

STEAM: Grand River Watershed Decision-Making (Grades 6-12)

Program Description:

In Watershed Decision-Making, learners will explore how land use and land features impact watersheds by rotating through three highly interactive stations, interfacing with an Augmented Reality sandbox, a floodplain simulator, and historic maps. Students will receive information on how decisions are made in watersheds and will hear about a real proposed restoration project for the Grand River in Grand Rapids. To conclude, participants will develop a position with a promotional sign or symbol from the perspective of an assigned stakeholder in which they will have to decide whether or not they support the proposed restoration and provide reasons.

What content standards align with this program?

NGSS Performance Expectations: LS2. Ecosystems: Interactions, Energy, and Dynamics; ESS3. Earth and Human Activity; ETS1. Engineering Design

NGSS Science and Engineering Practices: Developing and Using Models, Constructing Explanations and Designing Solutions, Engaging in Argument from Evidence, Obtaining, Evaluating, and Communicating Information

ELA Common Core Standards by Domain: Comprehension and Collaboration, Presentation of Knowledge and Ideas

Michigan K-12 Social Studies Standards: H3 The History of Michigan and the Great Lakes Region; G2 Places and Regions; G3 Physical Systems; G5 Environment and Society; C6 Citizenship in Action; E1 The Market Economy; P1 Reading and Communication; P2 Inquiry Research and Analysis

Museum Program Strand:

Empower individuals to use observations and inquiry to understand arguments and design creative solutions.

This program is aligned with the following Museum Learner Outcomes:

Holders of Foundational Knowledge	Masters of Fundamental Literacies	Creative Thinkers and Doers	Generous Collaborators for Tough Problems	Learners For Life	
X	X	X	X	X	

What will students know and be able to do after completing this program?

- Learners will be able to describe examples of land use and the effect of land-use and land features on watersheds.
- Learners will be able to understand the complex and collaborative role of government, industry, organizations, and citizens in making watershed decisions.
- Learners will be assigned a stakeholder group; they will take a position and create an argument about a proposal to restore the Grand River, considering biological, social, and economic factors.

What questions will students answer?

- What is a watershed?
- What is a stakeholder? Who are stakeholders in my watershed?

- What is land-use? How do different types of land use impact the watershed?
- How can we compromise and make watershed decisions that consider biological, social, and economic concerns?
- What is the current proposal to restore the Grand River? What will the restoration entail?
- How can I take the perspective of a stakeholder group and evaluate the restoration proposal?

Key Vocabulary

Watershed
 Nonpoint source pollution
 Land use
 Floodplain
 Green infrastructure
 Rehabilitation
 Stakeholders
 Biological/social/economic

Materials List and Setup:

Floodplain simulator
 Augmented Reality Sandbox
 Historic, Current and Future City Maps
 Stakeholder Cards
 Poster paper and markers
 Activity Station handout

Program Activities: 90 minutes

1. Engage:
 - a. Instructor will share program goals with the students and ask for students' prior knowledge of watersheds and land use.
2. Explore:
 - a. Students will participate in 3 short station activities--Augmented Reality sandbox, floodplain simulator, historic maps-- to examine how land-use and land features impact watersheds. They will record observations and responses on a handout.
3. Explain:
 - a. The instructor will deliver content knowledge on how decisions are made in a watershed--emphasizing the complex and collaborative work of government, tribes, and stakeholders.
 - b. The instructor will also present the proposed restoration project for the Grand River in Grand Rapids.
4. Extend/Elaborate:
 - a. Students will develop a position with a promotional sign or symbol from the perspective of an assigned stakeholder (Recreational fisherperson, Natural Resource Agency, Canoe Rental business, downtown restaurant and store owners, City of Grand Rapids officials, people looking to work and live in Grand Rapids).
 - b. The students will have to decide whether or not they support the proposed restoration and provide reasons.
 - c. They will present their poster to the class.
 - d. To wrap up, the instructor will prompt students to reflect on what types of reasoning were used in the posters: biological, social, or economic.

