# The Nature of Technology

## Standard 1:  Develop an understanding of the characteristics and scope of technology

*Students will understand that:*

| TECH8.1.1 | New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology. |
| TECH8.1.2 | Corporations can often create demand for a product by bringing it onto the market and advertising it. |

## Standard 2:  Develop an understanding of the core concepts of technology

*Students will understand that:*

| TECH8.2.1 | Technological systems include input, processes, output, and at times feedback. |
| TECH8.2.2 | Systems thinking involves considering how every part relates to others. |
| TECH8.2.3 | An open-loop system has no feedback path and requires human intervention, while a closed-loop system uses feedback |
| TECH8.2.4 | Technological systems can be connected to one another. |
| TECH8.2.5 | Malfunction of any part of a system may affect the function and quality of the system. |
| TECH8.2.6 | Requirements are the parameters placed on the development of a product or system. |
| TECH8.2.7 | Different technologies involve different sets of processes. |
| TECH8.2.8 | Controls are mechanisms or particular steps that people perform using information about the system that causes systems to change. |
| TECH8.2.9 | Maintenance is the process of inspecting and servicing a product or system on a regular basis in order for it to continue functioning properly, to extend its life, or to upgrade its capability. |

## Standard 3:  Develop an understanding of the relationships among technologies and connections between technology and other fields of study

*Students will understand that:*

| TECH8.3.1 | Technological often interact with one another. |
| TECH8.3.2 | A product, system, or environment developed for one setting may be applied to another setting. |
| TECH8.3.3 | Knowledge gained from other fields of study has a direct effect on the development of technological products and systems. |

# Technology and Society

## Standard 4:  Develop an understanding of the cultural, social, economic, and political effects of technology

*Students will understand that:*

| TECH8.4.3 | Technology, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences. |

## Standard 5:  Develop an understanding of the effects of technology on the environment

*Students will understand that:*

| TECH8.5.1 | The management of waste produced by technological systems is an important societal issue. |
| TECH8.5.2 | Technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems |
| TECH8.5.3 | Decisions to develop and use technologies often put environmental and economic concerns in direct competition with one another. |
### Standard 6:
Develop an understanding of the role of society in the development and use of technology

*This standard does not apply.*

### Standard 7:
Develop an understanding of the influences of technology in history

**Students will understand that:**

- **TECH8.7.1** The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships.
- **TECH8.7.2** In the past, an invention or innovation was not usually developed with the knowledge of science.

### Design

### Standard 8:
Develop an understanding of the attributes of design

**Students will understand that:**

- **TECH8.8.1** Design is a creative planning process that leads to useful products and systems.

### Standard 9:
Develop an understanding of engineering design

**Students will understand that:**

- **TECH8.9.1** Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.

### Standard 10:
Develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem-solving

**Students will understand that:**

- **TECH8.10.1** Troubleshooting is a problem solving method used to identify the cause of a malfunction in a technological system.
- **TECH8.10.2** 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.

### Abilities for a Technological World

### Standard 11:
Develop abilities to apply the design process

**Students will be able to:**

- **TECH8.11.1** Make a product or system and document the solution.

### Standard 12:
Develop abilities to use and maintain technological products and systems

**Students will be able to:**

- **TECH8.12.1** Use information provided in manuals, protocols, or by experienced people to see and understand how things work.
- **TECH8.12.2** Use tools, materials, and machines safely to diagnose, adjust, and repair systems.
- **TECH8.12.3** Use computers and calculators in various applications.
- **TECH8.12.4** Operate and maintain systems in order to achieve a given purpose.
Standard 13: Develop an understanding of and be able to assess the impact of products and systems

Students will be able to:

- TECH8.13.1 Design and use instruments to gather data.
- TECH8.13.2 Use data collected to analyze and interpret trends in order to identify the positive or negative effects of a technology.
- TECH8.13.3 Identify trends and monitor potential consequences of technological development.
- TECH8.13.4 Interpret and evaluate the accuracy of the information obtained and determine if it is useful.

The Designed World

Standard 14: Develop an understanding of and be able to select and use communications, manufacturing, construction, transportation, energy and power technologies

Students will know and understand:

- TECH8.14.1 Energy can be used to do work using many processes.
- TECH8.14.2 Power systems are used to drive and provide propulsion to other technological products and systems.
- TECH8.14.3 Information and communication systems allow information to be transferred from human to human, human to machine, and machine to human.
- TECH8.14.4 Communication systems are made up of a source, encoder, transmitter, receiver, decoder, and destination.
- TECH8.14.5 The design of a message is influenced by such factors as the intended audience, medium, purpose, and nature of the message.
- TECH8.14.6 Transporting people and goods involves a combination of individuals and vehicles.
- TECH8.14.7 Transportation vehicles are made up of subsystems, such as structural, propulsion, suspension, guidance, control, and support, that must function together for a system to work effectively.
- TECH8.14.8 Processes, such as receiving, holding, storing, loading, moving, unloading, delivering, evaluating, marketing, managing, communicating, and using conventions are necessary for the entire transportation system to operate efficiently.
- TECH8.14.9 The manufacturing process includes the designing, development, and making and servicing of products and systems.
- TECH8.14.11 Some structures are temporary, while others are permanent.
- TECH8.14.12 Buildings generally contain a variety of subsystems.