



SOUTHERN LEHIGH SCHOOL DISTRICT
 5775 Main Street
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Scope and Sequence for **Grade 4 STEM**

The Nature of Technology

National Standards for Technological Literacy	PA Standards for Science and Technology and Engineering Education
1. The characteristics and scope of technology. 3-5.D Tools, materials, and skills are used to make things and carry out tasks.	1. Characteristics of Technology 3.4.4.A1 Understand that tools, materials, and skills are used to make things and carry out tasks.
2. The core concepts of technology. 3-5.L Requirements are the limits to designing or making a product or system.	2. Core Concepts of Technology 3.4.4.A2 Understand that systems have parts and components that work together.
3. The relationships among technologies and the connections between technology and other fields. 3-5.D Technology systems often interact with one another.	3. Technology Connections 3.4.4.A3 Describe how various relationships exist between technology and other fields.

Technology and Society

National Standards for Technological Literacy	PA Standards for Science and Technology and Engineering Education
4. The cultural, social, economic, and political effects of technology. 3-5.B When using technology, results can be good or bad. 3-5.C The use of technology can have unintended consequences.	1. Effects of Technology 3.4.4.B1 Describe how technology affects humans in various ways.
5. The effects of technology on the environment. 3-5.B Waste must be appropriately recycled or disposed of to prevent unnecessary harm to the environment.	2. Technology and Environment 3.4.4.B2 Explain how materials are re-used or recycled.

Design

National Standards for Technological Literacy	PA Standards for Science and Technology and Engineering Education
8. The attributes of design. 3-5.C The design process is a purposeful method of planning practical solutions to problems. 3-5.D 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.	1. Design Attributes 3.4.4.C1 Understand that there is no perfect design.
9. Engineering design. 3-5.C 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. 3-5.D When designing an object, it is important to be creative and consider all ideas. 3-5.E Models are used to communicate and test design ideas and processes.	2. Engineering Design 3.4.4.C2 Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. Communicate the solution with others. Present the results.
10. The role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving. 3-5.C Troubleshooting is a way of finding out why something does not work so that it can be fixed.	3. Research & Development, Invention & Innovation, Experimentation / Problem Solving and Troubleshooting 3.4.4.C3 Explain how asking questions and making observations help a person understand how things work and can be repaired.

Abilities for a Technological World

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11. Apply the design process. 3-5.D Identify and collect information about everyday problems that can be solved by technology, and generate ideas and requirements for solving a problem. 3-5.E The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s) from many. 3-5.F Test and evaluate the solutions for the design problem. 3-5.G Improve the design solutions.	1. Applying the Design Process 3.4.4.D1 Investigate how things are made and how they can be improved.
12. Use and maintain technological products and systems. 3-5.F Use computers to access and organize information 3-5.G Use common symbols, such as numbers and words, to communicate key ideas.	2. Using and Maintaining Technological Systems 3.4.4.D2 Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate key ideas. Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.

The Designed World

National Standards for Technological Literacy	PA Standards for Science and Technology and Engineering Education
<p>17. Information and communication technologies. 3-5.E Information can be acquired and sent through a variety of technological sources, including print and electronic media. 3-5.G Letters, characters, icons, and signs are symbols that represent ideas, quantities, elements, and operations.</p>	<p>4. Information and Communication Technologies 3.4.4.E4 Explain how information and communication systems allow information to be transferred from human to human.</p>
<p>19. Manufacturing technologies. 3-5.D Manufacturing processes include designing products, gathering resources, and using tools to separate, form, and combine materials in order to produce products.</p>	<p>6. Manufacturing Technologies 3.4.4.E6 Identify key aspects of manufacturing processes (designing products, gathering resources and using tools to separate, form and combine materials in order to produce products).</p>