group, put a star by the supporting question(s) that can be investigated through this outdoor field experience. If there are additional questions that the

group would like to add to the list, this is a great time to do so. Additionally, supporting questions might need to be refined to become investigative questions. The Fish & Wildlife Field Investigations document is a great resource for thinking about question types.

Ask participants to break into groups of 3-5 based on mutual interest in an investigative question. Remind them that they will be actively involved in planning and conducting the investigation. Each group will work together to create a procedure for conducting their investigation before going outside.

Prior to planning, introduce participants to the tools and equipment available. These will vary depending on your resources and investigation focus. Discuss/demonstrate as needed how each of the tools are used. Ask participants to share stories of use and provide space for asking questions. Examples of tools/equipment/supplies you might use include refractometers, turbidity tubes, probeware, quadrats, profiling rods, field guides etc. This is an ideal opportunity for participants to use the same or similar tools their students will be using to develop comfort as the user and later as the facilitator.

CALL OUT BOX

Before the workshop, you'll want to scope out the field site you'll be using for this investigation. Think about the driving and possible supporting questions for the workshop and choose tools appropriate for those questions.

As the groups start to plan and design their investigation, you might provide them with the following questions to guide their discussion:

- What information and/or data closely related to this question currently exists and how could it inform your investigation (consider environmental data, scientific articles, web resources, etc.)?
- What prior knowledge and skills might you need to help make your investigation successful? How can you obtain that information?
- What tools will you need to answer your investigative question?
- Describe your study site. How will it help you to address your investigative questions?
- How will you collect the information/data? What are the protocols and procedures? What are the roles for each group member?

- How will the data be physically collected and organized?
- Discuss and make contingencies for any safety or logistical concerns.

Engagement Questions: *Before we go outside...What do we (as educators) need to consider to make this a safe, effective, and manageable experience? Invite participants to brainstorm different considerations and classify into categories like safety, class management, logistics, pre-trip/classroom prep, etc. Keep the list up so more can be added after the outdoor field experience.*

2. Collect Data:

   Each group will collect the data that they have pre-determined as significant to the investigative question. You can structure this more or less by asking groups to create their own tools for recording data or you can provide them with a standard data sheet so that everyone is recording similar information.

   Logistically, during this part you will want to put some constraints on where participants can go, what time and where the group will reconvene, and any other safety considerations. You might set some expectations for the group including the importance of working as a team, the need to focus on accomplishing the task in the time provided, and the need to conduct multiple trials.

3. Synthesis and Conclusions:

   After conducting the investigation, ask each small group to spend some time analyzing and interpreting their data/results. You might have them report out on the following questions to the bigger group:

   - What supporting question did you focus on?
   - Briefly describe how your field work went.
   - What conclusions can be drawn based on the information and data you collected and synthesized?
   - Communicate (pictures/charts/graph) what your conclusions were and how they relate to the Driving Question and Local Issue.
   - What more do you need to know? Were there new questions that popped up? What additional research and/or data do you need now?

Next, engage the full group in a discussion around the following:

- What information did we learn?
- How sure are we of our results (did we encounter any unusual data points or outliers? Why might that be? What should we do about them?)
- What conclusions can we draw based on the information and data collected and synthesized by all the groups?
- Consider if there are other data points or observations that we might need to collect before moving forward.
- What more do we as a group need to know? What is the next step in our investigation of this issue?

Using a white board, or chalk on pavement, or technology, have the group design a graphic representation that they think represents the collective data. This can be a chart, graph, model, etc. that provides information on the investigative question and ties it back to the driving question. This can be improved upon and enhanced back in the classroom.

Engagement Questions:

- *What sorts of challenges do you foresee when bringing your students outdoors and what strategies can you employ to get ahead of them?*
- *What opportunities do you see for supporting student-led inquiry during outdoor field experiences?*
- *Back in the classroom what are some opportunities to connect this outdoor field experience with the other pieces of the MWEE?*
- *How might this field experience look differently if it took place on school grounds, in a park, by a stream, at a farm, etc.?*
- *What are some best practices/ideas that we can share about working with students outdoors based on this modeled experience?*
- *How can you assess student learning during/after outdoor field experiences?*
- *How can this be scaffolded across grade levels?*
- *Add any considerations/activities to the list you created during the previous Engagement Question.*

Activity 3.2: Outputs/Deliverables

- Participants will experience a hands-on outdoor field experience where they investigate one or more supporting questions by designing an investigation, collect and synthesize data, and share their conclusions with the group.

Activity 3.3: Outdoor Field Experiences in Delaware

(30 minutes / slides 12-13)

This activity will introduce participants to a number of resources in Delaware for planning and implementing outdoor field experiences. Participants will consider how they can apply some of these resources within the workshop's modeled MWEE.

Break participants into groups of 2-4. Each group will be assigned a different resource or tool (listed below) for planning and implementing outdoor field experiences. As groups explore the resources, ask them to choose at least one new field experience/partner/opportunity that they didn't know about before and how they might be able to use it within the context of their own classroom/program. Consider both experiences that are hyper-local (on/around school grounds) as well as those that might be a bus trip away. Groups will share resources after adequately researching them.

Resources:

- Field Scope
- Find Your Park
- Watershed Address
- EPA Surf My Watershed
- School Group Programs - Delaware State Parks
- Schools & Homeschoolers - Delaware Nature Society
- School & Group Programs – Delaware Museum of Nature & Science (delmns.org)

Each group should now fill-in the Incorporating Outdoor Field Experiences worksheet (page 18) of the MWEE Guide for additional sites that could support the workshop's modeled MWEE. Participants may not be able to complete every question in detail but should take notes on questions or concerns they should consider while planning an outdoor field experience.

Wrap up the discussion with an overview of some of the key resources in each of these categories. This can be an overview of what is available in Delaware as a whole or showcase what is available in the city or towns that your participants are working in. Categories that you might consider elaborating on include:

- Partners (for both field-based instruction and access to tools and equipment)
- Field sites (schoolyard and off-site)
- Funding for outdoor field experiences

Examples of Delaware resources are available in the appendix of this guide.

Activity 3.3: Output/Deliverable

- Participants will complete the Incorporating Outdoor Field Experiences worksheet (page 18) of the MWEE Guide for the workshop's modeled MWEE.

Activity 3.4: Issue Investigation - More Than Outdoor Field Experiences

(30 minutes / slides 14-16)

Example **MWEE**

This activity will engage participants in connecting the local issues, outdoor field experiences, in-class experiences, and the educational standards by examining the FCPS/Blandy example MWEE. In this activity participants will consider how this example uses outdoor field experiences to address questions and how in-class components support the overall issue investigation.

Use the FCPS/Blandy example to demonstrate what the full issue investigation portion of their MWEE looks like. Participants will have already seen the **Asking Questions and Planning Investigations** worksheet and the **Curriculum Anchor** page of the FCPS/Blandy ELM. Now with their practice **Incorporating Outdoor Field Experiences** worksheet from the previous activity and the two **Issue Investigation** pages of the FCPS/Blandy ELM, participants will be able to see the bigger picture of where standards, issues, outdoor field experiences, and classroom activities come together to support a comprehensive investigation guided by a locally-focused driving question. Ask participants to apply the **MWEE Audit Tool** (page 37 of the **MWEE Guide**) to the FCPS/Blandy ELM to consider the strengths of the program and the opportunities for improvement.

Discussion Questions:

- How do outdoor field experiences help to answer or look more deeply at the driving question/supporting questions?
- Which learning objectives or standards do the outdoor field experiences help to address?
- How was each outdoor field experience contextualized to give it more meaning?
- How do indoor lessons and components support the overall issue investigation?
- How might the indoor components provide students the opportunity to translate existing knowledge to the investigation?

Activity 3.4: Output/Deliverables

- Participants become familiar with the **Issue Investigation** pages of the ELM.
- Participants will use the **MWEE Audit Tool** to evaluate the FCPS/Blandy MWEE example.

Activity 3.5: Plan It

(60 minutes / slides 17-18)

Your **MWEE**

Now it's time to re-engage participants in the development of their own MWEE. With the driving and supporting questions they developed in the Part 2 "Plan It" section, have participants use the **Incorporating Outdoor Field Experiences** worksheet (page 18 of the **MWEE Guide**) and the resources you explored during Part 3 to identify and evaluate possible field sites for their own MWEE. They should consider opportunities both on and off school grounds.

After they identify what these experiences could be, participants will complete the **Issue Investigation** pages of the ELM (pages 24-25 of the MWEE Guide), outlining the outdoor field experiences and in-class investigations that will build off of each other.

Activity 3.5: Output/Deliverables

- Participants will complete the **Incorporating Outdoor Field Experiences** worksheet for their own MWEE.
- Participants will complete the **Issue Investigation** pages of the **Environmental Literacy Model (ELM)** for their own MWEE.

Part 4: Informed Action

This part aligns with slides in the Part 4 Slide Deck.

Summary

Activities:

4.1 Claim Evidence Reasoning
4.2 Bolstering Youth Voice in Action
4.3 Choosing an Action Project
4.4 Action Project Planning
4.5 Plan It

Objectives:

- Participants will develop actionable claims based on conclusions drawn throughout the issue investigation to address the driving and/or supporting question.
- Participants will use tools for generating action project ideas based on the evidence-based claim, using Claim-Evidence-Reasoning tools.
- Participants will identify opportunities to actively incorporate youth voice through student claims, student action project ideas and planning, student communication with partners, and student communication with the public.
- Participants will identify resources and supports (partners, funding, volunteers, supply donors, etc) for the implementation of action projects.

Estimated time for this part: 4 hours

Suggested location: Indoors

Activity 4.1: Claim Evidence Reasoning

(45 minutes / slides 1-6)

Activity 4.1: Background Information

CER, or the claim evidence reasoning model which derives from Common Core ELA Standards, engages students in two science and engineering Practices: (1) engaging in argument from evidence, (2) obtaining, evaluating, and communicating information.

Claim: A statement of a student's understanding about a phenomenon or about the results of an investigation.

- A one-sentence answer to the question you investigated
- It answers: what can you conclude*?*
- It should not start with yes or no
- It should describe the relationship between dependent and independent variables

Evidence: Scientific data used to support the claim. The evidence must be:

- Sufficient - use enough evidence to support the claim
- Appropriate - use data that supports the claim, leave out information that doesn't support the claim
- Qualitative, quantitative, or both

Reasoning: Ties together the claim and the evidence.

- Shows how or why the data count as evidence to support the claim
- Provides the justification for why this evidence is important to this claim
- Includes one or more scientific principles that are important to the claim and evidence

Actionable: The claim provides students a springboard for identifying action to address the issue at hand. Actions must be directly connected to the investigation and students should be able to use CER to describe why they are taking such action.

**A printable copy of 'Activity 4.1 Background Information' is located in the Appendix.*

Activity 4.1: Continued…

Workshop
MWEE

This activity is designed for participants to practice claim evidence reasoning (CER) as a means to connect the issue investigations (Part 3) to the action (Part 4). Choosing an action that directly relates to the issue can be a challenge. CER provides a framework for thinking through the connections. *If your participants are unfamiliar with CER, consider using the CER Practice found in the Additional Resources section at the end of this activity.*

1. Handout a blank CER worksheet to each participant and ask them to fill in the workshop's driving question or one of the supporting questions. Participants will complete page 1 of the CER worksheet using research, data, and/or observations collected during Part 2 and 3 to develop a claim backed up by evidence and a reasoning statement. NOTE: Page 2 of the worksheet will be used during the next activity.

Engagement Questions: Has anyone used CER with students? What other approaches have you used for developing evidence-based claims?

2. Rubrics are an easy and effective way to assess student conceptual understanding. An example of a rubric designed by a middle school teacher to evaluate a CER is available in the slide deck for this activity. Ask participants to exchange their CER worksheet with a partner and practice using this rubric.

Engagement Questions: What do you think of this rubric? Would you make changes based on the grade that you work with? For those that have used CER, how have you assessed student work?

Activity 4.1: Outputs/Deliverables

Participants will practice claim evidence reasoning using the workshop's driving/supporting questions and discuss how to use the method with students in support of a MWEE.

Activity 4.2: Bolstering Youth Voice in Action

(45 minutes / slides 7-16)

Background Information

Supporting students in creating novel actions that relate directly to their issue investigations can be challenging. As educators, we know the importance of having a few ideas for action in our back-pocket in case students revert to actions that don't necessarily address the issue at hand (i.e. after looking at pervious and impervious surface on their schoolyard and identifying an issue with runoff, a trash clean-up is not an appropriate action). But how do we practically foster innovative thinking? This article from Edutopia on Cultivating Creativity in Standards-based Classrooms outlines both the importance of this idea as well as some strategies for fostering student creativity in the confines of a classroom.

**A printable copy of 'Activity 4.2 Background Information' is located in the Appendix.*

Activity 4.2: Continued…

Workshop
MWEE

This section includes two activities that can bolster youth voice while brainstorming action projects—choose whichever one fits your context best. The Divergent / Convergent Thinking activity can help to inspire innovative thinking and provide opportunities for all students to be heard. The Modeling Action Throughout the MWEE activity summarizes a method used to help prepare students to come up with relevant and actionable projects.

Divergent / Convergent Thinking

To encourage everyone's participation in action project brainstorming, this activity starts with individuals then builds up to the larger group. Project a CER statement from the workshop-modeled MWEE on the screen so that participants can reflect on it as they move through the activity.

1. Ask participants to open page 10 of the **MWEE Guide** to review the **Types of Environmental Action Projects** sidebar to get them thinking about the full range of possibilities.
2. Set a timer for two minutes. Ask participants to "solo-storm"— jotting down as many actions to address this issue as they can. At this point all ideas are welcome, even if they might seem a little far-fetched! This is the time for creativity and unique ideas.
3. Ask participants to share their ideas with their table groups. There are likely a number of commonalities and similar ideas, but perhaps there are some unique ones, too.
4. Now that all ideas are on the table, groups might already be naturally coalescing around a single action or set of actions. Ask participants to work together to identify an action project that builds on one or more of the ideas. Each group should be able to describe what the action is, how it will address the issue, and the basic steps needed to make it happen. At this point groups need not dive deep into specific logistics.
5. Ask each group to share the action they selected and give a quick summary.

Engagement Questions: *How was your experience of first thinking of projects on your own? How did your ideas compare to others? Do you think this method would work with your students? What adjustments would you make?*

Modeling Action Throughout the MWEE

A challenge that educators come up against in asking students to develop action projects is that sometimes they don't know what it means to "take action." One way to alleviate this gap in understanding is to model what action could look like throughout the MWEE. This approach sets students up with examples of what action could look like.

1. Review the "Wave of Plastic" MWEE (a B-WET funded project, NA18NMF4570316) with your participants using the corresponding slides (slides 12-13). This cohort of teachers followed each of their five lessons with a "modeled action" so by the end of their MWEE, students were more prepared to design their own student-directed action.

   Important Note: The modeled action pieces were not student-created, rather they were prescribed activities and assignments created by the teacher. The teacher was careful to select modeled actions that were low-to-no cost, could be completed in one class period or as homework, and that may also function as an assessment of understanding. The modeled actions are different from the student-directed action that takes place in the Wave of Plastic's lesson 5, which is where students take the lead in identifying, planning, and carrying out the action.

2. Ask participants to consider the investigations that they've undertaken so far in the workshop model MWEE (both outdoor and indoor) and identify if there are any opportunities where they could have modeled action the way the Wave of Plastic project does. *What are the opportunities or challenges around employing this method?*

Apply It

1. Have participants return to the CER worksheet they started in Activity 1 based on the workshop's driving and supporting questions. Ask them to copy their claim to the **Moving from Claims to Informed Action** student worksheet. They should then brainstorm three action projects or solutions as a group and answer the questions for each idea on the worksheet.
2. As a group, choose one action idea and use the **Project Goal and Strategy template** (created by Earth Force) to summarize the chosen action. Back in the classroom, this template could be used with students as they prepare to present their ideas to the larger group/class or other partners.

Engagement Questions: It may seem like we're spending a lot of time practicing action project brainstorming. This is often one of the more challenging aspects of the MWEE. Of the activities that we've practiced or discussed, which could you imagine working best with your students? What other approaches are you currently taking with your students? If you're working with multiple classes of students, what are some strategies for managing one or more MWEEs (systemic MWEEs)?

Activity 4.2: Outputs/Deliverables

- Participants will practice supporting youth voice during action project brainstorming.
- Participants will complete the **Moving from Claims to Informed Action** worksheet from the MWEE Guide using the workshop's modeled MWEE.

Activity 4.2: Additional Resources

Building on Local Priorities and Initiatives

Activity 2 lays a framework for engaging students in brainstorming and developing new and unique ideas for action. There also may be times where educators may want to bring in experts to showcase

some of the on-going and existing efforts that your school/city/state is engaged in to identify synergies with their action project.

Bringing in experts can happen at the action stage or perhaps it's already happened during issue definition. Providing students the understanding of what is going on in their community does a couple of important things:

1. It demonstrates that there is momentum and that they're a part of an important effort

2. It may provide opportunities for students to parlay their work with that of another organization or municipality which can lead different kinds of additional support like funding, press, volunteers, and other resources

3. It can provide unique opportunities for students to gain insight into careers related to these fields

Connecting with outside efforts can be very beneficial but approach this method with caution. Students sometimes lose interest and drive after they learn they aren't the "first and only" ones working on an issue or problem, that someone else is taking care of the issue or problem and their work is not as important or needed.

Engagement Questions: If you were to organize outside experts to talk with students about their similar or parallel work, what steps would you take to ensure the students recognize the uniqueness and importance of their own work?

During this part you might consider spending a bit of time diving into some of the local efforts that have the potential to align or connect with MWEE action. Examples of such may include green business certifications, efforts led by local organizations, local festivals or events, climate or environmental-focused task forces, youth summits, or green teams and afterschool clubs.

Activity 4.3: Choosing an Action Project

(30 minutes / slides 17-22)

Workshop **MWEE**

By this point, students have generated many ideas as possible actions that will directly address the issue at hand. In most cases, having one action project for a single class or group of students is the most manageable for educators. While this isn't always the case—some educators will choose to facilitate small groups of students taking on different action projects and sometimes an action project is large enough for multiple classes —a critical part of the action project is that every student is meaningfully engaged in deciding on the action and carrying it out. This activity will help participants consider they can best accomplish this goal.

If all of the projects on the list seem doable given the constraints (time, funding, resources, etc), dot voting or digital polling could be an easy way to democratically choose an action. Recognizing that might not always be the case, criteria-based decision-making tools help to balance student interest with teacher goals and other constraints. This **Choosing and Action Project student worksheet** (adapted from an Earth Force) Is a great method for doing just that. With the whole group, set up an example with the grid using the workshop's model MWEE and model the activity.

1. Identify five possible actions that participants selected in Activity 2. Before writing them on the grid, double check to make sure that the actions are directly related to the driving question. Participants should be able to use their claim evidence reasoning statement to explain how each of the proposed actions will impact the issue. Once this is confirmed, write the action options under the strategy section of the grid.
2. As a group, decide on criteria for choosing a strategy (action).

Engagement Questions: As an educator, it's important that you list the criteria that you know to be a limiting factor for the action projects. At the same time, you still want to support the youth voice in the selection process. What can you do to make sure that both the students and your criteria are recognized in this process?

Examples of possible criteria are: can be completed in two class periods, costs less than $50, requires participation from every student. Criteria may be specific or general. Some considerations when identifying criteria for selection strategies are:

a) Realistic - will students be able to carry out the strategy given the available resources?
b) Precedent - how have others used this strategy before, and how well did it work?
c) Relevance - how much does the strategy actually address the project goal?
d) Simplicity - how easy or difficult will the strategy be to carry out?
e) Impact - how likely is it that the strategy will have a lasting impact? Will it be sustainable?

CALL OUT BOX

Providing the time and space for educators to actually experience the process of 'taking action' during a workshop can be very powerful. If you plan to do this, be sure to add appropriate criteria to the strategy grid that reflects the parameters that they'll need to stick within.

3. Ask participants to write the criteria on the shared grid. Then apply the criteria, rating each strategy against each criterion. Tally the results using the grid. After each strategy is ranked against the criteria, one may stand out as the clear winner. If one does not emerge, participants may need to establish additional criteria to apply to each possible strategy or have a group discussion about the frontrunners to see if there is a way for the ideas to be combined in a meaningful way to ensure class buy-in. In the end the group should conclude to advance one action project.

Engagement Questions: How do you see this grid working with students to select an action project? Would you make changes to the activity?

Activity 4.3: Output/Deliverable

- Participants will come to a conclusion around one action project idea for the workshop's driving question using the strategy selection grid.

Activity 4.3: Additional Resources

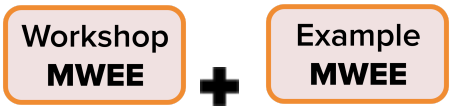
Pre-Determined Action

Sometimes there are elements of action that are pre-determined for a number of reasons—perhaps your school has already acquired funding to install a rain garden or there is an initiative that your Parent Teacher Organization is counting on your class to participate in. This is not an ideal situation, as we previously discussed the importance of students identifying and developing their own ideas for action. However, sometimes this situation is unavoidable and there are ways to ensure that this is a truly meaningful action project. It's important to find ways for students to make the project their own and to facilitate the learning so that they feel invested in the action. Here is an example of how this has been done before: Pickering Creek Audubon Center Example.

Engagement Questions: Has anyone been in a similar situation or anticipates this being the case for their MWEE? If so, what could you do to ensure that youth voice is authentically incorporated?

Activity 4.4: Action Project Planning

(60 minutes / slides 23-27)



This activity is designed to engage participants in thinking about how to involve all students meaningfully in the execution of an action project.

Once an action project has been identified, students engage in the process of planning how to make their vision a reality. This part is all about the logistics–from timelines, to who's doing what, to acquiring appropriate supplies, and communicating about the project. Because the MWEE is student-led, these tasks should not fall onto the shoulders of the educator; rather, the educator should provide the students agency in taking them on and supporting them through the process.

One way to ensure that all students feel empowered and find meaning in the action project is by harnessing student talents and interests. Educators can help students organize into different teams and/or roles that leverage their strengths. Examples of student talents and interest areas may include but are not limited to: public speaking, writing, networking, decision-making, mathematics/budgeting, graphic arts, music, photography, video, websites, social media, foreign language/ASL, storytelling, logistics/project management, etc.

The **Environmental Action Planning Worksheets** (adapted from a ShoreRivers resource) can be used to help students plan an action project. Pull out the worksheets that make sense for your project or use them all! The worksheets are designed for students or a class to work through each page as they plan, implement, and maintain their action project.

This could be used with older students in small groups as they think through their idea or as part of the work an entire class uses to brainstorm some key logistics after a decision has been made or a combination of small group and class-wide work.

1. Project the action project strategy that participants selected during the previous activity on the screen. Workshop participants will work in small groups to create a work plan for setting this action in motion. They may use the worksheet as a model or start from scratch. Allow participants time to brainstorm and discuss with each other how they would run this step with their students.

Engagement Question: Did your group come up with a question or activity in your work plan that you would like to share with others that can help encourage and embrace youth voice and participation?

2. Provide the time, space, and resources for workshop participants to bring their action into fruition. Examples of projects that could be accomplished in a small period of time might include writing a collective letter to a public official, creating a short video for a social media account with a call to action, or signing up to present about the topic at a local meeting.

3. After participants take action it's important for them to have adequate time to reflect and process the experience. This can occur through many forms—journaling, reflective essays, guided conversation, etc. A few important pieces to consider include:

a) Recommendations for sustainability and/or future adaptation. What would you change if you had to start over? What do you wish you had known from the outset? How could you adapt your approach to action for future impact? If the project is to be sustained, who are the next stewards of making sure it lives on? What information will you pass on to them and what form will it take?

b) Impact data. Was this action successful? How do we know? If we don't know yet, what is the method for tracking this and what are the indicators for success?

c) Plan for sharing and communicating results. How will you communicate the success of the action? Who are the key stakeholders that will care about the action? What does this form of communication look like (presentation, newspaper article, social media post, etc)?

Engagement Question: What assessment methods have you used in the past that would lend itself well to guiding students through reflecting on the MWEE experience, particularly around the action project?

Have participants evaluate the process they just practiced of selecting, designing and evaluating the action project against the MWEE Audit Tool (specifically page 9 - Environmental Action Projects).

4. Review the last page of the FCPS/Blandy ELM - Informed Action. Sometimes participants misinterpret this section of the ELM and think they need to complete it with an action project in mind. Use the FCPS/Blandy example to show how they should use the planning tool to sketch out how they will guide action project selection, design and implementation. Ask participants to apply the **MWEE Audit Tool** (page 37 of the **MWEE Guide**) to the FCPS/Blandy ELM to consider the strengths of the program and the opportunities for improvement.

Activity 4.4: Output/Deliverables

- Participants will create a work plan for setting the workshop's shared action into motion that identifies opportunities for all students to be meaningfully involved.
- Participants will use the **MWEE Audit Tool** (page 37 of the **MWEE Guide**) to review the extent to which students identify, explore, and implement solutions that address the conclusions and claims drawn through investigation and consider the effectiveness of these solutions.
- Participants become familiar with the **Informed Action** page of the ELM.
  Participants will use the **MWEE Audit Tool** to evaluate the FCPS/Blandy MWEE example.

Activity 4.5: Plan It

(60 minutes / slides 28-29)

Your **MWEE**

Now that you're an expert in student-led action, it's time to consider how this applies directly to your MWEE. Complete the **Informed Action** section of the **Environmental Literacy Model (ELM)** on page 26 of the MWEE Guide, giving consideration to the activities and approaches that have been modeled during this workshop. Remember, this is a student-led action project so instead of listing out your action ideas, list out the methods and strategies you would use throughout the process for encouraging youth voice and participation.

Activity 4.5: Output/Deliverable

- Participants will complete the Informed Action page of the **Environmental Literacy Model (ELM)** for their own MWEE.

Part 5: Auditing your MWEE

This part aligns with slides in the Part 5 Slide Deck.

Summary

Activities:

5.1 Auditing your MWEE

5.2 Sharing your MWEE

5.3 Plan it

Objectives:

1. Participants will review their Environmental Literacy Model (ELM) and evaluate it against the MWEE Audit Tool. They will identify areas that need improvement or more detail.
2. Participants will use the MWEE Audit Tool to evaluate another participant's ELM and offer suggestions.
3. Participants will share their MWEE plan with the larger workshop group to collect feedback and suggestions.

Estimated time for this part: 2 hours

Suggested location: Indoors

Activity 5.1: Auditing your MWEE

(45 minutes / slides 1-3)

At this point, all participants should have completed the **Environmental Literacy Model** (pages 23-26 of the **MWEE Guide** for their own MWEE. Everyone should now open to page 27 of the MWEE Guide, which is the first page of the **MWEE Audit Tool**. This tool can be used to strengthen an existing MWEE or help plan a new MWEE to ensure the essential elements (issue definition, outdoor field experiences, synthesis and conclusions, environmental action projects) and supporting practices (classroom integration, active teacher support, local context, sustained activity) are all meaningfully included.

1. Ask participants to review their ELM with the MWEE Audit Tool. Encourage them to be honest with their scoring so they can better identify areas needing improvement. Use the "Ideas to Strengthen…" sections to write notes as they work through the tool.
2. Next participants should exchange their ELM with another workshop participant. Using a new MWEE Audit Tool worksheet, each reviewer should score the ELM and include notes and suggestions under each "Ideas to Strengthen…" section. Participants should use any remaining time reviewing each other's notes and brainstorming together how to improve each other's MWEE.

Engagement Questions: How was your experience working through the Audit Tool? Did you find it helpful, why or why not? What changes would you make to your MWEE? After exchanging your ELM with another participant, do you have any insights you'd like to share about the experience?

The MWEE Audit Tool is designed to be used more than once. Use the tool as you create a new MWEE, at the completion of a MWEE to guide you through reflection of the program, before repeating a MWEE with a new group of students, and anytime you feel a section needs strengthening.

Activity 5.1: Outputs/Deliverables

- Participants will use the **MWEE Audit Tool** of the **MWEE Guide** to critique their own **ELM.**
- Participants will exchange their **ELM** with another participant and use the **MWEE Audit Tool** of the **MWEE Guide** to review their partner's **ELM**.

Activity 5.2: Sharing your MWEE

(30-60 minutes / slide 4-6)

The length of this activity is dependent on how many participants you have in your workshop and how engaged they are in the activity. This is a designated time for participants to share their MWEE idea and collect feedback and suggestions from the larger group. Be careful not to cut this activity short. For many participants, this might be a rare opportunity to receive feedback about new ideas and share experiences with their peers - a new MWEE partnership might even develop!

Ask each participant to summarize their MWEE for the group, you may want to set a time limit of 5 minutes. MWEE summaries should not be limited to sharing the general MWEE plan, but also include lesson ideas, outdoor field locations, methods for integrating youth voice, partners, and resources so that others might learn of ways to strengthen their own MWEE.

As each participant shares their MWEE summary, the other participants should be thinking through the MWEE Audit Tool and be ready with questions and constructive feedback.

Engagement Question: After listening to everyone's MWEE ideas what observations can be made about the group as a whole? How has your MWEE idea evolved from the beginning of this workshop to this point?

Activity 5.2: Outputs/Deliverables

- Each participant will share their MWEE idea with the larger group and provide feedback to others.

Activity 5.3: Plan It

(45 minutes / slide 7-8)

Your **MWEE**

Use the remaining workshop time to take advantage of this shared learning environment. Participants should go back through their **ELM** and make changes based on the feedback they received and add any new ideas they may have learned while listening to other MWEE ideas.

Participants should use this informal time to continue brainstorming with other workshop participants on how to strengthen each other's MWEEs, make connections, and possibly create collaborations.

Activity 5.3: Outputs/Deliverables

- Participants will make adjustments to their **Environmental literacy Model (ELM)** based on feedback and conversations with other workshop participants.

APPENDIX

Potential partners to support MWEEs in Delaware

Partners can play critical roles in supporting student action projects, offering locations for outdoor field experiences and/or serving as experts as students research their environmental issue. They can provide knowledge, labor, in-kind contributions, supplies, and other resources that can help ensure the success of a MWEE. Delaware-specific partners include but are not limited to:

Organization	**Website**
4H Club Leaders	www.udel.edu/academics/colleges/canr/cooperative-extension/personal-economic-development/4H-youth-development/
American Green Zone Alliance	agza.net/
Bay Backpack	www.baybackpack.com/state-initiatives/delaware
Brandywine Red Clay Alliance	brandywineredclay.org
Brandywine Zoo	brandywinezoo.org
Captain Planet Foundation	captainplanetfoundation.org
Chesapeake Bay Foundation	cbf.org
Chesapeake Bay National Estuarine Research Reserve	coast.noaa.gov/nerrs/reserves/delaware.html
Chesapeake Bay Program	chesapeakebay.net
Chesapeake Bay Trust	cbtrust.org
Chesapeake Progress	chesapeakeprogress.com
Choose Natives	choosenatives.org
Claude E. Phillips Herbarium	herbarium.desu.edu

Delaware Department of Agriculture (DDA)	agriculture.delaware.gov
DDA - Plant Industries	agriculture.delaware.gov/plant-industries/contact-us
DDA - Pesticide Management	agriculture.delaware.gov/pesticide-management
Delaware Audubon Society	delawareaudubon.org
Delaware Botanic Garden	delawaregardens.org
Delaware Center for Horticulture	thedch.org
Delaware Center for the Inland Bays	inlandbays.org
Delaware Community Composting Initiative	plasticfreedelaware.org/de-composting-initiative
Delaware Council of Wildlife Rehabilitation & Education	dewildliferescue.com
Delaware Department of Education	education.delaware.gov
Delaware Forest Service	agriculture.delaware.gov/forest-service
Delaware Foundation for Science & Mathematics Education	dfsme.org
Delaware Invasive Species Council	delawareinvasives.net
Delaware Livable Lawns	delawarelivablelawns.org
Delaware Master Gardeners	udel.edu/canr/cooperative-extension/environmental-stewardship/master-gardeners
Delaware Museum of Nature & Science	delmns.org
Delaware Native Plant Society	delawarenativeplants.org
Delaware Nature Society	delawarenaturesociety.org
Delaware Nursery & Landscape Association	dnlaonline.org
Delaware Ornithological Society	dosbirds.org
Delaware Pathways - Natural Resource Management	delawarepathways.org/pathways/natural-resource-management

Delaware Recreation & Parks Society	delawarerecreationandparkssociety.com
Delaware Riverkeeper Network	delawareriverkeeper.org
Delaware Sea Grant College Program	udel.edu/academics/colleges/ceoe/delaware-sea-grant
Delaware Solid Waste Authority	dswaeducation.com
Delaware State Parks	destateparks.com
Delaware Wild Lands	dewildlands.org
Delaware Wildflowers	delawarewildflowers.org
Delaware Yes Youth Environmental Summit	delawareyes.org
Delaware Department of Transportation	deldot.gov
Delaware Department of Natural Resources and Environmental Control (DNREC)	dnrec.delaware.gov
DNREC Division of Fish & Wildlife	dnrec.alpha.delaware.gov/fish-wildlife
DNREC Division of Climate, Coastal and Energy	dnrec.delaware.gov/climate-coastal-energy/efficient-renewable
DNREC Division of Water	dnrec.delaware.gov/water
DNREC Division of Watershed Stewardship	dnrec.delaware.gov/watershed-stewardship
DuPont Environmental Education Center	delawarenaturesociety.org/centers/dupont-environmental-education-center
DuPont Nature Center at the Mispillion Harbor Reserve	dnrec.alpha.delaware.gov/fish-wildlife/education-outreach/dupont-nature-center
Energize Delaware	EnergizeDelaware.org
Energize Delaware Marketplace	EnergizeDelawareMarketplace.com
Hagley Museum & Library	hagley.org
Healthy Foods for Healthy Kids	healthyfoodsforhealthykids.org

Inland Bays Garden Center	inlandbaysgardencenter.com
Keep Delaware Beautiful	keepdelawarebeautiful.com
Kent County Conservation District	kentcd.org
Mt. Cuba Center	mtcubacenter.org
Nanticoke River Watershed Conservancy	nanticokeconservancy.weebly.com
Nanticoke Watershed Alliance	nanticokeriver.org
NC County Conservation District	newcastlecd.org
Partnership for the Delaware Estuary	delawareestuary.org
Pickering Creek Audubon Center	pickeringcreek.org
Plants for a Livable Delaware	dnlaonline.org/resources/livable-delaware
Project Learning Tree	plt.org/network/delaware
Project Wild (Fish & Wildlife Agencies)	fishwildlife.org/projectwild
Schools for Climate Action	schoolsforclimateaction.weebly.com
Sierra Club Delaware Chapter	sierraclub.org/delaware
Solar Delaware	solardelaware.org
Stroud Water Research Center	stroudcenter.org
Sussex County Conservation District	sussexconservation.org
The Nature Conservancy in Delaware	nature.org/en-us/about-us/where-we-work/united-states/delaware
US Fish & Wildlife - Bombay Hook Refuge	fws.gov/refuge/bombay_hook
US Fish & Wildlife - Prime Hook Refuge	fws.gov/refuge/prime_hook
White Clay Wild & Scenic River Program	whiteclay.org

Winterthur Museum, Garden & Library	winterthur.org
Xerces Society for Invertebrate Conservation	xerces.org

Funding to support action in Delaware

Some action projects might require funding to make them happen. Luckily there are many places where educators can go to find financial support for action projects. Some examples include:

- DAEE Mini-Grants - A grant of up to $500 will be available annually to formal educators (
- NOAA Planet Stewards (Educators in the Stewardship Community are eligible for up to $2,000 in action project support funds)
- Captain Planet Foundation (ecoSolution grants from $500-$2,500)
- Walmart (Local Community Grants from $250-$5,000)

Another important source for funding to make action projects happen that is sometimes overlooked is in-kind donations from local companies and businesses in a school community.

Activity 1.2: State Policies & State Education Standards

Activity 1.2: Background Information

Key Drivers for Environmental Literacy

- Chesapeake Bay Watershed Agreement
- Delaware Environmental Literacy Plan
- Portrait of an Environmentally Literate Citizen
- State Education Standards in Delaware

Chesapeake Bay Watershed Agreement

The MWEE is a key part of the Student Outcome of the Chesapeake Bay Watershed Agreement's Environmental Literacy Goal. This is a commitment that every student will graduate environmentally literate. The goal includes three outcomes focused on students, sustainable schools, and environmental literacy planning. Specifically, the Environmental Literacy Goal acknowledges that "the future well-being of the Chesapeake Bay Watershed will soon rest in the hands of its youngest citizens—more than three million students in grades K-12. Establishing a strong, targeted environmental education program now provides a vital foundation for those future watershed stewards." The Agreement recommends that every student have a Meaningful Watershed Educational Experience (MWEE) at least once in each elementary, middle, and high school.

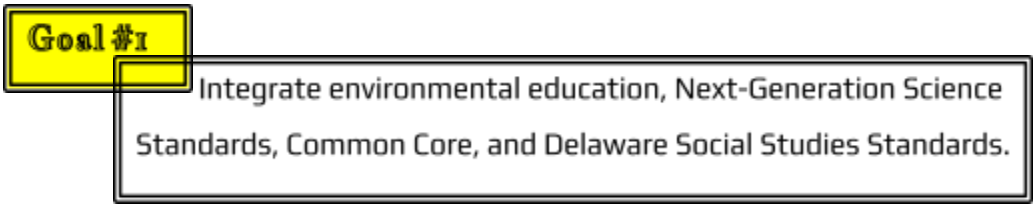
Chesapeake Bay Program partners envision an environmentally and economically sustainable Chesapeake Bay watershed with clean water, abundant life, conserved lands and access to the water, a vibrant cultural heritage, and a diversity of engaged citizens and stakeholders.

Delaware Environmental Literacy Plan

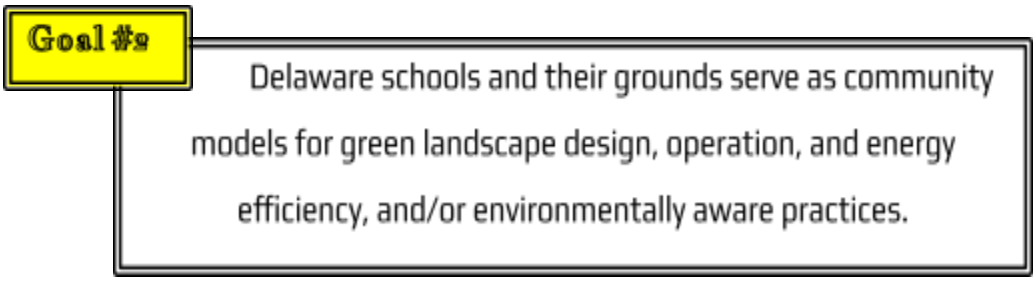
The **Delaware Environmental Literacy Plan** (DELP) was written in 2015 by Delaware Children in Nature Coalition (DCIN). The plan address three major issues:

4. Defining meaningful outdoor experiences for students, children, families, and community members.
5. Defining the need for an environmentally literate community in Delaware.
6. Establishes goals for environmental literacy at home, work, school, and at leisure.

The plan recommends two specific goals for schools.



- Identify where environmental education already exists within these standards.
- Identify ways environmental education can be integrated more effectively across the curriculum.
- Provide meaningful outdoor experiences for students that:
    - Occur at least once in each grade ban: K-2, 3-5, 6-8, 9-12
    - Promote Delaware's unique history, culture, environment, economy, literature, and/or art.
    - Engage practice-based investigative or project-oriented activities in the natural environment.
    - Develop sustainable experiences that continue through students' academic careers. Enhance the experience with natural resources personnel to add expertise and promote career opportunities.



- All schools are enrolled either in Federal Green Schools Program or the Pathways to Green Schools Program.
- Each school will choose a "Green" focus to increase environmental literacy:
    - Option 1: Schoolyard Habitat
    - Option 2: School Garden
    - Option 3: NATURE STEM School (NATURE STEM projects conducted during each grade level)

The Delaware Environmental Literacy Plan also states:

- Education programming should be relevant to the educational and developmental levels of all students and inclusive of all learners.
- In-school instruction and meaningful outdoor experiences that support environmental literacy can promote the critical thinking skills needed to academic achievement in all subject areas.
- Professional development opportunities should be made available for formal and non-formal teacher training that infuses environmental education in all grade levels.

Portrait of an Environmentally Literate Citizen

An environmentally literate Delaware Citizen…

- Is prepared for success in college, career, and life. (1)
- Has had access to a rigorous course of study that met education standards in elementary, middle, and high school. (1)
- Has participated in authentic inquiry-based learning outside at least once in elementary, middle, and high school. (2)
- Has been involved in environmental stewardship at the classroom, school, and/or community level.
- Can analyze local and global environmental issues from a variety of viewpoints including social, cultural, political, and economic. (3)
- Can understand environmental processes and systems including the dynamics of human interaction. (3)

- Understands local, regional, and global environmental issues and strategies for addressing them. (3)
- Can use this understanding to make responsible decisions about environmental, economic, and social issues. (3)
- In aware of careers in the environmental field.

Notes:

(4) Delaware Department of Education Mission, Vision, and Priorities

(5) Chesapeake Bay Agreement

(6) Delaware State Environmental Literacy Plan

State Education Standards in Delaware

The Delaware Department of Education believe every learner should be ready for success in college, career, and life. The mission is to empower every learner with the highest quality education through shared leadership, innovative practices, and exemplary services. The Next Generation Science Standards (NGSS) and Common Core reflect what a student should understand and accomplish by high school graduation. Environmental Education is embedded in the NGSS and Common Core.

The Next Generation Science Standards (NGSS) are designed to provide foundational knowledge and skills for all students to develop proficiency in science. The Project 2061's Benchmarks for Science Literacy and the follow up work, A Framework for K-12 Science Education were used as the core of the standards to determine appropriate content and process skills for students. The integration of rigorous content and application reflects how science and engineering are practiced in the real world. Science and engineering practices (SEPs) and crosscutting concepts (CCs) are designed to be taught in context, not in a vacuum. The Next Generation Science Standards encourage integration with multiple core concepts throughout each year. Science concepts build coherently across K-12. The emphasis of the NGSS is a focused and coherent progression of knowledge from grade band to grade band, allowing for a dynamic process of building knowledge throughout a student's entire K-12 science education.

Delaware NGSS K-12 Alignment: Science / Next Generation Science Standards

Delaware Social Studies Standards prepares young people to become informed and active citizens who accept their responsibilities, understand their rights, and actively participate in society and government. Effective citizens must be able to research issues, form reasoned opinions, support their positions, and engage in the political process.

- Social Studies / Standards for Social Studies (doe.k12.de.us)
- Other Standards connections to Environmental Literacy: Culturally Responsive Education / Welcome (doe.k12.de.us)

The Science Standards of Learning provide a focused treatment of key physical, biological, and planetary science concepts from kindergarten through the high-school grades. These concepts build sequentially and create a comprehensive foundation for the post-secondary world students will enter upon graduation.

Understanding *sustainability* requires the application of many facets of science including…

- Energy
- Natural Resources
- Ecological and Physical Science Principles
- Time
- Management

All of this must be further integrated with an understanding of complex systems interactions**.** For this reason, virtually every standard in the *Science Standards of Learning* document has some direct or indirect connection to *sustainability*. *Sustainability* also has social and economic dimensions, and certain science standards incorporate these ideas where they are key to the application of the standard (e.g., 6.9). These dimensions generally focus on two key areas of *management* and *economics*.

In addition to the expectations for students outlined in the NGSS, MWEE lessons should be constructed to address learning across disciplines and there are clear connections with the Delaware Social Studies Standards and Common Core-ELA among others. As an environmentally literate citizen, students should have a foundation in science concepts, be able to analyze and interpret environmental studies and data, reflect on the historical development and implementation of environmental practices to determine how policies have impacted the environment, and be able to

communicate these findings to others. Communication can occur through a variety of means including written, verbal, and artistic products. Environmental literacy goes beyond a single discipline; opportunities should be provided to allow students to look at environmental issues and data holistically and communicate their learning through a variety of products. Action projects, a critical component of MWEEs, allows students to build and demonstrate an understanding of a local environmental issue and provides opportunities to apply multiple discipline concepts and practices.

Environmental Literacy and CTE in Delaware

Delaware Department of Education have partnered with Advance CTE to develop (1) environmental literacy competencies for Career Technical Education (CTE); (2) an environmental literacy framework expanding on these competencies; and (3) a technical assistance and professional learning plan for implementation in related CTE programs of study. The environmental literacy framework will provide an opportunity for educators, employers, and community members to align knowledge, skills, and action planning strategies. In addition, it will support meaningful connections between academic content and technical learning for educators and learners, as well as an integrated model of CTE and academic content professional learning. To view the environmental literacy competencies for Career Technical Education (CTE) and learn more about the project visit the Delaware Pathways website.

Additional Support for Environmental Literacy

Green Ribbon Schools

The aim of U.S. Department of Education (National) Green Ribbon Schools is to inspire schools (both public and private), districts, early learning centers (OLCs), and institutions of high education (IHEs) to strive for 21st-century excellence by highlighting promising school sustainability practices and resources that all can employ. To that end, the award recognizes schools, districts, OLCs, and IHEs that:

- Reduce environmental impacts and costs
- Improve the health and wellness of schools, students, and staff
- Provide effective environmental and sustainability education

Each spring the Delaware Department of Education (DDOE) recognizes national and state finalists in an award ceremony held at one of the Delaware's schools. All national winners are recognized in Washington, D.C., in the summer. Learn more about Green Ribbon Schools in Delaware here.

Activity 2.3: Introducing Action Early

Activity 2.3: Background Information

There are several factors that can have positive or negative influences over an individual's choices and actions regarding environmental stewardship. These include internal factors such as environmental knowledge, motivation, values, attitudes, sense of the locus of control, perceived responsibilities, and priorities. They also include external factors such as institutional and cultural factors. If MWEEs are to have lasting impacts on the stewardship behaviors of students, they must go beyond simply engaging students in restoration activities and attempt to access some of the other factors that may influence "behavior change." It is important to empower students throughout the MWEE to give voice to their thoughts about, feelings toward, and understandings of the core ideas underpinning the environmental topics under investigation as they define "the issues" for themselves and each other. These thoughts, feelings, and understandings should directly connect to and guide the process of developing action plans. Furthermore, students should be actively engaged in identifying and evaluating strategies and solutions that they can influence and/or implement.

Authentic, student-driven engagement is critical for supporting students' perceptions that they, themselves, can bring about change through their own actions. In other words, it is important for helping students develop a strong internal locus of control. When students only learn about the actions of others or participate in stewardship activities developed by someone else, they are at risk for developing a sense that the locus of control for affecting environmental change resides exclusively with external sources (particularly adults). Furthermore, it risks the assumption that the students, themselves, have little personal responsibility for affecting change.

(Source: Designing Effective MWEEs: Common Challenges and How to Address Them, Amy Green)

Activity 3.1: Youth Voice

Activity 3.1: Background Information

Youth voice (also sometimes referred to as student voice) is supporting young people in taking a leading role in their own education through inquiry and applied learning. Youth voice may be considered a continuum where "student choice" is on one end and "student-led" is on the other. Encouraging youth voice during a MWEE is important for both increasing student engagement and fostering a lasting environmental stewardship ethic in students. Giving students the opportunity to make decisions throughout the MWEE helps them to foster a belief in their own abilities, realize that their voices matter in the community, and apply innovation and creativity to tackle real issues. There are many instructional methods that help to support youth voice. Page 6 of the **MWEE Guide** outlines a few ways that youth voice can be supported in each of the essential elements. The action component is particularly suited to supporting youth voice, as actions are ideally developed, selected, and implemented by students with the support from teachers and/or partners. This reframing of power dynamics in the classroom is called Youth-Adult-Partnerships, where young people are valued partners in shared decision-making.

Activity 3.2: Modeling an Investigation

Activity 3.2: Background Information

Outdoor field experiences are an essential element of the MWEE. It's important to recognize that these experiences can be an integral part of many aspects of the MWEE from supporting the identification of an issue, to completing background research and data collection, to taking action. Engaging students in meaningful outdoor investigations is critical to developing the foundation of future stewardship of our natural resources. Outdoor field experiences, whether they occur on the sidewalks or schoolyard in downtown Wilmington, in the tidal marshes of Kent County, or a state park on the Delaware Coast, provide the critical context that drives meaning for the questions, investigations, and student actions that comprise the MWEE.