Alabama Science, Technology, Engineering, and Mathematics (STEM)

Grades 6, 7, 8

Adopted 2020

STEM Technologies I

1. Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and following protocols for fire and electrical safety. S1.FS.1
2. Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork. S1.FS.2
3. Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing. S1.FS.3
4. Demonstrate digital literacy by using digital and electronic tools appropriately, safely, and ethically. S1.FS.4
5. Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork. S1.FS.5
1. Describe the development of technology as a human activity that is the result of creatively meeting individual or collective needs. S1.1
2. Explain the close link between technology and creativity and how it results in innovation. S1.2
3. Describe technological systems, including input, processes, output, and feedback. S1.3
4. Explain how technological systems can be connected to one another. S1.4
5. Identify the difference between open loop and closed loop systems. S1.5
6. Identify positive and negative ways the use of technology affects humans. S1.6
7. Investigate the management of waste produced by technological systems as a societal issue. S1.7
8. Describe how technologies can be used to repair damage caused by natural disasters and to break down waste from various products and systems. S1.8

9. **Describe the development of a technology from the demands, values, and interests of employers.** S1.9

10. **Identify inventions and innovations that have evolved through slow and methodical processes of testing and refinement.** S1.10

11. **Utilize the design process to produce products and systems.** S1.11

12. **Identify the steps of an engineering design process.** S1.12

13. **Identify criteria and constraints in a design.** S1.13

14. **Describe how the design process is used to develop solutions for a problem.** S1.14

15. **Describe the importance of documentation and how it is used to communicate ideas.** S1.15

16. **Model designs to transform ideas into practical solutions.** S1.16

17. **Obtain, evaluate, and share information to support the assertion that there is no perfect design.** S1.17

18. **Practice brainstorming as a group problem-solving design process in which each person in the group presents ideas in an open forum.** S1.18

19. **Identify two-dimensional and three-dimensional representations of the design solution.** S1.19

20. **Describe the permanence of digital data and the importance of managing one's digital identity and reputation.** S1.20

21. **Engage in positive, safe, legal, and ethical behaviors when using technology, including during social interactions online and when using networked devices.** S1.21

22. **Identify research strategies to locate information and other resources for their intellectual and/or creative pursuits.** S1.22

23. **Identify information from digital resources, using a variety of tools and methods to create a collection of artifacts that demonstrates meaningful connections or conclusions.** S1.23

24. **Identify real-world issues, develop ideas, and pursue solutions to address the issues.** S1.24

STEM Technologies II

1. **Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and following protocols for fire and electrical safety.** S2.FS.1
2. **Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.** S2.FS.2
3. **Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.** S2.FS.3
4. **Demonstrate digital literacy by using digital and electronic tools appropriately, safely, and ethically.** S2.FS.4
5. **Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork.** S2.FS.5
1. **Investigate how technological systems can be connected to one another.** S2.1
2. **Explore different technologies that involve different sets of processes.** S2.2
3. **Gather and present information about ways corporations may create demand for a product by bringing it onto the market and advertising it.** S2.3
4. **Differentiate between positive and negative effects of technology usage on human beings, including their safety, comfort, choices, and attitudes about technology's development and use.** S2.4
5. **Analyze the management of waste produced by technological systems as a societal issue.** S2.5
6. **Research and communicate how technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems.** S2.6
7. **Identify ethical issues associated with the development and use of technology.** S2.7
8. **Describe how social and cultural priorities and values are reflected in technological devices.** S2.8
9. **Explain how meeting societal expectations can be a driving force behind the acceptance and use of products and systems.** S2.9
10. **Design a plan to produce products and systems.** S2.10
11. **Create criteria and constraints in a design.** S2.11

12. **Use the design process to develop solutions for a problem.** S2.12
13. **Employ brainstorming in a group problem-solving setting where each person presents design process related ideas in an open forum as part of the design process.** S2.13
14. **Model two-dimensional and three-dimensional solutions of a design.** S2.14
15. **Test and modify designs to transform ideas into practical solutions.** S2.15
16. **Accurately identify different resources used in projects.** S2.16
17. **Make a product or system to solve a problem and document the solution.** S2.17
18. **Create and maintain a digital identity and reputation, demonstrating an awareness of the permanence of one's actions in the digital world.** S2.18
19. **Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.** S2.19
20. **Manage their personal data to maintain digital privacy and security.** S2.20
21. **Create strategies to locate information and other resources for their intellectual or creative pursuits.** S2.21
22. **Generate ideas about real-world issues and problems and pursue answers and solutions to them.** S2.22

STEM Technologies III

1. **Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and following protocols for fire and electrical safety.** S3.FS.1
2. **Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.** S3.FS.2
3. **Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.** S3.FS.3
4. **Demonstrate digital literacy by using digital and electronic tools appropriately, safely, and ethically.** S3.FS.4
5. **Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork.** S3.FS.5
1. **Design a technological system that can be connected to another system.** S3.1

2. **Design a variety of technologies that involve different sets of processes.** S3.2

3. **Demonstrate how every part of a system relates to another.** S3.3

4. **Analyze malfunctions of any part of a system that may affect the system's function and quality.** S3.4

5. **Compare and contrast trade-offs as a decision process and describe the need for careful compromises among competing factors.** S3.5

6. **Perform basic maintenance on systems within the program.** S3.6

7. **Analyze the ways, both positive and negative, that the use of technology affects humans, including their safety, comfort, choices, and attitudes about technology's development and use.** S3.7

8. **Critique the management of waste produced by technological systems as a societal issue.** S3.8

9. **Design a solution to alleviate and/or repair the damage caused by various disasters.** S3.9

10. **Make decisions about the development and use of technologies that put environmental and economic concerns in direct competition with one another.** S3.10

11. **Develop a plan to produce products and systems.** S3.11

12. **Critique criteria, constraints, and tradeoffs in a design.** S3.12

13. **Synthesize elements of the design process to develop solutions for a problem.** S3.13

14. **Analyze results of solutions to problems using the steps in the design process.** S3.14

15. **Design two-dimensional and three-dimensional representations of a design solution.** S3.15

16. **Evaluate designs to transform ideas into practical solutions.** S3.16

17. **Critique a product or system and document the evaluation.** S3.17

18. **Apply a design process to solve problems in and beyond the classroom.** S3.18

19. **Test, evaluate, and modify a design in relation to criteria and constraints.** S3.19

20. **Cultivate a digital identity and reputation, demonstrating an awareness of the permanence of one's actions in the digital world.** S3.20

21. **Manage their personal data to maintain digital privacy and security, demonstrating awareness of data-collection technology used to track their navigation online.** S3.21

22. **Employ research strategies to locate information and other resources for their intellectual or creative pursuits.** S3.22

23. **Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.** S3.23

24. **Curate information from digital resources using a variety of tools and methods to create a collection of artifacts that demonstrate meaningful connections or conclusions.** S3.24

25. **Develop solutions to real-world issues by analyzing ideas and solutions.** S3.25