

Technological Issues

Unit I Recognizing Technological Issues

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STL Standards

- Students will develop an understanding of the relationships among technologies and the connections between technology and other fields. (3)
- Students will develop an understanding of the cultural, social, economic, and political effects of technology. (4)
- Students will develop an understanding of the effects of technology on the environment. (5)
- Students will develop an understanding of the role of society in the development and use of technology. (6)
- Students will develop an understanding of the influence of technology on history. (7)
- Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation and problem solving. (10)
- Students will develop the abilities to use and maintain technological products and systems. (12)

STL Benchmarks

- Technological innovation often results when ideas, knowledge, or skills are shared within a technology, among technologies, or across other fields. (3H)
- Technological progress promotes the advancement of science and mathematics. (3J)
- Changes caused by the use of technology can range from gradual to rapid and from subtle to obvious. (4H)
- Decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment. (5L)
- The decision whether to develop a technology is influenced by societal opinions and demands, in addition to corporate cultures. (6I)
- Throughout history, technology has been a powerful force in reshaping the social, cultural, political, and economic landscape. (7I)
- Not all problems are technological, and not every problem can be solved using technology. (10K)
- Many technological problems require a multidisciplinary approach. (10L)
- (Students should be able to) Use computers and calculators to access, retrieve, organize, process, maintain, interpret, and evaluate data and information in order to communicate. (12P)

Mathematics Standards

- 14H Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population
- 22C Use representations to model and interpret physical, social, and mathematical phenomena

Science Standards

- 3P Progress in science and invention depends heavily on what else is happening in society, and history often depends on scientific and technological developments.
- 8J In designing a device or process, thought should be given to how it will be manufactured, operated, maintained, replaced, and disposed of and who will sell, operate, and take care of it.
- 8K The value of any given technology may be different for different groups of people and at different points in time.
- 8M Risk analysis is used to minimize the likelihood of unwanted side effects of a new technology. The public perception of risk may depend, however, on psychological factors as well as scientific ones.

- 9Q Social and economic forces strongly influence which technologies will be developed and used. Which will prevail is affected by many factors, such as personal values, consumer acceptance, patent laws, the availability of risk capital, the federal budget, local and national regulations, media attention, economic competition, and tax incentives.
- 9U Human inventiveness has brought new risks as well as improvements to human existence.

Big Idea:

The selection, application, and consequences of all technology create various types of issues, which may affect individuals, groups and/or society as a whole.

Unit 1 Objectives

At the completion of this unit, students will be able to:

- Recognize various types of issues that arise from the implementation of technology.
- Examine technological issues using a multidisciplinary approach.
- Examine the effects of society on the rate and nature of technology adoption.
- Evaluate technology alternatives in terms of benefits and risks.

Assessment

Assessment for each lesson includes a quiz, and rubrics will be used for group work and/or parts of the research, analysis and presentation.

Teacher Preparation

Teacher preparation for this unit should include:

- Before beginning the unit, review the four lessons and then review the optional Concurrent Learning Activity at the end of the unit. This activity can be used to supplement the unit lessons, providing appropriate facilities are available. However, adding it will require changes to the unit instructional delivery, as explained in the activity. It is not meant to replace any of the lessons.
- Gather references, or make available examples of historical changes and technological innovations and inventions. As students discover good references, Web sites, films/documentaries, local historical sites, etc., develop a database.
- Research historical events to examine their technological and social interactions. Develop a list of potential topics for the students.
- Discuss with other teachers what students are studying in their classes, including history, economics, social studies, science, mathematics, and other technology classes, and how those concepts are related to technological issues.
- Gather examples of technological and/or social issues that are current from news articles or media presentations.
- Review teaching methodologies used in lessons one through four.
- Make copies of the assignments (one page, double sided if need be) and the worksheets (one page, double sided if need be) for each student or group.