

Systems Thinking and Green Woods Charter School’s EIC Model

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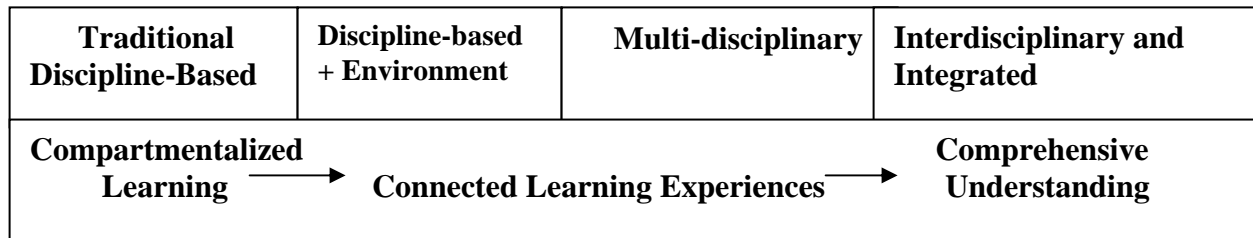
“The natural and designed world is complex; it is too large and complicated to investigate and comprehend all at once. Scientists and students learn to define small portions for the convenience of investigation. The units of investigation can be referred to as “systems.” A system is an organized group of related objects or components that form a whole. Systems can consist, for example, of organisms, machines, fundamental particles, galaxies, ideas, numbers, transportation, and education. Systems have boundaries, components, resources flow (input and output), and feedback”...Nat’l Research Council, 1996

“Systems” thinking focuses on how systems’ components interact with the components of other systems. Learning about systems is not another subject added to the curriculum; it is instead a tool used to model and understand relationships in the real world and in the curriculum. The systems-thinking process helps students understand the complex interactions between NATURAL and SOCIAL systems, and develops strategies that facilitate the solving of complex problems.

Through the EIC Model, (Using the Environment as an Integrating Context) educators help students develop their understanding of the interactions among natural and social systems and their community’s cultural characteristics. Studying the natural systems in their region may involve exploring natural habitats, ecosystems, or the area defined by the local watershed. Through investigation of local social systems students may study agricultural, industrial, political, legal or cultural structures.

Students can apply higher-level thinking and creative problem solving when they explore the interface between the natural and social systems that comprise their community. They develop a more comprehensive understanding of the complexity of real-world concerns as they investigate how their natural surroundings interact with the diverse cultural, economic, and political systems. In addition, students can apply their knowledge and skills, from a variety of subject areas, to studying the systems that define their community.

Integrated-interdisciplinary instruction focuses on developing an understanding of the local community by studying the relevant social and natural systems, structures, functions and relationships. Students who learn within the framework of the EIC Model begin to recognize connections that they were previously unaware of and see how what they are learning fits together to explain the world around them. In addition to providing students with their specialized disciplinary knowledge and skills, EIC Model teaching teams provide students with a means by which they can gain a holistic understanding of the natural and social systems that constitute their community.



The foundation for Green Woods EIC Curriculum is the Environment and Ecology Standards which focus on the real world and how it works. Systems are found in the natural as well as the social world we live in. In order to teach about the environment we must have students look at how the things we do impact BOTH systems. These impacts can be positive as well as negative. In order to make informed decisions we must look at complex issues in a much broader light. Each part of a system is connected and therefore affected.

What is a System?

The scientific idea of a system implies detailed attention to inputs and outputs and interactions among the system’s components. A system is comprised of:

- Components
- A specific function
- Inputs-things that influence the system; and
- Outputs – things that the system influences; and
- Feedback from the environment that provides information about outputs, helps to maintain stability and determines the system’s behavior over time.

Systems to consider when creating interdisciplinary units:

- **Natural Systems**
 - Wetlands
 - Water
 - Plants
 - Ecosystems
 - Soil
 - Agriculture
 - Forest
 - River
- **Social Systems**
 - Community
 - School
 - Governments: Local, Regional, State, and Federal
 - Economics
 - Transportation
 - Agriculture
 - Cultural
 - Religion

“Systems-Thinking” essential questions incorporated in Green Woods middle school curriculum:

- How did rivers & forts affect the outcome of the French/Indian War?
- How does the US Government address global problems?
- What is global citizenship & how does it relate to global warming?
- How did the environment affect early economic systems?
- How did the location of resources & trade affect ancient world economies?
- How do nations work together to address global problems?
- How is saltwater different than fresh? How do these differences affect ecosystems and human societies?
- What influence did the Yellow Fever epidemic have on medicine, public health and the political climate of Philadelphia and the United States during this time period?
- Do human activities have any impact upon weather/climate?
- How did the coal mining industry shape the economic and social development in towns in Northeastern Pennsylvania during the late 1800’s and early 1900’s?

References

National Research Council. (1996). National science education standards. Washington, D.C.: National Academy Press

American Association for the Advancement of Science. (2001). Atlas of Science Literacy. Washington, DC.: AAAS and NSTA

Planning Guide for Implementing the EIC Model in Your School www.seer.org