

TECHNOLOGY STANDARDS Grade 1

Standard 1 Nature of Technology

Students develop an understanding of technology, its characteristics, scope, core concepts* and relationships between technologies and other fields. Students learn that technology extends human potential by allowing people to do things more efficiently than they would otherwise be able to do. Students learn that useful technological development is a product of human knowledge, creativity, invention, innovation, motivation and demand for new products and systems. They learn that the natural and human-made designed worlds are different, and that tools and materials are used to alter the environment. Students learn that the development of emerging technology is exponential, driven by history, design, commercialization, and shaped by creative/inventive thinking, economic factors and cultural influences.

*The core concepts of technology include systems, resources, requirements, optimization and trade-offs, processes and controls.

Benchmark A: Recognize the characteristics and scope of technology.

Grade One

Technology Characteristics

1. Distinguish between the natural and human-made world (e.g., a forest vs. a city skyline).
2. Cite examples of how people use tools and processes to perform tasks.

Benchmark B: Describe and give examples of technology's core concepts: systems, resources and processes.

Grade One

Systems 1. Identify and describe a technological system.

Processes 2. Identify and demonstrate processes necessary to complete a task.

Benchmark C: Describe the relationships among technologies, and the connections between technology and other fields of study.

Grade One

Technology Devices

1. Identify school-wide technology devices (e.g., office public address system, library automated book check-out, auditorium audio-visual system, electronic lunch purchase).

Connections

2. Describe the connections between technology and other fields of study (e.g., teachers use computers, scientists use microscopes, farmers use tractors).

Standard 2 Technology and Society Interaction

Students recognize interactions among society, the environment and technology, and understand technology's relationship with history. Consideration of these concepts forms a foundation for engaging in responsible and ethical use of technology. Students learn that the interaction between society and technology has an impact on their lives, that technology may have unintended consequences which may be helpful or harmful. They learn that interaction of technology will affect the economy, ethical standards, environment and culture. Students evaluate the impact of products or systems by gathering and synthesizing information, analyzing trends and drawing conclusions. Students analyze technological issues and the implications of using technology. They acquire technological understanding, and develop attitudes and practices that support ethical decision-making and lifelong learning.

Benchmark A: Identify responsible citizenship relative to technology and its use.

Grade One

Technology and Citizenship

1. Identify tools and machines that can be helpful and/or harmful.
2. Describe the reasons for making products (e.g., to meet needs and wants).

Benchmark B: Recognize that technology has an interrelationship with the environment.

Grade One

Technology and the Environment

1. Explain how various materials can be reused or recycled.

2. Describe the reasons for doing things or behaving in ways that protect the environment.

Benchmark C: Describe and demonstrate how technology has had an influence on our world.

Grade One

Technology and History

1. Describe or list ways technology has changed the way people lived and worked throughout history (e.g., grandparents' era to today).

Benchmark D: Collect information about products and discuss whether solutions create positive or negative results.

Grade One

Technology Assessment

1. Collect information about products and systems used at school by asking questions (e.g., books, computers, piano).

2. Describe how the use of a product or system might cause something bad to happen (e.g., running a car causes pollution).

Standard 3 Technology for Productivity Applications

Students learn the operations of technology through the usage of technology and productivity tools. Students use computer and multimedia resources to support their learning. Students understand terminology, communicate technically and select the appropriate technology tool based on their needs. They use technology tools to collaborate, plan and produce a sample product to enhance their learning, and solve problems by investigating, troubleshooting and experimenting using technical resources.

Benchmark A: Understand basic computer and multimedia technology concepts and terminology.

Grade One

Basic Concepts

1. Identify and use computer and multimedia technology and know the terms used to describe it (e.g., computer, printer, VCR, DVD player, audio players).

2. Identify various parts of a computer by name (e.g., monitor, mouse, keyboard, power button, disk drive, CD/DVD drive).

Benchmark B: Demonstrate operation of basic computer and multimedia technology tools.

Grade One

Responsible Usage

1. Discuss and demonstrate proper care when using computer and multimedia technology resources (e.g., describe rules, list directions).

2. Turn computer and multimedia technology resources on and off.

Basic Operations

3. Discuss software and why it is necessary to operate computer and multimedia technology.

4. Start, use and exit software programs with teacher assistance.

5. Use input (keyboard, mouse) and output (printer) devices to operate computer and multimedia technology tools with teacher assistance.

Problem-solving

6. Use software programs designed to develop problem-solving skills.

Beginning Keyboarding

7. Begin to locate letters and special keys on the keyboard with teacher assistance (e.g., enter key, escape key, space bar).

Benchmark C: Use productivity tools to produce creative works.

Grade One

Productivity Tools

1. Describe how productivity tools are used to create documents, presentations and drawings.

Research Tools

2. Use technology resources with teacher assistance (e.g., pre-selected Web sites, launching applications, educational software).

Standard 4 Technology and Communication Applications

Students use an array of technologies and apply design concepts to communicate with multiple audiences, acquire and disseminate information and enhance learning. Students acquire and publish

information in a variety of media formats. They incorporate communication design principles in their work. They use technology to disseminate information to multiple audiences. Students use telecommunication tools to interact with others. They collaborate in real time with individuals and groups who are located in different schools, communities, states and countries. Students participate in distance education opportunities which expand academic offerings and enhance learning.

Benchmark A: Investigate the nature and operation of communication systems.

Grade One

Media Formats

1. Explain media formats used to communicate information (e.g., e-mail, newsletters, TV, phones, newspapers, Web pages).
2. Show, within a group, various types of communication formats used in everyday life.

Benchmark B: Explore how information can be published and presented in different formats.

Grade One

Productivity Tools

1. Create documents with teacher assistance (e.g., students observe the teacher making a document, they add ideas, and select images for the teacher to import).

Communication Tools

2. Identify and explore different forms of electronic communication (e.g., written documents in electronic form, e-mail, Web pages, video, multimedia).

Benchmark C: Participate in group projects and learning activities using technology communications.

Grade One

Use of Communications

1. Contribute to teacher-directed online projects (e.g., collecting weather data, listing of bird counts).

Standard 5 Technology and Information Literacy

Students engage in information literacy strategies, use the Internet, technology tools and resources, and apply information-management skills to answer questions and expand knowledge. Students become information-literate learners by utilizing a research process model. They recognize the need for information and define the problem, need or task. Students understand the structure of information systems and apply these concepts in acquiring and managing information. Using technology tools, a variety of resources are identified, accessed and evaluated.

Relevant information is selected, analyzed and synthesized to generate a finished product. Students evaluate their information process and product.

Benchmark A: State what information is, and show where it can be found.

Grade One

Understanding Information

1. Talk about the difference between factual information and fiction (e.g., what is real and what is pretend or make-believe).
2. Use a graphic organizer to sort information.

Benchmark B: Use a simple research process model which includes deciding what to use, finding resources, using information and checking work to generate a product.

Grade One

Decide

1. Ask questions about an identified topic and list facts already known about the topic (e.g., graphic organizers for brainstorming, charting, webbing).

Find

2. Find information in a technology-based resource (e.g., Web site, database, DVD, software program, video).

Use

3. Use technology to tell what was learned from information gathered (e.g., use simple presentation tools to create a poster, book, slide show).

Check

4. Tell where information came from (e.g., name of Web sites, software, databases).

Benchmark C: Apply basic browser and navigation skills to find information from the Internet.

Grade One

Internet Concepts

1. List types of information available on the Internet (e.g., school Web site, local information, animals, maps).
2. Use teacher or librarian selected Web site to find information or learn new things.
3. Use browser tools and buttons:
 - a. Forward and back button;
 - b. Home button; and
 - c. Choose a link from the bookmarks or favorites list.

Standard 6 Design

Students will apply a number of problem-solving strategies demonstrating the nature of design, the role of engineering and the role of assessment. Students recognize the attributes of design; that it is purposeful, based on requirements, systematic, iterative, creative, and provides solution and alternatives. Students explain critical design factors and/or processes in the development, application and utilization of technology as a key process in problem-solving. Students describe inventors and their inventions, multiple inventions that solve the same problem, and how design has affected their community. They apply and explain the contribution of thinking and procedural steps to create an appropriate design and the process skills required to build a product or system. They critically evaluate a design to address a problem of personal, societal and environmental interests. Students systematically solve a variety of types of problems using different design approaches including troubleshooting, research and development, innovation, invention and experimentation.

Benchmark A: Identify problems and potential technological solutions.

Grade One

Technical Problem-solving

1. Identify possible solutions to a problem.
2. Distinguish the difference between people's needs and wants and how this can influence potential solutions.

Strength and Materials

3. Identify and describe characteristics of different materials used to create technological products that provide solutions (e.g., wood, metal, glass, plastic).

Benchmark B: Understand that changes in design can be used to strengthen or improve an object.

Grade One

Strength and Materials

1. Recognize that designs have limited strength (e.g., a toy bridge made of craft sticks can support only so much weight).
2. List the materials used in common items (e.g., house, car, toys).

Design Process

3. Describe how things are built by thinking of an idea, trying out a design and sharing it with others.

Technical Communication

4. Understand we can draw things and then have someone else build them.

Benchmark C: Explore how products are invented and repaired.

Grade One

Technical Problem-solving

1. Understand that things break but often they can be fixed (e.g., have students share their experiences).
2. Describe how to repair a broken toy (e.g., make sure the switch is on, the batteries are charged and nothing is blocking the toy's operation).

Standard 7 Designed World

Students understand how the physical, informational and bio-related technological systems* of the designed world are brought about by the design process. Critical to this will be students' understanding of their role in the designed world: its processes, products, standards, services, history, future, impact, issues and career connections.

Students learn that the designed world consists of technological systems* reflecting the modifications that humans have made to the natural world to satisfy their own needs and wants. Students understand how through the design process the resources: materials, tools and machines, information, energy, capital, time and people are used in the development of useful products and

systems. Students develop a foundation of knowledge and skills through participation in technically oriented activities for the application of technological systems. Students demonstrate understanding, skills and proficient use of technological tools, machines, instruments, materials and processes across technological systems in unique and/or new contexts. Students identify and assess the historical, cultural, environmental, governmental and economic impacts of technological systems in the designed world. *The technological systems areas include energy and power technologies, transportation technologies, manufacturing technologies, construction technologies, information and communication technologies, medical technologies, agricultural and related biotechnologies.

Benchmark A: Develop an understanding of the goals in physical technologies.

Grade One

Energy and Power

1. List the various forms of energy that are used in the community (e.g., electrical, mechanical, thermal).
2. List the kinds of energy we can purchase (e.g., batteries, gas, electricity).

Transportation

3. Understand that vehicles move people or goods from one place to another in water, air, or space and on land (e.g., boats, airplanes, rockets, trucks).

Manufacturing

4. Name products that are produced in large quantities (e.g., candy, baseballs, cars).

Construction

5. Name things that are constructed where they are used (e.g., roads, buildings, bridges).

Benchmark B: Develop an understanding of the goals of informational technologies.

Grade One

Information and Communication

1. Use symbols to communicate (e.g., write a sentence using pictures).
2. Describe how technology enables communication by sending and receiving information (e.g., telephone, TV, magazines, e-mail).

Grade Two

Information and Communication

1. Understand that information is data that has been organized (e.g., make a table of data that has been collected).
2. List job titles that are in the technological system of information and communication technologies (e.g., reporter, camera person, printer, newscaster).

Benchmark C: Develop an understanding of the goals of bio-related technologies.

Grade One

Medical

1. Know that vaccinations protect people from getting certain diseases.

Agriculture and Related Biotechnologies

2. Explain how the use of technologies in agriculture makes it possible for food to be available year round.