

Bi-Borough Technology Curriculum

Grades K-6



**Mr. Matthew Wilson
Superintendent
Oradell Public School**

**Dr. Tova Ben-Dov
Superintendent
River Edge Public Schools**

**Ms. Megan Bozios
Principal
Oradell Public School**

**Ms. Denise Heitman
Principal
Cherry Hill School**

**Ms. J. Diminich-Kucharski
Bi-Borough Supervisor
Of Curriculum**

**Mr. Michael Henzel
Principal
Roosevelt School**

Technology Committee

**Ms. Megan Bozios
Mr. William Feldman
Mr. Paul Garofano
Ms. Denise Heitman
Ms. Corinne Lynch
Mr. Kevin Stokes**

Philosophy

While the Common Core standards focus on Math and Language Arts, they also emphasize technology as a way to learn knowledge and skills in these areas. Technology skills allow students to succeed in college and careers. That is why technology should be integrated into academics as well as taught separately. Although the standards include technology skills, they call for students to use technology to help them learn instead of just having technology skills.

The use of computer applications and technology tools enables students to conduct research, solve problems, improve learning, achieve goals, and produce products and presentations in conjunction with standards in all content areas. They allow students to develop, locate, summarize, organize, synthesize, and evaluate information for lifelong learning.

In addition, students also need to understand the various facets of technology and the design process that entails analyzing and evaluating design options and then apply the design process to solve problems. A systems perspective needs to be employed to emphasize interconnectedness of all knowledge and the impact of technology and technological change as it applies to physical systems, biological systems, and information and communication systems. The intent is that all students develop technological literacy and are prepared for the option of further study in the field of technology education.

Across the globe, growth in technology has transformed every aspect of business, government, society, and life. Education must adapt to these changes as well. Effective classroom technology integration is the bridge that invites millennium learners to be successful, engaged, classroom learners. The intent of the curriculum is to build the bridge between school and the world in the 21st century.

Introduction

To ensure that students are prepared for life in the digital age, students must be proficient technology users. It is no longer adequate for instruction to focus solely on basic technology skills. Rapid change in our global society and technological advancements warrant changes to the ways technologies are integrated into the classroom instruction. The standards contained in this curriculum still address basic competence but also incorporate the skills and knowledge that students require to learn effectively and live productively in an increasing digital society.

The notion of technology integration suggests that technology taught in isolation is not as effective as when technology is used in context. For instance, teaching students how to conduct internet research without a topic does not carry the same rigor or relevance as conducting research on the Gettysburg Address to write a history paper. Therefore, the standards in this document are simply standards, and the content is derived from the subject areas in which they are integrated. The intent is to integrate the technology standards into any content area or incorporate them into the content standards of other subjects.

Standards describe what students need to know and be able to do at certain grade levels. Standards reflect the floor, not the ceiling for student learning and performance. It is essential that the standards are not taught in isolation; rather, multiple standards are taught within a single lesson ensuring teachers, students, and parents make the connections between reading and writing to enhance performance.

To help teachers identify the technology skills that need to be introduced, practiced and mastered, the curriculum was revised to include a chart that outlines technology skill development at each grade level. The chart is defined into the following sections and each section shows the level of proficiency students should reach at each grade level: Basic Operations of District Network and Hardware, Keyboarding, Word Processing, Spreadsheets and Graphs, Digital Resources and Literacy, Multi-media Presentations.

Recognizing the rapid changes that occur regarding technology, the curriculum was written in a way that allows for new methodologies and resources to emerge rather than directing teachers to use any particular application. However, the expectation is that administration sets guidelines regarding the types and number of artifacts that students are expected to produce, in order to reflect the technology skills that they are expected to learn. These skills are outlined in the chart contained in the curriculum.

Bi-Borough Technology Curriculum

The Technology Committee, with feedback from faculty, put together the following scope and sequence of computer literacy skills students are expected to master. This scope and sequence is a guide of the 8.1 New Jersey Core Content Standards. These standards will be infused into all of our content areas because we believe computers and their applications are tools utilized to improve student learning. Use the key below to identify when to introduce, practice and master technology in your classroom.

New Jersey Core Content Standard 8.1

- 1) Basic Operations and Concepts
- 2) Keyboarding
- 3) Word Processing
- 4) Spreadsheets and Graphs
- 5) Digital Literacy and Resources
- 6) Multi-Media Presentations

Key
*I= Introduce by
teacher*
T= Teacher only
P= Practice
M = Master

Basic Operations of District Network and Hardware

	K	1	2	3	4	5	6
Handle and care of device	I	P	P	P	P	P	P
Proper use, storage and care of laptops/tablet	T	I	P	P	P	M	M
Ethical Use of Network and applications (Acceptable Use Policy, digital citizenship)	I	P	P	P	P	P	P
Explain purpose of AUP and the consequences of inappropriate use		I	P	P	P	P	P
Mouse Skills: point, click and drag; device specific skills	P	P	P	M	M	M	M
Advanced right click menus	I	I	I	P	P	P	P
Log in – Log out, navigate programs via network passwords, accounts	I	P	P	P	M	M	M
Open and quit applications	I	P	P	M	M	M	M
Use drop down menus	I	P	P	P	M	M	M
Name documents	I	P	M	M	M	M	M
Save/retrieve documents	I	P	P	M	M	M	M
Open browsers, navigate websites, launch applications	I	P	P	M	M	M	M
Identification and use fo peripheral components		I	P	M	M	M	M
Use multiple applications simultaneously		I	P	M	M	M	M
Printers: print preview and select network printer	T	I	P	P	M	M	M
Navigate multiple open programs				I	P	P	M
Recognize use of LCD projection equipment	T	T	T	T	T	T	T
Recognize use of video-conferencing equipment	T	T	T	T	T	T	T
In all applications, use help menu							I

Keyboarding

	K	1	2	3	4	5	6
Explore Keyboard	I	P	P	P	P	P	P
Left and Right Hand keys		I	P	P	P	P	P
Explore Home Row			I	P	P	P	P
Home Row and standard fingering				I	P	P	P
Improve accuracy and technique					I	P	P
Identification of Keys	I	M	M	M	M	M	M
8 words per minute, 90% accuracy		M	M	M	M	M	M
10 words per minute, 90% accuracy			M				
15 words per minute, 92% accuracy				M			
20 words per minute, 92% accuracy					M		

Word Processing

	K	1	2	3	4	5	6
Create a new document, enter text correctly		I	P	P	M	M	M
Edit text, spell check, thesaurus			I	P	P	P	M
Advanced editing; cut, copy, paste			I	P	P	P	P
Format text: alignment, font, sizes, styles, spacing, line spacing, tabs key, bullets		I	P	P	P	P	P
Format documents: columns, headers, footers, page numbers					I	P	P
Use toolbars and toolboxes	I	P	P	P	P	M	M
Images: insert, position, resize			I	P	M	M	M
Cite references				I	P	P	P
Utilize graphic organizers/outlines	I	P	P	P	P	P	P
Type name and simple sentences	I	P	M	M	M	M	M
Shift key and period	I	P	M	M	M	M	M
Incorporating images		I	M	M	M	M	M

Spreadsheets and Graphs

	K	1	2	3	4	5	6
Enter survey data to create a graph		I	P	P	P	P	P
Create a spreadsheet and enter data correctly			I	P	P	P	P
Create a graph from spreadsheet data			I	P	P	P	P
Use formula						I	P
Enter survey data to find a graph	I	P	M	M	M	M	M

Digital Literacy and Resources

	K	1	2	3	4	5	6
Personal Security and Safety on the Internet	I	I	P	P	P	P	P
Ethical and legal responsibilities of the Internet, A.V.P.	I	I	P	P	P	P	P
Understand and use digital information and avoid plagiarism			I	P	P	P	P
Recognize and practice responsible use of copyrighted material				I	P	P	P
Navigate and use on-line websites/databases to access information	I	P	P	P	P	P	P
Identify images that correlate to text	I	P	P	P	P	P	P
Navigate web browser	I	P	P	P			
Use internet searching strategies				I	P	P	P
Evaluate websites					I	P	P
Access and participate in digital collaborative projects/web quests		I	P	P	P	P	P

Multi-Media Presentations

	K	1	2	3	4	5	6
Create a slide (slideshow) for multimedia presentation integrating grade level word processing skills		I	P	P	P	P	P
Create content based slide shows	I	P	P	P	P	P	P
Illustrate using drawing/Paint skills	I	P	P	P	M	M	M
Introduce digital camera	I	P	P	P	P	P	P
Create and edit a movie						T	T

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EDUCATIONAL TECHNOLOGY BY THE END OF SECOND GRADE

STATE STANDARDS

Technology

- 8.1** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaboratively to create and communicate knowledge.
- 8.1.2.A.1** Identify the basic features of a computer and explain how to use them effectively.
- 8.1.2.A.2** Use technology terms in daily practice.
- 8.1.2.A.3** Discuss the common uses of computer applications and hardware and identify their advantages and disadvantages.
- 8.8.2.A.4** Create a document with text using a word processing program.
- 8.1.2.A.5** Demonstrate the ability to navigate in developmentally appropriate virtual environments.

21st Century Life and Careers

- 9.1.4.A.1** Apply critical thinking and problem solving skills to solve problems
- 9.1.4.B.1** Gather and evaluate knowledge from a variety of sources that fosters creativity and innovative thinking
- 9.1.4.C.1** Collaborate in teams that allows groups to achieve common goals with greater efficiency
- 9.1.4.D.3** Understand different cultural perspectives to enhance community
- 9.1.4.E.1** Integrate digital media to enhance communication

MODULE 1

BIG IDEAS/COMMON THREADS

Technology is necessary to address the challenges of the 21st Century.

ENDURING UNDERSTANDINGS

Using technology enhances your ability to complete tasks more quickly and with more ease.

ESSENTIAL QUESTIONS

- What are the features of a computer?
- How is each feature used?
- How are computers used in society?

OBJECTIVES

Students will have the knowledge to appropriately use technology and digital tools.

SKILLS

Students will be able to:

- Identify the basic features of a computer and explain how to use them effectively.
 - Use technology terms in daily practice.
 - Discuss the common use of computer applications and hardware and identify their advantages and disadvantages.
 - Create a document with text using a word processing program.
 - Develop the ability to navigate in developmentally appropriate environments.
-

MODULE 2

BIG IDEAS/COMMON THREADS

Challenges in the 21st Century will be solved with new ideas. Information is the foundation in creating new ideas.

ENDURING UNDERSTANDINGS

Technology provides access to information from a variety of resources throughout the world.

ESSENTIAL QUESTIONS

- How can technology be used to communicate ideas?
- How can technology be used to find resources that provide you with information?

OBJECTIVES

Students will use digital tools to enhance creativity and the construction of knowledge.

SKILLS

Students will be able to:

- Illustrate and communicate original ideas and stories using digital tools and media-rich resources.
 - Develop the ability to navigate in developmentally appropriate environments.
-

MODULE 3

BIG IDEAS/COMMON THREADS

Technology dissolves borders and brings people from different cultures together. Decisions have a broader impact as a result.

ENDURING UNDERSTANDINGS

There is benefit in listening to other points of view before making a decision. Another perspective can improve an idea and the subsequent outcomes.

ESSENTIAL QUESTIONS

- How have people from different backgrounds worked together to solve a problem?
- How did technology help the communication process?

OBJECTIVES

Students will recognize how digital tools and environments foster collaboration in solving local and global issues and problems.

SKILLS

Students will be able to:

- Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using electronic tools.
 - Develop the ability to navigate in developmentally appropriate environments.
-

MODULE 4

BIG IDEAS/COMMON THREADS

Everything has a purpose. When something is used for the wrong purpose, it can cause harm.

ENDURING UNDERSTANDINGS

Agreements should be honored. A person who is responsible and has integrity honors their agreements.

ESSENTIAL QUESTIONS

- How do you show legal and ethical behaviors when using information?

OBJECTIVES

Students will understand how technological advancements create societal concerns regarding the practice of safe, legal, and ethical behaviors.

SKILLS

Students will be able to:

- Model legal and ethical behaviors when using both print and non-print information by citing resources.
 - Develop the ability to navigate in developmentally appropriate environment
-

MODULE 5

BIG IDEAS/COMMON THREADS

With the passing of time, more information accumulates and digital tools help us organize information and selectively process it.

ENDURING UNDERSTANDINGS

Information is more accessible when it is organized according to a structure. Digital tools help create those structures.

ESSENTIAL QUESTIONS

- What is a problem effecting children?
- How can digital tools and online resources assist in solving a problem?

OBJECTIVES

Students will understand how effective use of digital tools assists in gathering and managing information.

SKILLS

Students will be able to:

- Explore a problem/issue related to children, using digital tools and online resources and discuss problem solutions.
 - Develop the ability to navigate in developmentally appropriate environments.
-

MODULE 6

BIG IDEAS/COMMON THREADS

Information is neutral. What we think the information means reflects our point of view. Other people viewing the same information can have a different point of view.

ENDURING UNDERSTANDING

Technology allows information to be readily accessible and having access to information increases the likelihood of making decisions that produce desired outcomes.

ESSENTIAL QUESTIONS

- How can digital tools be used to make decisions?
- How can digital tools be used to solve problems?

OBJECTIVES

Students will understand how information assessed through the use of digital tools assists in generating solutions and making decisions.

SKILLS

Students will be able to:

- Use mapping tools to plan and choose alternate routes to and from various locations.
 - Develop the ability to navigate in developmentally appropriate environments.
-

TECHNOLOGY EDUCATION, ENGINEERING AND DESIGN BY THE END OF SECOND GRADE

STATE STANDARDS

Technology

8.2.2.A.1 Describe how technology's products, systems and resources are useful tools at school, home and work.

21st Century Life and Careers

9.1.4.A.1 Apply critical thinking and problem solving skills to solve problems

9.1.4.B.1 Gather and evaluate knowledge from a variety of sources that fosters creativity and innovative thinking

9.1.4.C.1 Collaborate in teams that allows groups to achieve common goals with greater efficiency

9.1.4.D.3 Understand different cultural perspectives to enhance community

9.1.4.E.1 Integrate digital media to enhance communication

MODULE 1

BIG IDEAS/COMMON THREADS

Life is an organized system. Technology impacts the life system and all of its parts.

ENDURING UNDERSTANDINGS

Systems are interconnected with each part being dependent on the other. Anything we do has ripple effects that we need to be cognizant of to inform our decisions.

ESSENTIAL QUESTIONS

- How is technology useful for school?
- How is technology useful at home?
- How is technology useful at work?

OBJECTIVES

Students will understand how technology systems impact every aspect of the world in which we live.

SKILLS

Students will be able to:

- Describe how technology's products, systems and resources are useful tools at school, home and work.
 - Develop the ability to navigate in developmentally appropriate environments
-

MODULE 2

BIG IDEAS/COMMON THREADS

Things function as a result of their design. Design includes the size, shape, and motion of parts that make up the whole.

ENDURING UNDERSTANDINGS

Solutions to problems have a beginning, middle, and an end. Part of the design process is to follow that sequence.

ESSENTIAL QUESTIONS

- What makes a toy work?
- What are the steps to prepare a broken toy?
- How can technology be used as part of the solution to solve a problem?

OBJECTIVES

Students will understand how the design process is a systematic approach to solving problems.

SKILLS

Students will be able to:

- Brainstorm and devise a plan to repair a broken toy/tool using design process.
 - Investigate the influence of a specific technology on the individual, family, community, and environment.
 - Develop the ability to navigate in developmentally appropriate environments.
-

MODULE 3

BIG IDEAS/COMMON THREADS

People from different cultures have unique value systems and desires. What one culture considers progress another could consider a setback.

ENDURING UNDERSTANDINGS

Decisions should be arrived at collaboratively and should reflect the values of all concerned.

ESSENTIAL QUESTIONS

- What are the benefits of reusing products?

OBJECTIVES

Students will recognize how knowledge of human cultural and societal values are fundamental when designing technology systems and products in global society.

SKILLS

Students should be able to:

- Demonstrate how reusing a product affects the local and global environment.
-

MODULE 4

BIG IDEAS/COMMON THREADS

Circumstances are the products of a multitude of factors dynamically interrelating. Solutions need to reflect an awareness of the dynamics of a circumstance.

ENDURING UNDERSTANDINGS

Technological solutions are at the end point following investigation and communication.

ESSENTIAL QUESTIONS

- Why are surveys important?
- How can technology be used to gather and post survey results?
- How can surveys be used to make predictions?

OBJECTIVES

Students will understand how information literacy skills, research, data analysis, and prediction are the basis for the effective design of technology systems.

SKILLS

Students should be able to:

- Collect and post results of a digital classroom survey about a problem or issue and predict consequences based on claims and reasons.
 - Develop the ability to navigate in developmentally appropriate environments.
-

MODULE 5

BIG IDEAS/COMMON THREADS

Information is the first step and the basis for decision-making.

ENDURING UNDERSTANDINGS

Technology is a tool that allows for information gathering from diverse groups from different location that can be used in the decision-making process.

ESSENTIAL QUESTIONS

- How can technology be used to communicate with students from different parts of the world?

OBJECTIVES

Students will understand how digital tools facilitate local and global communication and collaboration in designing product systems.

SKILLS

Students will be able to:

- Communicate with students in the United States and other countries using digital tools to gather information about a specific topic and share results.
-

MODULE 6

BIG IDEAS/COMMON THREADS

Resources can be renewable or non-renewable. Resources can be biodegradable or they can pollute. Technology uses non-renewable resources and technology products that can be a source of pollution.

ENDURING UNDERSTANDINGS

Technology uses non-renewable resources and technology products that can be a source of pollution.

ESSENTIAL QUESTIONS

- What resources are required to produce technological products?

OBJECTIVES

Students will understand that technology is created through the application and appropriate use of technological resources.

SKILLS

Students will be able to:

- Identify the resources needed to create technological products and systems.
-

MODULE 7

BIG IDEAS/COMMON THREADS

The design process is critical in achieving desired outcomes.

ENDURING UNDERSTANDINGS

Outcomes are the manifestation of a process that operates in accordance to a design.

ESSENTIAL QUESTIONS

- How do parts of a tool work together as part of a system?
- What precautions can be taken to ensure safety in the process of design?

OBJECTIVES

Students will understand how the designed world is the product of a designed process that provides means to convert resources into products and systems.

SKILLS

Students will be able to:

- Describe how the parts of a common toy/tool interact and work as part of a system.
 - Explain the importance of safety in the use and selection of appropriate tools and resources for a specific purpose.
-

EDUCATIONAL TECHNOLOGY BY THE END OF GRADE 4

STATE STANDARDS

Technology

- 8.1.4.A.1** Demonstrate effective input of text and data using an input device
- 8.1.4.A.2** Create a document with text formatting and graphics using word processing.
- 8.1.4.A.3** Create and present a multimedia presentation that includes graphics.
- 8.1.4.A.4** Create a simple spreadsheet, enter data and interpret the information.
- 8.1.4.A.5** Determine the benefits of a wide range of digital tools by using them to solve problems.

21st Century Life and Careers

- 9.1.4.A.1** Apply critical thinking and problem solving skills to solve problems
- 9.1.4.B.1** Gather and evaluate knowledge from a variety of sources that fosters creativity and innovative thinking
- 9.1.4.C.1** Collaborate in teams that allows groups to achieve common goals with greater efficiency
- 9.1.4.D.3** Understand different cultural perspectives to enhance community
- 9.1.4.E.1** Integrate digital media to enhance communication

MODULE 1

BIG IDEAS/COMMON THREADS

Technology is necessary to address the challenges of the 21st Century.

ENDURING UNDERSTANDINGS

Using technology enhances your ability to complete tasks more quickly and with more ease.

ESSENTIAL QUESTIONS

- How can you create a multimedia presentation that includes graphics?
- How does a spreadsheet help you interpret data?
- How can other digital tools help solve problems?

OBJECTIVES

Students will have the knowledge to appropriately use technology and digital tools.

SKILLS

Students will be able to:

- Demonstrate effective input of text and data using an input device.
 - Create a document with text formatting and graphics using word processing.
 - Create and present a multimedia presentation that includes graphics.
 - Create a simple spreadsheet, enter data, and interpret information.
 - Determine the benefits of a wide range of digital tools by using them to solve problems.
-

MODULE 2

BIG IDEAS/COMMON THREADS

Challenges in the 21st century will be solved with new ideas. Information is the foundation of creating new ideas.

ENDURING UNDERSTANDINGS

Technology provides access to information from a variety of resources throughout the world.

ESSENTIAL QUESTIONS

- How can technology be used to present information about a significant local event?

OBJECTIVES

Students will use digital tools to enhance creativity and the construction of knowledge.

SKILLS

Students will be able to:

- Produce a media rich digital story about a significant local event or issue based on first person interviews.
-

MODULE 3

BIG IDEAS/COMMON THREADS

Technology dissolves borders and brings people from different cultures together.
Decisions have a broader impact as a result.

ENDURING UNDERSTANDINGS

There is benefit in listening to other points of view before making a decision. Another perspective can improve an idea and subsequent outcomes.

ESSENTIAL QUESTIONS

- How can technology be used for on-line discussions?
- What challenges facing society is discussion worthy?
- How do perspectives from people living in other parts of the world differ?

OBJECTIVES

Students will recognize how digital tools and environments foster collaboration in solving local and global issues and problems.

SKILLS

Students will be able to:

- Engage in on-line discussions with learners in the United States or from other countries to understand their perspectives on a global problem or issue.
-

MODULE 4

BIG IDEAS/COMMON THREADS

Everything has a purpose. When something is used for the wrong purpose, it can cause harm.

ENDURING UNDERSTANDINGS

Agreements should be honored. A person who is responsible and has integrity honors their agreements.

ESSENTIAL QUESTIONS

- What is the importance to practice cyber safety, cyber security, and cyber ethics?
- What is the purpose of an Acceptable Use Policy?
- What are the consequences of not abiding by the Acceptable Use Policy?

OBJECTIVES

Students will understand how technological advancements create societal concerns regarding the practice of safe, legal, and ethical behaviors.

SKILLS

Students will be able to:

- Explain the need for individuals and members of the global community to practice cyber safety, cyber security, and cyber ethics when using existing and emerging technologies.
- Analyze the need for and use of copyrights.
- Explain the purpose of an Acceptable Use Policy (AUP) and the consequences of inappropriate use of technology.

MODULE 5

BIG IDEAS/COMMON THREADS

With the passing of time, more information accumulates and digital tools helps us organize information and selectively process it.

ENDURING UNDERSTANDINGS

Information is more accessible when it is organized according to a structure. Digital tools help create those structures.

ESSENTIAL QUESTIONS

- How can we use on-line resources to develop solutions?
- How can you evaluate the accuracy, relevance, and appropriateness of online resources?

OBJECTIVES

Students will understand how effective use of digital tools assists in gathering and managing information.

SKILLS

Students will be able to:

- Investigate a problem/issue found in the United States and another country from multiple perspectives using digital tools and on-line resources and evaluate findings to present possible solutions.
 - Evaluate the accuracy, relevance, and appropriateness of print and non-print electronic information sources to complete a variety of tasks.
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MODULE 6

BIG IDEAS/COMMON THREADS

Information is neutral. What we think the information means reflects our point of view. Other people viewing the same information can have a different point of view.

ENDURING UNDERSTANDINGS

Technology allows information to be readily accessible and having access to information increases the likelihood of making decisions that produce desired outcomes.

ESSENTIAL QUESTIONS

- How can digital tools be used to collect, organize and evaluate scientific data?

OBJECTIVES

Students will understand how information assessed through the use of digital tools assists in generating solutions and making decisions.

SKILLS

Students will be able to:

- Select and apply digital tools to collect, organize, and analyze data that support a scientific finding.
-

TECHNOLOGY EDUCATION, ENGINEERING AND DESIGN BY THE END OF GRADE 4

STATE STANDARDS

Technology

- 8.2.4.A.1** Investigate factors that influence the development and function of products and systems.
- 8.2.4.A.2** Compare and contrast how a product has changed over time due to economic, political and/or cultural influences using a digital format.

21st Century Life and Careers

- 9.1.4.A.1** Apply critical thinking and problem solving skills to solve problems
- 9.1.4.B.1** Gather and evaluate knowledge from a variety of sources that fosters creativity and innovative thinking
- 9.1.4.C.1** Collaborate in teams that allows groups to achieve common goals with greater efficiency
- 9.1.4.D.3** Understand different cultural perspectives to enhance community
- 9.1.4.E.1** Integrate digital media to enhance communication

MODULE 1

BIG IDEAS/COMMON THREADS

Life is an organized system. Technology impacts the life system and all of its parts.

ENDURING UNDERSTANDINGS

Systems are interconnected with each part being dependent on the other. Anything we do has a ripple effect that we need to be cognizant of to inform our decisions.

ESSENTIAL QUESTIONS

- What factors influence the development and function of product systems?
- How have products changed over time as a result of economic, political, and cultural influences?
- How can we show how products changed over time using a digital format?

OBJECTIVES

Students will understand how technology systems impact every aspect of the world in which we live.

SKILLS

Students will be able to:

- Investigate factors that influence the development and function of product systems.
 - Compare and contrast how a product has changed over time due to economic, political, and/or cultural influences using a digital format.
-

MODULE 2

BIG IDEAS/COMMON THREADS

Things function as a result of their design. Design includes the size, shape, composition, and motion of the parts that make up the whole.

ENDURING UNDERSTANDINGS

Solutions to problems have a beginning, middle, and an end. Part of the design process is to follow that sequence.

ESSENTIAL QUESTIONS

- How can an on-line simulation help develop a product?
- How can an existing product be used for different purposes?
- What are unintentional negative impacts of products?
- What are different ways the same technology can be used for different purposes?

OBJECTIVES

Students will understand how the design process is a systematic approach to solving problems.

SKILLS

Students will be able to:

- Develop a product using an on-line simulation that explores the design process.
- Design an alternative use for an existing product.
- Explain a positive and negative effect of products and systems on humans, other species, and the environment.
- Compare and contrast how technology transfer happens within a technology, among technologies, and among other fields of study.

MODULE 3

BIG IDEAS/COMMON THREADS

People from different cultures have unique value systems and desires. What one culture considers progress another can consider a setback.

ENDURING UNDERSTANDINGS

Decisions should be arrived at collaboratively and reflect the values of all concerned.

ESSENTIAL QUESTIONS

- What is the value of disposing of materials in a responsible way?
- What are trademarks?
- What are the consequences of trademark infringements?
- What are the ethical considerations in the development, production, and disposal of products?

OBJECTIVES

Students will recognize how knowledge of human cultural and societal values are fundamental when designing technology systems and products in global society.

SKILLS

Students will be able to:

- Explain the impact of disposing of materials in a responsible way.
 - Explain the purpose of trademarks and the impact of trademark infringement on business.
 - Examine ethical considerations in the development and production process of a product from it.
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MODULE 4

BIG IDEAS/COMMON THREADS

Circumstances are the products of a multitude of factors dynamically interrelating.

ENDURING UNDERSTANDINGS

Technological solutions are at the end point following investigation and communication.

ESSENTIAL QUESTIONS

- How can feedback be used to improve product design?

OBJECTIVES

Students will understand how information literacy skills, research, data analysis, and prediction are the basis for the effective design of technology system

SKILLS

Students will be able to:

- Analyze responses collected from owners/users of a particular product and suggest modifications in the design of the product based on responses.
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MODULE 5

BIG IDEAS/COMMON THREADS

Information is the first step and basis for decision-making.

ENDURING UNDERSTANDINGS

Technology is a tool that allows for information gathering from diverse groups from different locations that can be used in the decision-making process.

ESSENTIAL QUESTIONS

- How was technology successfully used to address a problem?
- How was technology unsuccessfully used to address a problem?
- How can technology be used to report findings?

LESSON OBJECTIVES

Students will understand how digital tools facilitate local and global communication and collaboration in designing product systems.

SKILLS

Students will be able to:

- Explain how technology is/was successfully or unsuccessfully used to address a local/global problem by producing and publishing a report in collaboration with peers.
-

MODULE 6

BIG IDEAS/COMMON THREADS

Matter is formed through the dynamic interaction of molecular structures composed of different elements. How these molecular structures combine determine the properties of matter.

ENDURING UNDERSTANDINGS

Resources can be renewable or non-renewable. Resources can be bio-degradable or they can pollute. Technology uses non-renewable resources and technology products that can be a source of pollution.

ESSENTIAL QUESTIONS

- How are resources used to create technological products?

LESSON OBJECTIVES

Students will understand that technology is created through the application and appropriate use of technological resources.

SKILLS

Students will be able to:

- Describe how resources are used in a technological product or system.
-

MODULE 7

BIG IDEAS/COMMON THREADS

The design process is critical in achieving desired outcomes.

ENDURING UNDERSTANDING

Outcomes are the manifestation of a design process.

ESSENTIAL QUESTIONS

- What are the design errors interfering with the process?
- How can errors in the design process be rectified?
- What are the functions of subsystems?
- How do subsystems contribute to the system as a whole?
- How does the user and designer view the technological product differently?

LESSON OBJECTIVES

Students will understand how the designed world is the product of a designed process that provides means to convert resources into products and systems.

MODULE SKILLS

Students will be able to:

- Examine a malfunctioning tool and use a step by step process to troubleshoot and present options to repair the product.
- Explain the functions of a system and subsystem.
- Evaluate the function, value, and esthetics of a technological product, system, or environment from the perspective of the user and the producer.

EDUCATIONAL TECHNOLOGY BY THE END OF GRADE 6

STATE STANDARDS

Technology

- 8.1** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaboratively to create and communicate knowledge.

21st Century Life and Careers

- 9.1.4.A.1** Apply critical thinking and problem solving skills to solve problems
- 9.1.4.B.1** Gather and evaluate knowledge from a variety of sources that fosters creativity and innovative thinking
- 9.1.4.C.1** Collaborate in teams that allows groups to achieve common goals with greater efficiency
- 9.1.4.D.3** Understand different cultural perspectives to enhance community
- 9.1.4.E.1** Integrate digital media to enhance communication

MODULE 1

BIG IDEAS/COMMON THREADS

Technology is necessary to address the challenges of the 21st century.

ENDURING UNDERSTANDINGS

Using technology enhances your ability to complete tasks more quickly and with ease.

ESSENTIAL QUESTIONS

- How can digital tools be used to communicate information and solve problems?

OBJECTIVES

Students will have the Knowledge to appropriately use technology and digital tools.

SKILLS

Students will be able to:

- Create professional documents using advanced features of a word processing program.
 - Plan and create a simple database, define fields, input data, and produce a report using sort and query.
 - Create a multimedia presentation including sound and image.
 - Create a spreadsheet to calculate, graph, and present information.
 - Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
-

MODULE 2

BIG IDEAS/COMMON THREADS

Challenges in the 21st Century will be solved with new ideas. Information is the foundation in creating new ideas.

ENDURING UNDERSTANDINGS

Technology provides access to information from a variety of resources across the world.

ESSENTIAL QUESTIONS

- How can web-based shared hosted service help synthesize and publish information?

OBJECTIVES

Students will use digital tools to enhance creativity and the construction of knowledge.

SKILLS

Students will be able to:

- Synthesize and publish information about a local or global issue or event on a web-based shared hosted service.
-

MODULE 3

BIG IDEAS/COMMON THREADS

Technology dissolves borders and brings people from different cultures together. Decisions have a broader impact as a result.

ENDURING UNDERSTANDINGS

There is benefit in listening to other points of view before making a decision. Another perspective can improve an idea and the subsequent outcomes.

ESSENTIAL QUESTIONS

- What are the views of citizens from other parts of the world on 21st Century problems?
- What are the views of solutions to these problems?
- How can technology be used to enhance communication?

OBJECTIVES

Students will recognize how digital tools and environments foster collaboration in solving local and global issues and problems.

SKILLS

Students will be able to:

- Participate in an online learning community with learners from other countries to understand perspectives on a global problem/issue and propose possible solutions.
-

MODULE 4

BIG IDEAS/COMMON THREADS

Everything has a purpose. When something is used for the wrong purpose, it can cause harm.

ENDURING UNDERSTANDINGS

Agreements should be honored. A person who is responsible and has integrity honors their agreements.

ESSENTIAL QUESTIONS

- How do you demonstrate model cyber safety and ethics in your behavior?

OBJECTIVES

Students will understand how technological advancements create societal concerns regarding the practice of safe, legal, and ethical behaviors.

SKILLS

Students will be able to:

- Model appropriate on-line behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics.
-

MODULE 5

BIG IDEAS/COMMON THREADS

With the passing of time, more information accumulates and digital tools help us organize information and selectively process it.

ENDURING UNDERSTANDINGS

Information is more accessible when it is organized according to a structure. Digital tools help create those structures.

ESSENTIAL QUESTIONS

- How can data collection technology help solve real life problems?

OBJECTIVES

Students will understand how effective use of digital tools assists in gathering and managing information.

SKILLS

Students will be able to:

- Gather and analyze findings to produce a possible solution for a content-related or real world problem using data collection technology.
-

MODULE 6

BIG IDEAS/COMMON THREADS

Information is neutral. What we think the information means reflects our point of view. Other people viewing the same information can have a different point of view.

ENDURING UNDERSTANDINGS

Technology allows information to be readily accessible and having access to information increases the likelihood of making decisions to produce desired outcomes.

ESSENTIAL QUESTIONS

- How can an authoring tool be used to evaluate and summarize perspectives of people from different cultures?

OBJECTIVES

Students will understand how information assessed through use of digital tools assists in generating solutions and making decisions.

SKILLS

Students will be able to:

- Use an electronic authoring tool in collaboration with learners from other countries to evaluate and summarize the perspectives of other cultures about a current event or contemporary figure.
-

TECHNOLOGY EDUCATION, ENGINEERING AND DESIGN BY THE END OF GRADE 6

STATE STANDARDS

Technology

8.2 All students will develop an understanding of the nature and impact of technology, engineering, technological design and the designed world as they relate to the individual, global society and the environment.

21st Century Life and Careers

9.1.4.A.1 Apply critical thinking and problem solving skills to solve problems

9.1.4.B.1 Gather and evaluate knowledge from a variety of sources that fosters creativity and innovative thinking

9.1.4.C.1 Collaborate in teams that allows groups to achieve common goals with greater efficiency

9.1.4.D.3 Understand different cultural perspectives to enhance community

9.1.4.E.1 Integrate digital media to enhance communication

MODULE 1

BIG IDEAS/COMMON THREADS

Life is an organized system. Technology Impacts the life system and all of its parts.

ENDURING UNDERSTANDINGS

Systems are interconnected with each part being dependent on the other. Anything we do has ripple effects that we need to be cognizant of to inform our decisions.

ESSENTIAL QUESTIONS

- How has globalization impacted the development of technological systems?

OBJECTIVES

Students will understand how technology systems impact every aspect of the world in which we live.

SKILLS

Students will be able to:

- Explain the impact of globalization on the development of a technological system over time.
-

MODULE 2

BIG IDEAS/COMMON THREADS

Things function as a result of their design. Design includes the size, shape, composition, and motion of the parts that make up the whole.

ENDURING UNDERSTANDINGS

Solutions to problems have a beginning, middle, and an end. Part of the design process is to follow that sequence.

ESSENTIAL QUESTIONS

- How do criteria and constraints effect the design process?
- How can technology be used as a tool for communication?

OBJECTIVES

Students will understand how the design process is a systematic approach to solving problems.

SKILLS

Students will be able to:

- Design and create a product using the design process that addresses a real world problem with specific criteria and constraints.
 - Identify the design constraints and tradeoffs involved in designing a prototype by completing a design project and reporting the results in a multimedia presentation.
-

MODULE 3

BIG IDEAS/COMMON THREADS

People from different cultures have unique value systems and desires. What one culture considers progress another could consider a setback.

ENDURING UNDERSTANDINGS

Decisions should be arrived at collaboratively and should reflect the values of all concerned.

ESSENTIAL QUESTIONS

- What is the need for a patent?
- What is the process to register for one?

OBJECTIVES

Students will recognize how knowledge of human cultural and societal values are fundamental when designing technology systems and products in global society.

SKILLS

Students should be able to:

- Explain the need for a patent and the process of registering one.
-

MODULE 4

BIG IDEAS/COMMON THREADS

Circumstances are the products of a multitude of factors dynamically interrelating. Solutions need to reflect an awareness of the dynamics of a circumstance.

ENDURING UNDERSTANDINGS

Technological solutions are at the end point following investigation and communication.

ESSENTIAL QUESTIONS

- What is the relationship between ethics and bias on trends?
- What impact does ethics and bias have on planning the development of a product?

OBJECTIVES

Students will understand how information literacy skills, research, data analysis, and prediction are the basis for the effective design of technology systems.

SKILLS

Students will be able to:

- Evaluate the role of ethics and bias on trend analysis and prediction in the development of a product and suggest modifications in the design of the product based on responses.
-

MODULE 5

BIG IDEAS/COMMON THREADS

Information is the first step and the basis for decision-making.

ENDURING UNDERSTANDINGS

Technology is a tool that allows for information gathered from diverse groups, from different locations, that can be used in the decision making process.

ESSENTIAL QUESTIONS

- How does design process help develop a product?
- How does data analysis help develop a product?
- How can using a digital log and annotated sketches help develop a product?

OBJECTIVES

Students will understand how digital tools facilitate local and global communication and collaboration in designing product systems.

SKILLS

Students will be able to:

- Develop a product using the design process, data analysis, and trends and maintain a digital log with annotated sketches to record the developmental cycle in collaboration with peers and experts in the field.
-

MODULE 6

BIG IDEAS/COMMON THREADS

Matter is formed through the dynamic interaction of molecular structures composed of different elements. How these molecular structures combine determine the properties of matter.

ENDURING UNDERSTANDINGS

Resources can be renewable or non-renewable. Resources can be biodegradable or they can pollute. Technology uses non-renewable resources and technology products that can be a source of pollution.

ESSENTIAL QUESTIONS

- What is the significance of resource selection?
- What is the significance of how resources are processed?

OBJECTIVES

Students will understand that technology is created through the application and appropriate use of technological resources.

SKILLS

Students will be able to:

- Explain the impact of resource selection and processing in the development of a common technological product or system.

MODULE 7

BIG IDEAS/COMMON THREADS

Outcomes are the manifestation of a process that operates in accordance to a design.

ENDURING UNDERSTANDING

The design process is critical in achieving desired outcomes.

ESSENTIAL QUESTIONS

- What is the importance of continually monitoring human designed systems?
- How are sub systems interdependent on the system it is contained in?

OBJECTIVES

Students will understand how the designed world is the product of a designed process that provides means to convert resources into products and systems.

SKILLS

Students will be able to:

- Explain why human designed systems, products, and environments need to be constantly monitored, maintained, and improved.
 - Explain the interdependence of a sub-system that operates as part of a system.
-