Pennsylvania Facilitator's Guide to MWEE Training

A companion text to the *Educator's Guide to the Meaningful Watershed Educational Experience* to support effective Meaningful Watershed Educational Experience (MWEE) professional development for teachers, school administrators, and non-formal educators in the Commonwealth of Pennsylvania.

Meaningful Watershed Educational Experience

Welcome & How to Use this Facilitator's Guide

Welcome to the PA MWEE Facilitator Team! We appreciate your interest and dedication to Meaningful Watershed Educational Experiences (MWEEs), and WE NEED YOU! In a state as large as Pennsylvania, MWEE Facilitators like you sustain an important delivery network to spread the word about the MWEE framework.

This Facilitator's Guide has been designed for practitioners who are deeply familiar with the MWEE and who will be training other educators to become MWEE Ambassadors. This facilitator's guide provides guidance, easy-to-use training resources, and consistency for MWEE professional development across the state. The activities are modular and can be adapted to support your local context, including the unique teaching needs of the MWEE Ambassadors you train and the unique watershed issues experienced in your local region.

Whether this is your first time hosting a MWEE professional development workshop, or you are looking to incorporate new activities to support your existing MWEE workshop, ***we recommend reviewing this entire guide***. The resources are curated in a thoughtful way that provide support for some of the biggest challenges that educators are known to face in implementing MWEEs.

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, how detailed the workshop will be (from an introduction to MWEEs to fully immersive multi-day). Some modules may also be used for advanced MWEE workshops on skills such as encouraging student voice or civic and environmental action.

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 Pennsylvania.
3. EXAMPLE: A MWEE case study from Conestoga Valley High School and the Chesapeake Bay Foundation is threaded throughout this guide. The example includes all of the completed MWEE Toolbox worksheets and ELM pages. If you have these tools developed for a project that is more relevant to your participants and their local watershed, 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 of the additional resources are extensions for activities. These components are not included in the estimated time for the activities and overall parts, but are helpful if participants need more practice.
5. PLAN IT: Each part concludes with a Plan It section, where workshop participants apply what they have learned to design their own MWEE using the MWEE Toolbox worksheets and pages from the Environmental Literacy Model (ELM). If there is already a MWEE in place that you are training participants on, this might be an opportunity for reflection and fine-tuning rather than development.
6. SLIDES: Each part has a corresponding slide deck. The slides highlight the activities and engagement questions and use the icons below to cue the facilitator and participants on whether the focus is on the model Workshop MWEE, the Example MWEE, or the MWEE that participants are developing. Make adjustments to the slides based on the specific needs of your workshop.

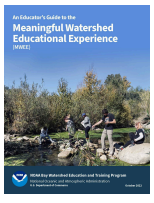
Slide Deck Icons

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

This icon is used when participants are wearing their "student-hat" engaging in the workshop's modeled MWEE. Participants will engage in all aspects of the MWEE—from issue definition and outdoor field experiences to synthesis and conclusions and 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 Conestoga Valley High School and the Chesapeake Bay Foundation.

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.

Table of Contents

Planning Your Workshop Page 7

Part 1: Framing the MWEE Page 10

Total Estimated Time: 55 minutes

Activities
1. Watersheds of Pennsylvania Icebreaker 2. Reflection on MWEE 101 Online Course 3. State Policies, Education Standards & Initiatives 4. Environmental Literacy Plans
Objectives: 1. Participants will utilize the PA Major Water Basins map to introduce themselves, identify PA's 5 major water basins, and find connections to each other and their work. 2. Participants will reflect on their work in the pre-requisite MWEE 101 Online Course. 3. Participants will develop understanding around Pennsylvania state policies, education standards, initiatives, and planning efforts that support MWEEs.

Part 2: Curriculum Anchor Page 18

Total Estimated Time: 4 hours / half-day

Activities
1. Exploring Local Issues 2. Connecting Issues with Questions and Standards 3. Introducing Action Early 4. MWEE Planning Tools (**Asking Questions and Planning Investigations** student worksheet) 5. Plan It (**Curriculum Anchor** page of the **ELM**)
Objectives: 1. Participants will identify and describe one or more local issues affecting environments and societies in Pennsylvania.

2. Participants will explain ways in which one or more local issues affecting environments and societies in Pennsylvania 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.

Part 3: Issue Investigation

Page 27

Total Estimated Time: 6 hours / full-day

Activities

1. Youth Voice
2. Modeling an Investigation
3. Outdoor Field Experiences in Pennsylvania
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 educational standards.
4. Participants will identify resources (inc. partners) available in Pennsylvania to support the planning and implementation of outdoor field experiences.

Part 4: Informed Action

Page 36

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

Page 46

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.

Planning Your Workshop

Whether this is your first time hosting a MWEE professional development workshop, or you are looking to incorporate new activities to support your existing MWEE workshop, start by considering your workshop's logistics. **Review this entire guide and the appendices before hosting your workshop.** Successful workshops take preparation, such as finding the perfect facilitation team that represents multiple perspectives and partnerships; creating a driving question for your workshop; and scoping out field site(s) and/or activity settings for your workshop. There are **Tips** throughout the guide that highlight this pre-workshop planning, as well as areas in the slide deck for you to insert the appropriate information.

Below are some ideas of how you might approach workshop logistics. Additional information, resources, sample flyers, sample agendas, and more covering how to be an effective MWEE Facilitator can be found in the Appendices.

Workshop Date: Choose dates that are known to work well for teachers. Be mindful of testing dates, in-service days, and other important dates. Ensure that your workshop facility and all co-facilitators are available on your chosen date.

Workshop Length: This guide includes activities for approximately three days (18 hours) of programming. You can utilize this guide to create anything from a two-hour MWEE presentation to a MWEE three-day institute. There are many different ways of structuring professional development workshops. In a perfect world, you might have educators for three or four consecutive days in the summer with follow-up sessions to support them throughout the school year, during which you can use much of what is included in this guide plus additional components of your existing programming. Alternatively, you might have educators for only a one-day, six-hour workshop. In these cases, it is helpful to follow the one-day workshops with a second, optional day of advanced watershed education skill-building and modeling of hands-on activities. This optional training extension could also take place throughout multiple, shorter after-school meetings; time between meetings can create an opportunity for participants to process and reflect on how they're introducing elements into their practice.

Portions of this guide can also be utilized to present an introduction to MWEEs in a presentation or a three-hour mini-workshop. 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, meaning that 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, safe outdoor space where you can model what outdoor field experiences look like with your participants. It is highly recommended that MWEE Facilitators visit this space beforehand so they know what the opportunities are for discussing local environmental issues and engaging in outdoor field experiences. If possible, ensure 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, parking, handicap accessibility, and projectors/screens/technology.

Workshop Co-Facilitators and Partners: A workshop is always richer with multiple voices and experiences. MWEE workshops often benefit from multiple partners, including perspectives from state agencies, non-profits, and schools.

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 or don't have the desired instructional supplies. Partners highly specialized in topics including but not limited to environmental justice, civic or environmental action, sustainability, best-management practices, land use, freshwater systems, and/or formal classroom instruction bring a richness of perspective to your workshop. 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 staff from the PA Department of Education (PDE) or a Curriculum Specialist from a local Intermediate Unit (IU) or a school administrator to speak to these aspects. Involve partners in the planning process so they fully understand your goals and objectives for the workshop.

Act 48 hours/CPE (IU) Credits/College Credit for PA Certified Teachers:
Act 48 of 1999 requires persons holding Pennsylvania professional teacher certifications to complete continuing education requirements every five years in order to maintain their certificates in active status. Educators must earn either six graduate credits of collegiate study, six credits of PDE-approved continuing professional education courses, 180 hours of continuing professional development programs (Act 48 hours), or any combination of the above every five years to maintain active certification status. Typically, Act 48 hours are offered for MWEE Ambassador training. One of the facilitators should be an approved PA Act 48 provider.

Proper paperwork will need to be completed and submitted in a timely fashion. To receive Act 48 hours, teachers must attend the entire workshop, fully complete the Act 48 hours form, and provide their PA Department of Education Personnel Professional ID number (PPID - 7 digits). If you would like to instead offer PDE-approved continuing professional education (CPE) credits, you will need to work through your local Intermediate Unit (IU). Each credit is worth 30 Act 48 hours. There will be an extra fee for CPE credit. If you would like to offer either graduate college credits, you will need to work with a college or university. There will be a fee for each college credit, which will be paid to the college.

MWEE 101: This guide presupposes that participants in your workshop have completed the MWEE 101 online course (another free resource accessible via BayBackpack). MWEE 101 is a self-guided course that introduces educators to the basics of the MWEE through a series of case studies. By the end of the course participants have a basic understanding of the essential elements, supporting practices, the MWEE Toolbox, the Environmental Literacy Model, and 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 eight additional Act 48 hours. Appendix II includes step-by-step instructions that you may send out to your workshop participants to have them enroll in the MWEE 101 online course. If they have questions or challenges enrolling, there is contact information on the course page.

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. The more that you can model the use of different instructional tools, the stronger the training.

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 and professional development tools that are part of an Act 48 Provider's approved evaluation measures. Because this workshop includes aspects where participants are planning a new MWEE or refining an existing one, it is highly recommended that they bring any pertinent curriculum documents or unit plans to work from during the *Plan It* sections.

Part 1
Framing the MWEE

This part aligns with slides in Part 1 Slide Deck.

Summary

Objectives

1. Participants will utilize the PA Major Water Basins map to introduce themselves, identify PA's 5 major water basins, and find connections to each other and their work.
2. Participants will reflect on their work in the MWEE 101 Online Course.
3. Participants will develop an understanding of Pennsylvania state policies, education standards, and planning efforts that support MWEEs.

Estimated time for this part: 55 minutes

Suggested location: Indoors

Activity 1: Watersheds of Pennsylvania Icebreaker
(20 minutes)

Background

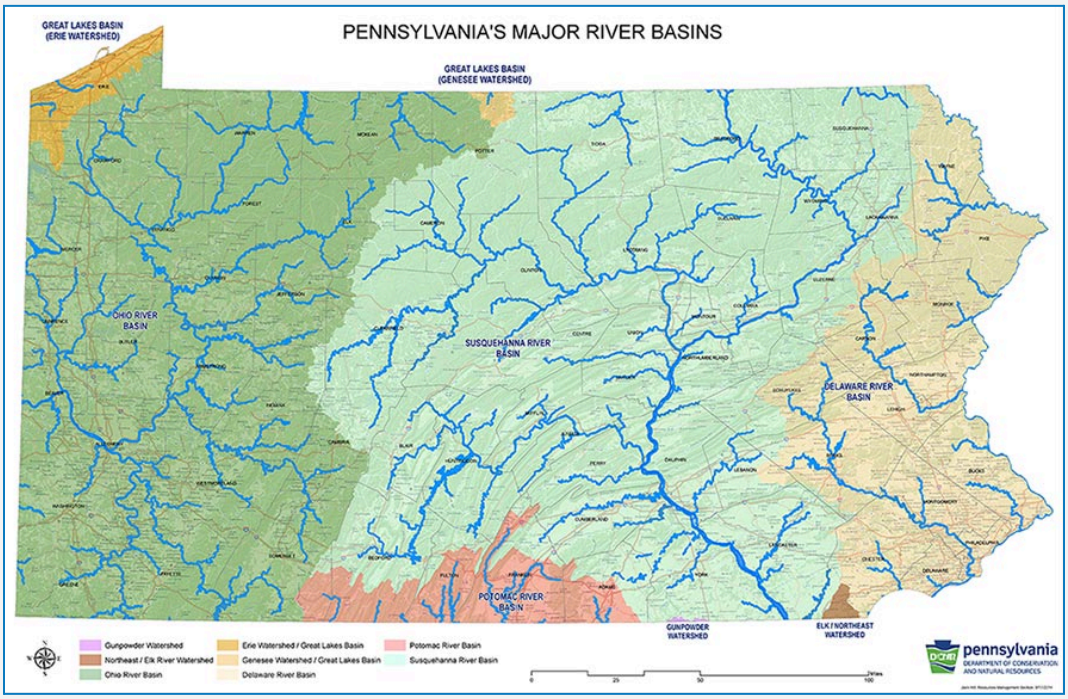
A truly effective MWEE is place-based. It catapults students into environmental discovery, inquiry, and action in the story of their local community and watershed. Pennsylvania's streams have quite the story to tell; a story of wildlife that live along muddy banks or hide in quiet pools; a story of people who make their homes in its basin, quench thirst from its waters, harness its power, irrigate crops, or enjoy it for recreation. Pennsylvania boasts more miles of streams than almost any other state, an estimated 86,000 stream and river miles. These streams provide a wonderful educational resource for students and teachers while building a sense of stewardship and creating positive partnerships for schools and communities.

These streams also act as a conveyor belt of water and energy as they drain from the water's source – a spring, pond, lake, snowmelt, or rainwater – into a single larger body of water, such as a larger river, lake, estuary, bay, or ocean. The area of land over which all water drains downhill through a series of streams and rivers to a common outlet is defined as a **watershed.**

The term “watershed” is often used interchangeably with “water basin” or “river basin,” as both a watershed and a river basin include an area of land that drains to a larger water body. A key difference is that in a river basin, all the water drains to a large river. A watershed, meanwhile, describes a smaller area of land that drains to a smaller stream, lake, or wetland. There are many smaller watersheds nested within a river basin. Colloquially, however, the two terms may be used synonymously. State agencies in Pennsylvania differ in their classification of Pennsylvania’s major watershed and river basins, but this guide utilizes the classifications from the PA Department of Natural Resources (DCNR) - Bureau of State Parks.

<u>Pennsylvania contains five major river basins:</u>

1. Ohio Water Basin
2. Susquehanna Water Basin (contains the Chesapeake Bay Watershed)
3. Delaware Water Basin
4. Great Lakes Water Basin (which contains the Lake Erie and Genesee Watersheds)
5. Potomac Water Basin



(Download this map and any of the other basin maps at http://www.watersheded.dcnr.state.pa.us/maps)

Two other watersheds in PA are not a part of these basins: the Gunpowder River Watershed and the Elk & Northeast Rivers Watershed. Both of these watersheds drain directly into the Chesapeake without joining any of the other major basin systems.

To tailor their workshops to the unique place-based needs of MWEE Ambassadors and their workshop location, MWEE Facilitators should explore DCNR’s high-resolution maps of the statewide river basins and the five major river basins. Maps can be shared electronically or

printed in color (11" x 17" ledger size or larger) for educational purposes only, including distribution at a MWEE Ambassador training. Facilitators are also encouraged to review the DCNR Watershed Education website, the curriculum, and related resources available in the Appendix, particularly the fact sheets for each of Pennsylvania's five major watersheds (Step 3 on this webpage).

This activity is designed to be both an icebreaker at the beginning of a workshop and to situate participants within the local context of PA watersheds. You'll need to have a PA Major Water Basins Map handy and hanging somewhere in the classroom. You can access the map here (*print in large size at least 30 X 22).*

1. As participants arrive, have them write their name on a post-it flag and place it on the map where they either live or work (i.e. in their watershed).
2. Once everyone has added their name (including facilitators), gather the group in a circle so that everyone can see the map.
3. Starting with the further post-it flag from the workshop location, call out each participant and ask them to briefly introduce themselves with their name, title, their watershed, and what they hope to learn during the workshop. As the facilitator, this is an opportunity to start bridging connections across participants.
4. Wrap up by sharing the difference between the DCNR map (5 basins) and the PFBC map (6 basins). Consider providing a map for every teacher to take back and use in their classroom.

Activity 1 Output/Deliverable

1. Participants will meet one another through an interactive icebreaker and will identify where in PA's 5 water basins they are coming from.

Activity 2: Reflection on MWEE 101 Online Course

(15 minutes / slides 3-5)

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.

Virtual Option 1: Using slide #16 in the Slide Deck 1, ask participants to work in small groups to organize the essential elements and supporting practices stickies to illustrate the flow of the MWEE.

Virtual Option 2: In small groups ask participants to respond to the prompts on slides 17-20 in the Slide Deck 1.

Activity 2 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 3: State Policies, Education Standards & Initiatives

(10 minutes / slides 6-9)

Background

Drivers of Environmental Literacy

Environmental & Ecology (EE) instruction belongs in every PA classroom. The inclusion of EE in the classroom is supported by the following:

- **Chesapeake Bay Watershed Agreement**
- **Pennsylvania Code (PA Code) and Bulletin**
- **Environmental Education (EE) Act**
- **Pennsylvania Pathways to Green Schools**

Chesapeake Bay Watershed Agreement: This agreement was signed by all of the governors of all of the states that influence the water in the Chesapeake Bay, including Pennsylvania. The MWEE is a key part of the Student Outcome in 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.

Pennsylvania Code (PA Code) and Bulletin: The PA Code is the official compilation of all administrative regulations issued by Pennsylvania's state agencies. It includes the final rules and regulations of the different state departments and agencies, the rules of the General Assembly, court rules, and county and municipality home rule charters.

Often discussed in hand with the PA Code, the Pennsylvania Bulletin is where proposed and final administrative rules and regulations are shared before they are officially printed in the PA Code.

The PA Code provides policy and guidance for Local Educational Agencies (LEAs) within the Title 22 regulations. It includes legislatively ratified and mandated academic standards (**Chapter 4**), which includes the interdisciplinary Environment and Ecology (E&E) and the Science and Technology Academic Standards, as well as all other disciplinary and career and technology instructional standards. When a school system implements and follows these regulations it is considered as 'being in compliance.'

Areas of study described within the E&E standards:

- Watersheds and Wetlands,
- Renewable and Nonrenewable Resources
- Environmental Health
- Agriculture and Society
- Integrated Pest Management
- Ecosystems and Interactions
- Threatened, Endangered, Endangered, and Extinct Species
- Humans and the Environment

Environmental Education (EE) Act of Jun. 22, 1993, P.L. 105, No. 24 Cl. 24: In 1993, the General Assembly enacted the Environmental Education Act, citing Article 1, Section 27 of the Pennsylvania Constitution which states, "The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustees of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people." The initial act named the PA Department of Environmental Resources (DER) - now two agencies: the PA Department of Environmental Protection (DEP) and the Department of Conservation and Natural Resources (DCNR) - along with the PA Department of Education (PDE) as primarily responsible for ensuring all citizens have equitable access to quality environmental education opportunities.

More information about the EE Act can be found in the Appendix.

Pennsylvania Pathways to Green Schools: The aim of the PA Program is directly aligned with the US Department of Education Green Ribbon Schools (ED-GRS) program. It is designed to inspire schools, districts and institutions of higher education to strive for 21st century excellence, by highlighting promising practices and resources that all can employ. To that end, the award recognizes schools, districts, and institutions of higher education that:

- Reduce environmental impact and costs;
- Improve the health and wellness of schools, students, and staff, and;
- Provide environmental education, which teaches many disciplines, and is especially good at effectively incorporating STEM, civic skills, and green career pathways.

Combined with the statewide mandate for Integrated Pest Management (IPM) implementation schools and childcare centers across the state, the program provides the necessary tools and resources for Pennsylvania schools as they progress on the path towards a more green and sustainable future. Whether a school district is considering a renovation or construction project; reviewing operations and maintenance practices; planting a school garden; or updating curriculum, there is an opportunity to make our schools more cost-efficient, environmentally friendly and healthier places of learning.

Environmental Justice

Environmental Justice (EJ) is a priority for many state agencies in PA. As defined by the United States Environmental Protection Agency (EPA), EJ is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys:

- The same degree of protection from environmental and health hazards, and
- Equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

Bridging EJ barriers begins not only with culturally responsive teaching, but also with the thoughtful engagement of local EJ communities. Although there is not a federally recognized or Pennsylvania-wide definition for marginalized and underserved communities, the Pennsylvania Department of Environmental Protection (DEP) defines an **EJ Area** as any census tract where 20 percent or more individuals live at or below the federal poverty line, and/or 30 percent or more of the population identifies as a non-white minority, based on data from the U.S. Census Bureau and the federal guidelines for poverty. EJ Areas are mapped on DEP's EJ Areas Viewer at dep.pa.gov/EJViewer.

Meaningfully engaging Pennsylvania's EJ Areas is the focus of the DEP's Office of Environmental Justice (OEJ), which fulfills a critical role within the DEP and statewide – ensuring that the Pennsylvanians most at risk from pollution and other environmental impacts have a voice in the decision-making process. MWEE Ambassadors are crucial gateways to EJ in Pennsylvania, particularly when leading EJ-responsive MWEEs through a place-based lens. To encourage this capacity, MWEE Facilitators are strongly encouraged to explore the main goals, EJ Areas Viewer, and resources on the DEP OEJ website, and to share this information widely

with their MWEE Ambassadors. For a deeper understanding of responsive environmental education, MWEE Facilitators and MWEE Ambassadors should explore the myriad resources for Justice, Equity, Diversity, and Inclusion (JEDI) available from the North American Association for Environmental Education (NAAEE).

Meaningful Watershed Educational Experiences (MWEEs) are supported by a number of Pennsylvania policies, standards, and initiatives. 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 Pennsylvania 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, initiatives, etc) that guide the way you approach teaching environmental literacy in Pennsylvania?*

1. Divide participants into groups and assign them one of the following four pieces of policy that support environmental literacy in Pennsylvania: the Chesapeake Bay Watershed Agreement, PA Code; PA Environmental Education Act, and Pathways to Green Schools. Ask each group to familiarize themselves with the policy by using the information in the background section and/or the associated webpages.
2. Each group will report out on what the initiative is and any initial impressions or experiences with the initiative.
3. Engage all groups in a discussion around these questions:
    - To what extent are the educators that you work with aware of these policies/initiatives?
    - What sort of learning experiences are supported by these policies/initiatives?
    - How do these initiatives build on each other to provide a structure for helping students become environmentally literate?
4. Review the state education standards and other policies which support environmental literacy and implementation of the MWEE framework. Engage workshop participants in a discussion around how MWEEs can help to meet multiple academic standards and what that could look like at the grade band in which they work. Ask them to reflect on how MWEEs can be an important vehicle for environmental justice.

Activity 3 Output/Deliverable

1. Participants will review Pennsylvania State policies, education standards, and initiatives and discuss how they support MWEEs.

Activity 4: Environmental Literacy Plans

(10 minutes / slides 10-13)

School districts in Pennsylvania have been conducting planning efforts to determine where MWEEs — among other things like annual outdoor field experiences, service learning, etc. — happen across a student's academic career. We call these efforts Environmental Literacy Plans.

TIP: Before the workshop, determine the school districts 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 district or county-wide Environmental Literacy Plan helping the implementation and continuation of a MWEE?

1. If the district/county 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 does not have a plan available, use the examples below or show the PA Environmental Literacy Plan Template that is available for school districts to adapt. Ask participants what they think should be a part of the plan and how it connects to MWEEs.

   Anne Arundel County Public School's Environmental Literacy Plan

   Prince George's County Public School's Environmental Literacy Plan

   Queen Anne's County Public School's Environmental Literacy Matrix

   Lancaster-Lebanon Intermediate Unit 13 Environmental Literacy Plan

Activity 4 Outputs/Deliverables

1. Participants will examine a district or county-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 Pennsylvania. 2. Participants will explain ways in which one or more local issues affecting environments and societies in Pennsylvania 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 issues in Pennsylvania's watersheds that can be connected to learning objectives and are suitable to explore through a MWEE. *This activity requires internet connectivity.*

There are many agencies and organizations working in partnership at federal, state, and local levels to guide the protection and restoration of Pennsylvania's abundant water resources. These partners work to address issues ranging from water quality to the ways in which society uses land throughout all of Pennsylvania's watersheds.

1. Allow participants to explore the Pennsylvania Integrated Water Quality Report provided by PA DEP. This can be done individually, in small groups, or as a whole group.
2. Engage participants in a discussion around these questions:

- How many miles of streams and rivers are there in Pennsylvania? What about acres of lakes, ponds, bays, and wetlands? Does that seem like a lot of water resources to you?
- How many miles of streams and acres of lakes are impaired in Pennsylvania? What are the different types of impairments that can be declared?
- What types of pollutants are monitored in Pennsylvania's groundwater?
- What types of Control Programs and Restoration Programs are taking place in Pennsylvania to protect and improve our water resources?

3. Provide each participant (or small group) with a *Pennsylvania Water Issue Card*. Each issue card includes a web-based resource that further explains that issue. Allow time for participants to explore and read about the specific issue.
4. Using big pads, whiteboards, magnets, etc. place *Issue Descriptor Cards* in a space with enough room for participants to connect them with the issue they explored.
5. The descriptor cards are split into three categories: Natural Systems, Human/Social Systems, and Value Descriptors that describe the value of a system. You can work through all the cards at once or go through three rounds doing one category at a time. Ask participants to place their issue next to a descriptor and defend why they associated this descriptor with their issue. Consider reviewing the following vocabulary with participants:
    - A **system** is a collection of parts that interact with each other to function as a whole. *Systems Thinking* or "Seeing the Big Picture" enables us to see how things are connected, fostering an understanding of how actions affect individual parts as well as the whole system. In the K-12 setting using systems thinking as a context creates possibilities to connect every content area in meaningful and relevant ways to students' lives.
    - **Systems thinking** is about relationships and the dynamics produced by those relationships. This type of thinking is particularly important when understanding how decisions are made and the impacts of decisions and actions on a system.
        i. Natural Systems (ex: forest, stream, meadow)
        ii. Human/Social Systems: (human-made, e.g.: roads, structures, families, communities, economic, justice)
    - For more information about systems thinking and identifying local environmental issues, see *Education and the Environment: Creating Standards-Based Programs in Schools and Districts* by Gerald A. Lieberman (2013).
6. Facilitate a group discussion considering the following questions:
    - Is the issue you explored particularly relevant to where you work/live? What about other issues you heard presented about?
    - Were you surprised by any of the issues?
    - Are there any major issues missing that are important in your community?
    - How else might you find out about locally relevant issues?

    Try creating a driving question that is locally relevant using a couple of the issues, natural systems, human systems, and values from this activity.
    If practical, note that environmental issues are often the result of tensions between groups and/or natural and human/social systems.

Virtual Option: PA Watershed Issues Slide Deck
Participants can use this slide deck to ID issues and associate the natural, human and value systems with each issue. Encourage the use of new issue cards on stickies and connecting lines to show relationships.

Activity 1 Output/Deliverable

1. Participants will create a conceptual diagram illustrating the connections between Pennsylvania water resource issues and systems, both human and natural.

Activity 2: Connecting Issues with Questions and Standards

(60 minutes / slides 5-25)

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.

TIP: Before the workshop, choose a single issue from the *Pennsylvania Water Issue Cards* 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 about the single issue that will become the focus of the workshop's model MWEE. Again, you can pull this directly from the *Pennsylvania Water Issue Card* of your choice. After participants learn about the issue, discuss the questions below**.** 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**.**
   NOTES: All of the PA Water Issues Cards are on the same document. Associated content is found in the links under each one. You may have participants use the websites to do readings or print the content for them to review. Watching the videos will require internet connectivity.

Discussion Questions:

- Why is this issue important and how does it affect the health of Pennsylvania's waterways and watersheds?
- 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 interdisciplinary learning (social studies, language arts, mathematics, art, reading?)
- 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. Bring participants to your outdoor field location, whether it's right outside, or if not, plan time for travel in your agenda. 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 Backyard Report Card for virtual workshops!) 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.

TIP: 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 projects.

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. 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 workshop location).
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 2 Additional Resource

(slides 34-35)

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 26-30)

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.

1. Engage participants in thinking about examples where they have been involved in either environmental or social action. It could be during their childhood, during college, or in their adult life.
2. 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 they saw a gap that needed to be filled and created something themselves. Social networks can be important support systems that encourage people 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 31-32)

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**.

TIP: If there is an existing MWEE that you would prefer to use in place of the Conestoga Valley High School example, you'll want to compile and ensure that all of the pages of the MWEE Toolbox and ELM are completed.

Conestoga Valley High School and the Chesapeake Bay Foundation partnered to develop a MWEE for high school students in their local community. 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 page** of the Conestoga Valley 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 facilitators can remind participants that the MWEE Planning tools and Student worksheets are tools to help educators think about the different aspects of the ELM; the ELM is a planning tool for articulating the arc 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? (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. Have participants pair up and ask them to apply the three sections of the MWEE Audit Tool to the Curriculum Anchor page of the Conestoga Valley ELM.
3. Engage the group in a discussion regarding 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 33-34)

Your MWEE

Participants will identify a local environmental issue that is relevant to the community they serve and connect it with learning objectives. This can be as specific as an NGSS or C3 standard, or as basic as “understand cause and effect.” The product of this activity is to

develop driving and supporting questions that connect the two by situating the learning of the objective in the context of the issue.

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

TIP: If this professional development is specifically for teachers in a single district that already has a MWEE, use the Plan It sections 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 **Developing Driving and Supporting Questions** worksheet (page 19) and 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 Pennsylvania 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 1-6)

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. (VIRTUAL OPTION: Breakout Discussion Slides)

1. Use the background information above to introduce the topic of youth voice.
2. Engage participants in a conversation about youth voice to recall their experience supporting it in their classrooms and programs.
3. Engage participants in a discussion around these 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?
4. As a group, review the supporting questions from Part 2 (they should be hanging up 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 7-13)

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 Philadelphia, in the marshes along lake Erie, a crop field or barnyard of a willing farmer, or a state park in the Allegheny National Forest, 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 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.

TIP: 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/chalk on pavement/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 synthesize data, and share their conclusions with the group.

Activity 3: Outdoor Field Experiences in Pennsylvania

(30 minutes / slides 14-15)

This activity will introduce participants to a number of resources in Pennsylvania for planning and implementing outdoor field experiences. Participants will consider how they can apply some of these resources within the workshop's modeled MWEE. If possible, encourage classroom teachers to pair up with a local non-formal educator during this activity.

1. Break participants into small groups. 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 MWEE. 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: *These resources are specific to Pennsylvania.

   a. Field Scope
   b. Find EE Near Me in Pennsylvania*
   c. Find Your Park
   d. Macroinvertebrates.org
   e. Watershed Address
   f. DCNR Watershed Education*
   g. Watershed Basin Maps in Pennsylvania*

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 they should take notes on questions or concerns they should consider while planning an outdoor field experience. A sample version of this worksheet is available.

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 Pennsylvania as a whole or showcase what is available in the city or county that your participants are working in. Categories that you might consider elaborating on include:

a. Types of outdoor field experiences (e.g. macroinvertebrate and water chemistry stream studies; exploring a schoolyard or demonstration site of best management practices; comparing infiltration rates of pervious and impervious surfaces; touring a drinking water or wastewater treatment facility; investigating stream/pond habitat, etc.)
b. Partners (for both field-based instruction and access to tools and equipment)
c. Field sites (schoolyard and off-site)
d. Funding for outdoor field experiences

Examples of some of these 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 16-18)

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 Conestoga Valley High School 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.

1. Use the Conestoga Valley High School example to demonstrate what the full issue investigation portion of their MWEE looks like. Participants will have already seen the **Asking Questions and Planning Investigations** student worksheet and the **Curriculum Anchor** page of the Conestoga Valley High School ELM. Now with their practice **Incorporating Outdoor Field Experiences** planning worksheet from the previous activity and the two **Issue Investigation pages** of the Conestoga Valley High School 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 Conestoga Valley High School ELM to consider the strengths of the program and the

opportunities for improvement.

2. Engage participants in a discussion around the following 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 Conestoga Valley High School MWEE example.

Activity 5: Plan It

(60 minutes / slides 19-20)

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 NGSS Science & Engineering Practices: (1) engaging in argument from evidence, (2) obtaining, evaluating, and communicating information.

It also supports the third of Pennsylvania's State STEM Standards of Practices (interpret and communicate information from science, technology, engineering, and mathematics). CER helps students to align their conclusions to the purpose of the investigation, using their evidence to create reasoning that then provides an avenue for taking action on the issue at hand.
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 NOAA B-WET funded project, NA18NMF4570316) with your participants using the corresponding slides (slides 11-12). 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?

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 how 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?

TIP: 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

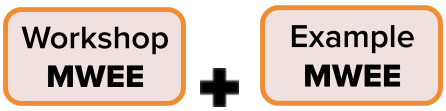
Pre-Determined Action

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 Association (PTA or PTO) 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 worksheet as a model or start from scratch. Allow participants time to brainstorm and discuss with each other how they would run this step with their students.

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

2. Provide the time, space, and resources for workshop participants to bring their action to 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 Conestoga Valley High School 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 Conestoga Valley High School 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 Conestoga Valley High School 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 Conestoga Valley High School 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 open 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. Provide time for participants to ask questions and provide 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. Extended Tips for Workshop Planning

Logistics

Advertisement / Teacher Workshop Flyer *(See examples in the Appendix VI)*

Workshops should be marketed at least 2 months in advance. Marketing materials should be sent at least four weeks in advance. Utilize your organization's social media. Send the workshop information out to your educator email distribution list. Sample flyers are included below.

Marketing Materials Should Include**:**

- Workshop title
- Date
- Time
- Location
- List funding sources
- Proper logos
- Description/purpose
- Lunch plan
- Registration deadline and contact information
- Cost
- Target audience
- Number of Act 48 hours offered

When planning a teacher workshop, always remember *Maslow's Hierarchy.* Meet participant's basic needs first!

These basic needs include the following:

- A safe ADA accessible workshop location that is temperature controlled, has electricity, tables, and comfortable chairs
- Working bathrooms that are ADA accessible and have running water
- Break food, coffee, and tea (or at least tell participants to bring their own)
- If you are not able to provide lunch, make sure that participants are notified in advance that no lunch will be provided
- A safe and accessible outdoor teaching area
- Before you review the schedule for the day with the group, always go over bathroom locations, break times, and lunch location
- Offering a refrigerator for lunch storage is a nice option
- If you are offering your workshop in a more rustic location (ex: outdoors under a pavilion) make sure all participants are aware of this before they arrive

Sample Planning Timeline

For a 1- or 2-day MWEE Ambassador Workshop in December

September

- Pick a workshop location and date
- Reserve the workshop location and date with site manager
- If the workshop is at your work site, let all staff know about it
- Identify other facilitators to help you co-teach the workshop
- Determine facilitator roles and delegate workload
- If you would like to recruit a sponsor for the workshop, begin the search, and confirm
- Document expenses, file invoices, and in-kind contributions
- Develop workshop design, taking into consideration:
    - Audience
    - Workshop objectives
    - Constraints (ex. space or time) and strategies for overcoming constraints
    - Critical workshop elements
    - Requirements for Act 48 hours or credit, if offered
    - Materials and equipment

October

- Prepare workshop facilitator agenda
- Purchase any necessary materials (MWEE guides, giveaways, etc.)
- Set up registration procedures
- Submit purchasing invoices
- Contact and book any additional presenters or partners
- Prepare marketing materials and advertise
- Book caterer
- Begin accepting workshop registrations
- Begin working on PPT/Google Slides for workshop with co-facilitators

November

- Confirm speakers
- If needed, design and send the pre-workshop participant survey
- Confirm location, refreshments, etc.
- Continue accepting workshop registrations
- Use facilitator agenda to create a participant agenda
- Review your workshop registrants and tweak the agenda to their needs
- Meet with your co-facilitators to prepare
- Make a facilitator-only agenda with assigned tasks
- Design workshop evaluation
- Email out workshop confirmation letters and directions to workshop participants
- Make copies of handouts
- Remind workshop location staff about the workshop
- Finalize the workshop PPT/Google Slides

December

- Conduct your MWEE Ambassador Workshop
- Send evaluation link to participants

Email the participants with any post-workshop answers or resources
Send thank you's to speakers

Considering the Audience

Before you plan the specifics of your workshop, it is helpful if you know some of the needs and interests of your participants. If you have enough lead time, consider sending out a pre-workshop online survey to find out teacher needs and expectations for the workshop; knowledge of MWEEs; experience with MWEEs; grade levels and their audience; academic standards they are working on; and any special needs. This way, you can tailor the entire workshop to suit their needs. Survey Monkey, Google Forms, and other online tools may be helpful for this task.

Even if you do not know the specific needs of your audience, try to visualize what the audience would want from the workshop. Is their attendance mandatory or voluntary? If it is mandatory, ask yourself, "Why would the participants want to attend?" and be prepared to show what they can gain from using the MWEE Framework with their students.

Planning for Health and Safety

Medical emergencies may occur at any time. As a MWEE facilitator, be aware of your own safety, use common sense, and do not put yourself or your participants in any possible danger. To be prepared, consider the following:

- Bring a first aid kit or ensure that one is available at the workshop site. It should include basic supplies such as Band-Aids, antibiotic ointment, an ice pack, and gloves. Let participants know that you have a first aid kit on hand. Bring the kit on any field excursions.
- Be familiar with your site. Locate exits, hazards, sources of water, and telephones; and be able to explain the location.
- Know the emergency numbers for the area.
- Consider the physical safety of your participants. Encourage them to participate in activities within their physical capabilities and "comfort zone."
- Make sure to have accessible water and safe shelter available.
- If individual medical issues arise, stay calm and seek medical attention.
- Check the weather for any severe weather advisories that are predicted for the day of your workshop.

Planning the Agenda

When planning the schedule, remember that the pacing of the activities is important. Offering a variety helps participants stay interested in the materials and ideas you present. Keep in mind that certain modes work better at certain times of the day. For example–after lunch when most of us tend to get sleepy, you might consider choosing outdoor activities that include physical movement (not too much right after lunch).

If possible, include both "alone time" and small group time so that individuals can reflect on the workshop and share ideas with each other. Be sure to include time for breaks. Short frequent breaks can do wonders for reviving everyone's energy level.

Evaluating Yourself as a Facilitator

Once the workshop is complete, spend a few minutes evaluating how you did and make note of improvements and changes to be incorporated into the next workshop.

Some questions you may ask yourself include, did you:

- Choose an appropriate workshop site?
- Include multiple co-facilitators and/or a resource specialist?
- Consider the audience and plan accordingly?
- Develop and distribute promotional materials at least six-weeks prior to workshop date?
- Order MWEE guides and materials in a timely fashion?
- Meet the minimum workshop time requirements? End the workshop at the stated time?
- Have enough time to complete the agenda?
- Include the critical workshop elements?
- Provide additional resources?
- Organize time, materials, and people effectively?
- Encourage feedback and questions from workshop participants?
- Provide opportunities for follow-up support?
- Provide space to hear new opinions? Learn something new?

Characteristics of Adult Learners

- Have a good deal of first-hand training that can make a significant contribution to the training.
- Expect to be treated with respect due their maturity and individualism in the learning situation.
- Usually have specific and immediate learning goals.
- Expect structure and clear goals for the learning program. Want to know how it is applicable or transferable to their personal or professional lives.
- Will usually withdraw from the instructional setting when the learning goals have been reached or if the instruction is not harmonious with the goals of the learner.
- Have a desire to be active participants in the learning process.
- Need to be involved in the planning and in participatory activities. Effective workshops tend to be centered on problem solving and are interactive.
- Are critical of excessive procedural red tape, unprepared trainers, poorly articulated programs, and individuals or processes that interfere with their learning.
- Have some amount of pride and are frequently anxious about their learning abilities.
- Are anxious for educational success. Have a strong need for periodic feedback and encouragement.
- Expect to have their physical needs met with adequate furniture and appropriate breaks.
- Need a good balance between tight, well-paced, content-oriented presentations, and the time needed for learning integration.
- Have established emotional frameworks consisting of values, attitudes, and tendencies that may or may not support change. Effective workshops assist adults in making changes in an atmosphere where there is a high degree of safety, mutual commitment, and choice.

Adapted from: "Better learning Programs: What Andragogy Can Tell Us." Herman E. Behnling, Sr. Assistant State Superintendent, Maryland State Department of Education. Planning, Conducting, and Evaluating Workshops, Larry Nolan Davis

Conducting Adult Workshops

- Begin with a suitable introduction which is as experiential, fun, and as low-risk as possible.
- Plan how you will establish confidence and trust between you and your participants.
- Seek out participant expectations and be prepared to act on any serious discrepancies between yours and theirs.
- Know what is negotiable with you. Be available to change what is negotiable and stick to what is not.
- Achieve a balance among independent, interdependent, and dependent activities. Plan for variety and unity in groupings.
- Plan regular feedback points and be aware of other times when feedback is in order.
- Be aware of the pacing implied by your plans.
- Show energy and confidence. This usually results in a level of trust and makes the group more willing to take risks.
- Allow participants to show and feel creativity, but always give participants the option of passing on any activity.
- Always be aware of opportunities (and plan many) to relate experiences to participants' lives and work.
- Consciously make the workshop session a model of what your training is about.
- Know how each part of your design relates to your overall philosophy or theory. Allow the participants to see these relationships.
- Turn appropriate questions back to the group. You shouldn't feel the pressure of being expected to have all the answers. It is also helpful to allow the group to see each other as resources. This can be fostered by resisting the tendency to respond to every statement and question.
- Be aware that hidden agendas are sometimes present. "Non-expectations" of the participants are sometimes really expectations.

How to be an Effective Facilitator

- Interact with the audience—get them involved!
- Be flexible—the best laid plans don't always work out.
- Listen to participants—what are their expectations?
- Use humor and enthusiasm—it's contagious.
- Avoid acronyms—don't assume people have prior knowledge.
- Be organized—pack materials, clearly label and set up prior to the workshop.
- Employ varying teaching strategies—be mindful of different learners (i.e. audio versus visual learners).
- Know your audience—demographics (grade level, formal/informal) and cultural differences.
- Respect the audience—don't talk over or down to people.
- Adapt. Read your audience. Watch body language.
- Fake it until you make it. Don't let them see you sweat—the show must go on!

- Use name tags and always start with an ice breaker.
- Mix up group dynamics.
- Establish good contact and communication with your workshop site.
- Leave your workshop site as you found it!
- Know your site logistics; such as room set up and room temperature.
- Keep a good pace—know your timing.
- Team up with other facilitators to co-teach.
- Be familiar with the equipment.
- Be yourself, use eye contact, and modulate your voice.
- Consider yourself a learner as well.
- Be mindful of breaks—break early if body language tells you that your audience needs to move.
- Safety first. Have liability forms and First Aid Kits ready.

The Art of Being an Effective Facilitator

Ask yourself...

- What are the reasons for this discussion/lesson/activity?
- What is my role in this experience?
- What techniques or strategies should be used?
- Where will the activity lead?
- In what setting will the goals of this discussion/lesson best be met?

Focus on the participants

- What are their interests, concerns, previous knowledge, capabilities, etc?
- Who are the participants? Level of maturity, past experiences, physical abilities
- How many participants are there?

Encourage exploratory learning

- Discovery is an important component of this type of learning.
- Be a resource, not a direct teacher.
- Encourage the participants to make logical bridges between known facts.
- Caution the overly bold and encourage the timid.

Create the “need to know”

- Ask leading questions.
- Don’t be too quick to answer questions, rather redirect them back.
- Ask questions in a manner which encourages participants to find the answers.
- Ask questions prior to beginning the activity and prep the participants.

Use the “teachable” moment

- Focus on those times that the participants are internally motivated to learn.
- Participants will naturally be curious in new situations; follow their lead.
- BE FLEXIBLE!!! It’s more important to address participants’ interests than to follow the lesson plans or agendas exactly.

Allow failure

- As long as it's safe, allow participants to struggle with the task or skill.
- We often learn more from our failures than from successes.
- Know at what point you need to "step in" to ward off total frustration.

Leave them excited

- Stop when participants are excited, not when they have become bored.
- Excitement will lead to enthusiasm and the desire for more.
- Prepare participants for the next step, next meeting, or outing.

Review, analyze, summarize, project, and evaluate

- Debrief the experience.
- Reflect on what occurred and what they have learned (their interpretation).
- Lead them to connections with other activities, skills, and lessons.
- Evaluate – What went well? What needs to be improved? Did it work?

Adapted from Simmons & Cannon (1991). It is Outdoors: A guide to experiential activities. American Alliance for Health, Physical Fitness, Recreation & Dance. Reston, VA, pp. 7-12.

II. MWEE 101 Instructions

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.

Even if your participants complete the MWEE 101 before the workshop, you’ll likely want to review the basics of a MWEE and the essential elements and supporting practices.

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. If they haven’t yet taken MWEE 101, recommend they take it after the workshop to reinforce the ideas that they have just learned.

III. Additional Information on the EE Act

The Pennsylvania Department of Education (PDE) has primary responsibility for formal environmental education within the Commonwealth's schools. A quality education should provide each student with knowledge of natural and human resources; an understanding of geographic environments; knowledge of the interrelationships and interdependence of natural and human systems; the development of environmental problem solving and management skills; and knowledge of and appropriate uses of energy.

In 2007, the Environmental Education (EE) Act was amended to recognize the adoption of the E&E Academic Standards, by the PA State Board of Education and the legislative approval process.

The Department of Environmental Protection (DEP) and the Department of Conservation and Natural Resources (DCNR) have responsibility for adult and nonformal environmental education and a support role in basic and higher education. This includes support to adults, businesses, local officials, and farmers emphasizing environmental stewardship related to environmental laws; pollution reduction and prevention; sustainable energy issues; and environmental problem solving.

These three departments regularly convene workgroups and provide programming to advance environmental literacy within the Commonwealth of Pennsylvania.

Within the EE Act, partner agencies are required to provide additional support to ensure environmental education programs maintain relevance and fiscal stability.

The EE Act established the Environmental Education Grant Program by mandating that five percent of all pollution fines and penalties collected annually by the DEP be set aside for environmental education.

The PA Advisory Council on Environmental Education, an interagency council was also established under the umbrella of the PDE to advise the executive branch in the following areas:

- Status and needs related to environmental education activities and education programs across the state
- Distribution and use of funds used to support environmental education activities

The PA Commission for Agriculture Education Excellence provides additional support for E&E and agriculture literacy efforts. In recognition of future workforce needs, the Pennsylvania Departments of Agriculture (PDA) and Education (PDE) have produced a comprehensive agricultural education report for schools across the commonwealth and have created a 15-member Commission for Agricultural Education Excellence. The commission operates under the concurrent authority of PDA and PDE, and is charged with assisting in the development of a statewide plan for agricultural education and coordinating the implementation of related programming with both departments. As part of PDA's workforce development plan, the Department works tirelessly to identify gaps in education and training for those in-demand career paths; focus on work-based learning, including micro-credentials and apprenticeships; and help Pennsylvanians obtain meaningful careers on the way to finding solutions to the shortage of talent in the near and long-term.

The goals of the PA Advisory Council on Environmental Education and the Commission on Agriculture Excellence workgroups are intimately tied to those Pennsylvania's Environmental Literacy Goals and those named in the Chesapeake Bay Watershed Agreement.

IV. Potential partners to support MWEEs in Pennsylvania

Partners can play critical roles in supporting the MWEE like 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. Pennsylvania teachers and educators are encouraged to utilize the statewide inventory of environmental education (EE) providers, where providers can be conveniently sorted by region: Find EE Near Me.

Examples of Pennsylvania-specific partners include but are not limited to:

- 21st Century Community Learning Centers (CCLC) Grantee Network
- Colleges and Universities
- Corporations can provide in-kind volunteer hours, food and/or supply discounts/donations if they have a local store (American Eagle Outfitters, Chipotle, Dick's Sporting, REI, Starbucks, Target, Waste Management, etc.)
- County Conservation Districts
- County Extension Offices: including 4-H, Master Gardener, and Master Watershed Steward programs
- County & Local Parks
- Intermediate Units (IUs)
- Municipalities (e.g., sustainability coordinators, directors of Infrastructure and Development, etc.)
- Non-profit organizations, nature centers, aquariums, field stations, land trusts, conservation organizations, etc.
- Outdoor Clubs (National Wild Turkey Federation, PA Bass Federation, Pheasants Forever, Trout Unlimited, etc.)
- Parents/PTAs/PTOs
- Pennsylvania Master Naturalist
- Public Safety (police and fire departments)
- Pennsylvania Sea Grant
- Scouting organizations (e.g., Boy Scouts of America, Girl Scouts USA)
- State Agencies and Public Lands (Department of Conservation & Natural Resources - PA State Parks; Department of Environmental Protection; PA Fish & Boat Commission; PA Game Commission; U.S. Fish and Wildlife Service; USDA Forest Service; National Parks, etc.).
- STEM Ecosystems

V. Funding to Support MWEEs in Pennsylvania

MWEEs may require funding to make them happen. There are many places where educators can go to find financial support. Some examples in Pennsylvania include:

- Captain Planet Foundation - ecoSolution grants - from $500-$2,500
- 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 project support funds
- NOAA Chesapeake Bay Office's B-WET Program - from $50,000 to $150,000 for systemic MWEEs
- Pennsylvania Department of Environmental Protection Environmental - Education Grant Program. This program includes three tiers of grants ranging from mini grants as small as $3,000 to general grants up to $85,000.
- Pennsylvania Department of Agriculture
    - Ag and Youth Grants - This program includes two types of grants ranging from direct grants up to $7.500 to matching grants up to $25,000.
    - Urban Agriculture Infrastructure Grant Program - Microgrants up to $2,500 and collaboration grants up to $50,000.
- Pennsylvania Department of Conservation & Natural Resources (DCNR) Grant Programs. There are multiple categories of grants for eligible counties, municipalities, municipal agencies, nonprofits, state heritage areas, prequalified land trusts and for-profit enterprises (for some grant types). Most grants require a 50% matching contribution from the applicant.
- Pennsylvania Department of Education 21st Century Community Learning Centers Grant. A minimum of $50,000 request.
- Pennsylvania Fish and Boat Commission and PA Council of Trout Unlimited, Trout in the Classroom Program grants
- Toyota Tapestry Grants - Average grants of $2,500.
- Utility Providers
    - Pennsylvania American Water Environmental Grant Program up to $3,000.
    - Waste Management Charitable Contributions. They support environmental conservation, environmental education, and community vitality.
- 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.

A more comprehensive and current list of grants can be found on the PA Watershed Literacy website.

VI. Sample Agendas and Promotional Materials

Example of a Teacher Workshop Flyer

Implement Meaningful Watershed Education in Your School!

Are you a *Pennsylvania K-12 teacher* passionate about bringing relevant and real watershed education into your classroom?

Learn how to implement **Meaningful Watershed Educational Experiences** (MWEEs) to advance **environmental literacy** and **stewardship** while increasing **standards-based student achievement**! MWEEs are learner-centered experiences in which students investigate local environmental issues and complete informed action projects.

These hybrid (online and face-to-face) workshops will help teachers plug existing activities and lessons into the MWEE instructional framework. While becoming Certified MWEE Ambassadors, you will discover partnerships with environmental education (EE) providers in your region, plan how to bring the MWEE into your classroom, and participate in hands-on watershed education activities. EE providers are also welcome to attend.

Earn **six Act 48 credits** in the face-to-face workshop! Please complete the MWEE 101 online course *prior to the workshop* to receive **three additional Act 48 credits**.

Find the MWEE 101 online course here:
https://cbexapp.noaa.gov/course/view.php?id=5555

COST: FREE! Includes catered lunch.
If funding is needed to cover a substitute teacher so you may attend the workshop, please indicate so on the registration form.

BONUS! All attending educators will receive **environmental education instructional materials** at the workshop. One attending school district will ***WIN*** **a $500 stipend for instructional materials**, and four others will receive **$250**!

MWEE Ambassador Workshops for Pennsylvania Teachers

WHERE:

Northcentral PA on November 13, 2019
Bald Eagle State Park
149 Main Park Rd., Howard, PA 16814
Visit event page to register: bit.ly/2Oe273U

Western PA on November 20, 2019
Frick Environmental Center
2005 Beechwood Blvd., Pittsburgh, PA 15217
Visit event page to register: bit.ly/2M7Qs44

Eastern PA on February 20, 2020
Stroud Water Research Center
970 Spencer Rd., Avondale, PA 19311
Visit event page to register: bit.ly/330xenI

Southcentral PA on March 5, 2020
Dauphin County Agriculture & Natural Resources Center
1451 Peters Mountain Rd, Dauphin, PA 17018
Visit event page to register: bit.ly/2LL5qhi

WHEN:
All face-to-face workshops above occur 9 a.m. - 3 p.m. The pre-workshop course, MWEE 101, is available online.

FACILITATORS:
From the agencies and organizations with logos included at the bottom of this page.

Questions?

Contact Steve Kerlin at skerlin@stroudcenter.org or call 610-268-2153 ext. 297.

PRE-REGISTRATION IS REQUIRED! Visit our event pages to register today.

Funding made possible through generous B-WET grant from the National Oceanic and Atmospheric Administration (NOAA Grant #NA17NMF4570274).

Stroud Water Research Center · NOAA Chesapeake Bay · pennsylvania Department of Education · pennsylvania Department of Environmental Protection · pennsylvania Department of Conservation and Natural Resources · Pennsylvania Association for Environmental Educators · PennState Extension · Chesapeake Bay Foundation Saving a National Treasure · Millersville University

Example of an Educator Workshop Flyer (2-page, front and back)

Advanced Watershed Educator Workshops

*Workshops for **non-formal educators** to Become Meaningful Watershed Educational Experience (MWEE) Ambassadors*

We all rely on the services provided by our natural world to survive and thrive—and we can all play a role in supporting a healthy and vibrant ecosystem. More than 1,740,000 students live and learn in Pennsylvania, and the future well-being of our watersheds will soon rest in their hands.

Stakeholders across Pennsylvania are working to support students to graduate with the knowledge and skills to protect and restore their local watershed through the participation in MWEEs. MWEEs are learner-centered experiences that focus on investigations into local environmental issues that lead to informed action and civic engagement.

MWEEs depend on the facilitation and support of both school and non-formal, field-based educators for the experiences to be holistic and impactful. This workshop will help prepare non-formal environmental education providers to partner with K–12 classroom teachers on a MWEE.

This workshop has been designed to provide a deep understanding of the MWEE as a vehicle for advancing environmental literacy and stewardship while increasing standards-based student achievement. To become a MWEE Ambassador, non-formal educators need to attend one of the MWEE Ambassador trainings and complete online learning modules.

BONUS! Each MWEE workshop will be paired with an optional second day focused on enhancing your hands-on water education skills: aquatic macroinvertebrates, water chemistry, stream habitat assessments, riparian restoration, watershed modeling, stormwater best management practices, or manure management impacts (2-4 of these topics specific to each site)!

Find more information about MWEEs at
http://baybackpack.com/mwee/developing-your-mwee

Workshops available in each region of Pennsylvania!

(see other side or go online for more details)

AVONDALE: October 16–17, 2018
http://bit.ly/2ulR4og

AUSTIN: October 23–24, 2018
http://bit.ly/2JA2oYX

DAUPHIN: February 12–13, 2019
http://bit.ly/2L2wqud

SLIPPERY ROCK: March 27–28, 2019
http://bit.ly/2mtG4r6

Questions?

Contact Steve Kerlin at skerlin@stroudcenter.org or call 610-268-2153 ext. 297.

CHESAPEAKE BAY FOUNDATION
Saving a National Treasure
LEARN OUTSIDE

STROUD WATER RESEARCH CENTER

pennsylvania DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

NOAA CHESAPEAKE BAY

PennState Extension

Millersville University

Advanced Watershed Educator Workshops

	MWEE Workshop	Water Education Skills (*Optional Day 2*)	Location	Registration Link
AVONDALE	**Tuesday, October 16, 2018**	**Wednesday, October 17, 2018** Macros, WikiWatershed, LEED Tour	**Stroud Water Research Center** 970 Spencer Road Avondale, PA 19311	http://bit.ly/2uIR4og
AUSTIN	**Tuesday, October 23, 2018**	**Wednesday, October 24, 2018** Macros, H_2O Chemistry, Habitat Assessment	**Sinnemahoning State Park** 4843 Park Road Austin, PA 16720	http://bit.ly/2JA2oYX
DAUPHIN	**Tuesday, February 12, 2019** ***Snow Date: Wednesday, February 20–21, 2019***	**Wednesday, February 13, 2019** Stormwater & Ag BMPs, Drinking Water Chemistry	**Dauphin County Agriculture & Natural Resources Center** 1451 Peters Mountain Road Dauphin, PA 17018	http://bit.ly/2L2wqud
SLIPPERY ROCK	**Wednesday, March 27, 2019**	**Thursday, March 28, 2019** Macros, H_2O Chemistry, Habitat Assessment	**Jennings Environmental Education Center** 2951 Prospect Road Slippery Rock, PA 16057	http://bit.ly/2mtG4r6

MORE DETAILS

TIME: 9:00 a.m.–3:00 p.m.

COST: **FREE!** Includes a catered lunch, snacks, and refreshments.

AUDIENCE: Environmental Educators (non-formal, informal, field-based, naturalists)

ACT 48 HOURS: Provided by DCNR-PA State Parks

FACILITATORS: Trainers from Stroud Water Research Center, the Chesapeake Bay Foundation (CBF), DCNR-Bureau of PA State Parks, Penn State Extension, and Millersville University

PRE-REGISTRATION IS REQUIRED.

Funding made possible through generous B-WET grant from the National Oceanic and Atmospheric Administration (NOAA Grant #NA17NMF4570274).

CHESAPEAKE BAY FOUNDATION
Saving a National Treasure
LEARN OUTSIDE

STROUD WATER RESEARCH CENTER

pennsylvania DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

NOAA CHESAPEAKE BAY

PennState Extension

Millersville University

Questions? Contact Steve Kerlin at skerlin@stroudcenter.org or call 610-268-2153 ext. 297.

Sample 1-Day Participant Agenda

Meaningful Watershed Educational Experience (MWEE) Ambassador Workshop for Pennsylvania Teachers 6 hours

Date and Time
Host location
Address

Facilitators
Facilitator, Organization

MWEE Ambassador Workshop Agenda

8:45 AM **Welcome!** Participants sign in and settle in, including completion of Act 48 forms if applicable.

9:00 AM **Introductions, Agenda, and the MWEE**

9:30 AM **Pennsylvania Major River Basins Ice Breaker**

10:00 AM **Four Essential Elements of the MWEE**

11:00 AM **Watershed Education Activity #1** (outside if possible)

11:45 AM **Partnerships of Environmental Education (EE) Providers and School**

12:00 PM ***Lunch*** *(bag or provided)*

12:00 PM **MWEEs in Practice: Examples from a Teacher**

12:30 PM **Supporting Practices and Examples from Teacher Perspectives**

1:00 PM **Connecting MWEEs to PA Teaching and Learning Requirements**

1:30 PM **Watershed Education Activity #2**

2:00 PM **Finding Funding and Other Resources**

2:20 PM **Applying MWEEs to Your School Setting**

2:45 PM **Conclusions, Wrap-up, and Certificates**

3:00 PM **Optional Tour of Host Site**