



Next Generation Science Standards

Lesson: [Environmental Decision Making](#)

Activity: [Hydropoly – A Decision –Making Game](#)

Prior Knowledge Should Include:

- Societal activities have had major effects on the land, ocean, atmosphere and even outer space. Societal activities can also help protect Earth’s resources and environments.
- Energy and fuels humans use are derived from natural sources and their use affects the environment. Some resources are renewable over time others are not.

Performance Expectations:

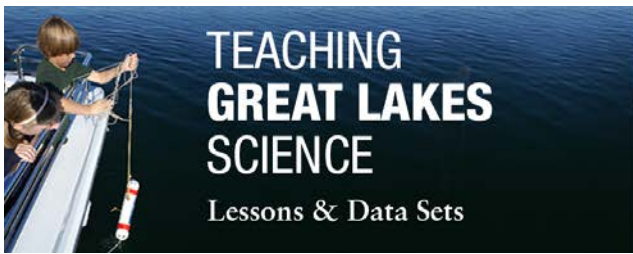
- MS-ESS3-4 Earth and Human Activity. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s Systems.
- HS-ESS3-2 Earth and Human Activity. Evaluate competing design solutions for developing, managing and utilizing energy and mineral resources based on cost-benefit ratios.
- HS-ESS3-4 Earth and Human Activity. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

Disciplinary Core Ideas:

- **ESS3.A Natural Resources:** All forms of energy production and other resource extraction have associated economic, social, environmental and geopolitical costs and risk as well as benefits. New technologies and social regulations can change the balance of these factors.
- **ESS3.C Human Impacts on Earth Systems:** Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and preclude ecosystem degradation. Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.
- **ETS1.B Developing Possible Solutions:** When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts.

Practices:

- **Engaging in Argument from Evidence (7)** – Progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).
- **Constructing Explanations and Designing Solutions (6)** – Progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific knowledge, principles and theories.



Crosscutting Concepts:

- **Cause and Effect:** Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given context and used to predict and explain events in new contexts.
- **Stability and Change:** For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

[Next Generation Science Standards](#)