

ITEEA Standards Alignment

Student Standards



Legend

•	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of FIRST® LEGO® League Discover either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grades K-2

Cluster	Indicator	Indicator Statement	Addressed
The Nature of Technology	1	Students will develop an understanding of the characteristics and scope of technology.	-
	A	<i>The natural world and human-made world are different.</i>	-
	B	<i>All people use tools and techniques (technology) to help them do things.</i>	-
	2	Students will develop an understanding of the core concepts of technology.	-
	A	<i>Some systems are found in nature, and some are made by humans.</i>	-
	B	<i>Systems have parts or components that work together to accomplish a goal.</i>	-
	C	<i>Tools are simple objects that help humans complete tasks.</i>	-
	D	<i>Different materials are used in making things.</i>	•
	E	<i>People plan in order to get things done.</i>	-
	3	Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	-
A	<i>The study of technology uses many of the same ideas and skills as other subjects.</i>	-	
Technology and Society	4	Students will develop an understanding of the cultural, social, economic, and political effects of technology.	-
	A	<i>The use of tools and machines can be helpful or harmful.</i>	-
	5	Students will develop an understanding of the effects of technology on the environment.	-
	A	<i>Some materials can be reused and/or recycled.</i>	-
	6	Students will develop an understanding of the role of society in the development and use of technology.	-
	A	<i>Products are made to meet individual needs and wants.</i>	-
	7	Students will develop an understanding of the influence of technology on history.	-
A	<i>The way people live and work has changed throughout history because of technology.</i>	-	
Design	8	Students will develop an understanding of the attributes of design.	•
	A	<i>Everyone can design solutions to a problem.</i>	•
	B	<i>Design is a creative process.</i>	•
	9	Students will develop an understanding of engineering design.	•
	A	<i>The engineering design process includes identifying a problem, looking for ideas, developing solutions, and sharing solutions with others.</i>	•
	B	<i>Expressing ideas to others verbally and through sketches and models is an important part of the design process.</i>	•
	10	Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	•
	A	<i>Asking questions and making observations helps a person to figure out how things work.</i>	•
	B	<i>All products and systems are subject to failure. Many products and systems, however, can be fixed.</i>	-

Abilities for a Technological World	11	Students will develop abilities to apply the design process.	●
	A	<i>Brainstorm people's needs and wants and pick some problems that can be solved through the design process.</i>	●
	B	<i>Build or construct an object using the design process.</i>	-
	C	<i>Investigate how things are made and... can be improved.</i>	●
	12	Students will develop abilities to use and maintain technological products and systems.	●
	A	<i>Discover how things work.</i>	●
	B	<i>Use hand tools correctly & safely & name them correctly.</i>	
	C	<i>Recognize and use everyday symbols.</i>	
	13	Students will develop abilities to assess the impact of products and systems.	-
	A	<i>Collect information about everyday products and systems by asking questions.</i>	-
B	<i>Determine if the human use of a product or system creates positive or negative results.</i>	-	
The Designed World	14	Students will develop an understanding of and be able to select and use medical technologies.	-
	A	<i>Vaccinations protect people from getting certain diseases.</i>	-
	B	<i>Medicine helps people who are sick to get better.</i>	-
	C	<i>There are many products designed specifically to help people take care of themselves.</i>	-
	15	Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.	-
	A	<i>The use of technologies in agriculture makes it possible for food to be available year round and to conserve resources.</i>	-
	B	<i>There are many different tools necessary to control and make up the parts of an ecosystem.</i>	-
	16	Students will develop an understanding of and be able to select and use energy and power technologies.	-
	A	<i>Energy comes in many forms.</i>	-
	B	<i>Energy should not be wasted.</i>	-
	17	Students will develop an understanding of and be able to select and use information and communication technologies.	-
	A	<i>Information is data that has been organized.</i>	-
	B	<i>Technology enables people to communicate by sending and receiving information over a distance.</i>	-
	C	<i>People use symbols when they communicate by technology.</i>	-
	18	Students will develop an understanding of and be able to select and use transportation technologies.	-
	A	<i>A transportation systems has many parts that work together to help people travel.</i>	-
	B	<i>Vehicles move people or goods from one place to another in water, air or space, and on land.</i>	-
	C	<i>Transportation vehicles must be cared for to prolong use.</i>	-
	19	Students will develop an understanding of and be able to select and use manufacturing technologies.	-
	A	<i>Manufacturing systems produce products in quantity.</i>	-
B	<i>Manufactured products are designed.</i>	-	
20	Students will develop an understanding of and be able to select and use construction technologies.	-	
A	<i>People live, work, & go to school in buildings, which are of different types: houses... office buildings, & schools.</i>	-	
B	<i>The type of structure determines how the parts are put together.</i>	-	

ITEEA Standards Alignment

Student Standards



EXPLORE

Legend

•	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of FIRST® LEGO® League Explore either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grades K-2

Cluster	Indicator	Indicator Statement	Addressed
The Nature of Technology	1	Students will develop an understanding of the characteristics and scope of technology.	•
	A	<i>The natural world and human-made world are different.</i>	-
	B	<i>All people use tools and techniques (technology) to help them do things.</i>	-
	2	Students will develop an understanding of the core concepts of technology.	•
	A	<i>Some systems are found in nature, and some are made by humans.</i>	-
	B	<i>Systems have parts or components that work together to accomplish a goal.</i>	-
	C	<i>Tools are simple objects that help humans complete tasks.</i>	-
	D	<i>Different materials are used in making things.</i>	•
	E	<i>People plan in order to get things done.</i>	•
	3	Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	-
A	<i>The study of technology uses many of the same ideas and skills as other subjects.</i>	-	
Technology and Society	4	Students will develop an understanding of the cultural, social, economic, and political effects of technology.	-
	A	<i>The use of tools and machines can be helpful or harmful.</i>	-
	5	Students will develop an understanding of the effects of technology on the environment.	-
	A	<i>Some materials can be reused and/or recycled.</i>	-
	6	Students will develop an understanding of the role of society in the development and use of technology.	-
	A	<i>Products are made to meet individual needs and wants.</i>	-
	7	Students will develop an understanding of the influence of technology on history.	-
A	<i>The way people live and work has changed throughout history because of technology.</i>	-	
Design	8	Students will develop an understanding of the attributes of design.	•
	A	<i>Everyone can design solutions to a problem.</i>	•
	B	<i>Design is a creative process.</i>	•
	9	Students will develop an understanding of engineering design.	•
	A	<i>The engineering design process includes identifying a problem, looking for ideas, developing solutions, and sharing solutions with others.</i>	•
	B	<i>Expressing ideas to others verbally and through sketches and models is an important part of the design process.</i>	•
	10	Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	•
	A	<i>Asking questions and making observations helps a person to figure out how things work.</i>	•
	B	<i>All products and systems are subject to failure. Many products and systems, however, can be fixed.</i>	-

Abilities for a Technological World	11	Students will develop abilities to apply the design process.	●
	A	<i>Brainstorm people's needs and wants and pick some problems that can be solved through the design process.</i>	●
	B	<i>Build or construct an object using the design process.</i>	-
	C	<i>Investigate how things are made and... can be improved.</i>	●
	12	Students will develop abilities to use and maintain technological products and systems.	●
	A	<i>Discover how things work.</i>	●
	B	<i>Use hand tools correctly & safely & name them correctly.</i>	-
	C	<i>Recognize and use everyday symbols.</i>	-
	13	Students will develop abilities to assess the impact of products and systems.	-
	A	<i>Collect information about everyday products and systems by asking questions.</i>	-
B	<i>Determine if the human use of a product or system creates positive or negative results.</i>	-	
The Designed World	14	Students will develop an understanding of and be able to select and use medical technologies.	-
	A	<i>Vaccinations protect people from getting certain diseases.</i>	-
	B	<i>Medicine helps people who are sick to get better.</i>	-
	C	<i>There are many products designed specifically to help people take care of themselves.</i>	-
	15	Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.	-
	A	<i>The use of technologies in agriculture makes it possible for food to be available year round and to conserve resources.</i>	-
	B	<i>There are many different tools necessary to control and make up the parts of an ecosystem.</i>	-
	16	Students will develop an understanding of and be able to select and use energy and power technologies.	-
	A	<i>Energy comes in many forms.</i>	-
	B	<i>Energy should not be wasted.</i>	-
	17	Students will develop an understanding of and be able to select and use information and communication technologies.	-
	A	<i>Information is data that has been organized.</i>	-
	B	<i>Technology enables people to communicate by sending and receiving information over a distance.</i>	-
	C	<i>People use symbols when they communicate by technology.</i>	-
	18	Students will develop an understanding of and be able to select and use transportation technologies.	-
	A	<i>A transportation systems has many parts that work together to help people travel.</i>	-
	B	<i>Vehicles move people or goods from one place to another in water, air or space, and on land.</i>	-
	C	<i>Transportation vehicles must be cared for to prolong use.</i>	-
	19	Students will develop an understanding of and be able to select and use manufacturing technologies.	-
	A	<i>Manufacturing systems produce products in quantity.</i>	-
B	<i>Manufactured products are designed.</i>	-	
20	Students will develop an understanding of and be able to select and use construction technologies.	-	
A	<i>People live, work, & go to school in buildings, which are of different types: houses... office buildings, & schools.</i>	-	
B	<i>The type of structure determines how the parts are put together.</i>	-	

Grades 3-5

Cluster	Indicator	Indicator Statement	Addressed
The Nature of Technology	1	Students will develop an understanding of the characteristics and scope of technology.	●
	C	<i>Things that are found in nature differ from things that are human-made in how they are produced and used.</i>	-
	D	<i>Tools, materials, and skills are used to make things and carry out tasks.</i>	-
	E	<i>Creative thinking and economic and cultural influences shape technological development.</i>	-
	2	Students will develop an understanding of the core concepts of technology.	●
	F	<i>A subsystem is a system that operates as a part of another system.</i>	-
	G	<i>When parts of a system are missing, it may not work as planned.</i>	-
	H	<i>Resources are the things needed to get a job done, such as tools and machines, materials, information, energy, people, capital, and time.</i>	-
	I	<i>Tools are used to design, make, use, and assess technology.</i>	-
	J	<i>Materials have many different properties.</i>	-
	K	<i>Tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.</i>	●
	L	<i>Requirements are the limits to designing or making a product or system.</i>	●
	3	Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	-
B	<i>Technologies are often combined.</i>	-	
C	<i>Various relationships exist between technology and other fields of study.</i>	-	
Technology and Society	4	Students will develop an understanding of the cultural, social, economic, and political effects of technology.	-
	B	<i>When using technology, results can be good or bad.</i>	-
	C	<i>The use of technology can have unintended consequences.</i>	-
	5	Students will develop an understanding of the effects of technology on the environment.	-
	B	<i>Waste must be appropriately recycled or disposed of to prevent unnecessary harm to the environment.</i>	-
	C	<i>The use of technology affects the environment in good and bad ways.</i>	-
	6	Students will develop an understanding of the role of society in the development and use of technology.	-
	B	<i>Because people's needs and wants change, new technologies are developed, and old ones are improved to meet those changes.</i>	-
	C	<i>Individual, family, community, and economic concerns may expand or limit the development of technologies.</i>	-
	7	Students will develop an understanding of the influence of technology on history.	-
B	<i>People have made tools to provide food, to make clothing, and to protect themselves.</i>	-	
Design	8	Students will develop an understanding of the attributes of design.	●
	C	<i>The design process is a purposeful method of planning practical solutions to problems.</i>	●
	D	<i>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.</i>	●
	9	Students will develop an understanding of engineering design.	●
	C	<i>The engineering design process involves defining a problem, generating ideas, selecting a solution, testing the solution(s), [making, evaluating, and presenting].</i>	●
	D	<i>When designing an object it is important to be creative and consider all ideas.</i>	●
	E	<i>Models are used to communicate & test design ideas & processes.</i>	●
	10	Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	●
	C	<i>Troubleshooting is a way of finding out why something does not work so that it can be fixed.</i>	●
	D	<i>Invention and innovation are creative ways to turn ideas into real things.</i>	●
E	<i>The process of experimentation, which is common in science, can also be used to solve technological problems.</i>	-	

Abilities for a Technological World	11	Students will develop abilities to apply the design process.	●
	D	<i>Identify and collect information about everyday problems that can be solved by technology, and generate ideas and requirements for solving a problem.</i>	-
	E	<i>The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s)...</i>	-
	F	<i>Test and evaluate the solutions for the design problem.</i>	-
	G	<i>Improve the design solutions.</i>	-
	12	Students will develop abilities to use and maintain technological products and systems.	●
	D	<i>Follow step-by-step directions to assemble a product.</i>	●
	E	<i>Select and safely use tools, products, and systems for specific tasks.</i>	-
	F	<i>Use computers to access and organize information.</i>	●
	G	<i>Use common symbols, such as numbers and words, to communicate key ideas.</i>	●
	13	Students will develop abilities to assess the impact of products and systems.	-
	C	<i>Compare, contrast and classify collected information in order to identify patterns.</i>	-
	D	<i>Investigate and assess the influence of a specific technology on the individual, family, community, and environment.</i>	-
E	<i>Examine the trade-offs of using a product or system and decide when it could be used.</i>	-	
The Designed World	14	Students will develop an understanding of and be able to select and use medical technologies.	-
	D	<i>Vaccines are designed to prevent diseases from developing and spreading; medicines are designed to relieve symptoms and stop diseases from developing.</i>	-
	E	<i>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.</i>	-
	F	<i>Many tools & devices have been designed to help provide clues about health and to provide a safe environment.</i>	-
	15	Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.	-
	C	<i>Artificial ecosystems are human-made environments that are designed to function as a unit and are comprised of humans, plants, and animals.</i>	-
	D	<i>Most agricultural waste can be recycled.</i>	-
	E	<i>Many processes used in agriculture require different procedures, products or systems.</i>	-
	16	Students will develop an understanding of and be able to select and use energy and power technologies.	-
	C	<i>Energy comes in different forms.</i>	-
	D	<i>Tools, machines, products, and systems use energy in order to do work.</i>	-
	17	Students will develop an understanding of and be able to select and use information and communication technologies.	-
	D	<i>The processing of information through the use of technology can be used to help humans make decisions and solve problems.</i>	-
	E	<i>Information can be acquired & sent through a variety of technological sources, including print & electronic media.</i>	-
	F	<i>Communication technology is the transfer of messages among people and/or machines over distances through the use of technology.</i>	-
	G	<i>Letters, characters, icons, and signs are symbols that represent ideas, quantities, elements and operations.</i>	-
	18	Students will develop an understanding of and be able to select and use transportation technologies.	-
	D	<i>The use of transportation allows people and goods to be moved from place to place.</i>	-
	E	<i>A transportation system may lose efficiency/fail if a part is missing/malfunctioning or a subsystem isn't working.</i>	-
	19	Students will develop an understanding of and be able to select and use manufacturing technologies.	-
	C	<i>Processing systems convert natural materials into products.</i>	-
D	<i>Manufacturing processes include designing products, gathering resources, and using tools to separate, form, and combine materials in order to produce products.</i>	-	
E	<i>Manufacturing enterprises exist because of a consumption of goods.</i>	-	

	20	Students will develop an understanding of and be able to select and use construction technologies.	-
	<i>C</i>	<i>Modern communities are usually planned according to guidelines.</i>	-
	<i>D</i>	<i>Structures need to be maintained.</i>	-
	<i>E</i>	<i>Many systems are used in buildings.</i>	-

ITEEA Standards Alignment

Student Standards



CHALLENGE

Legend

•	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of FIRST® LEGO® League Challenge either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grades 3-5

Cluster	Indicator	Indicator Statement	Addressed
The Nature of Technology	1	Students will develop an understanding of the characteristics and scope of technology.	•
	C	<i>Things that are found in nature differ from things that are human-made in how they are produced and used.</i>	-
	D	<i>Tools, materials, and skills are used to make things and carry out tasks.</i>	-
	E	<i>Creative thinking and economic and cultural influences shape technological development.</i>	-
	2	Students will develop an understanding of the core concepts of technology.	•
	F	<i>A subsystem is a system that operates as a part of another system.</i>	-
	G	<i>When parts of a system are missing, it may not work as planned.</i>	-
	H	<i>Resources are the things needed to get a job done, such as tools and machines, materials, information, energy, people, capital, and time.</i>	-
	I	<i>Tools are used to design, make, use, and assess technology.</i>	-
	J	<i>Materials have many different properties.</i>	-
	K	<i>Tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.</i>	•
	L	<i>Requirements are the limits to designing or making a product or system.</i>	•
	3	Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	•
B	<i>Technologies are often combined.</i>	•	
C	<i>Various relationships exist between technology and other fields of study.</i>	-	
Technology and Society	4	Students will develop an understanding of the cultural, social, economic, and political effects of technology.	•
	B	<i>When using technology, results can be good or bad.</i>	•
	C	<i>The use of technology can have unintended consequences.</i>	•
	5	Students will develop an understanding of the effects of technology on the environment.	-
	B	<i>Waste must be appropriately recycled or disposed of to prevent unnecessary harm to the environment.</i>	-
	C	<i>The use of technology affects the environment in good and bad ways.</i>	-
	6	Students will develop an understanding of the role of society in the development and use of technology.	•
	B	<i>Because people's needs and wants change, new technologies are developed, and old ones are improved to meet those changes.</i>	-
	C	<i>Individual, family, community, and economic concerns may expand or limit the development of technologies.</i>	-
	7	Students will develop an understanding of the influence of technology on history.	-
B	<i>People have made tools to provide food, to make clothing, and to protect themselves.</i>	-	
Design	8	Students will develop an understanding of the attributes of design.	•
	C	<i>The design process is a purposeful method of planning practical solutions to problems.</i>	•
	D	<i>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.</i>	•
	9	Students will develop an understanding of engineering design.	•

	C	<i>The engineering design process involves defining a problem, generating ideas, selecting a solution, testing the solution(s), [making, evaluating, and presenting].</i>	●
	D	<i>When designing an object it is important to be creative and consider all ideas.</i>	●
	E	<i>Models are used to communicate & test design ideas & processes.</i>	●
	10	Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	●
	C	<i>Troubleshooting is a way of finding out why something does not work so that it can be fixed.</i>	●
	D	<i>Invention and innovation are creative ways to turn ideas into real things.</i>	●
	E	<i>The process of experimentation, which is common in science, can also be used to solve technological problems.</i>	●
Abilities for a Technological World	11	Students will develop abilities to apply the design process.	●
	D	<i>Identify and collect information about everyday problems that can be solved by technology, and generate ideas and requirements for solving a problem.</i>	●
	E	<i>The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s)...</i>	-
	F	<i>Test and evaluate the solutions for the design problem.</i>	●
	G	<i>Improve the design solutions.</i>	●
	12	Students will develop abilities to use and maintain technological products and systems.	●
	D	<i>Follow step-by-step directions to assemble a product.</i>	●
	E	<i>Select and safely use tools, products, and systems for specific tasks.</i>	-
	F	<i>Use computers to access and organize information.</i>	●
	G	<i>Use common symbols, such as numbers and words, to communicate key ideas.</i>	●
	13	Students will develop abilities to assess the impact of products and systems.	●
	C	<i>Compare, contrast and classify collected information in order to identify patterns.</i>	-
	D	<i>Investigate and assess the influence of a specific technology on the individual, family, community, and environment.</i>	●
E	<i>Examine the trade-offs of using a product or system and decide when it could be used.</i>	-	
The Designed World	14	Students will develop an understanding of and be able to select and use medical technologies.	-
	D	<i>Vaccines are designed to prevent diseases from developing and spreading; medicines are designed to relieve symptoms and stop diseases from developing.</i>	-
	E	<i>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.</i>	-
	F	<i>Many tools & devices have been designed to help provide clues about health and to provide a safe environment.</i>	-
	15	Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.	-
	C	<i>Artificial ecosystems are human-made environments that are designed to function as a unit and are comprised of humans, plants, and animals.</i>	-
	D	<i>Most agricultural waste can be recycled.</i>	-
	E	<i>Many processes used in agriculture require different procedures, products or systems.</i>	-
	16	Students will develop an understanding of and be able to select and use energy and power technologies.	-
	C	<i>Energy comes in different forms.</i>	-
	D	<i>Tools, machines, products, and systems use energy in order to do work.</i>	-
	17	Students will develop an understanding of and be able to select and use information and communication technologies.	-
	D	<i>The processing of information through the use of technology can be used to help humans make decisions and solve problems.</i>	-
	E	<i>Information can be acquired & sent through a variety of technological sources, including print & electronic media.</i>	-
	F	<i>Communication technology is the transfer of messages among people and/or machines over distances through the use of technology.</i>	-
	G	<i>Letters, characters, icons, and signs are symbols that represent ideas, quantities, elements and operations.</i>	-
	18	Students will develop an understanding of and be able to select and use transportation technologies.	-

	D	<i>The use of transportation allows people and goods to be moved from place to place.</i>	-
	E	<i>A transportation system may lose efficiency/fail if a part is missing/malfunctioning or a subsystem isn't working.</i>	-
	19	Students will develop an understanding of and be able to select and use manufacturing technologies.	-
	C	<i>Processing systems convert natural materials into products.</i>	-
	D	<i>Manufacturing processes include designing products, gathering resources, and using tools to separate, form, and combine materials in order to produce products.</i>	-
	E	<i>Manufacturing enterprises exist because of a consumption of goods.</i>	-
	20	Students will develop an understanding of and be able to select and use construction technologies.	-
	C	<i>Modern communities are usually planned according to guidelines.</i>	-
	D	<i>Structures need to be maintained.</i>	-
	E	<i>Many systems are used in buildings.</i>	-

Grades 6-8

Cluster	Indicator	Indicator Statement	Addressed
The Nature of Technology	1	Students will develop an understanding of the characteristics and scope of technology.	●
	F	<i>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.</i>	●
	G	<i>The development of technology is a human activity and is the result of individual or collective needs and the ability to be creative.</i>	●
	H	<i>Technology is closely linked to creativity, which has resulted in innovation.</i>	●
	I	<i>Corporations can often create demand for a product by bringing it onto the market and advertising it.</i>	-
	2	Students will develop an understanding of the core concepts of technology.	●
	M	<i>Technological systems include input, processes, output, and at times, feedback.</i>	●
	N	<i>Systems thinking involves considering how every part relates to others.</i>	-
	O	<i>An open-loop system has no feedback path and requires human intervention, while a closed-loop system uses feedback.</i>	-
	P	<i>Technological systems can be connected to one another.</i>	-
	Q	<i>Malfunctions of any part of a system may affect the function and quality of the system.</i>	-
	R	<i>Requirements are the parameters placed on the development of a product or system.</i>	●
	S	<i>Trade-off is a decision process recognizing the need for careful compromises among competing factors.</i>	●
	T	<i>Different technologies involve different sets of processes.</i>	-
	U	<i>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 quality.</i>	-
	V	<i>Controls are mechanisms or particular steps that people perform using information about the system that causes systems to change.</i>	-
	3	Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	●
	D	<i>Technological systems often interact with one another.</i>	●
	E	<i>A product, system, or environment developed for one setting may be applied to another setting.</i>	-
	F	<i>Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.</i>	-
Technology and Society	4	Students will develop an understanding of the cultural, social, economic, and political effects of technology.	●
	D	<i>The use of technology affects humans in various ways, including their safety, comfort, choices, and attitudes about technology's development and use.</i>	-
	E	<i>Technology, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences.</i>	●
	F	<i>The development and use of technology poses ethical issues.</i>	-
	G	<i>Economic, political, and cultural issues are influenced by the development and use of technology.</i>	-
	5	Students will develop an understanding of the effects of technology on the environment.	-
	D	<i>The management of waste produced by technological systems is an important societal issue.</i>	-
	E	<i>Technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems.</i>	-

	F	<i>Decisions to develop and use technologies often put environmental and economic concerns in direct competition with one another.</i>	-
	6	Students will develop an understanding of the role of society in the development and use of technology.	●
	D	<i>Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.</i>	-
	E	<i>The use of inventions and innovations has led to changes in society and the creation of new needs and wants.</i>	●
	F	<i>Social and cultural priorities and values are reflected in technological devices.</i>	-
	G	<i>Meeting societal expectations is the driving force behind the acceptance and use of products and systems.</i>	-
	7	Students will develop an understanding of the influence of technology on history.	-
	C	<i>Many inventions and innovations have evolved using slow and methodical processes of tests and refinements.</i>	-
	D	<i>The specialization of function has been at the heart of many technological improvements.</i>	-
	E	<i>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.</i>	-
	F	<i>In the past, an invention or innovation was not usually developed with the knowledge of science.</i>	-
Design	8	Students will develop an understanding of the attributes of design.	●
	E	<i>Design is a creative planning process that leads to useful products and systems.</i>	●
	F	<i>There is no perfect design.</i>	-
	G	<i>Requirements for design are made up of criteria and constraints.</i>	●
	9	Students will develop an understanding of engineering design.	●
	F	<i>Design involves a set of steps, which can be performed in different sequences and repeated as needed.</i>	●
	G	<i>Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.</i>	●
	H	<i>Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.</i>	●
	10	Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	●
	F	<i>Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.</i>	●
	G	<i>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.</i>	●
	H	<i>Some technological problems are best solved through experimentation.</i>	●
Abilities for a Technological World	11	Students will develop abilities to apply the design process.	●
	H	<i>Apply a design process to solve problems in and beyond the laboratory- classroom.</i>	●
	I	<i>Specify criteria and constraints for the design.</i>	●
	J	<i>Make two-dimensional and three-dimensional representations of the designed solution.</i>	●
	K	<i>Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints, and refine as needed.</i>	●
	L	<i>Make a product or system and document the solution.</i>	●
	12	Students will develop abilities to use and maintain technological products and systems.	●
	H	<i>Use information provided in manuals, protocols, or by experienced people to see and understand how things work.</i>	-
	I	<i>Use tools, materials, and machines safely to diagnose, adjust, and repair systems.</i>	-
	J	<i>Use computers and calculators in various applications.</i>	●
	K	<i>Operate and maintain systems in order to achieve a given purpose.</i>	●
	13	Students will develop abilities to assess the impact of products and systems.	●
	F	<i>Design and use instruments to gather data.</i>	-
	G	<i>Use data collected to analyze and interpret trends in order to identify the positive and negative effects of a technology.</i>	-
	H	<i>Identify trends and monitor potential consequences of technological development.</i>	-
I	<i>Interpret and evaluate the accuracy of the information obtained and determine if it is useful.</i>	-	

The Designed World	14	Students will develop an understanding of and be able to select and use medical technologies.	-
	<i>G</i>	<i>Advances and innovations in medical technologies are used to improve health care.</i>	-
	<i>H</i>	<i>Sanitation processes used in the disposal of medical products help to protect people from harmful organisms and disease, and shape the ethics of medical safety.</i>	-
	<i>I</i>	<i>The vaccines developed for use in immunization require specialized technologies to support environments in which sufficient amounts of vaccines are produced.</i>	-
	<i>J</i>	<i>Genetic engineering involves modifying the structure of DNA to produce novel genetic make-ups.</i>	-
	15	Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.	-
	<i>F</i>	<i>Technological advances in agriculture directly affect the time and number of people required to produce food for a large population.</i>	-
	<i>G</i>	<i>A wide range of specialized equipment and practices is used to improve the production of food, fiber, fuel, and other useful products and in the care of animals.</i>	-
	<i>H</i>	<i>Biotechnology applies the principles of biology to create commercial products or processes.</i>	-
	<i>I</i>	<i>Artificial ecosystems are humanmade complexes that replicate some aspects of the natural environment.</i>	-
	<i>J</i>	<i>The development of refrigeration, freezing, dehydration, preservation, and irradiation provide long-term storage of food and reduce the health risks caused by tainted food.</i>	-
	16	Students will develop an understanding of and be able to select and use energy and power technologies.	-
	<i>E</i>	<i>Energy is the capacity to do work.</i>	-
	<i>F</i>	<i>Energy can be used to do work, using many processes.</i>	-
	<i>G</i>	<i>Power is the rate at which energy is converted from one form to another or transferred from one place to another, or the rate at which work is done.</i>	-
	<i>H</i>	<i>Power systems are used to drive and provide propulsion to other technological products and systems.</i>	-
	<i>I</i>	<i>Much of the energy used in our environment is not used efficiently.</i>	-
	17	Students will develop an understanding of and be able to select and use information and communication technologies.	-
	<i>H</i>	<i>Information and communication systems allow information to be transferred from human to human, human to machine, and machine to human.</i>	-
	<i>I</i>	<i>Communication systems are made up of a source, encoder, transmitter, receiver, decoder, and destination.</i>	-
	<i>J</i>	<i>The design of a message is influenced by such factors as the intended audience, medium, purpose, and nature of the message.</i>	-
	<i>K</i>	<i>The use of symbols, measurements, and drawings promotes a clear communication by providing a common language to express ideas.</i>	-
	18	Students will develop an understanding of and be able to select and use transportation technologies.	-
	<i>F</i>	<i>Transporting people and good involves a combination of individuals and vehicles.</i>	-
	<i>G</i>	<i>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.</i>	-
	<i>H</i>	<i>Governmental regulations often influence the design and operation of transportation systems.</i>	-
	<i>I</i>	<i>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.</i>	-
	19	Students will develop an understanding of and be able to select and use manufacturing technologies.	-
	<i>F</i>	<i>Manufacturing systems use mechanical processes that change the form of materials through the processes of separating, forming, combining, and conditioning.</i>	-
	<i>G</i>	<i>Manufactured goods may be classified as durable and nondurable.</i>	-
	<i>H</i>	<i>The manufacturing process includes the designing, development, making, and servicing of products and systems.</i>	-
	<i>I</i>	<i>Chemical technologies are used to modify or alter chemical substances.</i>	-
	<i>J</i>	<i>Materials must first be located before they can be extracted from the earth through such processes as harvesting, drilling, and mining.</i>	-
	<i>K</i>	<i>Marketing a product involves informing the public about it as well as assisting in selling and distributing it.</i>	-

	20	Students will develop an understanding of and be able to select and use construction technologies.	-
	<i>F</i>	<i>The selection of designs for structures is based on factors such as building laws and codes, style, convenience, cost, climate, and function.</i>	-
	<i>G</i>	<i>Structures rest on a foundation.</i>	-
	<i>H</i>	<i>Some structures are temporary, while others are permanent.</i>	-
	<i>I</i>	<i>Buildings generally contain a variety of subsystems.</i>	-