SOUTHERN LEHIGH SCHOOL DISTRICT
5775 Main Street
Center Valley, PA 18034

Scope and Sequence for **Grade 5 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.C** Things that are found in nature differ from things that are human-made in how they are produced and used. **3-5.D** Tools, materials, and skills are used to make things and carry out tasks. **3-5.E** Creative thinking and economic and cultural influences shape technological development.	**1. Characteristics of Technology** **3.4.5.A1** Explain how people use tools and techniques to help them do things.
2. The core concepts of technology. **3-5.H** Resources are the things needed to get a job done, such as tools and machines, materials, information, energy, people, capital, and time. **3-5.L** Requirements are the limits to designing or making a product or system.	**2. Core Concepts of Technology** **3.4.5.A2** Understand that a subsystem is a system that operates as part of a larger system.
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** **3.4.5.A3** Describe how technologies are often combined.

Technology and Society

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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** **3.4.5.B1** Explain how the use of technology can have unintended consequences.
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** **3.4.5.B2** Describe how waste may be appropriately recycled or disposed of to prevent unnecessary harm to the environment.
6. The role of society in the development and use of technology. **3-5.B** Because people's needs and wants change, new technologies are developed, and old ones are improved to meet those changes. **6-8.E** The use of inventions and innovations has led to changes in society and the creation of new needs and wants.	**3. Society and Development of Technology** **3.4.5.B3** Describe how community concerns support or limit technological developments.
7. The Influence of technology on history. **6-8.C** Many inventions and innovations have evolved using slow and methodical processes of tests and refinements.	**4. Technology and History** **3.4.5.B4** Identify how the way people live and work has changed history in terms of technology.

Design

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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** **3.4.5.C1** Explain how the design process is a purposeful method of planning practical solutions to problems.
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** **3.4.5.C2** Describe how design, as a dynamic process of steps, can be performed in different sequences and repeated.
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. **3-5.D** Invention and innovation are creative ways to turn ideas into real things. **6-8.G** Invention is a process of turning ideas and imagination into devices and systems. Innovation is the process of modifying an existing product or system to improve it. **6-8.H** Some technological problems are best solved through experimentation.	**3. Research & Development, Invention & Innovation, Experimentation / Problem Solving and Troubleshooting** **3.4.5.C3** Identify how invention and innovation are creative ways to turn ideas into real things.

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** **3.4.5.D1** Identify ways to improve a design solution.
12. Use and maintain technological products and systems. **3-5.E** Select and safely use tools, products, and systems for specific tasks. **3-5.F** Use computers to access and organize information	**2. Using and Maintaining Technological Systems** **3.4.5.D2** Use information provided in manuals, protocols, or by experienced people to see and understand how things work.

The Designed World

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14. Medical technologies. **3-5.E** Technological advances have made it possible to create new devices, to repair or replace certain parts of the body, and to provide a means for mobility.	**1. Medical Technologies** **3.4.5.E1** Identify how technological advances have made it possible to create new devices and to repair or replace certain parts of the human body.
16. Select and use energy and power technology. **3-5.C** Energy should not be wasted. **3-5.D** Tools, machines, products, and systems use energy in order to do work. **6-8.E** Energy is the capacity to do work. **6-8.F** Energy can be used to do work, using many processes. **6-8.I** Much of the energy used in our environment is not used efficiently.	**3. Energy and Power Technology** **3.4.5.E3** Explain how tools, machines, products, and systems use energy in order to do work.
17. Information and communication technologies. **3-5.G** Letters, characters, icons, and signs are symbols that represent ideas, quantities, elements, and operations.	**4. Information and Communication Technologies** **3.4.5.E4** Describe how the use of symbols, measurements, and drawings promotes clear communication by providing a common language to express ideas.
18. Select and use transportation technology. **3-5.D** The use of transportation allows people and goods to be moved from place to place. **3-5.E** A transportation system may lose efficiency or fail if one part is missing or malfunctioning or if a subsystem is not working.	**5. Transportation Technologies** **3.4.5.E4** Examine reasons why a transportation system may lose efficiency or fail (e.g., one part is missing or malfunctioning or if a subsystem is not working).