

# **Kenosha Unified School District No.1**

## **Technology Education Standards and Benchmarks**

### **STANDARD**

#### **S1 Understands the nature of technology.**

A basic understanding of technology is essential to make sense of today's changing world. Technology is how humans modify the world around them to meet their needs and wants or to solve practical problems. This standard outlines what students should understand about the nature of technology in order to become technological literate and adaptable.

### **BENCHMARKS**

S1A Students will develop an understanding of the characteristics and scope of technology

#### **Benchmark Topics 9-12**

Describe the nature of technology  
Understand the rate of technological diffusion  
Comprehend goal-directed research  
Analyze the commercialization of technology

S1B Students will develop an understanding of the core concepts of technology

#### **Benchmarks Topics 9-12**

Analyze systems  
Appraise resources  
Identify requirements  
Compare/Contrast optimization and trade-offs  
Differentiate processes  
Test controls

S1C Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study

## **Benchmark Topics 9-12**

Comprehend technology transfer  
Identify innovation and invention  
Compare/Contrast technological knowledge and advances of science and mathematics and vice versa

### **STANDARD #2**

#### **S2 Understands the impacts and consequences of technology on society.**

A society will determine the wants and needs that the use of technology seeks to address. Conversely, technology affects both society and the environment. Technology has been called “the engine of history” for the way in which its use drives change in society. It influences cultural patterns, political movement, local and global economics, and everyday life. The effects of society on technology and technology on society go hand in hand. This standard outlines how the use of technology affects society and the environment, as well as how society influences the development of technology, and how technology has changed and evolved over the course of human history.

### **BENCHMARKS**

S2A Students will develop an understanding of the cultural, social, economic and political effects of technology.

#### **Benchmark Topics 9-12**

Compare/Contrast rapid to gradual changes  
Assesses trade offs and effects  
Analyze ethical implications  
Distinguishes cultural, social, economic and political changes

S2B Students will develop an understanding of the effects of technology on the environment

#### **Benchmark Topics 9-12**

Give examples of conservation  
Assess reduction of resource use

Monitor the environment for effects of technology  
Evaluate the alignment of natural and technological processes  
Justify decisions and trade offs

S2C Students will develop an understanding of the role of society in the development and use of technology.

### **Benchmark Topics 9-12**

Compare/Contrast different cultures and technologies  
Evaluate development decisions  
Assess factors affecting designs and demands

S2D Students will develop an understanding of the influence of technology on history.

### **Benchmark Topics 9-12**

Analyze the evolutionary development of technology  
Differentiate dramatic changes in society  
Identify history of technology early technological history  
    The Middle Ages  
    The Iron Age  
    The Renaissance  
    The Industrial Revolution

## **STANDARD # 3**

### **S3 Understands and applies the design process**

Design is regarded by many as the core problem-solving process of technological development. To become literate in the design process requires acquiring the cognitive and procedural knowledge needed to create design in addition to familiarity with the process by which a design will be carried out to make a product or system. This standard outlines this process.

### **BENCHMARKS**

S3A Students will develop an understanding of the attributes of design

### **Benchmark Topics 9-12**

Apply the design process  
Understand design problems are usually not clear  
Demonstrate that designs need to be refined  
Evaluate the requirements

S3B Students will develop an understanding of engineering design

### **Benchmark Topics 9-12**

Demonstrate design principles  
Compares/Contrasts the influence of personal characteristics  
Investigate prototypes  
Differentiate the factors in engineering design

S3C Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

### **Benchmark Topics 9-12**

Identify research and development  
Research technological problems  
Conclude not all problems are technological or can be solved  
Use multidisciplinary approach

## **STANDARD #4**

**S4 Students will develop abilities for a technological world.**

With each decade technological knowledge becomes more specialized and widespread. Therefore, everyone needs a broad understanding of what it is, how it is developed, how it works, and how to make intelligent decisions about it. Technological literacy can be defined as having the ability to use, manage, assess, and understand technological products and systems. This standard outlines the development of important abilities for a technological world, which include applying the design process, using and maintaining technological products and systems, assessing products and systems, and others.

## **BENCHMARKS**

S4A Students will develop the abilities to apply the design process.

### **Benchmark Topics 9-12**

- Identify a design problem
- Identify criteria and constraints
- Refine the design
- Evaluate the design
- Develop a product or system using quality control
- Reevaluate final solution(s)

S4B Students will develop the abilities to use and maintain technological products systems

### **Benchmark Topics 9-12**

- Document and communicate processes and procedures
- Diagnose a malfunctioning system
- Troubleshoot and maintain systems
- Operate and maintain systems
- Use computers to communicate

S4C Students will develop the abilities to assess the impact of products and systems.

### **Benchmark Topics 9-12**

- Collect information and judge its quality
- Synthesize data to draw conclusions
- Employ assessment techniques
- Design forecasting techniques
- Practice real-world applications

## **STANDARD #5**

**S5 Students will be able to apply their understanding of technology as it relates to Medicine, Agriculture/Biotechnology, Communication, Construction, Manufacturing and Transportation/Power/Energy.**

Humans live in three worlds: the natural world, the social world, and the designed world. The designed world consists of all the modifications that humans have made to the natural world to satisfy their own needs and wants. The designed world is the product of a design process, which provides ways to turn resources: materials, tools and machines, people, information, energy, capital, and time into products and systems. This standard outlines six systems that contain a set of characteristics that define it and distinguishes it from the others.

## **BENCHMARKS**

S5A Students will develop an understanding of medical technologies

### **Benchmark Topics 9-12**

Analyze medical technologies for prevention and rehabilitation  
Synthesize research on telemedicine, genetic therapeutics, and biochemistry

S5B Students will develop an understanding of agricultural and related biotechnologies

### **Benchmark Topics 9-12**

Assess agricultural products and systems  
Synthesize research on biotechnology and conservation  
Evaluate engineering design and management of ecosystems

S5C Students will develop an understanding of and be able to select and use information and communication technologies.

### **Benchmark Topics 9-12**

Assess information and communication systems  
Evaluate the purpose of information and communication technology  
Compare/Contrast communication systems and sub-systems  
Compile list of the many ways of communicating  
Analyze communication through symbols

S5D Students will develop an understanding of and be able to select and use construction technologies.

## **Benchmark Topics 9-12**

- Analyze infrastructure
- Differentiate construction processes and procedures
- Assess requirements for maintenance, alterations, and renovation
- Evaluate prefabricated materials

S5E Students will develop an understanding of and be able to select and use manufacturing technologies.

## **Benchmark Topics 9-12**

- Compare/Contrast servicing and obsolescence
- Compare/Contrast durable or non-durable goods
- Evaluate manufacturing systems
- Assess interchangeability of parts
- Evaluate chemical technologies
- Market products

S5F Students will develop an understanding of and be able to select and use power, energy and transportation technologies.

## **Benchmark Topics 9-12**

- Define law of conservation of energy
- Analyze energy sources
- Apply second law of thermodynamics
- Compare/Contrast renewable and nonrenewable forms of energy
- Evaluate power systems as a source, a process, and a load
- Differentiate relationship of transportation and other technologies
- Assess intermodalism
- Judge transportation of services and negative impacts of transportation systems
- Compare/Contrast transportation processes and efficiency