Impacts of Computing: Runoff and Erosion

Participant Name:	**Kaitlin Prashaw**
District:	**Massena Central School District**
Grade Level:	**6**
Subject/Course:	**Technology**
Cross-curricular Link:	**Science**
Approximate Time (IN MINUTES):	**60**

CONTENT AND SKILLS

Learning Objectives:

- **Identify** computing technologies used by geologists to study erosion and runoff.
- **Explain** how computing technologies help control runoff and erosion.
- **Analyze** the influence of computing technologies on society and culture.
- **Evaluate** the impact of computing technologies on government agencies' ability to manage erosion and runoff.
- **Create** a presentation on the role of computing technologies in studying and managing runoff and erosion.

Essential Questions (optional):

- What impacts does technology have on the world around us?
- How does technology impact data collection?

Students' I can statements . . .

- I can describe runoff and erosion measurements using technology.

How will you meet the needs of SWD and ELL/MLL students?

- Peer Support: Students will work in groups
- Teacher Aide: Students will have a TA available to circulate for help.
- Multiple Modalities: Students will have digital access for Chrome Extensions

NYS COMPUTER SCIENCE AND DIGITAL FLUENCY STANDARDS

List all standards that authentically align (e.g., K-1.CT.4)

- **4-6.IC.1**: Describe computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.

OTHER SPECIFIC STANDARDS (e.g., Content, SEL Benchmarks)

List all standards that authentically align

https://www.p12.nysed.gov/sss/documents/SELBenchmarks2022.pdf

MS-ESS2-2: **Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.**
This standard includes understanding how processes such as weathering, erosion, and deposition shape the Earth's surface. Students learn about how water, wind, ice, and biological activity break down rocks and move sediments, which contributes to runoff and erosion.

Disciplinary Core Ideas (DCIs):

- **ESS2.C: The Roles of Water in Earth's Surface Processes**
  - **Water's Role in Erosion:** Water is a major agent of erosion and runoff, which can transport sediment and reshape landforms.
  - **Impact of Water on Earth's Surface:** Students learn about the impacts of surface water and groundwater on the landscape, including how it can lead to the formation of valleys, canyons, and deltas.

Crosscutting Concepts:

- **Stability and Change:** Students explore how Earth's surface features change over time due to the interplay between erosion, deposition, and other geoscience processes.

Science and Engineering Practices:

- **Developing and Using Models:** Students might create models to simulate runoff and erosion processes, helping them visualize and explain how water movement can shape the land.
- **Constructing Explanations:** Using evidence from investigations, students explain how water contributes to changes in Earth's surface.

These standards encourage students to engage in hands-on activities and investigations to understand the processes of runoff and erosion, and how they contribute to the dynamic nature of Earth's surface.

INSTRUCTIONAL PLAN
List the steps of the lesson, including instructions for the students.
Add and highlight Standard Indicator next to activity that aligns

Lesson Activities
Introduction (10 minutes)

1. Hook: Begin with a short video or animation showing the effects of erosion and runoff.
2. Discussion: Pose questions to the class:
    - What is erosion? What is runoff?
    - How do you think technology can help us understand and manage these processes?
3. Objective Overview: Explain the lesson objectives and activities.

Research Activity (20 minutes)

1. Exploration:
    - Divide students into small groups.
    - Assign each group to explore the NYS Erosion and Sediments Bluebook, focusing on the section about Runoff Control (section 3).
    - Use the SchoolAI Text Leveler tool to ensure comprehension of the document.
2. Task:
    - Each group will research the Standard and Specifications for Grassed Waterway.
    - Identify and list technologies used to control runoff and erosion.
3. Guidance: Circulate the room to provide support and answer questions.

Presentation Preparation (15 minutes)

1. **Group Work**:
    - Groups will create a presentation that includes the following:
        - An explanation of the technologies used to study and control erosion and runoff.
        - How these technologies influence and are influenced by society and culture.
        - The impact on government agencies' ability to manage these processes.
2. **Tools**:
    - Encourage the use of presentation software (Google Slides, PowerPoint).
    - Provide templates if necessary for structure.

Presentations (10 minutes)

1. Group Presentations:
    - Each group presents their findings to the class.
    - Encourage students to ask questions and provide feedback.

Conclusion (5 minutes)

1. Review: Summarize key points from the presentations.
2. Reflection: Ask students to write a short reflection on what they learned about the impact of computing technologies on erosion and runoff management.
3. Exit Ticket: Collect reflections as an exit ticket.

Assessment

- Formative: Participation in group discussions and activities.
- Summative: Group presentations and individual reflections.

Extensions

- Homework: Research another example of how computing technologies influence environmental management.
- Advanced Activity: Create a digital poster or infographic summarizing the lesson's findings.

SPECIFIC NEEDS: MATERIALS / RESOURCES / TECHNOLOGY Add additional resources needed for this lesson such as instructional technology templates, images, videos, etc.
• Computers/tablets with internet access • NYS Erosion and Sediments Bluebook (section on Runoff Control) • Erosion and Runoff Video • SchoolAI Text Leveler tool • Presentation software (e.g., Google Slides, PowerPoint) • Projector or interactive whiteboard