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 Virginia.

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 who 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 facilitator's guide provides guidance and easy-to-use training resources and provides consistency in MWEE professional development across the region. The activities are modular and can be adapted to support your local context.

Getting Started: Whether this is your first time hosting a professional development workshop focused on the MWEE, or you are looking to incorporate new activities to support your existing MWEE workshop, you should start by considering the workshop logistics. Read through this whole guide before hosting your workshop - you'll notice there is some pre-planning that you need to complete, like creating a driving question for the workshop or scoping out field site(s) you'll visit with your workshop participants. There are call out boxes throughout the guide that highlight this pre-workshop planning and 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 3-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, where 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 an easily accessible outdoor space where you can model what an outdoor field experience looks like with your participants. It is highly recommended that as a facilitator you 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.

Because of this, consider bringing in a partner or expert in environmental education if you (the facilitator) are not comfortable leading these components. In addition to providing this 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, storymaps, 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 as the facilitator to 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 Virginia.
3. EXAMPLE: A MWEE case study from Frederick County Public Schools and Blandy Experimental Farm is threaded throughout this guide. The example includes completed planning tools, student worksheets, and the 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 planning tools including 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. Make a copy of these slides and adjust based on the specific needs of your workshop.

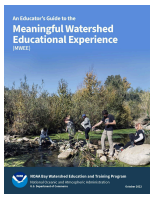
Slide Deck Icons

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 stewardship and civic action.

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 Frederick County Public Schools and Blandy Experimental Farm. Here is the MWEE Case Study as well as the Think Cloud.

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 (ELM), and the research that supports the MWEE as an effective educational approach. When participants complete the course they receive a certificate of completion and are eligible for CEU/CPD credit. As the facilitator, you can request your participants to turn in their certificates 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:

Creating a user account in Chesapeake Exploration

1. Navigate to: https://cbexapp.noaa.gov/
2. In the top right of the window there is a red “Log In” button. Click there.
3. If you already have an account in Chesapeake Exploration enter your username and password. If not, click on the “Create new account” button.
4. On the next page, fill in all of the required fields (the ones with the red star) and then click on the “Create my new account” button at the bottom of the page. NOTE: the password requirements are: eight characters, at least one digit, at least one lower case letter, at least one upper case letter, at least one non-alphanumeric character such as * - or #.
5. At this point you will get an email from Admin User (via Chesapeake Exploration) with a link to activate your account. Click that link to activate your account.

Enrolling in the MWEE 101 online course

1. Navigate to: https://cbexapp.noaa.gov/ and log into your account.
2. Scroll down and enter MWEE 101 in the Search Courses box.
3. Once you have the MWEE 101 course up, look on the right-hand side of the window and scroll down until you see “Enroll me in this course.” Click this link.
4. The link will bring you to a new page where you will scroll to the bottom and confirm your intent to enroll by clicking “Enroll me.” *You must enroll in the course before completing the course pre-assessment..*
5. *Complete the Pre-Assessment on the MWEE 101 homepage to make the course content appear.*
6. These instructions are also shown in the instructional videos found on the MWEE 101 homepage.

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.

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Part 3: Issue Investigation

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Total Estimated Time: 6 hours / full-day

Activities
1. Youth Voice 2. Modeling an Investigation 3. Outdoor Field Experiences in Virginia 4. Issue Investigation - More Than Outdoor Field Experiences 5. Plan It (**Incorporating Outdoor Field Experiences** worksheet and **Issue Investigation** pages of the **ELM**)
Objectives: 1. Participants will identify and describe a variety of outdoor field experiences and support 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.

Part 4: Informed Action

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Total Estimated Time: 4 hours / half-day

Activities
1. Claim Evidence Reasoning (**Claim, Evidence, Reasoning** student worksheet) 2. Bolstering Youth Voice in Action (**Moving from Claims to Informed Action** student worksheet) 3. Choosing an Action Project (**Choosing an Action Project** student worksheet) 4. Action Project Planning (**Environmental Action Project** student worksheets) 5. Plan It (**Informed Action** page of the **ELM**)
Objectives: 1. Participants will develop actionable claims based on conclusions drawn throughout the issue investigation to address the driving and/or supporting question. 2. Participants will use tools for generating action project ideas based on the evidence-based claim, using Claim-Evidence-Reasoning Tools.

3. 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.
4. Participants will identify resources and supports (partners, funding, volunteers, supply donors, etc) for the implementation of action projects.

Part 5: Auditing Your MWEE

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Total Estimated Time: 2 hours / half-day

Activities
1. Auditing your MWEE (**MWEE Audit Tool** and **ELM**) 2. Sharing your MWEE 3. Plan It (**ELM**)
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.

Part 1
Framing the MWEE

This part aligns with slides in Part 1 Slide Deck.

Summary

Objectives
1. Participants will reflect on their work in the MWEE 101 Online Course. 2. Participants will develop an understanding of Virginia state policies, education standards, and planning efforts that support MWEEs.

Estimated time for this part: 45 minutes

Suggested location: Indoors

Activity 1: Reflection on MWEE 101 Online Course
(15 minutes / slides 1-3)

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 Output/Deliverable

1. 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 2: State Policies & State Education Standards

(20 minutes / slides 4-6)

Background

Three Key Drivers for Environmental Literacy

1. 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.

2. The Profile of a Virginia Graduate and Meaningful Watershed Educational Experiences
The Profile of a Virginia Graduate describes the knowledge, skills, experiences and attributes that students must attain to be successful in college and/or the work force and to be “life ready.”

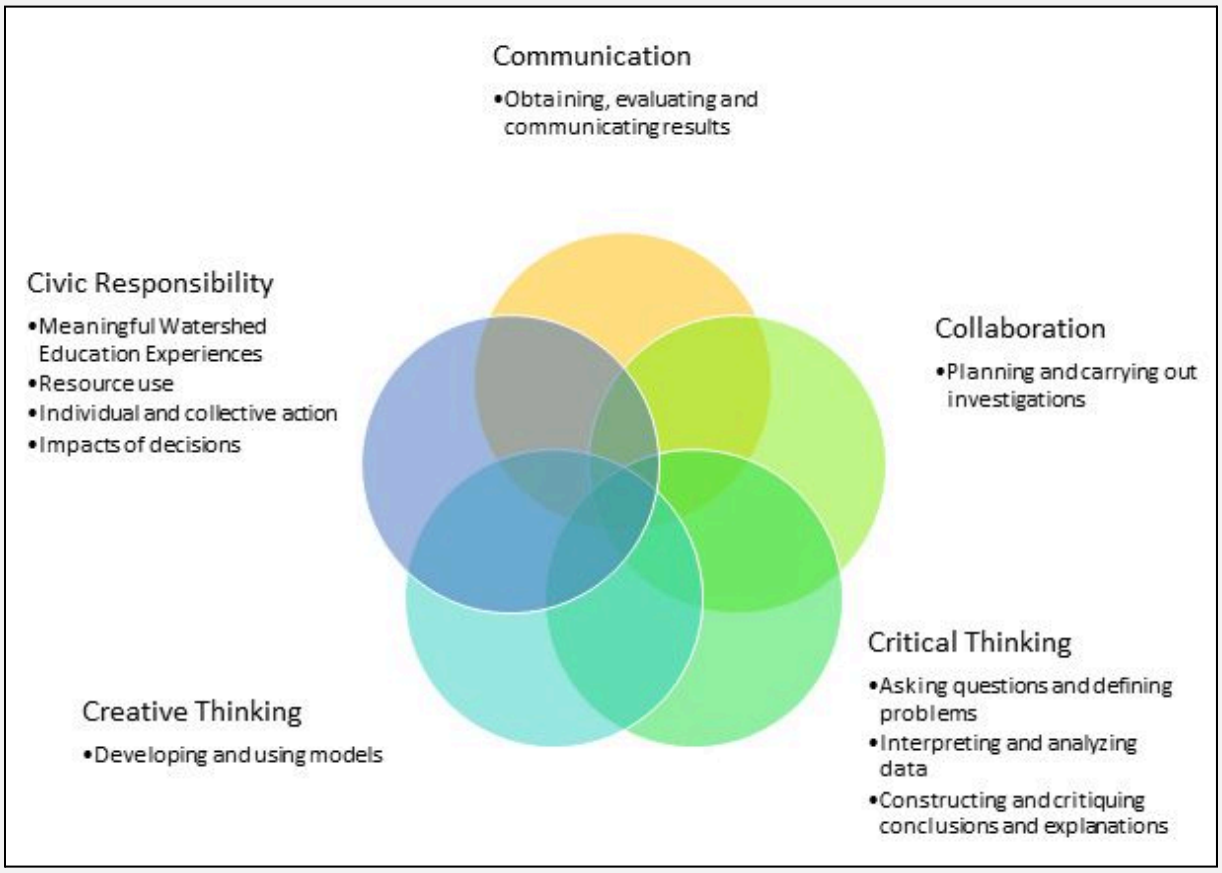
In developing the profile, the Virginia Board of Education determined that a life-ready Virginia graduate must:

- Achieve and apply appropriate academic and technical knowledge (content knowledge);
- Demonstrate productive workplace skills, qualities, and behaviors (workplace skills);
- Build connections and value interactions with others as a responsible and responsive citizen (community engagement and civic responsibility); and
- Align knowledge, skills and personal interests with career opportunities (career exploration)

There are three main facets to the Profile of a Graduate. These include:

- The explicit integration of the “5 C’s” into instruction:
  - critical thinking,
  - creative thinking,
  - collaboration,
  - communication and
  - citizenship;
- An emphasis on the development of core skill sets in the early years of high school;
- The establishment of multiple paths toward college and career readiness for students to follow in the later years of high school, which could include opportunities for internships, externships, and credentialing.

The “5 C’s” are incorporated into the Essential Skills and Practices of the 2018 Science Standards of Learning Curriculum Framework. The Essential Skills and Practices detail expectations of students to demonstrate mastery of the standards.



Visual representation of the science skills and processes aligned to the Profile of a Virginia Graduate

3. State Education Standards in Virginia

The Virginia Board of Education's *Regulations Establishing Standards for Accrediting Public Schools in Virginia* (also referred to as the "Standards of Accreditation") are designed to ensure that an effective educational program is established and maintained in all of Virginia's public schools. The 2017 Standards of Accreditation outlines the expectation that student instruction includes environmental issues (underlined for emphasis).

From the Standards of Accreditation - 8VAC20-131-70.
Program of Instruction and Learning Objectives.
Part IV
School Instructional Program

"As required by the Standards of Quality, each local school board shall develop and implement a program of instruction for grades kindergarten through 12 that is aligned to the Standards of Learning and meets or exceeds the requirements of the board. The program of instruction shall emphasize reading, writing, speaking, mathematical concepts and computations, proficiency in the use of computers and related technology, computer science and computational thinking, including computer coding, and scientific concepts and processes; essential skills and concepts of citizenship, including knowledge of Virginia history and world and United States history, economics, government, world languages, international cultures, health and physical education, environmental issues, and geography necessary for responsible participation in American society and in the international community; fine arts, which may include music and art, and practical arts; knowledge and skills needed to qualify for further education, gainful employment, or training in a career or technical field; and development of the ability to apply such skills and knowledge in preparation for eventual employment and lifelong learning and to achieve economic self-sufficiency."

Environmental Literacy in Virginia in the 2018 *Virginia Science Standards of Learning*

The 2018 *Virginia Science Standards of Learning* were developed to provide students a robust foundation of environmental concepts throughout their K-12 education with the expectation that students become environmentally literate graduates. As students progress in science coursework, they develop and use the Science and Engineering Practices outlined in the 2018 *Virginia Science Standards of Learning* to build a conceptual understanding of the standards. Both field and classroom experiences allow for the development and mastery of Science and Engineering Practices. Foundational Concepts for Environmental Literacy and Responsible Citizenship are embedded in the 2018 *Virginia Science Standards of Learning* at various grade levels and courses.

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 a) energy, b) natural resources, c) ecological and physical science principles, d) time, and e) 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 the areas of a) management and b) economics.

For more information about how the 2018 Science Standards of Learning directly support Environmental Literacy, view the 2018 Science Standards and Curriculum Framework on the Virginia Department of Education's website.

In addition to the expectations for students outlined in the *2018 Science Standards of Learning*, MWEE lessons should be constructed to address learning across disciplines and there are clear connections with the History and Social Studies Standards of Learning and the English Standards of Learning, 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.

Additional Support for Environmental Literacy:

Board of Education's Seal for Excellence in Science and the Environment:
The Board of Education's Seal for Excellence in Science and the Environment is awarded to students who enter the ninth grade for the first time in the 2018-2019 year and thereafter, and meet each of the following criteria:

- Earn either a Standard or Advanced Studies Diploma
- Complete at least three different first-level board-approved laboratory science courses and at least one rigorous advanced-level or postsecondary-level laboratory science course, each with a grade of "B" or higher
- Complete laboratory or field-science research and present that research in a formal, juried setting
- Complete at least 50 hours of voluntary participation in community service or extracurricular activities that involve the application of science such as environmental monitoring, protection, management, or restoration.

The Virginia Department of Education also maintains a Resource Repository for the Environmental Science Course that is accessible to educators across the commonwealth.

Meaningful Watershed Educational Experiences (MWEE) can be supported by a number of Virginia 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 Virginia 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: W*hat are the core elements (policies, standards, efforts, etc.) that guide the way you approach teaching environmental literacy in Virginia?*

1. Divide participants into three groups and assign them one of the following three drivers that support environmental literacy in Virginia: the Chesapeake Bay Watershed Agreement, Virginia State Standards, or Profile of a Virginia 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:
    - To what extent are the educators that you work with aware of these policies?
    - What sort of learning experiences are supported by these policies?
    - 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 Virginia.
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 2 Output/Deliverable

1. Participants will review Virginia State policies and education standards and discuss how they support MWEEs.

Activity 3: Environmental Literacy Plans

(10 minutes / slides 7-9)

Some school divisions in Virginia 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.

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-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

   Clarke County Public School's Environmental Literacy Plan

   Prince William County Public School's Environmental Literacy Plan

   Caroline County Public School's Environmental Literacy Plan

   Richmond Public School's Environmental Literacy Plan

   Essex County Public School's Environmental Literacy Plan

   Middlesex County Public School's Environmental Literacy Plan

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

Activity 3 Outputs/Deliverables

1. 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 the Part 2 Slide Deck.

Summary

Objectives
1. Participants will identify and describe one or more local issues affecting environments and communities in Virginia. 2. Participants will explain ways in which one or more local issues affecting environments and societies in Virginia can be contextualized for classroom learning. 3. Participants will explain why informed student action is critical to the MWEE, and ultimately, to their student's future stewardship. 4. Participants will identify resources available for information on issues and learning standards.

Estimated time for this part: 4 hours / half-day

Suggested location: Combination of indoors and outdoors

Activity 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 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 CBP Issue Cards in a space with enough room for participants to connect the *Issue Descriptor cards.*

2. Provide each participant with one or more Issue Descriptors cards. You'll notice 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:
    - What issue(s) are particularly relevant to where you work/live?
    - Were you surprised by any of the issues?
    - Are there any major issues missing that are important in your community?
    - How else might you identify locally relevant issues?
    - 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 environmental issues are often the result of tensions between groups and or natural and human/social systems.

Activity 1 Output/Deliverable

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

Activity 2: Connecting Issues with Questions and Standards

(60 minutes / slides 5-16)

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.

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, English language arts, mathematics, performing and visual arts, engineering)? 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.

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 question should be open-ended, provoke further inquiry, and provide opportunities for environmental action.

4. Using a whiteboard or chart paper, 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. 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 Output/Deliverables

1. Participants practice identifying issues in a place (schoolyard, park, or location of workshop).
2. 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 1 Additional Resource

(slides 25-26)

Identifying Public Policies, Private Policies, and Community Practices

All environmental issues are affected by some combination of public policies, private policies, and community practices. This Earth Force resource defines the difference between policy and practice and offers examples. A public policy is created by a government (federal, state, tribal, or local). Private policies are written by businesses, organizations 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 Questions: Why is it important for students to understand the policies and practices that underpin the issue they are investigating?

Activity 3: Introducing Action Early

(30 minutes / slides 17-19)

Background

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)

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: What are the benefits to engaging students in action? What are some successes and/or challenges to engaging students in action?

Activity 3 Outputs/Deliverables

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

Activity 4: MWEE Planning Tools

(60 minutes / slides 20-21)

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**.

If there is an existing MWEE that you would prefer to use in place of the Frederick County Public Schools and Blandy Experimental Farm example, you'll want to compile and ensure that all of the pages of the MWEE Planning tools 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 supporting questions.

1. Distribute the **Curriculum Anchor pages** of the FCPS/Blandy ELM, the **Asking Questions and Planning Investigations** student worksheet and the Issue Definition, Learning Integration, and Local Context sections of the **MWEE Audit Tool**. 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 Planning tools and Student 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 stewardship and/or civic action?
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 4 Output/Deliverables

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

Activity 5: Plan It

(60 minutes / slides 22-23)

Your **MWEE**

Now 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 a science SOL, 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.

If this professional development is specifically for teachers in a single district that already has a MWEE, use this time for participants to explore the existing ELM and engage them in 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 5 Output/Deliverable

1. Participants will complete the **Curriculum Anchor** page of the **ELM** (page 23).

Part 3
Issue Investigation

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

Summary

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 / full-day
(additional time may be needed to travel to your outdoor field experience location)

Suggested location: Outdoors or combination of outdoors and indoors.

Activity 1: Youth Voice
(15 minutes / slides 1-5)

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.

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 1 Outputs/Deliverables

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

Activity 2: Modeling an Investigation

(3 hours + travel time if needed / slides 6-12)

Background

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 Richmond, in the tidal marshes of Accomack County, or a state park in Western Virginia, provide the critical context that drives meaning for the questions, investigations, and student actions that comprise the MWEE.

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. Initiate Investigation:

   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.

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 2 Outputs/Deliverable

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

Activity 3: Outdoor Field Experiences in Virginia

(30 minutes / slides 13-14)

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

1. 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:

   a. Field Scope
   b. Find Your Park
   c. Watershed Address
   d. EPA Surf My Watershed

2. 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.

3. 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 Virginia 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:

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

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

Activity 3 Output/Deliverable

1. Participants will complete the **Incorporating Outdoor Field Experiences** planning tool (page 18) of the **MWEE Guide** for the workshop's modeled MWEE.

Activity 4: Issue Investigation - More Than Outdoor Field Experiences

(30 minutes / slides 15-16)

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 or practiced using the **Asking Questions and Planning Investigations** student worksheet and the **Curriculum Anchor** page of the FCPS/Blandy ELM. Now with their practice **Incorporating Outdoor Field Experiences** planning tool from the previous activity, the FCPS/Blandy Field Experience worksheet 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 4 Output/Deliverables

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

Activity 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 5 Output/Deliverables

1. Participants will complete the **Incorporating Outdoor Field Experiences** worksheet for their own MWEE.
2. 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

Objectives
1. Participants will develop actionable claims based on conclusions drawn throughout the issue investigation to address the driving and/or supporting question. 2. Participants will use tools for generating action project ideas based on the evidence-based claim, using Claim-Evidence-Reasoning tools. 3. 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. 4. 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 / half-day

Suggested location: Inside

Activity 1: Claim Evidence Reasoning
(45 minutes / slides 1-6)

Background

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.

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 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.

   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 1 Outputs/Deliverables

1. 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 1 Additional Resources

CER Additional Practice

If the participants require additional practice with CER, try this quick CER Practice Activity (10-15 minutes). The activity includes a blank CER worksheet and a picture. Participants will use just the picture to fill in the worksheet. If you don't use this activity during the workshop, you might share it with your participants to use with their students as a way to introduce and practice CER.

This offers an example of how to come to a reasoning statement with little evidence. Students might be tempted to use their imagination to create a story around the picture but any statement they include as evidence must be directly referenced in the picture. Time restraints or weather conditions during an outdoor field investigation may result in fewer data points than you originally planned for but, like this CER Practice, students must learn to use what they have to make conclusions.

Activity 2: Bolstering Youth Voice in Action

(45 minutes / slides 7-16)

Background

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.

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 go to page 10 of the **MWEE Guide** to review the **Types of Environmental Action Projects** 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.

It's important to note that 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 completed 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 2 Outputs/Deliverables

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

Activity 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 3: Choosing an Action Project

(30 minutes / slides 17-20)

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 an Action Project** student worksheet (adapted from an Earth Force resource) 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 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?

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 come to a conclusion 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 3 Output/Deliverable

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

Activity 3 Additional Resources

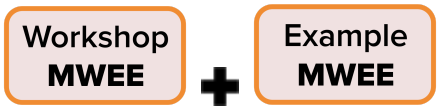
Pre-Determined Action

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: Action Project Planning

(60 minutes / slides 21-24)



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 Environmental Action Planning worksheets 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?

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?

4. 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).

5. 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 ShoreRivers 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 Output/Deliverables

1. 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.
2. 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.
3. Participants become familiar with the **Informed Action** page of the ELM.
4. Participants will use the **MWEE Audit Tool** to evaluate the ShoreRivers MWEE example.

Activity 5: Plan It

(60 minutes / slides 25-26)

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** page 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 5 Output/Deliverable

1. 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

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: Inside

Activity 1: Auditing your MWEE
(45 minutes / slides 1-3)

Your **MWEE**

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 go to page 37 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 (learning integration, teacher facilitation, local context, sustained experience) 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 questions following each review of the essential elements and supporting practices to brainstorm how to strengthen each MWEE component.

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 for improving the MWEE components. 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 1 Outputs/Deliverables

1. Participants will use the **MWEE Audit Tool** of the **MWEE Guide** to critique their own ELM.
2. 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 2: Sharing your MWEE

(30-60 minutes / slide 4)

Your **MWEE**

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 2 Output/Deliverable

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

Activity 3: Plan It

(45 minutes / slide 5)

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 of 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 3 Output/Deliverable

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

Appendix

I. Potential partners to support MWEEs in Virginia

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. Virginia-specific partners include but are not limited to:

- Chesapeake Bay National Estuarine and Research Reserve
- Colleges and Universities
- County Parks
- Master Gardener
- Master Naturalist
- Municipalities (example: sustainability coordinators, directors of Infrastructure and Development, etc)
- National Parks in Virginia
- Non-Profit/Environmental Education Organizations
    - Blandy Experimental Farm
    - Boxerwood
    - Chesapeake Bay Foundation
    - Claytor Nature Study Center
    - EarlySpace
    - EcoAction Arlington
    - Four Mile Run Conservatory Foundation
    - Friends of the North Fork of the Shenandoah
    - Friends of the Rappahannock
    - Gloucester Clean Community
    - James River Association
    - Loudoun Wildlife Conservancy
    - Lynchburg Water Resources
    - Maymont Foundation
    - Muddy Squirrel, LLC
    - Nature Club Kids, LLC
    - Rockfish Valley Foundation
    - The Nature Conservancy
    - Virginia Association for Environmental Educators
    - Western Virginia Water Authority
    - Wild Virginia

- Parents/PTAs/PTOs
- Public Safety (police and fire departments)
- State Agencies: Virginia Department of Forestry; Virginia Department of Game and Inland Fisheries; Virginia Department of Environmental Quality
- Scout Troops
- Sea Grant Extension Offices
- Virginia Cooperative Extension
- Virginia Soil and Water Conservation Districts
- Virginia State Parks

II. Funding to Support Action in Virginia

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:

- Chesapeake Bay Trust (Youth Environmental Education Grant Program - up to $10,000)
- NOAA Planet Stewards (Educators in the Stewardship Community are eligible for up to $2,000 in action project support funds)
- NOAA B-WET (Chesapeake B-WET - up to $150,000 annually for up to 3 years to support systemic MWEEs)
- Chesapeake Bay Restoration Fund (The Fund, based on Chesapeake Bay License plates, is intended for use by the Commonwealth of Virginia for environmental education and restoration projects relating to the Chesapeake Bay and its tributaries)
- Virginia Environmental Endowment - Virginia Program (matching funds required)
- Dominion Energy - Environmental Education and Stewardship Grants
- 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.