

## Wetland Water Quality Studies (Chemical Assessment)

Introductory Activity: Wetland Metaphors / Watershed Mapping

Field Activity: Tools Explanation, Outdoor Field Study

**Description:** As one component of water quality research, students use Vernier LabQuest scientific handhelds and sensors to measure wetland pH, dissolved oxygen, temperature and turbidity. Electronic field notebooks, running interactive water quality software, aid students in hypothesis creation, data entry, observation records and scientific conclusions concerning local wetland water.

\*If desired, to demonstrate the principles of wet chemistry, nitrate and phosphate levels can be measured using a CHEMetrics multi-analyte photometer.

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

- Define the terms wetland, watershed, pollutants, metaphor, pH, dissolved oxygen, and turbidity
- Identify local watersheds by name and number
- Name different sources of pollution
- Explain how different chemical properties of a wetland affect water quality
- Describe unique characteristics and functions of wetland ecosystems
- Identify different ways wetlands benefit plants, animals, humans, and the environment
- Use scientific investigation tools and mathematics to collect chemical water quality data
- Apply the scientific method
- 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 assessment

### Indiana Academic Standards for Science:

**Fourth:** 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.3, 2.4, 2.5, 2.7, 3.3, 4.7, 6.1, 6.2

**Fifth:** 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.4, 2.5, 2.7, 2.8, 5.1, 5.7, 5.8, 5.10

**Sixth:** 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.1, 2.2, 2.3, 2.8, 3.8, 4.8, 5.2, 5.4

**Seventh:** 1.1, 1.2, 1.3, 1.4, 1.7, 1.8, 1.9, 2.3, 2.6, 2.8, 3.12, 3.13, 4.14, 5.4, 7.1

**Eighth:** 1.1, 1.2, 1.3, 1.8, 2.2, 2.4, 2.5, 2.7, 2.9, 3.6, 5.1, 5.8, 5.9, 7.1, 7.2, 7.3, 7.4, 7.7

**High School:** Env.1.4, Env.1.6, Env.1.10, Env.1.15, Env.1.29, Env.1.34, Env.1.35, ES.1.10, ES.1.25, B.1.37, B.1.38, B.1.40, B.1.41, B.1.45

### Indiana Academic Standards for Mathematics:

**Fourth:** 1.1, 1.2, 1.3, 1.9, 2.5, 2.6, 7.1, 7.3, 7.4, 7.5, 7.6, 7.8, 7.9

**Fifth:** 1.2, 2.1, 2.5, 5.6, 7.1, 7.3, 7.4, 7.5, 7.7, 7.8

**Sixth:** 2.1, 2.2, 2.3, 5.1, 5.6, 6.3, 7.1, 7.4, 7.5, 7.6, 7.9, 7.10

**Seventh:** 2.1, 3.3, 6.2, 7.1, 7.4, 7.6, 7.7, 7.10, 7.11

**Eighth:** 2.1, 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, B, C, D, E, F, G	Strand 1 A, B, C, D, E, F, G	Strand 1 A, B, C, F, G
Strand 2.2 C	Strand 2.1 B	Strand 2.1 B
Strand 2.3 A, C	Strand 2.3 A	Strand 2.2 A
Strand 2.4 A, B, D	Strand 2.4 A, B, D, E	Strand 2.4 A, B, D
Strand 3.1 C	Strand 3.1 B, 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.