Alabama CTE

Introduction to Career Cluster Technologies

Nature of Technology NT

1 Develop an understanding of the characteristics and scope of technology. NT1

- a Identifying how things that are found in nature differ from things that are human-made in how they are produced and used NT1A
- b Explaining how tools, materials, and skills are used to make things and carry out tasks NT1B
- c Explaining how creative thinking and economic and cultural influences shape technological development NT1C

2 Develop an understanding of core concepts of technology. NT2

- a Identifying a subsystem that operates as part of another system NT2A
- b Describing when parts of a system are missing, it may not work as planned NT2B
- c Illustrating how resources are the things needed to get a job done NT2C
- d Describing how tools are used to design, make, use, and assess technology NT2D
- e Explaining that tools and machines extend human capabilities NT2E

3 Develop an understanding of the relationships among technologies and other fields of study. NT3

- a Explaining how technologies are often combined NT3A
- b Explaining how various relationships exist between technology and other fields of study NT3B

Technology and Society TS

4 Develop an understanding of the cultural, social, economic, and political affects of technology. TS4

- a Summarizing when using technology, results can be good or bad TS4A
- b Explaining that the use of technology can have unintended consequences TS4B

5 Summarize the effects of technology on the environment. TS5

- a Describing how waste must be appropriately recycled or disposed of to prevent unnecessary harm to the environment TS5A
- b Identifying how the use of technology affects the environment in good and bad ways TS5B

6 **Explain the role of society in the development and use of technology.** TS6

- a Describing how people's wants and needs change, new technologies are developed, and old ones are improved to meet those changes TS6A
- b Explaining how family, community, and economic concerns may expand or limit the development of technologies TS6B

7 **Understand the influence of technology on history** TS7

- a Summarizing why people have made tools to provide food, to make clothing, and to protect themselves TS7A

Design D

8 **Describe the attributes of design** D8

- a Explaining that the design process is a purposeful method of planning practical solutions to problems D8A
- b Recognizing the requirements for a design include such factors as the desired elements and features of a product or system or the limits that are placed on the design D8B

9 **Develop an understanding of the engineering design process.** D9

- a Identifying how the engineering design process involves defining a problem, generating ideas, selecting a solution, testing the solution(s), making the item, evaluating it, and presenting the results D9A
- b Explaining why when designing an object, it is important to be creative and consider all ideas D9B
- c Describing how models are used to communicate and test design ideas and processes D9C

10 **Explain the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.** D10

- a Recognizing how trouble shooting is a way of finding out why something does not work so that it can be fixed D10A
- b Explaining how invention and innovation are creative ways to turn ideas into real things D10B
- c Documenting the process of experimentation, which is common in science, and can be used to solve technological problems D10C

Abilities for a Technological World TW

11 Apply the design process TW11

- a Collecting information about everyday problems that can be solved by technology, and generate ideas and requirements for solving the problem TW11A
- b Explaining that the process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s) from many TW11B
- c Testing and evaluating the solutions for the design problem TW11C
- d Improving the design solutions TW11D

12 Develop the abilities to use and maintain technological products and systems. TW12

- a Following step-by-step instructions to assemble a product TW12A
- b Selecting and safely using tools, products, and systems for specific tasks TW12B
- c Using computers to access and organize information TW12C
- d Explaining why common symbols, such as numbers and words, are used to communicate ideas TW12D

13 Assess the impact of products and systems TW13

- a Classifying collected information in order to identify patterns TW13A
- b Assessing the influence of a specific technology on the individual, family, community, and environment TW13B
- c Evaluating the trade-offs of using a product or system and decide when it can be used TW13C

The Designed World DW

14 Identify advances and innovations in medical technologies and health care. DW14

- a Recognizing that technological advances have made it possible to create new devices, to repair or replace certain parts of the body, and to provide a means of mobility DW14A
- b Recognizing why vaccines are developed for use in immunization DW14B
- c Explaining how many tools and devices have been designed to help provide clues about health and provide a safe environment DW14C

15 Identify advances and innovations in agricultural and related biotechnologies. DW15

- a Describing how artificial ecosystems are human-made environments that are designed to function as a unit and are comprised of humans, plants, and animals DW15A
- b Recognizing that most agricultural waste can be recycled DW15B
- c Explaining that many processes used in agriculture require different procedures, products, or systems DW15C

16 **Identify advances and innovations in energy and power technologies.** DW16

- a Defining energy and power DW16A
- b Recognizing that energy comes in different forms DW16B
- c Describing how tools, machines, products, and systems use energy in order to do work DW16C

17 **Identify advances and innovations in information and communications technologies.** DW17

- a Identifying the processing of information through the use of technology can be used to help humans make decisions and solve problems DW17A
- b Describing how information can be acquired and sent through a variety of technological sources, including print and electronic media DW17B
- c Identifying communication technology as the transfer of messages among people and/or machines over distances through the use of technology DW17C

18 **Identify advances and innovations in transportation technologies.** DW18

- a Identifying how the use of transportation allows people and goods to move from place to place DW18A
- b Describing why a transportation system may lose efficiency or fail if one part is missing or malfunctioning or if a subsystem is not working DW18B

19 **Identify advances and innovations in manufacturing technologies.** DW19

- a Describing how processing systems convert natural materials into products DW19A
- b Explaining that manufacturing processes include designing products, gathering resources, and using tools to separate, form, and combine materials in order to produce products DW19B
- c Explaining that the manufacturing enterprises exist because of a consumption of goods DW19C

20 **Identify advances and innovations in construction technologies.** DW20

- a Describing that modern communities are usually planned according to guidelines DW20A
- b Explaining that structures need to be maintained DW20B
- c Classifying systems used in buildings DW20C

21 **Recognize Alabama's sixteen career clusters and associated pathways and their relationship to technology.** DW21

- a Describing how pathways lead students through secondary and postsecondary training towards a credential DW21A
- b Identifying employment opportunities associated with the clusters DW21B
- c Explaining employment skills for securing and keeping a job DW21C