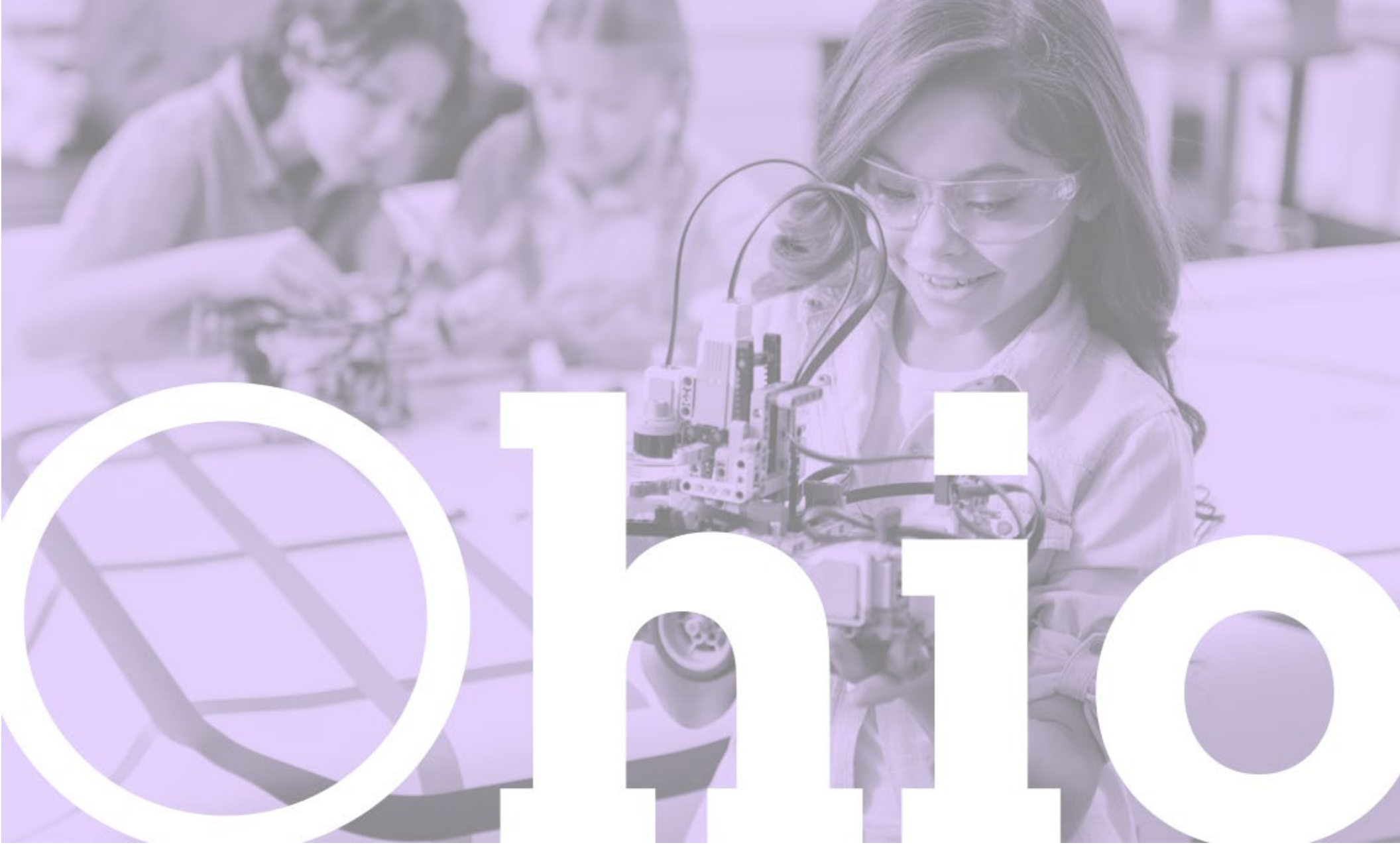


Ohio's Model Curriculum

Technology Grades K-2

ADOPTED JULY 2022

Ohio | Department of Education

TABLE OF CONTENTS

Organization of Ohio's Model Curriculum for Technology 3

Strand and Topic Descriptions 4
Content Statements 5

Ohio's Model Curriculum & Instructional Supports for Technology 6

Overview of the Model Curriculum Components 6
Overview of the Instructional Supports 6

Ohio's Model Curriculum for Technology: Career Connections 7

Career Connections Across K-12 7
Building Skills Aligned to the OhioMeansJobs-Readiness Seal 8

Kindergarten-Grade 2 Model Curriculum 9

Strand: Information and Communications Technology 9
Topic 1: Identify and use appropriate digital learning tools and resources to accomplish a defined task. 9
Topic 2: Use digital learning tools and resources to locate, evaluate and use information. 11
Topic 3: Use digital learning tools and resources to construct knowledge. 13
Topic 4: Use digital learning tools and resources to communicate and disseminate information to multiple audiences. 16

Strand: Society and Technology 18
Topic 1: Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically. 18
Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments. 20
Topic 3: Explain how technology, society and the individual impact one another. 23

Strand: Design and Technology 27
Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs. 27
Topic 2: Identify a problem and use an engineering design process to solve the problem. 31
Topic 3: Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding and systems thinking. 36
Topic 4: Evaluate designs using functional, aesthetic and creative elements. 38

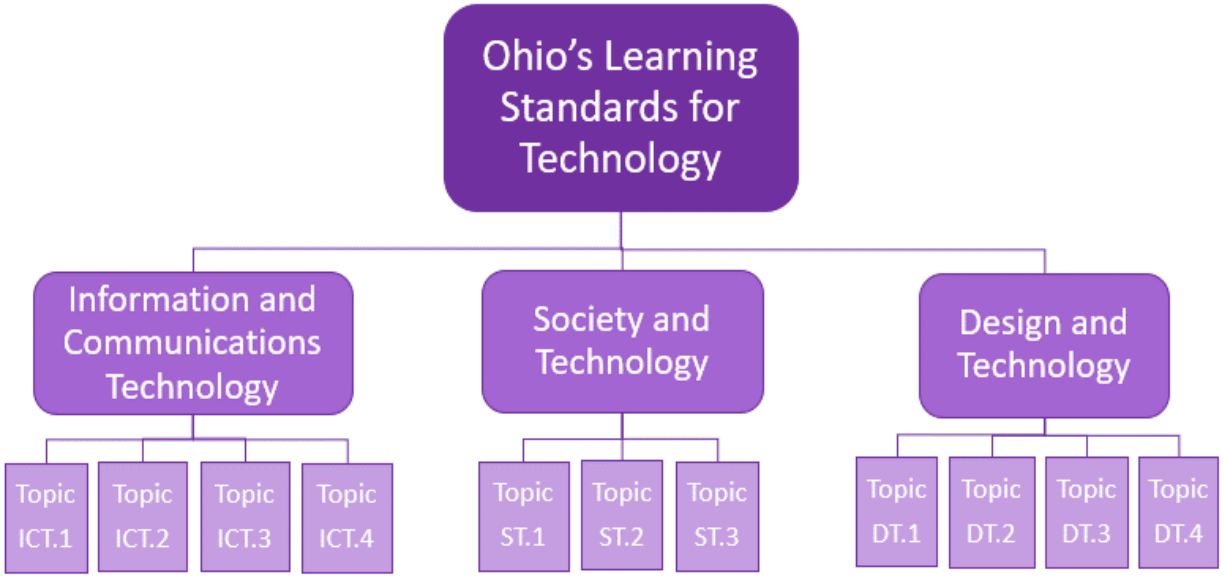
Organization of Ohio's Model Curriculum for Technology

The organization of Ohio's Model Curriculum for Technology follows the same format as Ohio's Learning Standards for Technology. The Technology Learning Standards and Model Curriculum consist of strands, topics and content statements. Both are organized by grade bands so students at the end of each grade band have acquired the knowledge and skills outlined.

Strands are overarching categories and provide three lenses through which kindergarten through grade 12 students consider and engage with technology.

Topics organize and focus the instruction. Each strand is broken into several topics. *Topic statements remain consistent from kindergarten through grade 12*.

Content Statements further refine the topic statements to define what students should know and be able to do at each grade band. Content statements are organized *by K-2, 3-5, 6-8 and 9-12 grade bands*.



STRAND AND TOPIC DESCRIPTIONS

Below, are the strand and topic statements for kindergarten through grade 12:

Information and Communications Technology

The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.

Topic 1: Identify and use appropriate digital learning tools and resources to accomplish a defined task.

Topic 2: Use digital learning tools and resources to locate, evaluate and use information.

Topic 3: Use digital learning tools and resources to construct knowledge.

Topic 4: Use digital learning tools and resources to communicate and disseminate information to multiple audiences.

Society and Technology

The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.

Topic 1: Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.

Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments.

Topic 3: Explain how technology, society and the individual impact one another.

Design and Technology

Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.

Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.

Topic 2: Identify a problem and use an engineering design process to solve the problem.

Topic 3: Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding and systems thinking.

Topic 4: Evaluate designs using functional, aesthetic and creative elements.

CONTENT STATEMENTS

Below, is an example of a content statement for grade band 6-8 with its corresponding content statement code. This content statement addresses Topic 2 within the Society and Technology (ST) Strand.

SOCIETY AND TECHNOLOGY

Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments.

6-8.ST.2.a. Critique specific instances of how technology has impacted access to information, communications and collaboration.

The example below breaks down the content statement code into its components.

NOTE: The topic statement numbers and content statement letters do not dictate curriculum or teaching methods. For example, while Topic 1 appears before Topic 2 in the standards for a given grade band, teachers do not need to teach Topic 1 before Topic 2. A teacher might prefer to teach Topic 2 before Topic 1 or to highlight connections by teaching Topic 1 and Topic 2 at the same time.

The lowercase letters for content statements do not indicate a preferred order. They do not identify relationships between content statements across grade bands. They are included to facilitate discussions, planning and implementation of the standards.

Ohio's Model Curriculum & Instructional Supports for Technology

OVERVIEW OF THE MODEL CURRICULUM COMPONENTS

The model curriculum contains two sections: **Expectations for Learning** and **Content Elaborations.**

Expectations for Learning

LEARNING PROGRESSION

Explains the position of the content statement within its respective learning progression, including previous and future learning

IMPORTANT CONCEPTS

Identifies important concepts students should develop

KEY SKILLS/PROCEDURES

Identifies key skills and procedures students should know and demonstrate

The information above clarifies the expectations for student learning and guides teachers in developing lessons and assessments, both formative and summative.

Content Elaborations

CLARIFICATIONS

Provides clarification of the content

CONTENT FOCUS

Identifies the aspects of the content that teachers should stress with their students

OVERVIEW OF THE INSTRUCTIONAL SUPPORTS

Instructional supports will offer instructional strategies and resources that target specific content statements. The Department will add instructional supports as they are identified and developed, after careful vetting and review.

These supports will include descriptive examples of instructional strategies. Supports will also identify connections to other content statements in technology, across content areas and to careers to help teachers plan instruction and incorporate technology content into their curricula. Other supports woven throughout will include descriptions of common misconceptions and ways to structure technology experiences that are equitable and accessible to all students.

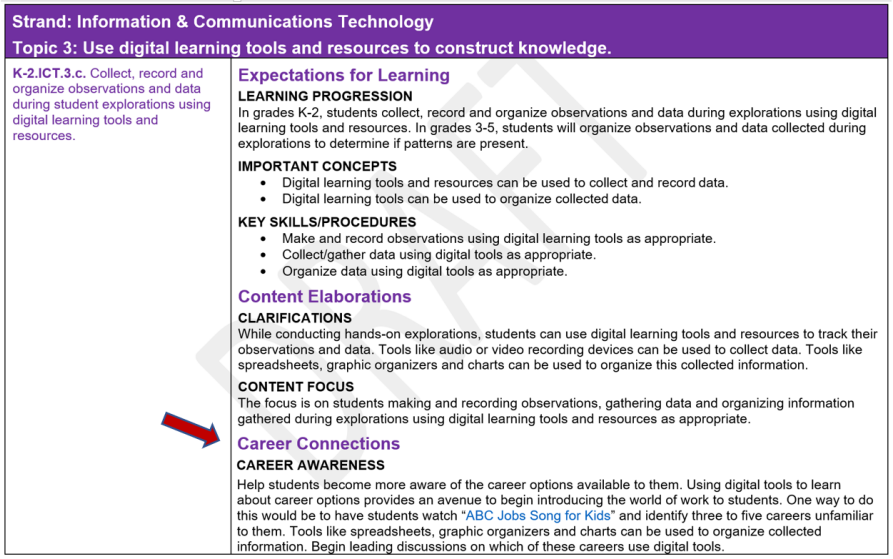
Ohio's Model Curriculum for Technology: Career Connections

It is important for students to understand how the knowledge and skills they acquire in school apply to their ultimate career and life goals. Ohio's Model Curriculum for Technology provides examples of Career Connections. These Career Connections are a starting point for teachers to begin drawing connections to careers for students. The Instructional Supports mentioned earlier will continue this work and address Career Connections more fully.

When developing Career Connections, schools and districts may consider using the Career Connections Framework. The framework is a planning tool districts and schools can use to provide students with opportunities to develop a vision and realistic plans for their future. It aligns the many efforts around college and career readiness to support students in becoming productive and engaged citizens. While many of the career connections throughout this model curriculum are designed to help students become aware, explore and plan for specific careers, it is understood that students often will change career pathways of interest over time.

Throughout Ohio's Learning Standards and Model Curriculum for Technology, many of the skills students are beginning to learn and refine can be associated with work environments. *Career Connections in this model curriculum are organized by the Technology Standards Strands, providing one example per grade band for each strand.* In this way, teachers can see how these connections relate to key technological knowledge and skills in each strand and progress by grade band. The Career Connections lend themselves to interdisciplinary connections and students explore careers that go well beyond those involving information technology. Again, these are a suggested starting point for educators and can be modified or expanded.

Career Connections are located in a separate section within those model curriculum entries that contain them.



Strand: Information & Communications Technology
Topic 3: Use digital learning tools and resources to construct knowledge.

K-2.ICT.3.c. Collect, record and organize observations and data during student explorations using digital learning tools and resources.

Expectations for Learning

LEARNING PROGRESSION
In grades K-2, students collect, record and organize observations and data during explorations using digital learning tools and resources. In grades 3-5, students will organize observations and data collected during explorations to determine if patterns are present.

IMPORTANT CONCEPTS
- Digital learning tools and resources can be used to collect and record data.
- Digital learning tools can be used to organize collected data.

KEY SKILLS/PROCEDURES
- Make and record observations using digital learning tools as appropriate.
- Collect/gather data using digital tools as appropriate.
- Organize data using digital tools as appropriate.

Content Elaborations

CLARIFICATIONS
While conducting hands-on explorations, students can use digital learning tools and resources to track their observations and data. Tools like audio or video recording devices can be used to collect data. Tools like spreadsheets, graphic organizers and charts can be used to organize this collected information.

CONTENT FOCUS
The focus is on students making and recording observations, gathering data and organizing information gathered during explorations using digital learning tools and resources as appropriate.

Career Connections

CAREER AWARENESS
Help students become more aware of the career options available to them. Using digital tools to learn about career options provides an avenue to begin introducing the world of work to students. One way to do this would be to have students watch "ABC Jobs Song for Kids" and identify three to five careers unfamiliar to them. Tools like spreadsheets, graphic organizers and charts can be used to organize collected information. Begin leading discussions on which of these careers use digital tools.

CAREER CONNECTIONS ACROSS K-12

Career Awareness - Elementary Grades (K-5)

Students become familiar with careers through learning that connects classroom instruction to future work. Career awareness strategies show students various types of careers and stimulate interest in future work.

Technology Model Curriculum Example: Giving elementary students opportunities to learn about work environments and discover unique career opportunities associated with the technology skills they are learning will aid in stimulating student interest in future work. Discussing careers that use digital tools can be an effective way to tie technology to career awareness.

> (3-5.ICT.3.c.) Engage students in organizing observations and data collected during student explorations to determine if patterns are present by using a video library such as *Kids Work* and having students record whether the career video they have watched is something they would enjoy doing. Ask students to record this information for multiple careers. Have the class

record their thoughts and then use the class data to determine if there is a pattern across the classroom of the careers that students would and would not enjoy.

Career Exploration - Middle Grades (6-8)

Students explore their career interests through embedded activities. Career exploration strategies are opportunities for students to discover work environments and understand the various aspects of the workplace. Strategies include tools and instruments that help students understand and appreciate their strengths and interests. Students start plans for their future with career information and postsecondary education data. Plans include course selection and planning as well as career aspirations and goals.

Technology Model Curriculum Example: Middle school is an important time for students to begin refining their interests and furthering their understanding of the workplace. These are prime grades to begin having students use their technology knowledge and skills to explore career options in the technology fields.

(6-8.ICT.3.a.) Using OhioMeansJobs K12, ask students to take the Career Cluster Inventory. Students use the Dynamic Career Pathways tool to explore occupations in information technology and the Employment Projections tool to research further and determine whether a career in this industry may be in their future. In the process, they analyze and integrate textual, visual and quantitative information (such as images, diagrams, graphs, infographics, videos and interactives) from multiple digital learning tools and resources. (Students must first create an account on the OhioMeansJobs K-12 website, to take the Career Cluster Inventory.)

Career Planning - High School (9-12)

Students continue career exploration while focusing on career planning. Activities provide advanced experiences that offer hands-on opportunities in the workplace. Career planning strategies focus on making clear links between career options and educational decisions. Students develop the skills to revisit previous exploration and planning strategies as they face career changes throughout life.

Technology Model Curriculum Example: High school students need to begin finalizing their post-high school plans. To gain further insight on what options exist for students, it is important to give students opportunities to interact with and work in the community.

(9-12.DT.4.c.) While critically evaluating a design solution at multiple points of a design process, have students work with their community to identify real-world problems to solve. Consider connecting students to the district's Business Advisory Council to hear about the real issues businesses face. Have students implement the design process to potentially solve those problems with evaluations of the process along the way. Consider how this type of opportunity may lead to an internship or other work-based learning opportunity for students.

BUILDING SKILLS ALIGNED TO THE OHIOMEANSJOBS-READINESS SEAL

Career Connections learning strategies are an effective way for students to establish an understanding of and demonstrate the professional skills that will be essential for success in their career and life goals. The professional skills outlined in the OhioMeansJobs-Readiness Seal can be found across the career connection learning strategies within the model curriculum. These associations will help students make connections to the expected skills and behaviors within the world of work and can be used to support high school students in meeting the seal requirements.

There are clear associations between Ohio's Learning Standards and Model Curriculum for Technology and the professional skills outlined in the OhioMeansJobs-Readiness Seal. For example, a distinct connection exists between the knowledge and skills in the standards and model curriculum and professional skills involving digital technology where the student has "an in-depth understanding of emerging technology and leverages technology to solve problems, complete tasks and accomplish goals." Additional associations (such as those involving creativity and innovation, teamwork and collaboration and critical thinking and problem-solving) exist through the use of the outlined Career Connections found throughout this model curriculum.

Kindergarten-Grade 2 Model Curriculum

STRAND: INFORMATION AND COMMUNICATIONS TECHNOLOGY

The understanding and application of digital learning tools for accessing, creating, evaluating, applying and communicating ideas and information.

Topic 1: Identify and use appropriate digital learning tools and resources to accomplish a defined task.

K-2.ICT.1.a. Develop basic skills for using digital learning tools and resources to accomplish a defined task.

Expectations for Learning

LEARNING PROGRESSION

In grades K-2, students develop basic skills for using digital learning tools and resources to accomplish a defined task. In grades 3-5, students will learn how to identify and use digital learning tools to support planning, implementing and reflecting upon a defined task.

IMPORTANT CONCEPTS

- When beginning a task, it is helpful to understand what digital learning tools are available and the functions offered within those learning tools.
- Learning the functions of different devices will help students properly care for the tools they select.

KEY SKILLS/PROCEDURES

- Demonstrate ways to take care of a digital learning tool.
- Use the functions of a learning tool to accomplish a defined task.

Content Elaborations

CLARIFICATIONS

Students use digital learning tools to accomplish tasks as they access information and communicate ideas. During use, they develop and practice basic skills. Learning tools can include computers, tablets and applications. Basic skills can include using a keyboard, a mouse (to click, click and drag, double-click and scroll) and learning software and applications. Students will be able to use these learning tools and skills to accomplish tasks such as word processing, research and problem-solving in a content area.

This also includes strategies to take care of and maintain digital tools properly.

CONTENT FOCUS

This content statement focuses on students using and learning to use digital learning tools and resources. Students gain these basic skills by participating in instructional activities to accomplish defined tasks.

Topic 1: Identify and use appropriate digital learning tools and resources to accomplish a defined task.	
K-2.ICT.1.b. With guidance, identify a goal and determine how digital learning tools can help accomplish that goal.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students with guidance identify goals and determine how digital learning tools can help them accomplish those goals. In grades 3-5, students will explain the use of selected digital learning tools and resources to support productivity and learning. **IMPORTANT CONCEPTS** • Digital learning tools can help students achieve their learning goals. **KEY SKILLS/PROCEDURES** • Identify a learning goal. • Determine how digital learning tools can help achieve the identified goal. • Select a digital tool or resource to support the goal. • Use the digital tool to make progress toward the learning goal. • Reflect on the process and effectiveness of the tool. **Content Elaborations** **CLARIFICATIONS** With guidance, students select learning goals, like decomposing numbers or increasing their vocabulary. They will select appropriate digital learning tools to help them accomplish their goals. For example, students could use embedded features in e-books like text-to-speech, dictionaries and highlighting tools to help them clarify the meaning of unknown words or phrases and increase their vocabularies. **CONTENT FOCUS** The focus is on each student identifying a goal, selecting a digital learning tool and using that tool to help them achieve the goal while explaining how it can help the student learn.

Topic 2: Use digital learning tools and resources to locate, evaluate and use information.	
K-2.ICT.2.a. Develop basic skills for locating information using digital learning tools and resources.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students develop basic skills for locating information using digital learning tools. In grades 3-5, students will expand on skills for locating information using digital tools and resources. **IMPORTANT CONCEPTS** • Information is organized in different ways digitally. • Search boxes can help locate specific information within a resource. **KEY SKILLS/PROCEDURES** • Select a resource or digital learning tool and use search strategies to find information. **Content Elaborations** **CLARIFICATIONS** Basic skills for locating information include using search boxes, selecting search terms, using navigational tools and following links. **CONTENT FOCUS** This content statement focuses on practicing effective search skills to access information.
K-2.ICT.2.b. Identify main ideas and details in information found with digital learning tools and resources.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students learn how to identify main ideas and details found with digital learning tools and resources. In grades 3-5, students will construct questions to broaden or narrow a topic. **IMPORTANT CONCEPTS** • The main idea and supporting details can be found in digital content. • Strategies used to identify main ideas and details for digital content may be different from those used for print content. **KEY SKILLS/PROCEDURES** • Identify the main idea and details found in digital resources. **Content Elaborations** **CLARIFICATIONS** Recognizing main ideas and details can be done using print and digital learning tools and resources. Some tools and features that may be available and useful are text-to-speech, translation, embedded word dictionary and highlighting. Some tasks that could support students' identification of main ideas and details

Topic 2: Use digital learning tools and resources to locate, evaluate and use information.	
	found in digital content are reading or research and modeling how to identify main ideas and details found with digital learning tools or resources. **CONTENT FOCUS** The focus is on students identifying main ideas and details in the information they find and use. Some strategies will be similar to those used for print-based materials, but digital materials require additional strategies.

Topic 3: Use digital learning tools and resources to construct knowledge.	
K-2.ICT.3.a. Develop basic skills for gathering and organizing information from multiple digital learning tools and resources to build knowledge.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students learn basic skills for gathering and organizing information from multiple digital learning tools and resources to build knowledge. In grades 3-5, students will gather, organize and summarize information from multiple digital learning tools and resources to build knowledge. **IMPORTANT CONCEPTS** • Digital learning tools and resources can provide content to develop a basic understanding of a concept. • Digital tools and resources can provide ways to help organize information. **KEY SKILLS/PROCEDURES** • Use various digital learning tools and resources to locate, collect and organize information. **Content Elaborations** **CLARIFICATIONS** Digital learning tools can be used to find information on a specific topic. Examples of these resources include databases, websites and electronic reference tools. This collected information then can be organized using digital learning tools like bulleted lists, slide presentations, mind maps and storyboards. **CONTENT FOCUS** This content statement focuses on providing experience with a variety of digital learning tools to identify correctly, collect and organize information.
K-2.ICT.3.b. Use visuals found in digital learning tools and resources to clarify and add to knowledge.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students use the visuals found in digital learning tools and resources to add knowledge. In grades 3-5, students will interpret visual information in digital learning tools and resources to add to knowledge. **IMPORTANT CONCEPTS** • Visual representations within a resource add deeper meaning and provide additional details to written text. **KEY SKILLS/PROCEDURES** • Use images or media from digital resources to expand knowledge of a topic.

Topic 3: Use digital learning tools and resources to construct knowledge.	
	Content Elaborations **CLARIFICATIONS** Digital learning tools have visual components that can be used to learn more about a topic. Pictures, graphs and data charts in digital tools and resources can help students gain a better understanding of information and add to their knowledge bases. **CONTENT FOCUS** The focus is on using visual representations from the gathered resources to add depth and clarity to the research topic.
K-2.ICT.3.c. Collect, record and organize observations and data during student explorations using digital learning tools and resources.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students collect, record and organize observations and data during explorations using digital learning tools and resources. In grades 3-5, students will organize observations and data collected during explorations to determine if patterns are present. **IMPORTANT CONCEPTS** • Digital learning tools and resources can be used to collect and record data. • Digital learning tools can be used to organize collected data. **KEY SKILLS/PROCEDURES** • Make and record observations using digital learning tools as appropriate. • Collect/gather data using digital tools as appropriate. • Organize data using digital tools as appropriate. **Content Elaborations** **CLARIFICATIONS** While conducting hands-on explorations, students can use digital learning tools and resources to track their observations and data. Tools like audio or video recording devices can be used to collect data. Tools like spreadsheets, graphic organizers and charts can be used to organize this collected information. **CONTENT FOCUS** The focus is on students making and recording observations, gathering data and organizing information gathered during explorations using digital learning tools and resources as appropriate.

Topic 3: Use digital learning tools and resources to construct knowledge.	
	Career Connections **CAREER AWARENESS** Help students become more aware of the career options available to them. Students can use digital tools to learn about career options as an avenue to begin introducing the world of work to students. One way to do this would be to have students watch a video such as *ABC Jobs Song for Kids* and identify three to five careers unfamiliar to them. Tools like spreadsheets, graphic organizers and charts can be used to organize collected information. Begin leading discussions on which of these careers use digital tools.
K-2.ICT.3.d. With guidance, create artifacts using digital learning tools and resources to demonstrate knowledge.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students create artifacts with guidance using digital learning tools and resources. In grades 3-5, students will create artifacts independently using digital learning tools and resources. **IMPORTANT CONCEPTS** • Digital learning tools can be used to create artifacts to demonstrate knowledge and understanding. • Artifacts are products that show competency and understanding of the subject matter. **KEY SKILLS/PROCEDURES** • With guidance, use digital learning tools to create a product or artifact that shows knowledge of a topic or mastery of a skill. **Content Elaborations** **CLARIFICATIONS** Digital learning tools can be used to create artifacts that are appropriate to use to share knowledge of content. Such digital tools include word processing, photography, slideshows and story creator software. **CONTENT FOCUS** The focus is on creating artifacts that align with content using digital learning tools and resources.

Topic 4: Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	
K-2.ICT.4.a. With guidance, discuss and identify communication needs considering the task, situation and information to be shared.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students discuss and identify with guidance communication needs considering the task, situation and information to be shared. In grades 3-5, students will discuss and identify with guidance communication needs for a task considering the audience and content. **IMPORTANT CONCEPTS** • Creating a plan helps guide the next steps. • Identifying the needs, task and situation are important to consider when deciding what information to share. **KEY SKILLS/PROCEDURES** • Choose information to share in a specific situation. **Content Elaborations** **CLARIFICATIONS** People communicate ideas and information in a variety of ways. It is important to determine what ideas they want to share based on their identified goals or situations. This content statement is one of three content statements, K-2.ICT.4.a.-4.c., that together guide students in planning, producing and publishing an artifact. **CONTENT FOCUS** The focus of this content statement is on students deciding what information to communicate based on the task, needs and goals.
K-2.ICT.4.b. With guidance, use digital learning tools to add audio and/or visual media to clarify information.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students use digital learning tools with guidance to add audio and/or visual media to clarify information. In grades 3-5, students will select with guidance media formats appropriate to content and audience. **IMPORTANT CONCEPTS** • Using audio and video can enhance understanding of a given topic. **KEY SKILLS/PROCEDURES** • Include a variety of digital media, such as audio and video, to reinforce the presented information.

Topic 4: Use digital learning tools and resources to communicate and disseminate information to multiple audiences.	
	Content Elaborations **CLARIFICATIONS** A variety of digital resources can reinforce the information being presented. Depending on the publication's focus, including digital resources such as audio and video can reinforce what was learned. Examples can include incorporating music, spoken word or visual representations into a product. This content statement is one of three content statements, K-2.ICT.4.a.-4.c., that together guide students in planning, producing and publishing an artifact. **CONTENT FOCUS** The focus is on students determining what digital learning tools to use and what audio and/or visual media to add to clarify information.
K-2.ICT.4.c. With guidance, select appropriate digital learning tools and resources to produce and publish information.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students select digital learning tools and resources to publish information with guidance. In grades 3-5, students will select digital learning tools and resources to produce and publish information for a target audience. **IMPORTANT CONCEPTS** • Choosing an appropriate digital learning tool to convey information is important. **KEY SKILLS/PROCEDURES** • Select digital learning tools to convey information to an audience. • Plan and outline an appropriate way to present the published information. **Content Elaborations** **CLARIFICATIONS** With assistance from teachers, students will choose an appropriate media format to display the information presented. Digital learning tools like word documents, social media, poster creation software and cameras can be used to share information. This content statement is one of three content statements, K-2.ICT.4.a.-4.c., that together guide students in planning, producing and publishing an artifact. **CONTENT FOCUS** The focus is on students selecting a digital learning tool and producing and publishing their work with guidance as needed.

STRAND: SOCIETY AND TECHNOLOGY

The interconnectedness of technology, self, society and the natural world, specifically addressing the ethical, legal, political and global impact of technology.

Topic 1: Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.	
K-2.ST.1.a. Demonstrate appropriate and identify inappropriate uses of technology required to be a responsible user.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students demonstrate appropriate uses of technology and identify inappropriate uses of technology. In grades 3-5, students will demonstrate appropriate uses of technology and explain the importance of responsible and ethical technology use. **IMPORTANT CONCEPTS** • There is an appropriate use of technology, and its advancement is based on its appropriate use and the needs and wants of its users. • The inappropriate use of technology can diminish its effectiveness and purpose. **KEY SKILLS/PROCEDURES** • Demonstrate the appropriate use of different types of technology. • Recognize the inappropriate uses of technology and associated consequences. **Content Elaborations** **CLARIFICATIONS** Based on technology encompassing knowledge, artifacts, infrastructure, tools, materials, processes and products modified from the natural environment, students appropriately utilize technology in a way that demonstrates responsibility while identifying irresponsible uses. Examples should move beyond digital devices with screens (such as tablets, phones and computers) to include other types of technology. For example, a stop sign is an example of technology because it is infrastructure. The appropriate use of a stop sign is to regulate and control traffic. At the same time, an inappropriate use could be defacing the stop sign, which would hinder traffic regulation. **CONTENT FOCUS** This content statement focuses on students demonstrating appropriate uses of all types of technology.

Topic 1: Demonstrate an understanding of technology's impact on the advancement of humanity – economically, environmentally and ethically.	
K-2.ST.1.b. Identify positive and negative impacts one's use of technology can have on oneself and one's family.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify positive and negative impacts their use of technology can have on themselves and their families. In grades 3-5, students will identify positive and negative impacts their use of technology can have on their communities. **IMPORTANT CONCEPTS** • The use of technology can positively and negatively impact the family and self. **KEY SKILLS/PROCEDURES** • List ways one and one's family use technology. • Determine positive and negative impacts of technology use on oneself and one's family. **Content Elaborations** **CLARIFICATIONS** Based on technology encompassing knowledge, artifacts, infrastructure, tools, materials, processes or products modified from the natural environment, students understand ways that technology can positively or negatively affect the needs and wants of their families. Students can discuss their use of technology and its impact on their families economically, environmentally and ethically. For example, a stove can make cooking dinner easier and faster. However, if it were left on and unattended, it could use too much electricity or cause a fire. Tablets, phones or other devices provide entertainment and access to information. Yet too much time spent interacting with a device on one's own can result in less time for family activities. **CONTENT FOCUS** The focus is on students' self-evaluation of their use of technology and its impacts on their lives.

Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments.	
K-2.ST.2.a. Communicate and collaborate using several digital methods.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students communicate and collaborate using several digital methods. In grades 3-5, students will create plans and select collaboration and/or communication tools to complete a given task. **IMPORTANT CONCEPTS** • Communication and collaboration skills including, but not limited to, speaking and listening are important in everyday life to make connections and contributions. **KEY SKILLS/PROCEDURES** • Communicate and collaborate using various digital tools within digital and physical spaces. **Content Elaborations** **CLARIFICATIONS** Communicate in a variety of ways and use digital tools for collaborative conversations. Teachers may provide multiple ways for students to communicate. Communication and collaboration can occur within a physical or digital environment. For example, students can use digital tools to engage in teamwork, participate in online discussions (such as those about an image or artwork), develop a blog post, talk with experts through video chats and use audio recordings to share their thinking. **CONTENT FOCUS** This content statement focuses on effective communication and collaboration in person or with digital tools in individual or peer group settings. **Career Connections** **CAREER AWARENESS** With guidance, students work together to determine a professional in the community to invite to a video chat the class is hosting. The class's career interests can be used to determine which professionals to video chat. Students use digital tools to collaborate on their selections and are prepared to ask the professional questions in a variety of ways during the video meeting. Students determine together their questions for the professional ahead of time using digital tools. Teachers can identify ways for students to interact with the professional during the video meeting (for example, using polling software and meeting functions such as the chat and hand raising).

Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments.	
K-2.ST.2.b. Identify positive and negative ways of collaborating in digital and physical environments.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify positive and negative ways of collaborating in digital and physical environments. In grades 3-5, students will exercise digital etiquette when communicating and collaborating. **IMPORTANT CONCEPTS** • Communicating and collaborating within a digital space can impact a physical environment. • Communicating and collaborating within a physical environment can impact a digital space. • Types of communication and collaboration can change depending on the digital learning tool being used. **KEY SKILLS/PROCEDURES** • Identify ways to communicate and collaborate digitally. • Identify ways to communicate and collaborate in physical environments. • Identify ways that interactions can be positive or negative. **Content Elaborations** **CLARIFICATIONS** When collaborating and communicating within different digital and physical spaces, there are positive and negative ways of interacting. Examples of digital spaces include texting, video games, online conferencing, video chats, learning platforms, social media, image sharing, educational apps with sharing features and creation environments. Students can have discussions to identify these digital spaces and connect how they interact in digital spaces with how they interact in the physical environment. **CONTENT FOCUS** Students recognize there are positive and negative impacts of collaborating and communicating within digital and physical environments.

Topic 2: Analyze the impact of communication and collaboration in both digital and physical environments.	
K-2.ST.2.c. Investigate how technology does (or does not) impact the way(s) one's family communicates.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students investigate how technology impacts the ways families communicate. In grades 3-5, students will identify the positive and negative impacts the use of technology can have on relationships, communities and themselves. **IMPORTANT CONCEPTS** • There are different types of technology used to communicate. • Types of technology used to communicate can impact the family in various ways. **KEY SKILLS/PROCEDURES** • Investigate different types of technology used to communicate. • Investigate how using different technologies to communicate impact the family. **Content Elaborations** **CLARIFICATIONS** Explore and explain different types of technology (knowledge, artifacts, infrastructure, tools, materials, processes and products) used to communicate. Examples can include a family calendar with a practice time so pick up is on time, a note in a lunch box that would make one feel good, a chore chart to help organize daily household tasks, a behavior chart to track good choices to earn a reward and a video chat to communicate with others. **CONTENT FOCUS** The focus is on the impact technology has on communication within the family.

Topic 3: Explain how technology, society and the individual impact one another.	
K-2.ST.3.a. State the advantages and disadvantages of technology in one's life.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students state the advantages and disadvantages of technology in their lives. In grades 3-5, students will describe the advantages and disadvantages of using technology to understand the relationship between technology, society and the individual. **IMPORTANT CONCEPTS** • There are advantages and disadvantages to every piece of technology. **KEY SKILLS/PROCEDURES** • Communicate the benefits and drawbacks to different forms of technology. **Content Elaborations** **CLARIFICATIONS** Explain benefits or drawbacks in the ways students use technology (knowledge, artifacts, infrastructure, tools, materials, processes and products) day-to-day. For example, students could discuss watching television and the advantages (such as entertainment or education) and disadvantages (such as less time to talk to family or play outside). **CONTENT FOCUS** This content statement focuses on students examining their current usage of technology and its impacts on them in positive or negative ways.
K-2.ST.3.b. Identify examples of how technology innovations/ inventions can have multiple applications.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify examples of how technology innovations/inventions can have multiple applications. In grades 3-5, students will demonstrate how technology innovations/inventions can have multiple applications. **IMPORTANT CONCEPTS** • Technological innovations and inventions have set purposes but can be used in multiple ways. **KEY SKILLS/PROCEDURES** • Communicate multiple ways a technology innovation or invention can be used. • Give an example of how technology was created to address a specific want or need. • Give an example of how technology can meet other wants or needs beyond its original application.

Topic 3: Explain how technology, society and the individual impact one another.	
	Content Elaborations **CLARIFICATIONS** Technology is something someone made to meet a need or want. Examine a technology innovation or invention and determine different uses for that technology. Critically and creatively think about different ways and purposes it can be used. For example, students use the internet to do research, but they also can use it to play games. Adults can use the internet to both shop and find jobs. Invention is the process of turning ideas and imagination into devices and systems. Innovation is the process of modifying an existing system or system element(s) to improve it. These are ways to develop ideas for different technologies. These two definitions and the distinction between the processes are not introduced until grades 6-8 but are mentioned here to encourage discussion. **CONTENT FOCUS** The focus is on identifying the different ways technology innovations and inventions can be used. There are multiple ways to use technology in addition to its original design.
K-2.ST.3.c. Identify how the use of technology affects self and others in various ways.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify how the use of technology impacts themselves and others in various ways. In grades 3-5, students will identify and discuss how the use of technology affects themselves and others in various ways. **IMPORTANT CONCEPTS** • There are direct and indirect effects of using a technology on users and non-users. **KEY SKILLS/PROCEDURES** • Describe how using a technology impacts the technology user. • Describe how the use of a technology impacts others. **Content Elaborations** **CLARIFICATIONS** Technology (knowledge, artifacts, infrastructure, tools, materials, processes and products) impacts the user and non-user directly and indirectly.

Topic 3: Explain how technology, society and the individual impact one another.	
	An example could be packing a lunch using an insulated lunch box. It impacts the lunch line, temperature of the food and environment depending on the disposal of the materials used to pack the lunch. **CONTENT FOCUS** The focus is on how the use of a technology affects the user and non-user.
K-2.ST.3.d. Define and discuss digital identity and digital footprints.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students define and discuss digital identities and digital footprints. In grades 3-5, students will identify components of their digital identities and digital footprints. **IMPORTANT CONCEPTS** • Determine appropriate information that can be shared publicly, which becomes part of one's digital identity. • A digital footprint (also called a digital tattoo) is created by personal information provided by the user or others that is published publicly. **KEY SKILLS/PROCEDURES** • Explain which types of personal information are acceptable to share publicly. • Explain how a digital footprint is created and that it is permanent. **Content Elaborations** **CLARIFICATIONS** Digital identity is affected by the information that is shared about someone online. This information could be shared by an individual or about an individual. For students in this grade band, their parents may be contributing more to their digital footprints or tattoos than the students are at this time. Only appropriate information should be shared as part of their digital footprints. Students at this age need to learn what information should be kept private and what information can be safely shared. Examples of information to keep private could include students' lunch numbers, phone numbers, home addresses and practice times or locations. Some students (such as students in foster care or students with parents in divorce or custody situations) may need to be more careful about sharing information than others. **CONTENT FOCUS** The focus is on students examining what information is private and should not be shared freely with others. Information shared publicly in a digital format is shared permanently and part of one's digital footprint.

Topic 3: Explain how technology, society and the individual impact one another.	
K-2.ST.3.e. Provide examples of how rules for respecting others' belongings apply to digital content and information.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students develop the idea that people not only own things but also ideas and content. In grades 3-5, students will discuss the rules and laws for digital content and information. **IMPORTANT CONCEPTS** • Individuals create digital content and information. • Digital content must be respected, and credit must be given if used. **KEY SKILLS/PROCEDURES** • Explain how to give credit and respect digital content and information. **Content Elaborations** **CLARIFICATIONS** Ideas and digital creations are personal property and cannot be used by others without permission. People need to respect and give credit to the creator of an idea or text. Examples of digital content and information can include stories, pictures, songs and videos. For example, students understand that a backpack or jacket belongs to another student. If someone used or took the jacket without permission, feelings could be hurt and rules might be broken. As they do with physical property (such as a jacket or backpack), students also need to respect digital and intellectual property (such as pictures, ideas and videos) and follow those rules. **CONTENT FOCUS** The focus is on the idea that people are owners of digital content, similar to a physical document or object.

STRAND: DESIGN AND TECHNOLOGY

Addresses the nature of technology to develop and improve products and systems over time to meet human/societal needs and wants through design processes.

Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.

K-2.DT.1.a. Identify and discuss differences between the human-designed world and the natural world.

Expectations for Learning

LEARNING PROGRESSION

In grades K-2, students identify and distinguish between the natural and human-designed world and describe how technology can be used to meet needs and wants. In grades 3-5, students will determine how human-designed items extend human capabilities to meet needs and wants.

IMPORTANT CONCEPTS

- Technology within the human-created world is created to meet specific purposes.
- Objects in the natural world exist without human interference.

KEY SKILLS/PROCEDURES

- Identify objects in the natural world and objects humans created to meet specific purposes.
- Compare and contrast objects from the natural world with objects created by humans to meet specific purposes.

Content Elaborations

CLARIFICATIONS

As students observe their environments, they notice things in the natural world (such as rivers, sticks, trees, plants and rocks) and things people create for specific purposes (such as pencil sharpeners, pens, tablets, buildings and highways).

For example, students could look at naturally occurring shelters (such as caves, anthills and tunnels) in comparison to human-made structures (such as houses, tents and yurts).

Items in the natural world often are used as raw materials when people build and create things. People also make tools to help them get jobs done. These tools and materials are called resources and tie into K-2.DT.1.d.

CONTENT FOCUS

This content statement focuses on students identifying what is human-designed and what is of the natural world. This could include identifying items around the room and outside the school.

Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.	
K-2.DT.1.b. Describe technology as something someone made to meet a want or need.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students describe how technology meets a need or want. In grades 3-5, students will demonstrate how applying human knowledge using tools and machines can extend human capabilities to meet needs and wants. **IMPORTANT CONCEPTS** • Technology is created to meet a need. • Technology is created to meet a want. **KEY SKILLS/PROCEDURES** • Define technology as something someone made to meet a want or a need. • Describe how technology satisfies a specific want or need. **Content Elaborations** **CLARIFICATIONS** Technology is created to solve human problems to meet a need or a want. Technology includes knowledge, artifacts, infrastructure, tools, materials, processes and products. For example, shoes can satisfy both a need and a want. People need shoes to protect their feet from cold temperatures and sharp objects. People may want a specific kind of shoe because of its style, color, pattern or material. **CONTENT FOCUS** The focus is on describing ways various technologies meet wants or needs. For example, students could identify a want or a need and then discuss how technology has helped meet the want or need.

Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.	
K-2.DT.1.c. Explain that systems have parts or components that work together to accomplish a goal.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students explain that systems have parts or components that work together to accomplish a goal. In grades 3-5, students will explain how controls in a system can use information to cause the system to change. **IMPORTANT CONCEPTS** • A system works best when its parts work together to accomplish a goal. • A system is incomplete when the parts do not work together to accomplish the goal. A missing, misused or broken part will lead to an incomplete system. (For example, a broken cord will not charge a device and missing cafeteria trays will impact the lunch line.) **KEY SKILLS/PROCEDURES** • Explain how components of a system work together to make the system complete. • Explain what happens when components of a system are not working together and the system is incomplete. **Content Elaborations** **CLARIFICATIONS** Various systems throughout the classroom and building can be identified and explored. This should include how parts or components of systems work together to complete a task, as well as what happens to the system when it is not working (that is, incomplete). For example, a printer and a computer work together as a system to produce a printed page. If the system is not working and the printer does not print, a part of the system could be the cause of the incomplete task. Other examples of systems within a classroom or school could include a fire drill or purchasing lunch in the cafeteria. **CONTENT FOCUS** The focus is to identify and explore how parts or components of a system work together to accomplish a goal and explain how parts play a role in working and non-working systems.

Topic 1: Define and describe technology, including its core concepts of systems, resources, requirements, processes, controls, optimization and trade-offs.	
K-2.DT.1.d. Give examples of how resources such as tools and materials are things that help people get a job done.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students give examples of how resources such as tools and materials are things that help people get jobs done. In grades 3-5, students will demonstrate how applying human knowledge using tools and machines extends human capabilities to meet needs and wants. **IMPORTANT CONCEPTS** • Tools help people complete jobs. • Materials are modified or combined to create products. • Resources include people, tools and materials. **KEY SKILLS/PROCEDURES** • Describe how tools, as a resource, help people complete their jobs. • Describe how materials are used as resources. • Identify resources that help people get their jobs done. **Content Elaborations** **CLARIFICATIONS** Help students connect everyday resources they use at home and school (for example, a comb, broom, water, paper, ruler or pencil) and how the items are used to achieve given tasks. Various resources help people in the community (such as police officers, construction workers, firefighters, teachers or students) get their jobs done. For example, students can use tools like pencils, paper and computers to communicate with people. When people build houses, they use materials like gravel, bricks and wood. People use tools like trucks and cranes to move building tools and materials from one place to another. Materials like stone can be found in the natural world and then modified to be used in buildings, such as granite counters, marble floors and limestone blocks, or combined with other materials to create a product. For example, gravel, sand and cement are combined to make concrete. This concept can tie into K-2.DT.1.a. by relating tools and materials to the differences between the natural and human-designed world. **CONTENT FOCUS** The focus is on explaining how people use different resources to complete jobs. Tools, materials and people are examples of resources.

<table>
<tr><th colspan="2">Topic 2: Identify a problem and use an engineering design process to solve the problem.</th></tr>
<tr><td>K-2.DT.2.a. Observe and describe details of an object's design.</td><td>
<h2>Expectations for Learning</h2>
LEARNING PROGRESSION
In grades K-2, students observe and describe the details of an object's design. In grades 3-5, students will critique the needs and opportunities for designing solutions.

IMPORTANT CONCEPTS
• The design of an object corresponds with its purpose and can impact how it is used.

KEY SKILLS/PROCEDURES
• Observe the characteristics of an object's design.
• Describe the parts of an object's design and how they function to accomplish a goal.

<h2>Content Elaborations</h2>
CLARIFICATIONS
Discussing familiar objects, like a chain or pair of glasses, can help connect student observations to the function, purpose and effectiveness of an object's design. Students can observe and describe the details noticed on objects found in the classroom, at home and in the community and on objects students create themselves.

For example, when observing the design of a backpack, students could notice the details of a zipper. They could then discuss and describe the function of the zipper on the backpack. Additionally, the adjustable shoulder straps, storage compartments, weight, durability and features added to enhance aesthetics could be observed and described.

CONTENT FOCUS
This content statement focuses on observing and describing an object's design and how the details or parts of the design accomplish a goal or complete a function.
</td></tr>
<tr><td>K-2.DT.2.b. Demonstrate the ability to follow a simple design process: identify a problem, think about ways to solve the problem, develop possible solutions and share and evaluate solutions with others.</td><td>
<h2>Expectations for Learning</h2>
LEARNING PROGRESSION
In grades K-2, students learn what a design process is and apply a simplified design process to solve a problem. In grades 3-5, students will plan and implement a design process to solve a problem, adding steps to test and redesign their solutions.

IMPORTANT CONCEPTS
• A design process is continuous and helps organize thinking.
</td></tr>
</table>

Topic 2: Identify a problem and use an engineering design process to solve the problem.	
	KEY SKILLS/PROCEDURES • Follow a design process to create a solution to a problem. **Content Elaborations** **CLARIFICATIONS** A design process is a tool to help students organize their thinking. It is a continuous process that is cyclical by nature. Students can use a simple design process to solve a problem. Beginning with a question can encourage students to consider their schools and communities and help them identify relevant problems to solve. Students take the lead in thinking about many ways to solve the problems they identified, and then they develop, create and/or build possible solutions to the problems. Audiences for the evaluation of the possible solutions to the student-identified problems will depend on the problems themselves. Students may be sharing and evaluating their solutions with peers from their classroom, other schools in their districts or other districts, parents or other members in their communities. Initially, this could be a shared or guided process, eventually evolving into a small group or independent experience. For example, after identifying a problem that mice are in a school, students could follow a design process to create innovative solutions to trapping the mice in nonlethal ways. **CONTENT FOCUS** The focus is on using a design process and building a simple design to solve an identified problem. **Career Connections** **CAREER AWARENESS** Once students have experience brainstorming solutions to problems using the design process, conduct a classroom discussion on the various general industries and occupations involved in the creation and implementation of the solution(s). For example, once students have created innovative solutions to trapping the mice in nonlethal ways, discuss what industries and occupations would be involved in making the solution a reality. Who designs the traps and makes the traps? Who delivers the traps? Who could take the mice once they are trapped?

Topic 2: Identify a problem and use an engineering design process to solve the problem.	
K-2.DT.2.c. Explain that a design process is a plan to find solutions to problems.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students learn what a design process is, apply a simplified design process to solve a problem and learn that a design process is a plan to find solutions to problems. In grades 3-5, students will plan and implement a design process to solve a problem, adding steps to test and redesign their solutions. **IMPORTANT CONCEPTS** • A design process is continuous and can produce multiple solutions. • A design process can be used as a plan to find solutions to problems. **KEY SKILLS/PROCEDURES** • Describe a design process as a plan to solve a problem. • List steps in a design process and explain how the steps help to find solutions. **Content Elaborations** **CLARIFICATIONS** Describing a design process helps develop an understanding of how problems are solved. Students can describe how a design process can be used as a plan to solve a problem by revisiting design projects they have completed. As they return to the processes they used, they can determine how the components of their processes formed plans that helped them solve their problems. In content statement K-2.DT.2.b., a simple design process includes the following steps: identify a problem, think about ways to solve the problem, develop possible solutions and, with others, share and evaluate solutions. Help students see how each of the steps together form a plan that moves them toward solving problems. Students can be encouraged to determine how seeking multiple solutions or improving their designs based on feedback could strengthen their solutions. Additional concepts that could be addressed include how to provide valuable feedback and how to evaluate feedback from others. **CONTENT FOCUS** The focus is on how a design process, one that is cyclical and continuous, can be used as a plan to generate multiple solutions to solve a problem.

Topic 2: Identify a problem and use an engineering design process to solve the problem.	
K-2.DT.2.d. Demonstrate that there are many possible solutions to a design problem.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students learn what a design process is and apply a simplified design process to solve a problem. In grades 3-5, students will plan and implement a design process to solve a problem and communicate their ideas and decisions. **IMPORTANT CONCEPTS** • There are multiple ways to solve a problem. • Feedback is important when improving designs. **KEY SKILLS/PROCEDURES** • Identify multiple solutions to a given problem. • Communicate feedback to peers to help improve designs. **Content Elaborations** **CLARIFICATIONS** There are many possible solutions to a design problem. Multiple solutions to a problem should be identified and developed. For instance, developing a humane mouse trap, described in the Clarification for K-2.DT.2.b., could have many design solutions. Evaluation of the solutions can be offered after developing evaluation criteria. Additional concepts that could be addressed include how to provide valuable feedback and how to evaluate feedback from others. Students can be encouraged to make improvements to their designs based on feedback. **CONTENT FOCUS** The focus is on creating many different solutions to the same problem.
K-2.DT.2.e. Communicate design plans and solutions using drawings and descriptive language.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students learn what a design process is and communicate design plans and solutions as they apply a simplified design process to solve a problem. In grades 3-5, students will plan and implement a design process to solve a problem and communicate their ideas and decisions. **IMPORTANT CONCEPTS** • Design plans and solutions can be communicated through drawings and descriptive language. **KEY SKILLS/PROCEDURES** • Share design plans that include drawings and descriptive language.

Topic 2: Identify a problem and use an engineering design process to solve the problem.	
	Content Elaborations **CLARIFICATIONS** Communicating plans and solutions is an important step in a design plan. Students should be able to share their plans and solutions in writing or verbally using descriptive language and drawings that show their designs and solutions. Students could include sketches, words, images, end products or models, symbols, text, spreadsheets, tables or slideshows. Recording audio may be helpful as students describe plans using descriptive language. Using digital tools may aid students in creating or capturing drawings (for example, taking digital pictures of paper drawings or creating a design plan in 2D or 3D). **CONTENT FOCUS** The focus is on students communicating their plans and solutions.

Topic 3: Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding and systems thinking.	
K-2.DT.3.a. Describe how different technologies are used in various fields.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students describe how different technologies are used in various fields. In grades 3-5, students will make connections between technology and other fields of study and how different disciplines combine their skills in the design and production of a product. **IMPORTANT CONCEPTS** • Varying technologies are used in occupations to help complete or perform a job. **KEY SKILLS/PROCEDURES** • List technologies for selected occupations. **Content Elaborations** **CLARIFICATIONS** People in the community (such as police, firefighters, teachers and students) use technology in their occupations. Students can identify multiple fields of employment and the technologies used by those roles. **CONTENT FOCUS** This content statement focuses on students describing how different occupations and different industries use different technologies.
K-2.DT.3.b. Work as a team to identify possible problems to solve and their potential technological solutions.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students work as a team to identify problems to solve and their solutions. In grades 3-5, students will design products and explain how knowledge and skills from different disciplines were combined in the design and production. **IMPORTANT CONCEPTS** • Working collaboratively allows for identifying and solving technical problems. • Working collaboratively generates more ideas and solutions for tasks and problems. **KEY SKILLS/PROCEDURES** • Collaboratively work in groups to identify problems and potential solutions.

Topic 3: Demonstrate that solutions to complex problems require collaboration, interdisciplinary understanding and systems thinking.	
	Content Elaborations **CLARIFICATIONS** A team approach to solving technical problems is more effective than an individual approach. Students can discuss what characteristics exist within a well-functioning team. Students identify possible problems and work in collaborative teams using a design process to develop possible solutions. Groups can include whole group, small collaborative groups or pairs or triads. **CONTENT FOCUS** The focus is on students practicing working collaboratively to solve a problem.

Topic 4: Evaluate designs using functional, aesthetic and creative elements.	
K-2.DT.4.a. Identify and discuss the use of aesthetics in everyday objects.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify and discuss the use of aesthetics in everyday objects. In grades 3-5, students will apply criteria developed with guidance to evaluate new or improved products for functional, aesthetic and creative elements. **IMPORTANT CONCEPTS** • The design of objects includes properties that help it function. • Aesthetic properties do not help an object function. • Aesthetic elements, like how an object looks, feels or sounds, increase the appeal of an object. **KEY SKILLS/PROCEDURES** • Identify the aesthetic design properties of an object. • Describe how the aesthetic properties of an object may or may not play a role in the object's function. **Content Elaborations** **CLARIFICATIONS** The aesthetic element considers the product's appeal, including visual, audio and tactile. An object's color, size or material(s) may or may not play a role in the purpose of the object's function. Discuss everyday objects with students, identify the use of aesthetics and the objects' uses in relation to their appearances. During the discussion, students may question why an object looks a certain way and if parts of the appearance have a functional purpose or are for aesthetic purposes only. **CONTENT FOCUS** This content statement focuses on students engaging in discussions about the appearance and aesthetic properties of everyday objects.
K-2.DT.4.b. Identify and discuss functional aspects of everyday objects.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify and discuss functional aspects of everyday objects. In grades 3-5, students will apply criteria developed with guidance to evaluate new or improved products for functional, aesthetic and creative elements. **IMPORTANT CONCEPTS** • Everyday objects have functions and purposes.

Topic 4: Evaluate designs using functional, aesthetic and creative elements.	
	KEY SKILLS/PROCEDURES • Identify the functions and uses of everyday items. **Content Elaborations** **CLARIFICATIONS** The functional element considers if the product fulfills the intended purpose. Discuss everyday objects with students and identify the intended purposes of the objects. Since students will be looking at following the design process and creating their own products and solutions to given or identified problems, examining the function of an item as it relates to its design is important to give them a reference point. **CONTENT FOCUS** The focus is on looking at objects that students interact with every day and discovering how an object's design helps it function.
K-2.DT.4.c. Identify and discuss examples of creativity found in everyday objects.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students identify and discuss examples of creativity found in everyday objects. In grades 3-5, students will apply criteria developed with guidance to evaluate new or improved products for functional, aesthetic and creative elements. **IMPORTANT CONCEPTS** • Everyday objects can be designed creatively. **KEY SKILLS/PROCEDURES** • Give examples of creativity in the design and use of everyday items. **Content Elaborations** **CLARIFICATIONS** The creative element considers the uniqueness of how the product fulfills its intended purpose. Discuss everyday objects with students and identify the intended purposes of objects. Then, students can discuss if each object met its purpose in a unique way. An example can be found in classroom organization and storage. Some teachers may use plastic cups or recycled food containers to store markers and crayons. These items might be designed for other purposes, but teachers may find they make excellent storage containers too.

Topic 4: Evaluate designs using functional, aesthetic and creative elements.	
	CONTENT FOCUS The focus is on students using common, everyday objects in creative ways and identifying how designers used creative ideas in creating these objects.
K-2.DT.4.d. Discuss and give examples of how changes in design can be used to strengthen or improve a product.	**Expectations for Learning** **LEARNING PROGRESSION** In grades K-2, students discuss and give examples of how changes in design can be used to strengthen or improve a product. In grades 3-5, students will examine a familiar product or process and suggest improvements to its design. **IMPORTANT CONCEPTS** • Changes in the design of a product can strengthen or improve it. **KEY SKILLS/PROCEDURES** • Provide constructive feedback to help improve or strengthen a design. • Give examples of ways to improve or strengthen a design. **Content Elaborations** **CLARIFICATIONS** Students will engage in discussions and provide examples of how they can improve a design to make a better product. Through learning how to give valuable feedback, students can think about what works within a given design and problem-solve any glitches or errors. As part of a design process, students identify any issues and develop ways to improve the design. Students also provide constructive feedback and specific examples. **CONTENT FOCUS** The focus is to increase the problem-solving discourse in the classroom around the design process and ways improvements can be made to designs.