

Integrating Sustainability into the Science Classroom



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What is Sustainability?

With your neighbor, discuss the following:

- How would you describe or explain the concept of sustainability?
- What ideas about sustainability might students bring from their everyday lives?



Common Sustainability Issues

- **Resource and energy use:** How can a home be made more energy efficient?
- **Water:** How should wastewater be treated before it is released into the environment?
- **Health:** How should research funding be allocated to address global health issues?
- **Biodiversity:** Where should conservation efforts be focused?
- **Food and nutrition:** Should foods be genetically modified?



Contaminants and the Water Cycle

In this activity, students simulate the travels of a water molecule in a water droplet through the water cycle.

- Use the cards to complete the activity.



Contaminants and the Water Cycle

- Identify potential content and processes that could be taught using this sustainability issue



Activity: Contaminants and the Water Cycle

Content-based approach

Content: Water cycle

Process: Modeling

Issue-based approach

Content: Water cycle plus potential for:
Water pollution,
Water quality,
Water treatment,
Health effects associated with contaminated water

Process: Modeling



3 Pillars of Sustainability

■ Economic

- People desire the highest standard of living that they can achieve. The generation of economic wealth supports adequate access to health care, jobs, education, etc.

■ Social

- To have a sustainable future, peoples' needs for clean air, water, resources, access to health care, etc must be met equally.

■ Environmental

- The Earth has limited resources which organisms need for survival and healthy life.



Sustainability and the issue of water pollution and clean water

- Think about the issue of water pollution and clean water in the context of the three pillars of sustainability.
 - Write down elements of the issue that fit into each of the three pillars.
 - Example: water treatment is part of the “Economic” pillar.



Water Pollution and Clean Water

Economic

- Water treatment
- Importing/exporting water
- Treatment of sick people

Environmental

- Water pollution

Social

- Equal access to health care/medical treatments



Sustainability can be viewed on three levels

- Personal
- Community
- Global

Discuss and record whether the factors you listed in each of the three pillars are at the personal, community, or global level.



Why Sustainability?

- Sustainability opens up more avenues to relevance for students.
- Sustainable issues relate to science.
- Sustainable living is where our society is going and will likely continue in the future.
- Sustainability decisions and scientific literacy are closely related - one has the potential to develop and inform the other.



Activity: Who Infected Whom?

- In this activity students take on the role of epidemiologists to investigate who is (or are) the carriers of the disease.
- Students make and test a hypothesis.



Activity: Who Infected Whom?

- Use the Cards to make a hypothesis in Part A.
- Use the dropper bottles to collect evidence and test the hypothesis in Part B.



Examine the following for the activity.

Record your ideas on chart paper:

- Content addressed
- Process skills taught
- Ties to the issue of sustainability
 - Three pillars
 - Personal, community, global levels



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