



The James River Association (JRA) partnered with Lynchburg Water Resources (LWR) to deliver an innovative and immersive environmental education program which connected 4th graders in Lynchburg City Schools to their James River through a Meaningful Watershed Educational Experience (MWEE). Throughout the 2023-2024 school year 141 4th grade students and 8 teachers, at two Title I elementary schools, explored the overarching question - How do our actions help or hurt local waterways and ultimately the Chesapeake Bay watershed? - through the four essential components of a MWEE tailored to the urban environment of the City of Lynchburg.

The James River Association had a wonderful time working with the teachers and students to identify and investigate locally relevant environmental issues. We helped teachers and students develop an understanding of their personal connection to the watershed, and shared knowledge and skills through student-led stewardship action projects.

Key program activity included:

#### 1. Professional Development

On February 27, 2024, JRA and LWR provided a one day/4-hour professional development (PD) session for the 4th grade science teachers. Hosted at JRA's Upper James River Center located at Riveredge Park, 8 teachers had the opportunity to collaborate with their peers. Teachers were guided through the three learning stations students encountered during the field experiences, and become familiarized with the MWEE curriculum and action project facilitation process.

#### 2. MWEE Element 1 - Class Lessons/Issue Definition

During this first phase of the MWEE, students and teachers worked together with JRA and LWR educators in the classroom to define environmental issues that impact the James River and the Chesapeake Bay watershed. Guided by the overarching question: How do our actions help or hurt local waterways and, ultimately, the Chesapeake Bay watershed? students explored pollutants common within the City of Lynchburg, such as stormwater runoff, sediment, litter, and dog waste. Students reviewed the water cycle using an interactive game where they explored ways that water moves throughout the environment to understand better how water pollution can impact more than just aquatic life. After class lessons, students reflected on their experiences and were introduced to their student field notebook. They made their first entry into their notebook to reflect on the in-class activities focused on sediment reductions and prepared for the field experience. The notebook was used throughout the MWEE program to guide students through data collection, reflection, writing, and reading, which have a strong focus within LCS.

#### 3. MWEE Element 2 - Field Experiences

Approximately 30 students each day, depending on the size of the 4th-grade classes, were engaged in a field experience at JRA's Upper James River Center at Riveredge Park. Guided by JRA and LWR educators students rotated between three learning stations with approximately 10 students per group. Each station lasted approximately 60 minutes (15 minutes for introduction, 30 minutes for the lesson, and 15 minutes for

reflection). After the final rotation, students joined together for a synthesis and conclusion group activity reviewing the day.

The group conclusion activity, Piecing It All Together, prompted students to complete the statement, "I can protect my watershed by \_\_\_\_\_." Educators guided each student to complete a large paper puzzle piece through both writing and drawing. Students shared actions they could take to protect their watershed, such as picking up litter, planting trees, and using a reusable water bottle. They then shared their puzzle pieces and action ideas with the group as their exit ticket for the day. Educators kept the puzzle pieces and combined them into the shape of a river, providing a visual representation to students that a single action, though it might feel small, could create a larger impact when combined through a group effort. This completed puzzle was used later in the program to help students recall the field experience at the start of their stewardship action project. During field experiences, students investigated their local surroundings in small groups and were introduced to and asked to follow "Leave No Trace" guidelines. Students had the opportunity to eat lunch and enjoy their surroundings at two different locations. Additionally, students used their field notebooks, with writing prompts and activities, to provide reflection and data collection opportunities correlated to each station.

#### 4. MWEE Element 3 - Synthesis and Conclusions

The synthesis and conclusion elements were incorporated into the in-class and field experience portions of the MWEE. The field notebooks were a great assessment tool for integrating synthesis and conclusion. Students used the notebooks to record data, reflections, and observations throughout the program (pre, during, and post-field experience) and drew conclusions based on the information collected and recorded throughout their learning experience. The goal of utilizing field notebooks as a synthesis and conclusion tool was for students to gain ownership over their data and environment, and better understand the impact of their action project. This first introduction to the field notebook during in-class lessons guided students in drawing conclusions from in-class lessons and prepared them to use the notebook during the field experience. Guided by JRA and LWR educators, the field notebooks were incorporated into each of the field experience stations with time allotted for students to record data and draw conclusions by utilizing data graphs, tables, drawings, writing prompts, and/or activity pages that correlated with and emphasized the station's learning goals. Examples of data students gathered included biotic water quality data (focused on macroinvertebrates), water pollution investigation, and aquatic food chain data.



## 5. MWEE Element 4 - Stewardship Action Projects

This final phase included a student-led stewardship action project. From the information gathered during the issue identification and field experience, students identified specific problems and planned action projects to address them. The problems identified by the students were: fertilizer running off into the water when people put it on their lawns, dog poop getting into the water when it rains, people littering, then trash getting into the James River, and sediment getting into the river because of a lack of erosion control. Projects addressed these water-related issues within the watershed and were visible within the school and/or community to inspire behavior change in the students' communities. Students were guided in this process in the classroom by their teachers. Teachers received training on this process during the PD, and lesson plans were correlated with this action project. Several ideas brainstormed with the students included school campus beautification, the impact of trees on school grounds, and stormwater awareness issues. With assistance from JRA and LWR, students planted four trees at the school, painted two storm drains, and cleaned up litter from their campus.