



Meaningful Watershed Educational Experiences (MWEE)

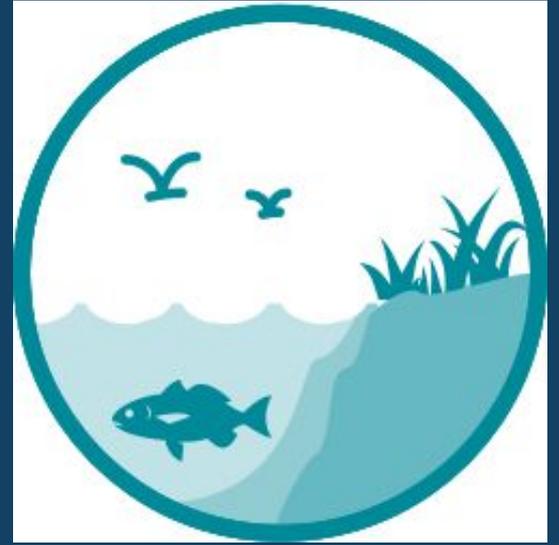
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NOAA



The National Oceanic and Atmospheric Administration (NOAA)



Fisheries, National Ocean Service, Environmental Satellites, National Weather Service, Oceanic and Atmospheric Research

Science, Service, Stewardship

How does NOAA cultivate
environmentally literate
citizens?



Meaningful Watershed Educational Experience (MWEE)

Issue
Definition

Outdoor Field
Activities

Stewardship
Action

Synthesis and
Conclusions



Issue Definition

Students focus on an environmental question, problem, or issue requiring background research and investigation.



**What has issue definition
looked like in YOUR
classroom/program?**



Outdoor Field Experiences

Students participate in one or more outdoor field experiences sufficient to investigate the issue. This may include collecting data or making observations. They may occur on school grounds or at an off-site location.



What sorts of outdoor field investigations have you engaged your students in?



Synthesis & Conclusions

Students identify, synthesize, and apply evidence from their investigations to draw conclusions and make actionable claims about the issue.



**What lessons or activities
lend themselves well to
synthesis and conclusions?**



Stewardship & Civic Action

Students brainstorm and evaluate solutions to the issue and then take action! Action comes in many forms but it should be student-driven.



**Have you supported your
students in taking action
before? What has that
looked like?**



MWEE SUPPORTING PRACTICES

- ▶ Active teacher support
- ▶ Classroom integration
- ▶ Local context
- ▶ Set of activities over time
- ▶ NOAA assets

Your Charge:

- Why is this an “Essential” element?
- What does this look like practically in your afterschool program?
- What challenges might you encounter while implementing this element?

Common Challenges:

- Establishing Curricular Connections
- Supporting 21st Century Student Learning
- Designing Effective Outdoor Field Experiences
- Effectively Capturing Affect & Attitude
- **Planning Student-driven Action Projects**
- Providing Effective Professional Development

Synthesis of B-WET Evaluations: Challenges & Opportunities Green, 2019



CHALLENGE: STUDENT IDEAS FOR ACTION

- ▶ Divergent thinking (solo-storming)
- ▶ Convergent (every idea counts)
- ▶ Planning and design





CHALLENGE: STUDENT IDEAS FOR ACTION

- ▶ Modeling action throughout the MWEE

Refuse

Make a choice to refuse plastic that can't be reused

- Plastic causes a problem because we use so much of it, it fills landfills to fast and ends up were it isn't suppose to be
- It has killed over 1 MILLION animals because it goes into water, animals think its food, etc.

Instead of using one use only plastic start using reusable items like reusable

- straws
- water bottles
- shopping bags
- containers

start saying no to single use plastic so we can reduce the amount of plastic that is where it shouldn't be

Spread the word to saying no to plastic and people will start making changes to the way they use plastic



8.3 MILLION plastic straws pollute the worlds beaches

The PlasticWatch Project – Survey!

With the PlasticWatch project, the University of Maryland Center for Environmental Science (UMCES) Chesapeake Biological Laboratory is partnering with local restaurants in Maryland to offer alternatives to single-use plastic products, such as biodegradable straws or the option of having no straws at all!

This survey is designed to find out how much plastic people use, what they think about alternative, biodegradable products, and their opinions on plastic in the environment. We will use the information we collect to identify how to most effectively switch from plastic products, including straws, cups and take-out containers, to biodegradable alternatives.

- 1) How many plastic disposable straws do you use per week?
 - None
 - 1-3
 - 4-7
 - 8-10
 - 10+
- 2) Are you willing to go without a straw in your drink?

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Plastic Pollution in Calvert County



Movement

When it rains, plastic that is on the ground gets washed into a storm drain. That leads to the Chesapeake Bay and eventually to the Atlantic Ocean. It then breaks down into microplastics and gets ingested by smaller organisms. Larger organisms that prey upon the smaller ones get microplastics into their systems and the plastic works its way up the food chain. This eventually leads to humans and can make them really sick. If it doesn't get to humans, it can still make fish or other organisms starve to death and die.



Destinations

- Chesapeake Bay
- Lyons Creek
- Graham Creek
- Friday Creek
- Hall Creek
- Hutchins Pond
- Chew Creek
- Cocktown Creek
- Tucker Creek
- Patuxent River



Sources

Sources of ocean based plastic pollution. Almost 90% of plastic debris that pollutes ocean water, which translates to 5.6 million tons comes from ocean based sources. Merchant ships expel cargo, sewage, used medical equipment, and other types of waste that contain plastic into the ocean.

By: Alysha Wallace, Kennedy Parkerson, and Josiah Hensley



CHALLENGE: STUDENT IDEAS FOR ACTION

- ▶ Earth Force (<https://earthforceresources.org/>)

Finding Policies + Practices Related to Our Issue

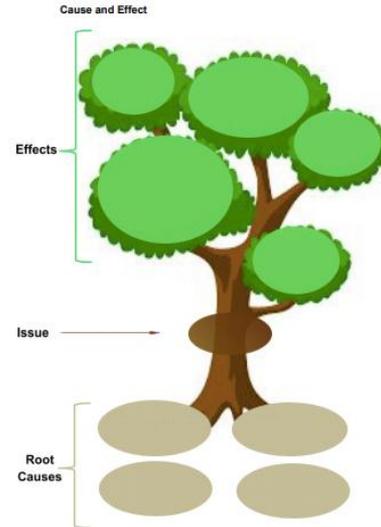
ISSUE: _____ NAME: _____ DATE: _____

WE HAVE IDENTIFIED THESE TWO SOURCES:

policies		practices	
DESCRIPTION (include whether it's a public policy or private policy)	+ / -	DESCRIPTION	+ / -

Use the columns below to help you take notes as you conduct your research. Put a plus (+) if the policy or practice supports (benefits) your issue. Put a minus (-) if the policy or practice doesn't support or benefit your issue.

Look at the pluses (+) and minuses (-) and consider if this source is biased. What do the number of pluses and minuses (+/-) tell you about this source's position on your issue?





CHALLENGE: DECISION-MAKING

- ▶ Earth Force (<https://earthforceresources.org/>)

Strategy Selection Grid



Use this grid to decide which strategy you would like to focus on for your Earth Force project. Fill in the top row with the issues you will be considering. Use the column on the far left hand side to list the criteria you have developed to make your selection. Rate each strategy against each criterion use a 1-3 scale (1 meaning it does not meet the criteria and 3 meaning it completely meets the criteria). Total the scores at the bottom.

		STRATEGIES				
		STRATEGY 1:	STRATEGY 2:	STRATEGY 3:	STRATEGY 4:	STRATEGY 5:
CRITERIA	CRITERION 1:					
	CRITERION 2:					
	CRITERION 3:					
	CRITERION 4:					
total score for each issue						



CHALLENGE: INVOLVING EVERY STUDENT IN ACTON

- ▶ Harnessing talents, skills, and interests

Public Speaking

Writing

Networking

Decision-Making

Math / Budgeting

Graphic Arts

Music

Photography / Video

Web Design

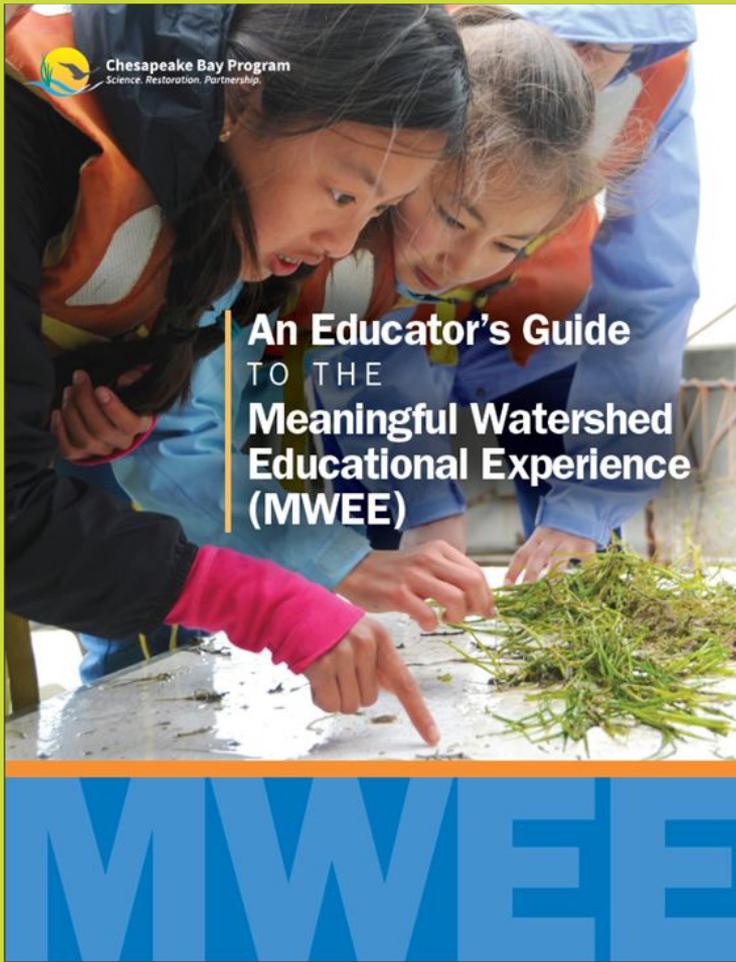
Social Media

Foreign Language / ASL

Storytelling

Logistics / Project Mgmt

Key Resources



- **MWEE definition / background (pg. 4)**
- **Planning worksheets (pg. 18)**
- **Planning tool - ELM (pg. 23)**
- **Evaluating tool - MWEE Audit (pg. 27)**

Issue Investigation

Asking Questions, Defining Issues and Problems

Students define the issue, problem, or phenomenon to be investigated and develop supporting questions that are relevant for investigation.

Issue Investigation 1	Issue Investigation 2	Issue Investigation 3
<p>What is Marine Debris? Where does it come from?</p> <p>Supporting supporting question: - What is a watershed?</p>	<p>How does marine debris impact living organisms?</p>	<p>Is marine debris a problem/issue in Oxford MD and if so how can we address this problem?</p>

Planning and Conducting Investigations

Students plan and conduct investigations and classroom activities (indoor and outdoor) that actively address students' supporting questions. Students collect data that will be used to inform actionable claims.

Issue Investigation 1	Issue Investigation 2	Issue Investigation 3
<p>Classroom Activity: Participants will be provided with an opportunity to identify some typical household waste and discuss these items with fellow participants. - Marine Debris Introduction and dinner party ice-breaker</p> <p>Classroom Activity: Using the We all live downstream activity participants will investigate how a model watershed works and how marine debris and other types of pollution generated upstream impact people and environments downstream.</p>	<p>Impacts of Marine Debris - science presentation by Cindy Orsillo</p> <p>Classroom Activity: Participants will investigate the properties of typical plastics found in the home to learn about what happens to plastics in the water and how might it impact the animals that live there (Plastics in the Water Column)</p> <p>Classroom Activity and investigation: Participants will dissect an oyster to learn about the structure and function of an oyster and view an Oyster Feeding Demo coupled with a Bay Journal article that discusses the impact of marine debris on the Bay and Oysters.</p> <p>Outdoor Field Experience: Participants will determine if habitat conditions in the Tred Avon are suitable for oysters.</p>	<p>Outdoor Field Experience: Participants will utilize their learning about marine debris and its properties to plan and conduct investigations looking at the presence or absence of marine debris in Oxford.</p> <p>Additionally, participants will examine marine debris to determine the source of the debris if possible and the debris' potential impact on living resources in the Bay/Tred Avon. This is intended to lead to claims about the extent of marine debris in Oxford and target potential stewardship and civic action opportunities.</p>

Issue Investigation (con't.)

Analyzing and Interpreting Data

Students analyze data through graphs, models, and other methods to reveal patterns and relationships. Students synthesize and apply evidence from their investigations to draw conclusions that address the supporting questions.

Issue Investigation 1	Issue Investigation 2	Issue Investigation 3
<p>Participants will use discussion and models of a watershed (we all live downstream) to look at the relationship between humans and their environment.</p>	<p>Participants will make observations and collect data about various types of plastics found in the home to determine what living resources these plastics might impact in the Bay based on where they sit in the water column.</p> <p>In the oyster dissection and feeding activity participants will utilize the oyster as a living model and make observations about how oysters feed and how marine debris might impact oysters.</p> <p>Participants will use readings, graphs and collect data on water quality in the Tred Avon to determine whether or not oysters can survive in the Tred Avon.</p>	<p>Participants will be collecting data on the quantity and quality of marine debris found along the shorelines in Oxford as well as try to ID the source of that marine debris. This will allow them to see if there are any patterns in where the marine debris shows up, if the debris can be identified and what or whom are the greatest contributors to debris.</p>

Constructing and Communicating a Claim

Students draw on the conclusions from their investigations to make a claim about the driving question and communicate these evidence-based claims to internal and/or external audiences.

Issue Investigation 1	Issue Investigation 2	Issue Investigation 3
<p>Participants will be prepared to make a claim about how humans impact their environment and whether or not they generate waste that has the potential to become marine debris.</p> <p>Participants will discuss these claims with their colleagues.</p>	<p>Through the examination of the properties of plastic, participants will be prepared to make a claim about the impact different types of plastic could have on living resources in the Bay based on where feeding occurs.</p> <p>Participants, following the oyster feeding demo, will be able to make a claim about how micro plastics in the environment could impact oysters. And through the habitat conditions investigation make a claim about oysters being present in the Tred Avon.</p>	<p>Through the marine debris field investigation each group will use data to make a claim about the presence, absence, type and source of marine debris in Oxford.</p> <p>These claims will be discussed amongst investigation groups.</p>



CHESAPEAKE EXPLORATION

Your progress

MWEE 101

Welcome to the online course for the Meaningful Watershed Educational Experience (MWEE). We're glad to have you here!

This course is made up of three lessons: Why MWEEs, What Makes a MWEE, and Planning and Evaluating MWEEs. These lessons will introduce you to the MWEE, explore what MWEEs can look like, highlight the MWEE's components, and introduce the tools that support the development and implementation of MWEEs.

After completing the course, you will see instructions on how to receive your certificate of completion and credits.

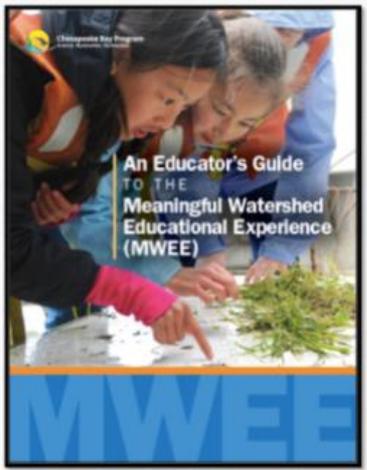
How to Use This Resource

In order to participate in this course you need to take two steps:

1. Create a user account
2. Enroll in the MWEE 101 Course

Once you enroll in the course the three lessons will appear below and you can begin! Detailed instructions for creating an account and enrolling can be found below. [We highly recommend following these directions.](#) If you have questions please contact elise.trelegan@noaa.gov.

[How to create an account and enroll in a CBEx course](#)



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Lesson 1: Why MWEEs

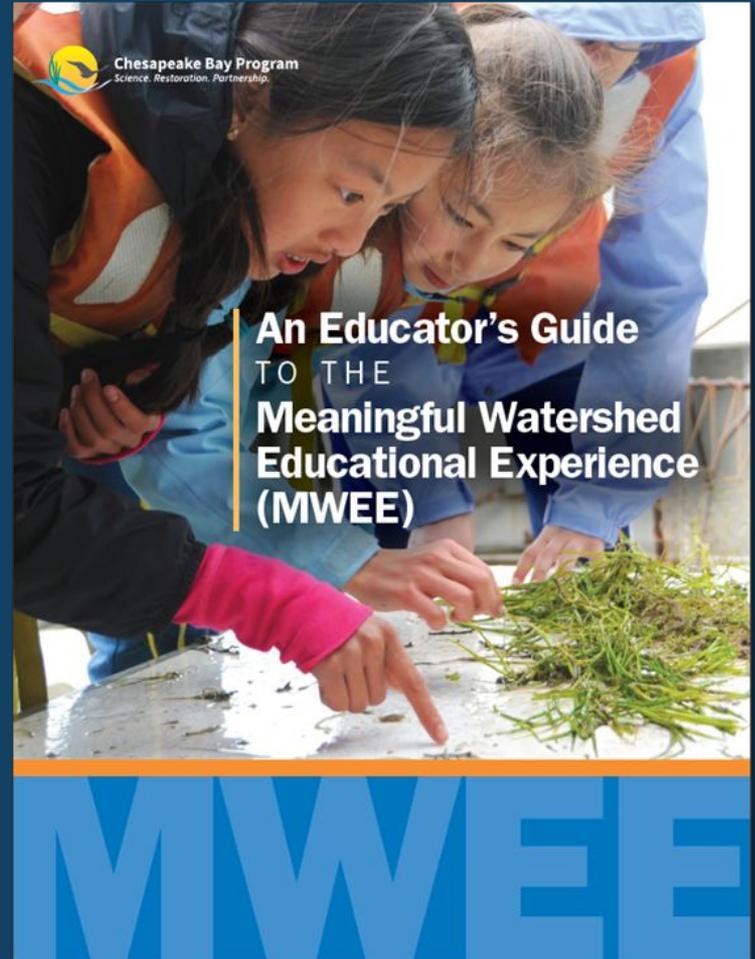
Scholarship
CBP

Lesson 2: What Makes a MWEE

Essential Elements
Supporting Practices
Case Studies
Completed Tools
Think Cloud

Lesson 3: Planning & Evaluating a MWEE

Case Studies
ELMS
Audit Tool



What is a MWEE?

Meaningful Watershed Educational Experiences (MWEEs) are learner-centered experiences that focus on investigations into local environmental issues that lead to informed action and civic engagement. Teachers play an important role in presenting unbiased information and assisting students with their research and exploration. Four essential elements and four supporting practices build upon each other to create this comprehensive learning experience for students.

“Part of the beauty of MWEEs is that they are not something extra but are, indeed, a means of enriching lessons for deeper student learning while strengthening local and national academic standards.”

— Donna Balado, Maryland State Department of Education

Essential Elements

The MWEE consists of four essential elements that describe “what students do.” These elements promote a learner-centered approach that emphasizes the role of the student in actively constructing meaning from the learning experiences. Throughout the process students have time for reflection, allowing them to refocus on how what they are learning and experiencing affects the driving question.

MWEE Guide

[What is a MWEE?](#)[Why MWEE?](#)[Developing Your MWEE](#)[Promoting Your MWEE](#)[Funding Your MWEE](#)[Download the Guide](#)[Download the Toolbox](#)



Thank You!

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