

Making the Link: A Pathway to Collaboratively Developing High-quality Standards-based MWEs

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Special thanks to the 36 educators who helped refine the Making the Link Pathway and use the Pathway to create high-quality standards-based MWEs

:

Making the Link Website

<https://research.al.umces.edu/cat-davis/making-the-link/>

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Introduction

What is the Pathway?

Making the Link: A Pathway to Collaboratively Developing High-quality Standards-based MWEEs is a guide that can help you create high-quality Meaningful Watershed Educational Experiences (MWEEs) that are well aligned with the Next Generation Science Standards (NGSS). The title is a mouthful, so from here-on-out, we will just simply refer to it as the “Pathway.”

The Pathway centers on making **two links**:

- MWEEs linked to NGSS
- Curriculum writers linked to environmental education (EE) providers

It is built on the **premise** that *collaboration and peer-review provides a robust pathway for writing high-quality standards-based MWEEs that teachers can and will use in their classroom.*

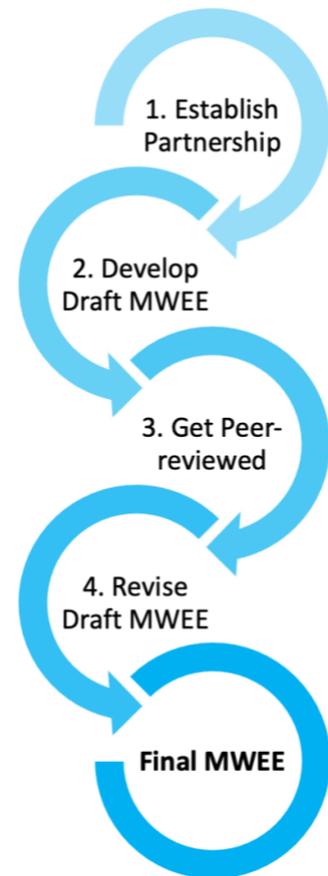
The Pathway consists of **four progressive steps**, which are briefly described below and in more detail on subsequent pages.

1. Establish a partnership between curriculum writers and EE providers
2. Collaboratively develop the first draft of a high-quality standards-based MWEE
3. Get draft MWEE reviewed by a peer(s)
4. Revise the draft MWEE based on peer review

From this approach, you can produce a final high-quality standards-based MWEE to implement with students in your school district.

It was a pleasure to work with an EE [provider] and I think she really helped us make this MWEE as rich as possible. She provided content knowledge and understanding of leading field experiences and modeling concepts for children that was invaluable. Partnership with an EE provider will ultimately benefit the teachers and their students as we embark on piloting this MWEE.

Making the Link curriculum writer



Who should head down the Pathway?

The partnership requires curriculum writers/teachers and EE providers working in the same school district. Prior experience with MWEEs is not necessary but at least one member of the partnership should have experience with writing curriculum. Additionally, all partners should have the desire to create a MWEE that is aligned with NGSS. The below links provide information on the value of MWEE and NGSS for classroom instruction.

- <https://www.baybackpack.com/mwee/what-is-a-mwee>

- <https://www.nextgenscience.org/>

I believe the partnerships helped create a stronger MWEE because there are individuals with a variety of expertise coming to the table.

Making the Link Participant

Who benefits from this collaboration?

All partners benefit from this approach:

- Curriculum writers/teachers benefit from the insights of EE providers who excel at teaching outdoors. They also gain support from peers who review and comment on the initial drafts of the MWEE.
- EE providers benefit from the insights of curriculum writers/teachers who excel in developing standards-based curriculum. They also have the opportunity to integrate their programming and/or EE sites into school district curricula.
- Curriculum writers/teachers and EE providers benefit from increased access to educational development resources.
- Students benefit from high-quality outdoor learning that deepens their understanding of science and related topics in the context of their local environment.

Collaborating with the LEA (school district) curriculum writers was beneficial to me because it gave me more experience working with incorporating standards into a MWEE, understanding the unique challenges teachers face working in a classroom environment, and creating partnerships with individuals in my county in the formal education field.

Making the Link EE Provider

Does the Pathway work?

YES! The Pathway team piloted and revised this development process through a five-year effort called *Making the Link*, which involved 11 partnerships among 36 curriculum writers/teachers and EE providers. Over an academic year or during an intensive summer month, these partners followed the Pathway and produced high-quality standards-based MWEEs that can be used throughout their school district.

This work occurred through a collaboration among education specialists at University of Maryland Center for Environmental Science (UMCES-AL), Maryland State Department of Education (MSDE) and the Maryland Department of Natural Resources (MD-DNR). It was funded by NOAA BWET program (#NA17NMF4570273).

I feel that this method of creating standard based, systemic MWEE's is one that should be repeated. From the EE provider side, the most common struggle is understanding what teachers need/the challenges they face. Having these two groups collaborate is an excellent way of tackling those challenges and creating a strong MWEE.

Making the Link EE Provider

How to use this guide

The document is broken into the four Pathway steps. Each step has a brief description followed by concrete actions that you will take to implement that step. Between external links and documents in the appendix, we provide you with all the resources necessary to complete these steps. These resources include 15 high-quality standards-based MWEEs, 11 of which were developed following The Pathway. All 15 are summarized using the “Environmental Literacy Model” (ELM) and are listed in the Appendix Table 1. We also offer seven case studies of a subset of these MWEEs, which provide insight into implementation in the classroom. Appendix Table 2 provides all of the links that are mentioned in this guide.

Additional information on the Making the Link project and the Pathway document are found on the University of Maryland Center for Environmental Science website:

<https://research.al.umces.edu/cat-davis/making-the-link/>

Step 1: Establish Partnership

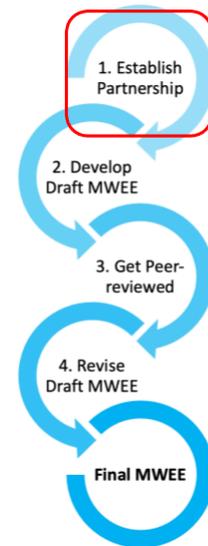
As noted, the partnership is a foundational link in the Pathway. You will need to consider three questions for this partnership: *who are the partners, how do you find partners, and how do you prepare for the Pathway work?*

The partnership should consist of **two types of professionals**:

- Curriculum writers for a school district (these might be classroom teachers or district administrators)
- EE providers based within or nearby this school district

We recommend partnerships consisting of two curriculum writers and one EE provider, as the curriculum writers will do most of the curriculum writing and EE organizations can often only spare one staff member. As previously mentioned, at least one member of the partnership should have prior experience writing curriculum.

It's ok if no one has prior experience writing MWEEs, but, of course, all partners must be interested in developing the MWEE!



Find partners

Typically, a **curriculum writer or district science supervisor will initiate this process** based on a need for a MWEE at a particular grade level(s). In this case, we suggest this school district representative reach out to an EE provider. Ideally, this provider is based in or near your school district as they will know the local outdoor environment and can serve as a local resource for implementation of the MWEE. They may have even worked with you or another teacher in your district. However, neither of these is a requirement.

What if your district doesn't have a prior relationship with a local EE provider? Below are some suggestions for organizations that can often provide one.

- District outdoor school
- Environmental education centers
- Nature centers
- Zoos
- Aquariums
- Museums
- Public gardens
- Arboretums
- Wetland or estuary sanctuaries
- Watershed or river associations
- Audubon Society
- Nature Conservancy
- Visitors centers

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- Outdoor adventure centers
- City, county or state parks
- State Extension Service
- Department of Natural Resources
- Natural Resource Conservation Service
- Agriculture associations
- Colleges or universities
- Various nonprofit organizations and foundations with a mission to provide environmental education (e.g., MAEOE)

For additional suggestions, visit this Bay Backpack webpage: <https://www.baybackpack.com/field-experiences>.

Pro-tip #1: Successful MWEE implementation can hinge on other entities beyond your MWEE writing partnership. While they aren't part of the development of the partnership, talk with your principal, groundskeepers, and other relevant staff members to ensure you have their support and buy-in to implement your new MWEE. Plan to touch base with them throughout the process.

Prepare for the Pathway work

Once you have your partnership in place, it is important to build connections, understanding and trust, and to minimize any potential hiccups. You should set up an in-person meeting with all the partners before getting started on the curriculum. Consider including leadership from your organizations in this initial meeting to make sure you have the buy-in that you will need.

At this meeting, discuss the following:

- Expertise and resources (including time) that each partner can bring to the work
- Statement of what you are creating (e.g., MWEE for 6th grade earth science classes)
- Clear expectations in terms of who will do what during the development of the MWEE
- Clear expectations in terms of who will implement each part of the MWEE, and where it will be implemented
- Funding for supplies, field trips, etc., including who will secure outside funding, if necessary

During this meeting, you should also create a timeline for developing the MWEE. You should outline key milestones and deadlines for each. You should also plan on meeting at least three more times (again, ideally in-person but virtual works too). We suggest using one of these time-windows:

- Academic year: You could meet and develop your MWEE throughout an academic year with fall, winter, and spring meetings and at least 9 days in total of additional asynchronous work. We have found this approach most useful as partners have more time to complete the necessary work and more options for meeting dates. However, you need to take care that other work duties don't prevent you from meeting deadlines.
- Summer: You could meet for three weeks over the summer with meetings spread across these weeks. We have found this intense but doable. It will enable you to focus on this

Pro-tip #2: Connect with another school district also interested in developing a MWEE with the Pathway approach. Then coordinate your timelines so you can use each other for peer review (Step 3).

work and may work better for some partners. Be sure to allow sufficient time to complete all the work.

To help you map out the timeline, we have created a template that you can use to list the necessary details of each work activity. Details for each of these steps (with the exception of the kickoff meeting) are provided in subsequent sections.

Table 1: Pathway Milestones and Time Requirements

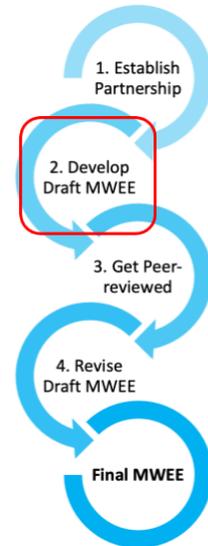
Milestone	Description/Purpose and Time Requirement	Start Date	End Date
Establish Partnership	<u>1- or 2-hour project kickoff meeting:</u> Discuss the items bulleted above. Include the partners plus leadership from each organization if possible.		
Develop Draft MWEE	<u>2- to 3-day MWEE partners meeting:</u> Review the NGSS, MWEE components, and exemplar MWEEs. Identify need and targeted NGSS, and MWEE focus; develop driving question; find field sites; and brainstorm student projects. Next outline the MWEE using Environmental Literacy Model (ELM). Assign ELM sections for partners to complete in the next step.		
	<u>At least 4 days of independent work:</u> Complete a draft of the assigned section(s) of the ELM. Also, flesh out associated lesson documents (e.g., teacher notes, student graphic organizers). Communicate via email or videoconference as needed.		
Get Peer Reviewed	<u>1-day reviewer meeting plus asynchronous work:</u> Meet with reviewer(s) to give an overview of the review process and their assignment.		
	<u>About a ½ -day of asynchronous work:</u> Have reviewer(s) draft and provide their feedback by an assigned deadline. If appropriate, review the ELM of their MWEE.		
Revise Draft MWEE	<u>1-day meeting:</u> Discuss reviewer(s) feedback and plan revisions.		
	<u>About 5 days of independent work:</u> Revise draft MWEE ELM and associated lesson documents.		
Implement	<u>½ -day meeting:</u> Plan implementation and any associated teaching training.		

Step 2: Develop Draft MWEE

With the partnership firmly established, work on the draft MWEE development can begin! As described in Table 1, Step 2 is divided into a 2-3 day meeting (length will vary depending on how well-versed all the partners are on MWEEs and NGSS) followed by independent work with communication as needed.

This step in the Pathway makes use of resources in the Chesapeake Bay Program’s MWEE Guide, as well as a few other helpful resources, including exemplar MWEEs for your review. The text below contains hyperlinks to the online resources; reminder, the exemplar MWEEs are listed in Appendix Table 1.

Note the following actions for this step are presented in a linear order but you will likely need to cycle through some of them several times as you develop your MWEE.



Review MWEE essential elements and supporting practices

Start by learning about what MWEEs are, including understanding their purpose, what distinguishes them from other outdoor experiences, and their essential elements and supporting practices. An excellent resource for understanding MWEEs is The Chesapeake Bay Program’s *An Educator’s Guide to the Meaningful Watershed Educational Experience (MWEE)*, which is available on the Bay Backpack website (<https://www.baybackpack.com/mwee/what-is-a-mwee>). You will be using graphic organizers from this guide as you develop your MWEE.

Review exemplar MWEEs

Review exemplar MWEEs listed in the Appendix Table 1. You can also check on the Bay Backpack website (<https://www.baybackpack.com/>) for more information. When you look at these examples, pay attention to where you see each of the four essential elements and four supporting practices that make up a MWEE. Consider how you can incorporate some of their practices into your own MWEE.

Identify the need for the MWEE

Identify need for the MWEE within your overall school curriculum. This need could be a gap in your current curriculum, a way to engage a certain group of students, an opportunity to update or tie curriculum topics together in a new way, or to strengthen the connection between classroom lessons and existing outdoor school experiences.

Identify the NGSS for your MWEE

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The next two tasks—identifying NGSS and your MWEE focus—are a bit “chicken and egg.” You may have a target grade level in mind, but not a topic, or you may have a specific topic or existing non-MWEE lesson and just need to find the related standards. So, tackle these next two tasks as appropriate but be sure to connect this the need within your overall school curriculum.

Pro-tip #3: As noted above, developing a MWEE is a cyclical process, and you should often refer back to your targeted standards during lesson development to ensure you are meeting them.

The Pathway focuses on NGSS because they are the current science standards in most states and are relevant to most other of science standards. If you are not familiar with the NGSS, begin by reviewing the “How to Read the Next Generation Science Standards (NGSS)” document ([https://www.nextgenscience.org/sites/default/files/How to Read NGSS - Final 4-19-13.pdf](https://www.nextgenscience.org/sites/default/files/How%20to%20Read%20NGSS%20-%20Final%204-19-13.pdf)). Note, although not covered here, you may also want to align your MWEE with other standards such as state environmental literacy standards or those in other subject area such as Art or English.

Review the NGSS by topic for your target grade level. If you are developing a high school MWEE, you will need to identify the discipline you teach. If you are developing an elementary or middle school MWEE, you will need to identify the topic you teach. Once you identify your discipline and/or topic, look for appropriate Performance Expectations (PEs). Consider one or two complimentary PEs that fit together and can be addressed in one MWEE (you shouldn’t try to integrate all the PEs in one MWEE!). Then, find the appropriate associated Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs) and Cross-Cutting Concepts (CCCs).

Identify the focus for your MWEE

Build your focus from the need you identified (i.e., a gap in your current curriculum). The topic or issue that is the focus of your MWEE should be local, and of interest and relevant to your students’ lives. For example, students in coastal communities whose family members or friends are fisherfolk might be interested in water quality as it relates to fish populations; meanwhile, students who live in agricultural areas might have more buy-in with a curriculum focused on best management practices in farming. Your MWEE focus may arise from a news headline. Or perhaps the issue is even more local and relatable than that—like flooding on the schoolyard during rainstorms that prevents students from playing kickball.

To help you brainstorm ideas for the focus of your MWEE, we suggest your partnership use the *MWEE Think Cloud* graphic organizer (page 18 in the MWEE Guide, which is available at <https://www.baybackpack.com/mwee/what-is-a-mwee>).

Develop driving question of your MWEE

As defined in the MWEE Guide, “Driving questions—often referred to as essential questions, organizing questions, or overarching questions—are the ‘big picture’ questions that are important for sparking curiosity and organizing inquiry for the issue investigation.” Use the *Developing Driving and Supporting Questions* graphic organizer to brainstorm questions that

are relevant to your MWEE focus and selected NGSSs and that will determine the elements of the locally-based lessons (page 19 in MWEE Guide, which is available at <https://www.baybackpack.com/mwee/what-is-a-mwee>).

Find meaningful outdoor field experience locations

One key aspect of a MWEE is that the outdoor field experience(s) is *meaningful*. Simply holding a class outside that could have just as easily been held inside is not meaningful. The MWEE lesson has to set up a need for students to go outside such as to make observations, conduct an experiment, etc. When planning an outdoor field experience, many factors must be considered. Your partnership should use the *Incorporating Outdoor Field Experiences* graphic organizer to identify the ideal location(s) for these lessons (pages 20-21 in the MWEE Guide, which is available at <https://www.baybackpack.com/mwee/what-is-a-mwee>).

Brainstorm potential student action projects

MWEEs are student-driven. Student observations should create a “need to know” that advances each lesson to the point that students ultimately develop an action project to address the topic or issue at the heart of the MWEE. We understand that it can be difficult for student action projects to be entirely student-driven. After all, there are permissions and safety and long-term maintenance factors to consider, just to name a few. However, you can help guide your students’ decision making as they navigate toward an appropriate action project. Your partnership should use the *Moving from Claims to Informed Action* graphic organizer to “help you visualize different action options for addressing the driving question explored in your MWEE” (page 22 in the MWEE Guide, which is available at <https://www.baybackpack.com/mwee/what-is-a-mwee>).

Pro-tip #4: When considering action projects, be sure to think about any long-term maintenance and/or responsibilities.

Outline the MWEE

While your school district might have its own format for outlining curricular units, creating a MWEE will be much easier if you use the Environmental Literacy Model (ELM) Planning Document (pages 23-26 in MWEE Guide, which is available at <https://www.baybackpack.com/mwee/what-is-a-mwee>). The ELM Planning Document is divided into three primary sections: Curriculum Anchor, Issue Investigation, and Stewardship and Civic Action. With this document, you can ensure you are incorporating all four essential elements and all four supporting practices as well as aligning your MWEE to the desired standards. The ELM format is also necessary for the peer-review portion of the Pathway.

We suggest you complete the outline your MWEE in the ELM Planning Document during the 2-3 in-person meetings of this step. Then, you can use the ELM to divide up writing the different sections of your draft MWEE. For these assignments, determine who will write each lesson, contact relevant stakeholders, etc. You might also set intermediate deadlines and brief virtual meeting to share progress and discuss questions.

Flesh out details

If possible, being to flesh out the details of your draft MWEE during the in-person meetings. The rest can be completed independent by the partners based on the plan you created in the previous step. As the details of your MWEE come together, start working on the supporting documents such as the Teachers Notes and any student documents. Throughout this process, review the graphic organizers you've completed thus far to ensure that your draft lessons align with your targeted need, standards and focus and that you are developing all the necessary documents. While this work will be completed independently, you will likely need to regularly discuss questions and concerns via email, phone calls, etc.

In the final portion of this Step, you should also take care of any logistical planning related to implementation of your MWEE. This might include:

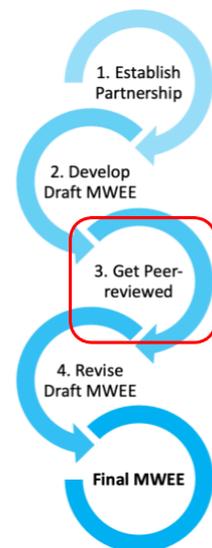
- Check with the school principal and/or district/organizational supervisors to make sure what is proposed in the MWEE is possible.
- Coordinate with any community partners relevant to the action project.
- Create a list of supplies with some practical consideration of what can be acquired, and a plan to obtain these supplies.

Step 3: Get Peer Reviewed

You have completed your draft MWEE—*Congratulations!* But you aren't done yet. As with any effort striving for a high-quality result, review and editing is necessary. Similar to the science research process, The Pathway approach embraces peer review as a method to ensure a high-quality MWEE.

Finding a peer for the peer-review process

In developing the Pathway approach, we always worked with at least two sets of partners from different school districts. These sets of partners supported each other in the peer review process. Ideally, you will also coordinate with a partner set from another school district as suggested in Step 1 (Pro-tip #2). If this isn't possible, then you ask one or two willing peers to serve as reviewers for you. The process and documents are well organized and clearly stated, so the review won't take them long. Peer reviewer(s) should have some prior experience in both curriculum development and outdoor education (alternatively, you could have two peer reviewers, each with experience in one area).



How to complete a peer review

The Pathway peer review process is straightforward. Reviewers will examine your ELM Planning Document for alignment with NGSS and MWEE essential elements and supporting practices using the *Adapted EQUiP NGSS Lesson Screener* and the *MWEE Audit Tool*.

- The **Adapted EQUiP NGSS Lesson Screener** was modified from original tool, which we found cumbersome and overwhelming for novice users (see this webpage for the original tool: <https://www.nextgenscience.org/resources/equip-rubric-science>) Our adapted version guides reviewers through an assessment focused on six points of alignment with NGSS. It can be access from this webpage: <http://research.al.umces.edu/cat-davis/making-the-link-pathway-guide/>.
- The **MWEE Audit Tool** is part of the Chesapeake Bay Program's MWEE Guide (pages 27-35 in the MWEE Guide, which is available at <https://www.baybackpack.com/mwee/what-is-a-mwee>). It guides reviewers through an assessment that focuses on how well a curricular unit meets the full definition of a MWEE including the essential elements and supporting practices.

For the peer review process, set up a meeting with your reviewer(s). Introduce the review purpose and tools. Ask your reviewer(s) to use these tools to review your completed *ELM Planning Document*, and make specific edits, comments and suggestions in terms of how well your MWEE aligns with the selected NGSS and with MWEE essential elements and supporting practices. Finally, agree on a deadline for the reviews and a format for these edits, comments and suggestions (e.g., track changes on a Word document).

Step 4: Revise Draft MWEE

You're in the final stretch. This is one of the most important steps in the Pathway: Revising, piloting and refining your initial draft. This can be a tough one as you might have to toss a much-loved section if it simply doesn't belong and is too long. It is important that you allow enough time for this step and that you are willing to make the necessary changes.

Revising your first draft MWEE

First, meet as a partnership to read through and discuss all the reviewers' scores, edits, comments, and questions. If necessary, check in with your reviewer(s) for clarification. At this meeting, make a list of needed changes, how each change will be addressed, any additional resources needed, and who is responsible for each one. Also, determine a deadline for these revisions. Note that your discussion might raise additional needed changes; be sure to add these to your list of needed revisions. Lastly, keep an eye to any changes that might require first checking with your school/district/organization leadership or groundskeepers for permission and/or support.

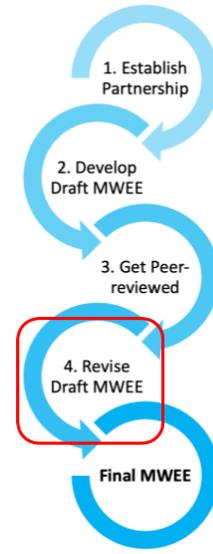
Next, make the revisions, and then have an internal review by everyone in the partnership. Each person should carefully review the entire MWEE with supporting documents to ensure all changes were made and to keep an eye out for grammatical errors, inconsistencies, lack of clarity, and any missing components. This process will produce an almost final product (i.e., second draft MWEE).

Pro-tip #5: Often holes that the reviewer(s) note in the ELM are items that you have already envisioned, but did not spell out in the document.

Piloting and refining your second draft MWEE

Pilot the MWEE second draft with a small group of students or a single classroom. If possible, gather student feedback on the MWEE through group discussions or a short survey. Ideally the piloting teacher is a member of the partnership but this is not required.

Have the piloting teacher share their feedback on the initial implementation with the partnership. Discuss and list any final changes, and again make and address the associated list of changes. Don't forget to update your Teachers Notes and student documents accordingly.



CONGRATULATIONS!!!

You now have a final high-quality standards-based MWEE!

Share and implement your final MWEE

Oh wait, you aren't quite done yet. You built a great curricular unit. Now you need to share it and ensure it is implemented. While guidance on implementation is beyond the Pathway's approach, we do have some suggestions to keep in mind:

- Continue to keep in touch with your school/district/organization leadership and groundskeepers about the MWEE and its implementation.
- Acquire necessary supplies for the implementation. You might apply for a Chesapeake Bay Trust Mini Grant to help with this.
- Make sure you have all the necessary permissions and have secured transportation for any off-campus activities.
- Remind any local community partners of potential action projects that may impact them (or be impacted by them).
- Hold a workshop to train teachers on the new MWEE. Consider including funding for lunch and substitute teachers for the day in the aforementioned grant proposal, or coordinate with your district professional development supervisor to hold the workshop on a district-wide professional development day.

Check out the MWEE Guide for additional guidance and resources on implementing a MWEE.

Some final thoughts from participants -

Working with a fellow LEA curriculum writer and an EE provider developing the MWEE, I did not realize that writing a MWEE could be very beneficial to my own learning/teaching strategies. I learned about Environmental standards, different learning/teaching strategies, and was able to feel confident that the MWEE can and will be successful within and outside of the classroom.

It is definitely worthwhile to assure that you have a quality teaching plan. Getting ready takes time but pays off in the end with memorable learning experiences for youth.

Hit the ground running, no idea is too big, share, share, and share some more. Stay committed and see the process through.

Appendix A

Table 1: Exemplar MWEEs

MWEE Title	Grade Level	Case Study Link	ELM Link
How can we Help our Environment	K	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/MWEE-Case-Study_Helping-Environment-1.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Help-our-environment-1.pdf
PIERS Schoolyard Plant – Animal Interactions	K or 2	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/10/PIERS_4MWEEs_CaseStudies.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_PIE RS-Interactions-1.pdf
Stopping Stormwater	1 or 2	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/MWEE-Case-Study_Hedgesville-ES-1.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Hedgesville-ES-1.pdf
Protecting Our Pollinators*	2	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Protecting-Our-Pollinators-1.pdf
Making a Difference in Our Watershed	2	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Making-a-Difference-in-Watershed.pdf
PIERS Survival Issue Investigation	3	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/PIERS_Survival_Issue_Investigation.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_PIE RS-Survival_Issue_Investigation-1.pdf

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Unit		ces.edu/cat-davis/wp-content/uploads/sites/9/2022/10/PIERS_4MWEEs_CaseStudies.pdf	ces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_PIE_RS-Survival-1.pdf
PIERS Soil Habitat Issue Investigation Unit	2, 4 or 5	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/10/PIERS_4MWEEs_CaseStudies.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_PIE_RS-Soil-Habitat-1.pdf
PIERS Raindrop to Runoff to Ocean Unit	5	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/10/PIERS_4MWEEs_CaseStudies.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_PIE_RS-RRO-1.pdf
Broadford Lake Restoration*	5	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Broadford-Lake-Restoration.ELM_1.pdf
Birds and Human Impacts in Chesapeake Bay ecosystems*	6	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/MWEE-Case-Study_Birds-and-Humans-1.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Birds-and-Human-Impacts-1.pdf
Monarchs for Change (A Species in Trouble - How Our Carbon Footprint is Impacting Monarch Migration)*	7	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Monarchs-for-Change-1.pdf
Shifting Shorelines	7	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Shifting-Shorelines-1.pdf

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			content/uploads/sites/9/2022/08/ELM_Shifting-Shorelines-1.pdf
The Impact of Runoff on Maryland's Coastal Bays	8	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/MWEE-Case-Study_Runoff-Impact-1.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Runoff-Impact-1.pdf
Wave of Plastic	MS	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/MWEE-Case-Study_Wave-of-Plastic-1.pdf	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Wave-of-Plastic.pdf
Water Quality Investigations	HS	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Water-Quality-Investigations-1.pdf
Farming the Future	HS	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Farming-the-Future-1.pdf
The Buck Stops Here: Is an Increasing Deer Population impacting biodiversity in Baltimore County?	HS	Not available	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_The-Buck-Stops-Here-1.pdf
Wicomico River Watershed Project	HS	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/MWEE-Case-Study_Wicomico-	http://research.al.umces.edu/cat-davis/wp-content/uploads/sites/9/2022/08/ELM_Wicomico-River-1.pdf

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		River-1.pdf
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*These ELMs are in the previous template format

Table 2: Links to all resources

Resource	Resource Link
<i>Making the Link</i> website (with <i>Pathway</i> and all relevant resources)	https://research.al.umces.edu/cat-davis/making-the-link/
<i>Bay Backpack</i> website	http://baybackpack.com/
MWEE description and access to the MWEE Guide on <i>Bay Backpack</i> website (see <i>Pathway</i> text for relevant pages including the Audit tool on pages 27-35)	https://www.baybackpack.com/mwee/what-is-a-mwee
<i>Next Generation Science Standards</i> (NGSS) website	https://www.nextgenscience.org/
Definitions associated with NGSS	https://www.nextgenscience.org/sites/default/files/How to Read NGSS - Final 4-19-13.pdf
<i>EQiP NGSS Lesson Screener</i> (original)	https://www.nextgenscience.org/resources/equip-rubric-science
<i>Adapted EQiP NGSS Lesson Screener</i> on <i>Making the Link</i> webpage	http://research.al.umces.edu/cat-davis/making-the-link-pathway-guide/
Exemplar MWEEs in the ELM format and associated case studies on the <i>Making the Link</i> webpage (also see Table 1)	http://research.al.umces.edu/cat-davis/making-the-link-pathway-guide/