Grades 9–12

3.5.9-12.II Technology and Engineering: Nature and Characteristics of Technology and Engineering

Students who demonstrate understanding can *investigate the widespread changes that have resulted from the Information Age, which has placed emphasis on the processing and exchange of information.*

Clarifying Statement: The development of binary language, transistors, microchips, and an electronic numerical integrator and calculator (ENIAC) led to an explosion of computers, calculators, and communication processes to quickly move information from place to place. Holography, cybernetics, xerographic copying, the breeder reactor, the hydrogen bomb, the lunar module, communication satellites, prefabrication, and gene editing have all been major developments during this time period.

Assessment Boundary: N/A

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Technology and Engineering Practices (TEP)
Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs. • Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible.	**Effects of Technology on the World of Information and Knowledge** • Give examples to illustrate the effects on society of the recording, distribution, and access to information and knowledge that have occurred in history, and discuss the effects of those revolutions on societal change.	**Systems Thinking** • Designs and troubleshoots technological systems in ways that consider the multiple components of the system.

Pennsylvania Context: N/A

Pennsylvania Career Ready Skills: Advocate for oneself in education, employment, and within the community.

Connections to Other Standards Content and Practices

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Core Standards: Reading and Writing in Science and Technical Areas	CC.1.2.3.G: Use information gained from text features to demonstrate understanding of a text. CC.1.2.4.G: Interpret various presentations of information within a text or digital source and explain how the information contributes to an understanding of text in which it appears. CC.1.2.5.G: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. CC.1.4.3.V: Conduct short research projects that build knowledge about a topic. CC.1.4.4.V: Conduct short research projects that build knowledge through investigation of different aspects of a topic. CC.1.4.5.V: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. CC.1.4.3.W: Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. CC.1.4.4.W: Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. CC.1.4.5.W: Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
PA Core Standards and Practices: Math	N/A
Integrated Standards for Science, Environment & Ecology, and Technology & Engineering Standards Grades K–12	3.3.9-12.O: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.