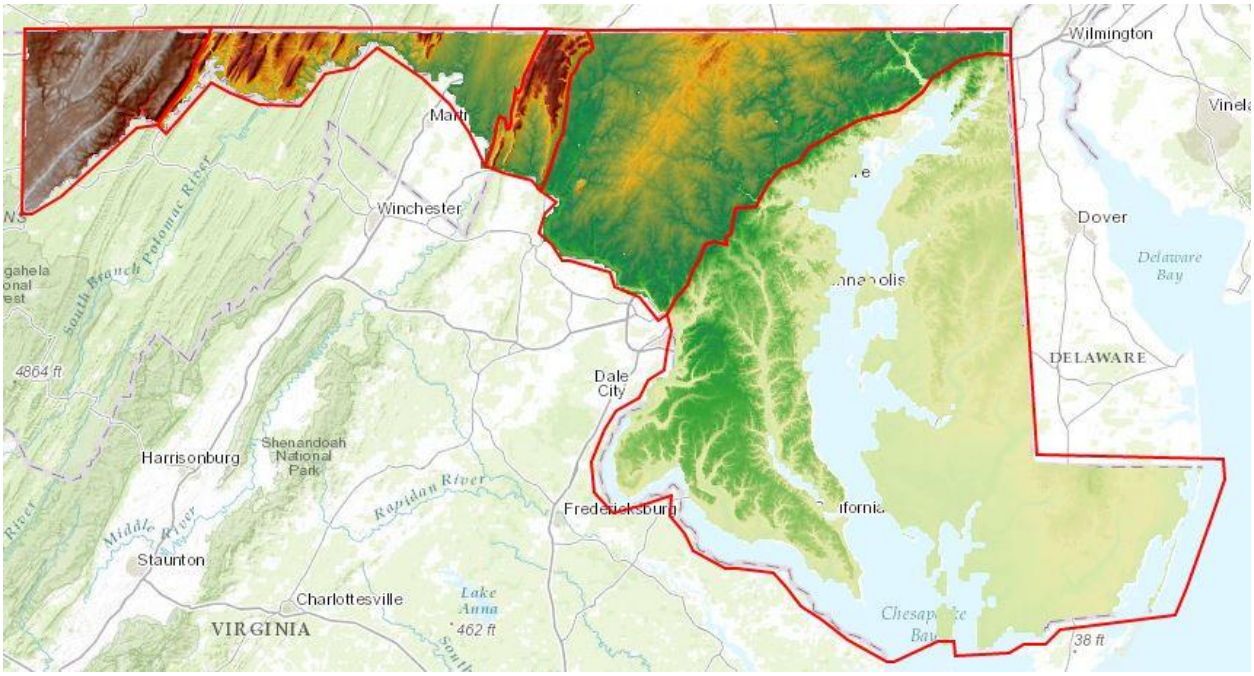
Integrating Chemistry & Earth Science

WEATHERING, EROSION & DEPOSITION MODULE

LESSON 5:

WEATHERING, EROSION AND DEPOSITION IN THE LOCAL ENVIRONMENT



THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

BALTIMORE CITY PUBLIC SCHOOLS

NSF

Cary Institute of Ecosystem Studies

ACKNOWLEDGEMENTS

ICE Leadership Team

- Alan R. Berkowitz, Head of Education, Cary Institute
- Joshua Gabrielse, Director of Science, City Schools
- Kevin Garner, Coordinator of Science, City Schools
- Kia Boose, Secondary Science Specialist, City Schools
- Vonceil Anderson, Curriculum Writer, City Schools
- Jonathon Grooms, Assistant Professor of Curriculum and Pedagogy, George Washington University
- Kevin Fleming, Graduate Research Assistant, George Washington University
- Mary Ellen Wolfinger, Doctoral Student, George Washington University
- Bess Caplan, Ecology Education Program Leader, Baltimore Ecosystem Study
- Tanaira Cullens, Education Assistant, Baltimore Ecosystem Study
- Chelsea McClure, Education Assistant, Baltimore Ecosystem Study
- Martin Schmidt, Upper School Science, McDonogh School

The following lesson and associated materials are part of the Integrating Chemistry and Earth science (ICE) Urban Heat Island Module. The Module brings together important concepts from Earth science and chemistry to help students build an understanding of why urban areas have higher temperatures both during the day and at night, than their rural counterparts.

ICE Partners

Cary Institute of Ecosystem Studies
BALTIMORE CITY PUBLIC SCHOOLS
THE GEORGE WASHINGTON UNIVERSITY WASHINGTON, DC

This material is based upon work supported by the National Science Foundation under Grant #DRL-1721163*. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.*

Lesson 5: Weathering, Erosion and Deposition in the Local Environment

Driving Question: *Where do we find evidence of weathering, erosion, and deposition in the local environment?*

Summary: Students will apply their knowledge of the **cause and effect relationships** of weathering erosion and deposition to their local environment in this lesson. As weather permits, student will go outside to **collect and analyze evidence** of weathering in the "Schoolyard Weathering and Erosion Treasure hunt."

Activity Description:

- **Opening Activity Photo Slideshow**: Challenge students to identify erosion and deposition as they watch a slideshow.
    - Show the *Baltimore Weathering and Deposition Photos* slideshow.
    - As the slide show proceeds, students should record how many images they see of erosion and how many images they see of deposition. In some cases, the image may show both processes.
    - Play the slide show once or twice then discuss the results as a class.
    - **Discussion Prompt:** How could you tell which images showed erosion and which images showed deposition?
- **Evidence of Weathering in the Schoolyard/Neighborhood:** In this activity students will move from images to real-world experiences by going outside to find and document examples of weathering and erosion.
    - Students go outside to examine the area around the school and gather data regarding weathering and erosion.
        - Worksheet: Schoolyard Weathering and Erosion Treasure Hunt
    - Upon returning to the classroom have students discuss their observations of patterns and cause and effect with their shoulder partner.
        - Share analysis with class.
    - **Discussion prompt:** What comparisons did you make? What kinds of weathering or erosion did you find?
- **Examine Maps and Other Visualizations of Weathering in the Baltimore Region:** With the guidance of the teacher, students will expand their view from local to regional. They will examine the effects of weathering in Baltimore, and Maryland as a whole.
    - Go through the PowerPoint presentation *MD Landforms and Weathering* to review reasons why some Maryland rocks weather more easily than others.
        - **Discussion Prompt:** What evidence presented here supports the claim that different rock types weather differently and shape the topography of Maryland?

EL Support: Purposefully choose one or more of the following options based upon student needs or formative assessment data to have students process and engage with content.

- Link concepts to students' background experiences
- Reduced vocabulary load
- Provide written notes
- Provide visuals

Differentiated Instruction: Purposefully choose one or more of the following options based upon student needs or formative assessment data to have students process and engage with content.

Utilize Pear Deck to allow students to work through the MD Landforms and Weathering slides as their own pace and annotate their ideas directly on the slides.

Lesson Summary: Students should have an idea of the following: Evidence of weathering includes broken items, such as sidewalks, curbs, rocks, cracks in the road, rusted items, etc. Evidence of erosion includes areas where the soil has been washed away, and on windy days students may see erosion if wind is blowing dust, dirt, leaves, etc. Evidence of deposition: include areas where rust (or other types of oxidation) has stained nearby structures, piles of dirt or sand, etc. Evidence of physical weathering include: the broken pieces that are still the same substance. Evidence of chemical weathering include: oxidized products, such as rust. Students should be asking questions like here does it all end up once it leaves here?

Schoolyard Weathering and Erosion Treasure Hunt

Date: _____ Your Name(s): _____

This activity is intended to guide you in searching the schoolyard for good evidence of weathering and erosion. Look for locations, environments, objects, places, or other features in the school grounds and the outside of the building itself. As you locate examples of weathering and erosion, record the location in the chart below. Try to compare weathering and erosion of two different sites. Use the word box at the bottom of the page to help you identify specific processes causing or preventing the weathering or erosion.

Change	Location	Chemical/ Physical	Specific process	Observations	Compare/contrast your two locations
Rust W or E					
Impact W or E					
Freeze/thaw W or E					
Water W or E					
Wind W or E					
Acid Rain W or E					
other (list name): W or E					

Word Box		
oxidation	friction	resistant
expansion	gravity	soft
contraction	cleaving	dissolution