Arkansas CTE

Fundamentals of Technology and Engineering: Grades 7, 8

Adopted 2015

Engineering and Technology Connections

1.1 Define technology and engineering and describe their relationship toward one another

1. Comprehends ideas and concepts related to technology and engineering. Communicates thoughts, ideas, or facts in written form in a clear, concise manner. 1.1.1
2. Comprehends ideas and concepts related to technology 1.1.2

1.2 Identify the various fields of technology and engineering

1. Comprehends ideas and concepts related to engineering. Communicates thoughts, ideas, or facts in written form in a clear, concise manner. 1.2.1
2. Determines what information is needed. 1.2.2
3. Applies/Uses technical terms as appropriate to audience. Comprehends ideas and concepts related to engineering. 1.2.3
4. Works effectively with others to reach a common goal. Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. Writing Describes/Explains significance of integrity, honesty, and work ethics. 1.2.4

1.3 Describe the concepts of technological systems and systems thinking

1. Comprehends ideas and concepts related to technology and engineering. Comprehends written information for main ideas. 1.3.1

1.4 Identify the parts of a technological system

1. Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. 1.4.1
2. Organizes information into an appropriate format. 1.4.2

Information and Communication Technologies

2.1 Define CAD/CADD - computer-aided drafting and design

1. Comprehends ideas and concepts related to computer-aided drafting and design. 2.1.1

2.2 Identify how a mathematical grid system is used to create 2-Dimensional (2D) and 3-Dimensional (3D) drawings using CAD software

1. Comprehends ideas and concepts related to CAD. 2.2.1
2. Comprehends mathematical ideas and concepts related to CAD. Comprehends ideas and concepts related to the use of CAD and a mathematical grid system. 2.2.2

2.3 Recognize 2-Dimensional and 3-Dimensional drawings

1. Constructs geometric figures. Uses basic geometric symbols, terms, principles, and formulas. Visualizes a finished product. 2.3.1

2.4 Define global information and global positioning systems (GIS/GPS)

1. Communicates thoughts, ideas, or facts in written form in a clear, concise manner. Uses logic to draw conclusions from available information. 2.4.1

2.5 Identify how global information and global positioning systems (GIS/GPS) are used to access and create geographic data

1. Organizes information into an appropriate format. Communicates a thought, idea, or fact in spoken form. 2.5.1
2. Combines ideas or information in a new way 2.5.2

2.6 Access and analyze specific coordinates in a global information system

1. Communicates thoughts, ideas, or facts in written form in a clear, concise manner. Records data related to global information systems. Uses logic to draw conclusions from available information. 2.6.1

Construction Technologies

3.1 Identify and describe common types of architectural drawings

1. Comprehends ideas and concepts related to construction 3.1.1
2. Communicates thoughts, ideas, or facts in written form in a clear, concise manner. 3.1.2

3.2 Understand the importance of the planning process before construction begins

1. Comprehends ideas and concepts related to the planning process in construction. 3.2.1

3.3 Develop an architectural floor plan

1. Draws to scale. Determines quantities/measurements in English and metric units. Visualizes a finished product. Applies rules and principles to a new situation. 3.3.1

3.4 Evaluate, design, and plan a civil structure using the engineering design process

1. Draws to scale. Reads measurements from common measuring Devices. Constructs model to depict basic concept of construction. Creates new design by applying specified Criteria. 3.4.1

Manufacturing Technologies

4.1 Understand how robotics and automation is used to manufacture products

1. Comprehends ideas and concepts related to robotics and automation. Takes an interest in what others say and do. 4.1.1

4.2 Identify the parts and functions of a robotics system

1. Comprehends ideas and concepts related to robotics. Applies information to new situations. Comprehends ideas and concepts related to manufacturing. 4.2.1

4.3 Design a robot that will solve a materials handling problem

1. Applies scientific principles related to robotics. Calculates different units of measurement. Creates new design by applying specified criteria. Demonstrates logical reasoning in reaching a conclusion. 4.3.1

4.4 Design a product or system and document the process

1. Applies knowledge to complete a practical task. Uses equipment and techniques appropriate in the field of invention and innovation. 4.4.1
2. Applies new knowledge and skills to manufacturing. 4.4.2

Energy, Power and Transportation Technologies

5.1 Understand terms associated with basic electronics

1. Comprehends ideas and concepts related to energy and power. Communicates thoughts, ideas or facts in written form in a clear, concise manner. 5.1.1
2. Applies information and concepts derived from printed materials. Comprehends ideas and concepts related to energy and power. 5.1.2

5.2 Understand and recognize types of circuits

1. Comprehends ideas and concepts related to energy and power. Performs experiment as specified. Tracks and evaluates results. 5.2.1

5.3 Describe electrical measuring units and use these measuring units to describe work and/or power

1. Composes and creates documents, letters, manuals, reports, proposals, graphs, flow charts, etc. Comprehends ideas and concepts related to energy and power. 5.3.1
2. See relationship between two or more ideas, objects, or situations. 5.3.2

5.4 Identify renewable (alternative) sources of energy and understand how they can be used to do work

1. Comprehends ideas and concepts related to energy and power. Communicates thoughts, ideas or facts in written form in a clear, concise manner. 5.4.1

5.5 Design an alternative energy device that converts wind energy into mechanical power

1. Applies scientific principles related to renewable energy. Calculates different units of measurement. Combines ideas or information in a new way. Creates new design by applying specified criteria. Demonstrates logical reasoning in reaching a conclusion. Draws conclusions from observations, evaluates conditions, and gives possible solutions. 5.5.1

Safety

6.1 Describe the need for safe work environments in the Engineering and Technology Educational classroom and laboratory

1. Imagines the flow of work activities from narrative descriptions. Applies new knowledge and skills to safety. 6.1.1
2. Makes connections between seemingly unrelated ideas. Pays close attention to details. 6.1.2

6.2 Describe specific procedures such as reporting illness, injuries, safety violations, etc.

1. Listens and follows directions 6.2.1

6.3 Use appropriate and required personal protection equipment (eye protection, ear protection, etc.)

1. Devises and implements a plan of action to resolve a problem 6.3.1

6.4 Describe machine and tool safety practices and procedures

1. Demonstrates decision-making skills. Comprehends written specifications and applies them to a task. 6.4.1
2. Reads and follows instructions to operate technical equipment 6.4.2
3. Uses standard occupational resource materials. 6.4.3
4. Follows safety guidelines. 6.4.4
5. Participates in conversation, discussion, and group presentations. Comprehends ideas and concepts related to machine and tool safety. 6.4.5