Utah CTE

Exploring Technology

Students will follow safety practices ET1

1. **Identify potential safety hazards and follow general laboratory safety practices** ET1.1
   - a Assess workplace conditions regarding safety and health ET1.1A
   - b Identify potential safety issues and align with relevant safety standards to ensure a safe workplace/jobsite. ET1.1B
   - c Locate and understand the use of shop safety equipment. ET1.1C
   - d Select appropriate personal protective equipment. ET1.1D
2. **Use safe work practices Ref: https://schools.utah.gov/cte/engineering/resources under the Safety Program and Management tab.** ET1.2
   - a Use personal protective equipment according to manufacturer rules and regulations. ET1.2A
   - b Follow correct procedures when using and hand or power tools. ET1.2B
3. **Complete a basic safety test without errors (100%) before using any tools or shop equipment.** ET1.3

Students will develop an understanding of the characteristics and scope of technology, the core concepts of technology, and the relationships among and between technologies and other fields of study. ET2

1. **In order to comprehend the scope of technology, students should learn that:** ET2.1
   - a New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology. ET2.1A
   - b The development of technology is a human activity and is the result of individual or collective needs and the ability to be creative. ET2.1B
   - c Technology is closely linked to creativity, which has resulted in innovation. ET2.1C
   - d Corporations can often create demand for a product by bringing it onto the market and advertising it. ET2.1D
2. **In order to recognize the core concepts of technology, student should learn that:** ET2.2
   - a Technological systems include input, processes, output, and, at times, feedback. ET2.2A
   - b Systems thinking involves considering how every part relates to other. ET2.2B
   - c An open-loop system has no feedback path and requires human intervention, while a closed-loop system uses feedback. ET2.2C
   - Technological systems can be connected to one another. ET2.2D

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e Malfunction of any part of a system may affect the function and quality of the system. ET2.2E

f Requirements are the parameters placed on the development of a product or system. ET2.2F

g Trade-off is a decision-making process recognizing the need for careful compromises among competing factors. ET2.2G

h Different technologies involve different sets of processes. ET2.2H

i Maintenance is the process of inspecting and servicing a product or system on a regular basis in order to continue functioning properly, to extend its life, or to upgrade its capability. ET2.2I

j Controls are mechanism or particular steps that people perform using information about the system that causes systems to change. ET2.2J

3 In order to appreciate the relationship among technologies and ther fields of study, students should learn that: ET2.3

a Technological systems often interact with one another. ET2.3A

b A product, system, or environment developed for one setting may be applied to another setting. ET2.3B

c Knowledge gained from other fields of study has a direct effect on the development of technological products and systems. ET2.3C

Students will develop an understanding of the cultural, social, economic, and political effects of technology, the effects of technology on the environment, the role of society in the development and use of technology, and the influence of technology on history. ET3

1 In order to recognize the changes in society caused by the use of technology, students should learn that ET3.1

a The use of technology affects humans in various ways, including their safety, comfort, choices, and attitudes about technologies development and use. ET3.1A

b Technology, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences. ET3.1B

c The development and use of technology poses ethical issues. ET3.1C

d Economic, political, and cultural issues are influenced by the development and use of technology. ET3.1D

2 In order to understand the effects of technology on the environment, students should learn that: ET3.2

a The management of waste produced by technological systems is an important societal issue. ET3.2A

b Technologies can be used to repair damage cause by natural disasters and to break down waste from the use of various products and systems. ET3.2B

c Decisions to develop and use technologies often put environmental and economic interests in direct competition with one another. ET3.2C

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n order to realize the impact of society on technology, students should learn hat: ET3.3

a Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies. ET3.3A

b The use of inventions and innovations has led to changes in society and the creation of new needs and wants. ET3.3B

c Social and cultural priorities and values are reflected in technological devices. ET3.3C

d Meeting societal expectations is the driving force behind the acceptance and use of products and systems. ET3.3D

4 **In order to be aware of the history of technology, students should learn that:** ET3.4

a Many inventions and innovations have evolved by using slow and methodical processes of tests and refinements. ET3.4A

b The specialization of function has been at the heart of many technoogical improvements. ET3.4B

c The design and constructions of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of special relationships. ET3.4C

d In the past, an invention or innovation was not usually developed with the knowledge of science. ET3.4D

Students will participate in problem-based learning activities that explore engineering and a range of other technological areas. ET4

1 **Students will know and be able to apply a basic design process that can be used to solve an engineering problem.** ET4.1

a Identify and define the design problem. (list requirements, identify constraints, conduct research to identify similar efforts) ET4.1A

b Brainstorm solutions. (list possible solutions, evaluate trade-offs,synthesize the results and select the best solution) ET4.1B

c Create models and build a prototype. (mathematical models, 3D solid models, scale models) ET4.1C

d Test the prototype. (record test results data, evaluate the test results against the requirements, identify weaknesses) ET4.1D

e Redesign and optimize. (Record findings, Improve on the initial design, consider discarded ideas) ET4.1E

2 **In order to explore a broad range of technologies, students will use a disciplined design process as they participate in problem-based learning activities in at least three (3) of the following areas of technology: agriculture and biotechnology, construction, energy and power, information and communication, manufacturing, medical, and transportation.** ET4.2

3 **Students should be given ample opportunities to use math and science pplications in each activity.** ET4.3

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Students will be introduced to careers related to each selected area of technology. Explore career opportunities in each selected area of technology. Explore training and education requirements for a given occupation in each selected area of technology. ET5

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