Wetland Water Quality Studies (Biological Assessment)

Introductory Activity: Wetland Metaphors / Watershed Mapping
Field Activity: Macroinvertebrate Matching, Outdoor Field Study

Description: As one component of water quality research, students collect, identify, and analyze benthic macroinvertebrate populations. Hester Dendy samplers are placed in wetland two weeks prior to collection and removed the day of the program or students will properly collect samples during the field activity. Using dichotomous keys, flow charts, and interpretive macroinvertebrate identification software, students identify and count different macroinvertebrate species, categorize them based on pollution tolerance, and create distribution graphs. This information is analyzed to draw conclusions about local wetland water.

Objectives: By the end of the program, the students will be able to:

- Define the terms watershed, wetland, metaphor, benthic, macroinvertebrate, and indicator species
- Identify local watersheds by name and number
- Describe how macroinvertebrates function as indicator species
- Explain how different changes in a wetland can impact macroinvertebrate populations
- Describe unique characteristics and functions of wetland ecosystems
- Identify different ways wetlands benefit plants, animals, humans, and the environment
- Use simple dichotomous keys and flow charts to correctly identify different macroinvertebrates
- Construct and interpret a distribution graph
- Examine their role and formulate ways they can aid in maintaining healthy water
- Recognize the overall health and water quality of a wetland is based on physical, chemical and biological analysis

Indiana Academic Standards for Science:
Fourth: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.3, 2.4, 2.5, 2.7, 3.3, 4.2, 4.3, 4.4, 4.6, 5.4, 6.1, 6.2
Fifth: 1.1, 1.2, 1.3, 1.5, 1.6, 2.1, 2.2, 2.4, 2.7, 2.8, 4.4, 4.5, 4.7, 5.7, 5.8, 5.9, 5.10
Sixth: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.2, 2.3, 2.5, 2.6, 2.7, 2.8, 3.8, 4.1, 4.3, 4.8, 4.13, 5.2, 5.4
Seventh: 1.1, 1.2, 1.3, 1.4, 1.7, 1.8, 1.9, 2.7, 2.8, 4.1, 4.2, 4.6, 4.8, 4.9, 4.14, 5.3, 5.4, 7.1
Eighth: 1.1, 1.2, 1.3, 1.8, 2.4, 2.5, 2.7, 2.8, 2.9, 3.6, 4.8, 5.8, 7.1, 7.2, 7.3, 7.4, 7.7
High School: Env.1.3, Env.1.4, Env.1.6, Env.1.10, Env.1.29, Env.1.34, Env.1.35, ES.1.10, ES.1.25, B.1.17, B.1.37, B.1.38, B.1.40, B.1.41, B.1.43, B.1.45

Indiana Academic Standards for Mathematics:
Fourth: 1.1, 1.2, 1.3, 1.9, 2.5, 2.6, 6.1, 6.2, 7.1, 7.3, 7.4, 7.5, 7.6, 7.8, 7.9
Fifth: 1.2, 2.1, 6.1, 7.1, 7.3, 7.4, 7.5, 7.7, 7.8
Sixth: 2.1, 2.2, 6.1, 7.1, 7.4, 7.5, 7.6, 7.9, 7.10
Seventh: 2.1, 6.1, 6.2, 6.4, 7.1, 7.4, 7.6, 7.7, 7.10, 7.11
Eighth: 2.1, 6.1, 6.2, 7.1, 7.4, 7.6, 7.7, 7.10, 7.11

Excellence in Environmental Education – Guidelines for Learning (Pre K – 12):

Fourth Grade	**Fifth – Eighth Grade**	**Ninth Grade**
Strand 1 A, C, D, E, G	Strand 1 C, D, E, G	Strand 1 C, D, E, G
Strand 2.2 A, C	Strand 2.2 A, B	Strand 2.2 A, B, C
Strand 2.3 A	Strand 2.4 A, B, D	Strand 2.4 A, D
Strand 2.4 A, D	Strand 3.1 C	Strand 3.1 C
Strand 3.1 C	Strand 4 D	Strand 4 D
Strand 4 D		

Please note specific learning objectives and academic standards will vary based on timeframe, location, availability of resources, and tailored content of programming.