

- In September 2000, the United Nations issued the Millennium Declaration, which proposed, as a goal, to “spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty, to which more than a billion people are currently subjected.” Ask students to form task groups that research the Millennium Development Goals and to develop plans that attempt to meet these goals utilizing science and technology. The full text of the Millennium Development Goals (MDGs) may be found at this web site: www.developmentgoals.org/
- In 2002, the NASA Earth System Science Pathfinder program helped launch the GRACE mission — two satellites that will reveal crucial information about the Earth and its atmosphere. For example, over the course of the five-year mission, the satellites will help scientists determine changes in the mass of ice sheets — a key indicator of climate change. Ask students to read the GRACE mission’s brochure, and write summaries of how GRACE hopes to help scientists better understand the Earth’s climate and climate change. The brochure may be found at this web site: www.csr.utexas.edu/grace/publications/brochure/
- Infant mortality, or the number of deaths of children under one year of age that occur each year, is a major indicator of a country’s overall health. Ask students to research and discuss the causes of infant mortality and locate countries with high levels of infant deaths on a map. Students may develop initiatives to lower infant death rates in various countries. Infant mortality statistics may be found at this CIA web site: www.cia.gov/cia/publications/factbook/rankorder/2091rank.html
- In 1955, scientist Albert Einstein and philosopher Bertrand Russell wrote about eliminating nuclear weapons, “The problem...stark and dreadful, and inescapable: Shall we put an end to the human race, or shall mankind renounce war?” The nuclear non-proliferation treaty includes language urging the main nuclear powers to work towards getting rid of all nuclear weapons. Ask students to research the number of nuclear warheads each main nuclear power has and identify countries that are purported to have or may be trying to develop their own nuclear weapons programs. Students may review government rationales throughout history for developing weapons of mass destruction and follow up with a mock U.N. debate regarding the elimination of these weapons.

Suggested Internet Resources

Periodically, Internet Resources are updated on our web site at www.LibraryVideo.com

- www.itu.int/wsis/
The United Nations-endorsed World Summit on the Information Society has adopted a Declaration of Principles and Plan of Action to help more people participate in the digital revolution.
- www.wto.org/english/tratop_e/devel_e/dev_wkqp_trade_transfer_technology_e.htm
The World Trade Organization has established a “Working Group on Trade and Transfer of Technology” that aims to facilitate the flow of technology to developing countries.
- www.bioethics.iastate.edu/outreach.html
Iowa State’s Office of Biotechnology offers teachers and students a Bioethics Outreach program to help communicate ethics issues related to the life sciences.

Suggested Print Resources

- Boon, Kevin Alexander. *Human Genome Project: What Does Decoding DNA Mean for Us?* Enslow Publishers, Berkeley Heights, NJ; 2002.
- Cheney, Glenn Alan. *Nuclear Proliferation: The Problems and Possibilities.* Franklin Watts, New York, NY; 2000.
- Marshall, Elizabeth L. *High Tech Harvest.* Franklin Watts, New York, NY; 2000.

TEACHER'S GUIDE

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TITLES IN THIS SERIES

- AFRICA: CHALLENGES IN THE 21ST CENTURY
- GENOCIDE
- GLOBAL ECONOMIC ISSUES
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- GLOBAL SCIENCE & TECHNOLOGY ISSUES
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GLOBAL SCIENCE & TECHNOLOGY ISSUES

Grades 9 & up

This guide is a supplement designed for teachers to use when presenting programs in the series, *Global Issues for Students*.

While science and technology have improved the standard of living for many people in the past fifty years, the global community has not been able to find solutions to major issues such as genocide, persistent poverty and environmental degradation. While the current wave of globalization has brought people in closer contact than ever before, it has also heightened our awareness of the tremendous gap in standards of living between the developed and developing worlds. *Global Issues for Students* will help viewers understand the historical causes, enduring effects and possible solutions to complex world problems. Students will increase their awareness of global issues that directly impact their lives, and in learning about these issues from a more global perspective, will become more knowledgeable citizens in our increasingly interconnected world.



Program Summary

Advancements in science and technology have transformed millions of lives over the past century. For people in the developed world, technology has improved standards of living and increased life expectancy while enabling most to carry out everyday activities with ease. However, people in the developing world not only do not have equal access to improvements in the fields of agriculture, medicine and information technology, but also lack the basics of technology such as telephones, electricity or running water. To find a way to share the benefits of technology would help alleviate the suffering that much of the planet's population endures daily, and create a more stable, hopeful world.

While technology sharing is considered to help address such issues as low crop yields, the high cost of AIDS drugs and the digital divide, a major global concern is how to make informed decisions regarding the use of technology. For example, while some believe that genetically modified foods may play a large role in ending world hunger, there are fears that in the long run these foods may prove harmful to both people and the environment. Also, increasingly lethal military advancements have created global fears of a potential catastrophe should these technologies fall into the wrong hands. Properly managing our increasingly sophisticated tools can help to reach the goal of sustainable development for all.

Vocabulary

Green Revolution — A major scientific research effort of the 1960s, which led to the development of seeds that thrive with fertilizers, pesticides and controlled irrigation.

digital divide — A term that describes the gap between those who have access to modern information technology, such as computers and the Internet, and those who don't.

pesticide — Any material that is used for the purpose of repelling or killing weeds, rodents or other pests.

genetically modified food — The result of the introduction of specific genes into plants to develop crops with specific desirable traits, such as resistance to insects/pests. The most commonly produced genetically modified foods are soybeans and corn.

infant mortality — Also known as the infant death rate, a statistic that is an important measure of the overall health and well-being of a country's population. The number refers to the number of children dying in their first year of life, and is highest in sub-Saharan Africa.

Food and Drug Administration (FDA) — An agency founded in 1906 to oversee and monitor food and drugs produced in the United States.

Global Positioning System (GPS) — A group of 24 orbiting satellites that can help pinpoint one's location anywhere on Earth.

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Human Genome Project — A major scientific effort begun in 1990 that attempted to identify all of the genes contained in human DNA. A rough map of the human genome was completed in 2000.

ARPANET — Known as the precursor to the Internet, a wide network developed in the 1960s that linked many research centers and universities. ARPA refers to the Advanced Research Projects Agency, a branch of the U.S. military.

desertification — The process by which other ecosystems become deserts due to unwise farming techniques, drought, wind or overgrazing by animals.

Manhattan Project — A program developed to produce a nuclear weapon during World War II. Named after the Manhattan Engineer District of the U.S. Army Corps of Engineers where much of the research took place.

Pre-viewing Discussion

- Ask students to create a list of information technologies they use on a daily basis. How would their lives be different without these gadgets?
- Advances in technology are often not available to people in the developing world. What is the best way to ensure that new technologies are shared?
- What is genetically modified food? Ask students if they know how often they eat food that has been genetically modified. How comfortable are they eating food derived from bioengineered plants?

Focus Questions

1. Describe some of the basics of technology that many developing countries lack.
2. What was the Green Revolution?
3. Why can a farmer in a developed country produce more food than a farmer in a developing country?
4. How much of the food on American grocery store shelves is made using genetically modified crops?
5. What concerns does the European Union have regarding genetically modified food?
6. Describe the extent of the AIDS crisis in developing countries.
7. What was the Human Genome Project?
8. Why are people without computers said to be at a huge competitive disadvantage?
9. Which countries have developed nuclear weapons since 1945?
10. What are "smart" weapons?
11. Explain some of the benefits and drawbacks of technology.

Follow-up Discussion

- Ask students to discuss the issue of reducing the cost of modern medicines to people in developing countries. Should drug companies supply low cost medicines to needy people? Should there be a limit to the profit drug companies can make at the expense of lives that could be saved?
- Smart weapons and command and control mechanisms are the most significant recent military developments, leading to remarkably less "collateral damage" to people and buildings. Is this technological development good or bad for humanity?
- Public attitudes toward science and technology vary widely. For example, some people believe that computers are impersonal and that many aspects of biotechnology are immoral. Ask students who should decide which new technologies are adopted and how they should be managed and regulated.

Follow-up Activities

- Many people cite potential health and environmental safety concerns as their main reasons for aversion to genetically modified (GM) foods. However, much of the debate about bioengineered food is based on economic issues. For example, many African and European governments fear that GM seeds could cross-pollinate with other plants, hurting their farmers' ability to sell produce to Europeans wary about eating GM food. Another economic issue is that only a small number of American companies produce all of the GM food worldwide, and critics believe these American companies will have too much control over the world's food supply. Ask students to research arguments from various perspectives regarding GM food and to conduct a mock debate reflecting the interests of American agribusiness, European and African farmers and European consumers.
- The World Health Organization and UNAIDS estimate that only 400,000 of the 6 million people who currently need AIDS treatment around the world have access to antiretroviral drugs. The WHO's Lee Jong-wook has said, "Lack of access to antiretroviral therapy is a global health emergency. To deliver antiretroviral treatment to the millions who need it, we must change the way we think and change the way we act." Ask students to research the costs associated with these life-saving therapies and discuss them in context with Jong-wook's thoughts and the WHO's 3 by 5 initiative, which aims to get three million people the medication they need by the end of 2005. Students may develop proposals to help the WHO meet the goals of 3 by 5, while discussing other non-drug related ways of dealing with the AIDS crisis.

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