

# Integrating Issues of World Health into a Life Science Classroom

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# The Science Education for Public Understanding Program

- Science curriculum design and professional development
- Based at the Lawrence Hall of Science, University of California at Berkeley
- Designing science curriculum, working with teachers, and supporting quality science instruction since 1983
- Major funding for curriculum work from the National Science Foundation



# Science & Global Issues (SGI)

## Project Overview

- National Science Foundation Curriculum Development Project
- Uses sustainability as the unifying context for studying important biological concepts
- Inquiry-based, Issue-oriented science...
  - students talk, think, and discuss science content as it relates to personal, societal, and global Issues
  - students learn to use evidence in the decision-making process
- Embedded assessments & literacy strategies
- Research-based & extensively field-tested

# Science and Global Issues: Biology

Unit	Content focus	Sustainability focus
Sustainability	Interdisciplinary	Sustainability from a personal, community and global perspective
Living on Earth	Ecology	Human influence on ecosystems
World Health	Cell Biology	Global health issues
Feeding the World	Genetics	Use of genetically modified organisms
Maintaining Diversity	Evolution	Changes in and threats to biodiversity



# Sustainability

- Sustainability in the context of human development can be defined as:
  - Meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- Sustainability can be examined through three perspectives - environmental, economic, and social.
- Sustainability can also be considered on three levels - personal, community, and global



# Cell Biology: World Health

- A unit that focuses on sustainability from a health perspective.
- Students:
  - Study life at the cellular level.
  - Examine health issues across the world and over time.
  - Decide how to allocate limited funding to address problems of world health.



# Stem Cell Differentiation

- Activity occurs late in the unit (Activity 14 out of 18)
- Students investigate and discuss how stem cells become specialized cells.
- Students have learned about cell structure and function, processes of cells, and the cell cycle.



# Stem Cell Differentiation: Getting Started

- Transparency 14.1
- Students name some organs in the human body or other organism.
- Students express their ideas about how all of the specialized cells develop.



# Stem Cell Differentiation

- Read the introduction and Challenge.



# Stem Cell Differentiation

- Work with your partner to complete Procedure Steps 1-7.
- Read the Analysis Questions.



# Activity 15: Stem Cell Research

- Students read about:
  - current scientific research on use of embryonic stem cells
  - the social controversy over embryonic stem cells



# Stem Cell Research

- Complete the “Know” and “Want to Know” columns of the KWL.
- Complete the Reading. As you read, complete the “Learned” part of the KWL.
- Review the Analysis questions.



# Stem Cell Research

- Much of current scientific research on stem cells revolves around different types of stem cells and their potential to differentiate into specific types of cells.
- Scientists think embryonic stem cells provide a faster route to inventing therapies for diseases.
- People's qualms about stem cell research are related to destroying a human embryo to obtain its stem cells.



# Cell Biology Topics

- Cell structure and function
- Cell principle
- Stem cell differentiation
- Cell cycle
- Homeostasis
- Structure and function of cellular organelles
- Movement of materials across a membrane
- Fluid mosaic model
- Photosynthesis and cellular respiration
- Roles of proteins
- Abnormal behavior of cells
- Viruses



# Why Use Issue-Oriented Science?

- Integrates sciences & science with other subjects
- Realistic view of how science contributes to solving problems and the role of science in careers
- Real-world connections
- Use of science in daily life
- More authentic science, for ALL students
- Helps students learn science
- Improves student attitudes toward science



# Contact Information

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SEPUP website

(for this presentation and other  
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