

**Ohio Academic Content
Standards reinforced or introduced by
this program:**

Third Grade

- Science and Technology: 2, 3, 4, 5
- Physical Sciences: 1, 2
- Scientific Ways of Knowing: 3
- Scientific Inquiry: 10

Fourth Grade

- Earth and Space Sciences: 8, 10
- Science and Technology: 3
- Scientific Inquiry: 4
- Scientific Ways of Knowing: 2

Fifth Grade

- Earth and Space: 6
- Life Sciences: 5, 6
- Science and Technology: 1, 2, 3
- Scientific Inquiry: 3, 4
- Scientific Ways of Knowing: 1, 2, 3

Sixth Grade

- Earth and Space Sciences: 2
- Science and Technology: 1, 2, 3
- Scientific Ways of Knowing: 1

Seventh Grade

- Earth and Space Sciences: 4, 9
- Life Science: 5, 6
- Science and Technology: 2, 3, 4
- Physical Science: 1

Eighth Grade

- Earth and Space Sciences: 11, 13
- Science and Technology: 2, 3, 4

Ninth Grade

- Science and Technology: 1, 2, 3
- Physical Science: 19, 21, 22
- Scientific Inquiry: 3, 6
- Scientific Ways of Knowing: 6

Tenth Grade

- Earth and Space: 5, 6, 7
- Life Sciences: 15, 17, 18
- Science and Technology: 1, 2, 3
- Physical Science: 19, 21, 22
- Scientific Inquiry: 3, 6
- Scientific Ways of Knowing: 6

Eleventh Grade

- Earth and Space: 6, 12, 13, 14
- Life Sciences: 5, 9, 11
- Science and Technology: 1, 2, 3
- Physical Science: 3
- Scientific Ways of Knowing: 2, 8, 9, 10

Twelfth Grade

- Life Sciences: 8
- Science and Technology: 1
- Physical Science: 2, 3
- Scientific Ways of Knowing: 8, 9, 11

Evaluation Form

Please fill out the evaluation form and return it to Geauga SWCD. We appreciate your comments and suggestions. If you enjoyed the program and would like to see future programs offered please write a letter to the Geauga County Commissioners and thank them for funding the Geauga SWCD.

This brochure was created by the Staff of the Geauga Soil and Water Conservation District under the authority of the Board of Supervisors and assistance from the USDA-Natural Resources Conservation Service.

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Gauga SWCD Mission:

"To conserve, protect, and enhance the resources of Geauga County by providing leadership, education, and assistance to all."

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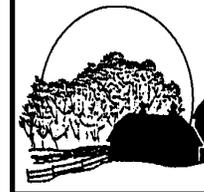
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**Geauga Soil and
Water Conservation
District**

Stream Team Detectives! Teacher Guide 3rd-12th Grade

Students will discover and utilize the Streamulator, a hands-on stream model. Students will be detectives and try to determine outcomes of different scenarios.



**Become a
Stream
Team
Detective!**

Running Water!

Fast moving water can carry heavy sediments including trees and large rocks. This fast moving water and debris causes erosion of the stream banks. This erosion typically takes place on the outside curve of a stream. As the water slows down in pools and along the inside curves or flood plains sediments are deposited. Areas of cobble stones and coarse gravel sediments indicate relatively fast water. Sand and fine sediment deposits indicate slow moving water. Over time the course of a river changes with erosion and sedimentation. A large tree can form a dam in a stream and deflect the water changing the course. Younger streams tend to follow a straight course, older streams meander back and forth. Close observation of a stream can clue you in to the history of the stream. Understanding the process of stream erosion and deposition can lead to proper land use near a stream. Planners will know which areas to avoid due to erosion or flooding and even predict the future course of the stream!

Vocabulary

Headwaters-the upper tributaries of a river.

Gradient-the slope or rate at which the elevation of a river or stream decreases.

Riparian Zone- the area of land connected with or immediately adjacent to the banks of a stream.

Point Bar-accumulated sediment on the inside of a river meander.

Meander-a rounded, or "S"-shaped bend or loop usually seen in an "older" or "mature" river.

Mouth- part of a river where it flows into another body of water.

Delta-the deposit formed at the mouth of a stream or river as it enters another body of water, slows its flow rate, and drops its load of sediment. Many deltas are triangular in shape.

Cut Bank- that portion of a riverbank most subjected to the erosive action of the river, it occurs on the outer edge of a meander curve, where velocity is greatest.

Pre-Visit Activities- Ethi-Reasoning

-Ask students to list some current local, national, and global environmental concerns. Record their responses on the board. Explain that these are not easy problems to solve. Each problem requires a lot of knowledge and thought to decide what to do.

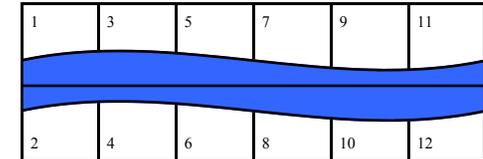
-Divide the class into four groups. Give each group two dilemma cards. The group has to read the cards and come up with how they would handle the issue. They need to be prepared to support their decision. **See student copy pages for dilemma cards.**

-Once the groups are ready, have them share their dilemma and their plan of action. Have the class start a debate/discussion showing different views of how to handle the dilemma.

-Adaptations-Have students create dilemma cards in reference to current local issues. Have upper grade levels research a specific environmental issue and create individual views and plans of action. Hold a class forum debating the different topics and views. Ask if their plan would differ if they were a business owner, farmer, conservationist, organic farmer or developer.

Post Visit Activities- Sum of the Parts

-Before the activity take sheets of 11 X 17 paper lay them out in two rows with the 11" sides touching. Draw a river on the connecting sheets. Number each sheet in order.



-Inform the students that they have just inherited valuable riverfront property and 1 million dollars. Pass out the "pieces of property" in random order to each student. Explain that they need to draw/design how they are going to use their land and money.

-When the students are complete have them look for the number and explain to them they are pieces to a puzzle and they must put them in order.

-Once the riverfront property puzzle is assembled, have the student with the first pieces of property explain how they used the money and land. Have them list any possible pollution from their property. Use paperclips, pencils, cups, etc. to represent pollution and have them pass the pollution to the next property owner.

-Have a class discussion on how pollution is passed downstream and what can be done to prevent this from happening. Have each student write a paragraph detailing how they could change their land use to help prevent pollution.

Pre/Post visit activities are adapted from Project WILD and Project WET! and may need to be adjusted depending on the grade level.