

A photograph of three young children in a classroom setting, looking intently at a tablet held by one of them. The image is overlaid with a semi-transparent orange filter. The child in the center is pointing at the screen with their right index finger. The child on the right is looking down at the tablet with an open mouth, appearing surprised or excited. The child on the left is also looking at the screen. In the background, there are bookshelves filled with books and other classroom items.

**Kentucky Academic Standards
for
Technology**
Kindergarten through Grade 12

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Introduction

Background

Today's society is witnessing an unprecedented explosion of information and use of digital resources. In an environment where information is doubling at an incredible rate and digital, distance, and remote learning resources are becoming an increased component of the classroom and the workplace, students face both difficult challenges and increased opportunities. Successful students, workers, and citizens of tomorrow will continue to be digitally connected self-directed agents of their own learning.

The KETS Master Plan for Education Technology (2024-2030) identified updating the current Technology Standards as an area of emphasis and priority for the KDE in collaboration with our local school districts and professional partners. The plan's vision for student learning highlights equitable, personalized, applied, and engaged digital, distance, and remote learning for all students. Safe and responsible digital tools can enhance student learning as they connect efforts to identify what students should know and be able to do, as well as help students and educators assess progress toward achieving academic goals. Strong technology skills can also help students perform, apply, and demonstrate what they have learned. To meet the needs of today's students and to ensure they are future-ready, schools are encouraged to be innovative in providing student learning experiences, adopting technologies and instruction in ways which meaningfully engage the tomorrow's generation of learners. Therefore, the Kentucky Department of Education (KDE) engaged with industry, school and community partners to develop the revised *Kentucky Academic Standards for Technology* which focus on providing students with opportunities to develop fundamental skills essential to all postsecondary and career paths; thereby stimulating Kentucky's economy and workforce.

New in these standards: These are newly revised Kentucky Academic Standards (KAS) for Technology. While the concept areas have remained consistent from the previous standards adoption cycle, they are revised to include new and emerging technologies such as artificial intelligence (AI), generative AI, with additional elaborations and clarifications in the grade level indicators. By way of example, AI is now seen through all seven concept areas of the KAS for Technology. Additionally, the revised digital citizenship concept champions safe, savvy, and social skills across all active and passive screen use with purposeful, intentional, and meaningful digital interactions.

Kentucky's Vision for Students

The Kentucky Board of Education's (KBE) vision is that *each and every Kentucky learner will become an engaged citizen and empowered learner prepared to lead a life filled with purpose*. To equip and empower students, the following capacity and goal statements frame instructional programs in Kentucky schools. They were established by the Kentucky Education Reform Act (KERA) of 1990, as found in Kentucky Revised Statute (KRS) 158.645 and KRS 158.6451. All students shall have the opportunity to acquire the following capacities and learning goals:

- Communication skills necessary to function in a complex and changing civilization;

- Knowledge to make economic, social and political choices;
- Core values and qualities of good character to make moral and ethical decisions throughout life;
- Understanding of governmental processes as they affect the community, the state and the nation;
- Sufficient self-knowledge and knowledge of their mental health and physical wellness;
- Sufficient grounding in the arts to enable each student to appreciate their cultural and historical heritage;
- Sufficient preparation to choose and pursue their life's work intelligently; and
- Skills to enable students to compete favorably with students in other states.

Furthermore, schools shall:

- Expect a high level of achievement from all students.
- Develop their students' ability to:
 - Use basic communication and mathematics skills for purposes and situations they will encounter throughout their lives;
 - Apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies and practical living studies to situations they will encounter throughout their lives;
 - Become self-sufficient individuals of good character exhibiting the qualities of altruism, citizenship, courtesy, hard work, honesty, human worth, justice, knowledge, patriotism, respect, responsibility and self-discipline;
 - Become responsible members of a family, work group or community, including demonstrating effectiveness in community service;
 - Think and solve problems in school situations and in a variety of situations they will encounter in life;
 - Connect and integrate experiences and new knowledge from all subject matter fields with what students have previously learned and build on past learning experiences to acquire new information through various media sources; and
 - Express their creative talents and interests in visual arts, music, dance and dramatic arts.
- Increase student attendance rates.
- Increase students' graduation rates and reduce dropout and retention rates.
- Reduce physical and mental health barriers to learning.
- Be measured on the proportion of students who make a successful transition to work, postsecondary education and the military.

Kentucky law establishes minimum requirements for all students to earn a diploma. However, elective courses are offered based on decisions of local districts and schools. Schools have also offered specialized technology-related courses in the past through Career and Technical Education (CTE) Pathways.

To ensure legal requirements of social studies classes are met, the Kentucky Department of Education (KDE) encourages schools to use the Model Curriculum Framework to inform development of curricula related to these courses. The Model Curriculum Framework encourages putting the student at the center of planning to ensure that:

...the goal of such a curriculum is to produce students that are ethical citizens in a democratic global society and to help them become self-sufficient individuals who are prepared to succeed in an ever-changing and diverse world. Design and implementation requires professionals to accommodate the needs of each student and focus on supporting the development of the whole child so that all students have equitable access to opportunities and support for maximum academic, emotional, social and physical development.

(Model Curriculum Framework, page 19)

Legal Basis

The following Kentucky Revised Statutes (KRS) and Kentucky Administrative Regulations (KAR) provide a legal basis for this publication:

KRS 156.160 Promulgation of administrative regulations by the Kentucky Board of Education

With the advice of the Local Superintendents Advisory Council (LSAC), the KBE shall promulgate administrative regulations establishing standards that public school districts shall meet in student, program, service and operational performance. These regulations shall comply with the expected outcomes for students and schools set forth in KRS 158:6451.

704 KAR 3:305 Minimum high school graduation requirements

This administrative regulation establishes the minimum high school graduation requirements necessary for entitlement to a public high school diploma. One of the stated minimum high school graduation requirements is centered on a students' demonstrated performance-based competency in technology prior to graduating. The KAS for Technology defines these competencies. Therefore, the academic standards found in this document (via 704 KAR 8:090) are required for ALL students prior to graduation, per 704 KAR 3:305 (See [Appendix A](#)). While the high school focused standards found below are explicitly connected to the graduation requirement, elementary and middle school students' exposure to these standards will be varied based on optional school-level decision making and readiness. The KAS for Technology are not required standards for K-8 students. Though, it is a recognized best practice for students to have grade level learning and exposure to these standards and not wait until high school to start to demonstrate these competencies as the grade-band standards and indicators found in this document build from lower grades through grade 12.

704 KAR 8:090 Kentucky Academic Standards for Technology

Senate Bill 1 (2017) calls for the KDE to implement a process for establishing new, as well as reviewing all approved academic standards and aligned assessments beginning in the 2017-18 school year. The current schedule calls for content areas to be reviewed each year and every six years thereafter on a rotating basis. The KDE collects public comment and input on all of the draft standards for 30 days prior to finalization.

Senate Bill 1 (2017) called for content standards that:

- Focus on critical knowledge, skills and capacities needed for success in the global economy;
- Result in fewer but more in-depth standards to facilitate mastery learning;
- Communicate expectations more clearly and concisely to teachers, parents, students and citizens;
- Are based on evidence-based research;
- Consider international benchmarks; and
- Ensure the standards are aligned from elementary to high school to postsecondary education so students can be successful at each education level.

704 KAR 8:090 adopts into law the *Kentucky Academic Standards for Technology*. Standards Creation Process

Per Senate Bill 1 (2017), the *Kentucky Academic Standards for Technology* was entirely conceived and written by teams of Kentucky educators. The Technology Advisory Panel (AP) was composed of 24 teachers, three public post-secondary professors from institutions of higher education and four community members. The function of the AP was to review and revise the standards and make recommendations for changes to a Review and Development Committee (RDC). The Technology RDC was composed of six teachers, four public post-secondary professors from institutions of higher education and three community members. The function of the RDC was to review the work and findings from the AP and make recommendations to revise or replace existing standards. The team was selected based on their expertise in the area of technology and learning through digital tools and resources, including those with a specialty in the disciplines of technology. When choosing writers, the selection committee considered state-wide representation for public elementary, middle and high school teachers as well as higher education instructors and community members.

Writers' Vision Statement

The writing team envisioned standards that would afford students the opportunity to engage in becoming empowered as a learner, constructing new meaning and new knowledge, digital citizenship, computational thinking, problem-solving, communication, and collaboration through demonstrated student technology skills. The writing team wanted standards that would:

- initiate cross-curricular connections to enhance the understanding of learning through digital technology skills and concepts;
- establish a continuum of technology competencies K-12 for (to be demonstrated);
- provide opportunities for ALL students to engage in learning through technology experiences and
- advanced demonstration of technology competencies (and digital skills) to prepare them for future success; and
- prepare students to address a critical workforce need related to technology knowledge, skills, and application.

Design Considerations

The writers designed a single set of standards to frame learning experiences in such a way so as to allow local schools and districts the flexibility to choose the curricular design that best meets the needs of students. The writers chose to organize the standards into seven broad concept areas that students should apply and embody. With digital technologies students should be an: empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, and a global collaborator. Standards in each area were written as performance expectations to depict what students must do to demonstrate competency in technology.

What is Technology Education?

Kentucky's Academic Standards for Technology identifies and defines the knowledge and skills essential for all Kentucky students to access, evaluate, and use information and technology to engage in and take ownership of their learning. These standards connect and interrelate current perspectives and fluencies in information, media, and technology into a unified conceptual framework. The standards also demonstrate processes for rethinking education, rethinking learning (when, how, space, and pace) adapting to a constantly changing digital landscape and preparing students to transition into an increasingly global economy.

Kentucky educators, we are preparing students for a future that we cannot yet imagine. Empowering students to become lifelong learners and providing them with the skills to face future challenges resourcefully and creatively is critical. Empowering students is not about using digital tools to support outdated education strategies and models: it is about tapping into technology's potential to amplify human capacity for collaboration, creativity, and communication. The Kentucky Academic Standards for Technology are about leveling the playing field and providing young people worldwide with equitable access to powerful learning experiences.

The purpose of these standards is to identify technology-related content (competencies and skills) and performance (application) standards for all students throughout the kindergarten through grade twelve (K-12) curriculum. We must ensure that all children have seamless access to high-quality education programs. Clear statements about what students must know and be able to do are essential in making sure our schools offer opportunities to get the knowledge, skills, and application of such, necessary for success in and beyond the classroom. The standards are designed to be integrated into all content and skill areas of the school curriculum. The focus is on transforming learning experiences **with technology and through technology** rather than learning about technologies or learning how to use technologies. Integration will be varied and diverse based on the curricula of individual schools and school systems. The reflective dialogue will occur in school districts among students, teachers, administrators, parents, curriculum directors, library media specialists, education technology leaders, digital learning coaches, instructional coaches, parents, and community members as each district leverages, aligns, and integrates these standards and into the local instructional program for students.

Technology Standards vs. Computer Science Standards

Kentucky officially recognized Technology Academic Standards in 2008, for the first time. The academic standards for technology represented in this document are a third refresh and modernization to those original (adopted) standards. While these technology standards complement the *Kentucky Academic Standards for Computer Science*, the resulting competencies are substantially different. The technology standards are broad and should lead students towards competencies that highlight learning (academic standards in other content areas: e.g. mathematics, social studies, science, etc.) with technology. These academic standards for technology are also designed to support the implementation of content-area standards, such as digital fluency skills demonstrating the responsible use of appropriate technology to communicate, solve problems, access, manage, integrate, evaluate and create information to improve learning in all subject areas.

The *Kentucky Academic Standards for Technology*, anchored on the International Society for Technology in Education ([ISTE](#)) Student Standards, provide a framework for integrating technology into all content areas and reflect the basic digital skills required for each student to be competitive in today's global economy. Additionally, "demonstrating performance-based competency in technology" is included as a [minimum graduation requirement](#) in Kentucky public schools. For students to attain the required technology competencies, it is essential they have access to technology during the school day at all grade levels and during digital, distance, and remote learning. Instruction should provide opportunities for students to gain and demonstrate technology skills that build throughout their K-12 educational careers.

Computer science, however, often is confused with the everyday use of computers and computer applications, such as learning how to safely and responsibly navigate the Internet and use digital presentation software. Parents, teachers, students, and local and state education leaders share this confusion. The Kentucky Academic Standards for Computer Science clarifies not only what computer science is but also what students should know and be

able to do in computer science from kindergarten to 12th grade. Computer science builds on the KAS for Technology, computer fluency, educational technology, digital citizenship, and information technology. Simply stated, the KAS for Technology build on students using technologies, while the KAS for Computer Science details the skills needed to make technologies. Their slight differences and relationship with technology are described below.

- **Computer literacy** (or digital literacy) refers to the general use of computers and programs (i.e., computer applications) such as productivity software. Examples include performing an Internet search and creating a digital presentation.
- **Educational technology** applies computer literacy to school subjects. For example, students in an English class can use a web-based application to collaboratively create, edit, and store an essay online.
- **Digital citizenship** refers to the appropriate and responsible use of technology, such as choosing an appropriate password and keeping it secure.
- **Information technology** often overlaps with computer science but is mainly focused on industrial applications of computer science, such as installing and operating software rather than creating it. Information technology professionals often have a background in computer science.
- **Computer Science** as an academic discipline encompassing the study of computers and algorithmic processes to include principles, hardware and software designs, applications, networks and the impact on society.

These aspects of computing and technology are distinguished from each other because they focus on *using* computer technologies rather than understanding *why* they work and *how* to create those technologies. Knowing why and how computers work (i.e., computer science), provides the basis for a deep understanding of computer use and the relevant rights, responsibilities and applications).

Consulted Partners

Through the *Kentucky Academic Standards for Technology* development process many partners were consulted. The following list represents partners who assisted in the drafting of these standards provided valuable research and resources:

- The International Society for Technology in Education (2016). ISTE Standards for Students, Revised 2016. Retrieved from <https://www.iste.org/standards/standards/adopting-the-standards>.
- States Consulted and referenced: Wisconsin, Washington, Ohio, Montana.
- States modeled after: Wisconsin

Standards Use and Development

The Kentucky Academic Standards (KAS) are Standards, not Curriculum

The Kentucky Academic Standards for Technology outlines the minimum standards Kentucky students should learn in each grade level kindergarten through high school grade-span. The standards address a foundational framework of what is to be learned but do not address how learning experiences are to be designed or what resources should be used.

A standard represents a goal or outcome of an educational program; standards are vertically aligned expected outcomes for all students. The standards do not dictate the design of a lesson plan or how units should be organized. The standards establish a statewide baseline of what students should know and be able to do at the conclusion of a grade or grade-span. The instructional program should emphasize the development of students' abilities to acquire and apply the standards. The curriculum must ensure that appropriate accommodations are made for diverse populations of students found within Kentucky schools.

These standards are not a set of instructional or assessment tasks, but rather statements of what students should be able to master after instruction. Decisions on how best to help students meet these program goals are left to local school districts and teachers. Curriculum includes the vast array of instructional materials, readings, learning experiences and local mechanisms of assessment, including the full body of content knowledge to be covered, all of which are to be selected at the local level according to Kentucky law.

Translating the Standards into Curriculum

The KDE does not require specific curricula or strategies to be used to engage students in the Kentucky Academic Standards. Local schools and districts choose to meet the minimum required standards using a locally adopted curriculum according to KRS 160.345, which outlines the method by which the curriculum is to be determined. As educators implement academic standards, they, along with community members, must guarantee postsecondary readiness. To achieve this, Kentucky students need a curriculum designed and structured for a rigorous, relevant and personalized learning experience, including a wide variety of learning opportunities. The Kentucky Model Curriculum Framework is a resource to support districts and schools in the continuous process of developing and reviewing local curriculum.

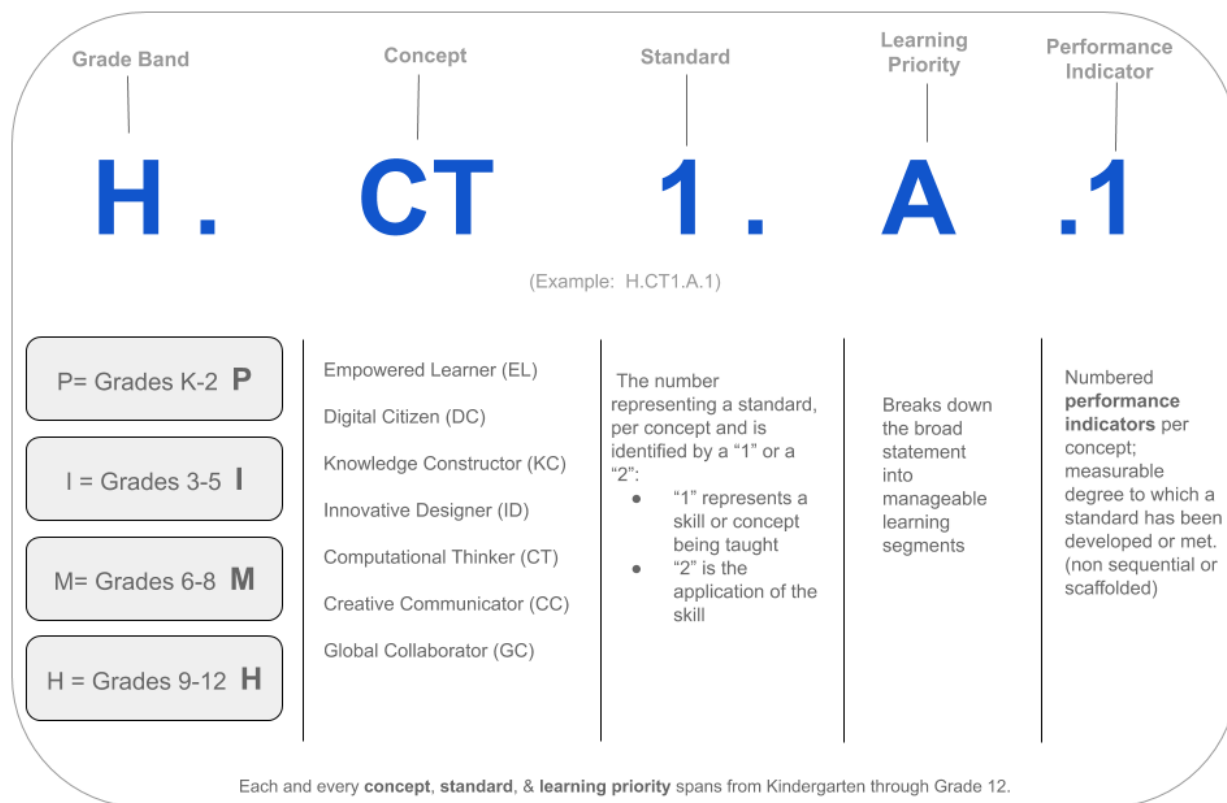
Organization of the Standards

Standards Structure and Identifiers

The Kentucky Academic Standards for Technology follow a specific structure.

- **Standard Identifier:** reflects consistent coding for the identification of a standard representing the grade (or grade band), the concept area and the numerated standard number per concept.
- **Grade Band:** identifies the grade band associated with the standard.
- **Concept:** categorizes the standards into seven concepts (Empowered Learner, Digital Citizen, Knowledge Constructor, Innovative Designer, Computational Thinker, Creative Communicator, and Global Collaborator).
- **Standard:** outlines what students are expected to know or be able to do.
- **Learning Priority:** translates the standard into manageable learning pieces and represents the specific ideas within that concept. Subconcept overviews summarize how learning progresses across multiple grade bands and are used to develop the progression chart (Appendix C).
- **Grade-by-Grade Performance Indicators:** provide a comprehensive picture of performance expectations for each standard in the K-12 grade band and include thorough descriptions of exemplary practices and processes.

Standard Identifier (example)



Grade Bands and Grade Level Considerations

The Kentucky Academic Standards for Technology are organized in specific grade bands (K-2, 3-5, 6-8 and 9-12). This organization enables teachers to create grade level or course-specific student expectations derived from the standards. Additionally, connections exist between standards in different grade bands and demonstrate how one concept builds on another to provide vertically aligned learning experiences for students.

- *The Kentucky Academic Standards for Technology* represent knowledge and skills that should be demonstrated through the transition of each grade band (i.e. grade 2, grade 5, grade 8 and grade 12). While middle school and high school students generally have the opportunity to demonstrate the learning of technology skills and concepts through dedicated technology empowered projects, students in elementary school may be more likely to learn technology skills integrated throughout the curriculum in all content areas. Therefore, **grade-by-grade indicators are included, per standard, for kindergarten through grade 12.**
- Technology at the middle school level continues to develop students' foundational skills (in problem solving, computational and critical thinking) through the awareness and exploration of technology-related concepts.
- Technology at the high school level continues to develop students' foundational understanding of transformational learning with technology through in-depth learning

opportunities, demonstrated competencies, including awareness and exploration activities.

Supplementary Materials to the Standards

The final set of the *Kentucky Academic Standards for Technology* is the result of educator involvement and public feedback. Short summaries of each of the appendices are listed below.

Appendix A: Connection to Graduation

The *Kentucky Academic Standards for Technology* are included in Kentucky's minimum graduation requirements. This section provides key points, an explanation of the requirement, and guidance for implementation.

Appendix B: Writing and Review Teams

Team members who revised and edited the 2026 update to the *Kentucky Academic Standards for Technology* are included. Additional information includes those who reviewed the standards and/or provided feedback.

Appendix C: Grade Band Progression Chart

The progression chart represents the K-12 *Kentucky Academic Standards for Technology* progressions for ALL students, to include all concept areas and subconcepts.

Kentucky Academic Standards (KAS) for Technology Primary (Grades K-2)

Primary (K-2) KAS for Technology

Overview for Primary (K-2):

The technology standards at the primary level provide an entry-point into necessary knowledge, skills, and competencies that equip students for a successful future. This goal requires the understanding of content that helps: empower learners, create responsible digital citizens, facilitate knowledge construction, design and innovate for learning, think computationally, communicate creatively, and collaborate with a global mindset.

Application of the technology standards at the primary level should focus on active learning and integrating the identified skills into other disciplines. These standards provide a clear progression of skills, and students develop a broad conceptual understanding of technology. All content teachers should provide opportunities for students to apply the skills and knowledge identified.

Concept: **Empowered Learner (EL)**

Competency: Students use technology to take an active role in their learning.

Standard:

EL1. Leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

Learning Priority:

A. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

Indicator(s) for grades K-2:

1. Set personal learning goals and use digital tools, including AI-powered learning applications for youth, to achieve those goals, with guidance and support (ex.: increase reading fluency by recording and reflecting upon student reading).
2. Reflect on the learning process to improve learning over time, with guidance and support (ex.: using digital writing portfolio and reflection log/journal). Students will also learn how AI-powered tools provide feedback and adjust to their progress, while reflecting on how these responses help them grow as learners.

Learning Priority:

B. Build networks and customize their learning environments in ways that support the learning process.

Indicator(s) for grades K-2:

1. Participate in teacher-led explorations utilizing digital tools to expand learning spaces beyond the classroom (ex.: expert video channels, video conferencing with

professionals, authors' blogs). Students will also explore, with guidance, how some tools use artificial intelligence to personalize learning experiences (ex.: suggesting new books or adjusting difficulty levels) and discuss how these features support their learning.

Learning Priority:

C. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

Indicator(s) for grades K-2:

1. Recognize and use technology, including AI-powered tools, to seek feedback as a valued component of the learning process.
2. Use feedback, including AI-generated feedback, to improve the demonstration of learning (ex.: students use interactive software with immediate feedback to guide their performance).

Learning Priority:

D. Understanding the fundamental concepts of how to use technology (technology operations).

Indicator(s) for grades K-2:

1. Explore a variety of digital tools and discover how they work based on fundamental concepts of technology operations (ex.: switching between devices, navigating apps, selecting tools within a program). Students discover that some tools use AI to personalize experiences based on the user's actions or inputs.
2. Transfer conceptual knowledge of technology operations in multiple contexts, with guidance and support (ex.: A student has learned to use a smartphone, and they use what they know about smartphones to use a different device).
3. Students recognize that some digital tools use AI to make choices or respond to users (ex.: adaptive learning programs). With guidance, students learn how to employ these tools to support their learning.

Standard:

EL2. Apply the fundamental concepts of technology operations and demonstrate the ability to choose, use, and/or troubleshoot current technologies.

Learning Priority:

A. Demonstrate learning with the use of technology.

Indicator(s) for grades K-2:

1. Use age-appropriate digital resources, including AI-supported tools, to produce and publish information (ex.: creating and illustrating a story or project using digital tools).
2. Demonstrate basic ability to communicate a message with digital input strategies (ex.: typing/keyboarding, voice to text, video or audio, images). With guidance, students use AI-supported tools to enhance expression and discuss how to ensure their message represents their own ideas.

Learning Priority:

B. Apply functions and concepts of technology operations; demonstrate the ability to choose, use and troubleshoot current technologies.

Indicator(s) for grades K-2:

1. Choose technology appropriate to task and purpose, with guidance and support. Students begin to recognize when AI-supported tools are helpful and when they are not needed.

2. With guidance and support, students choose digital tools, including those with AI features, to complete tasks.

Learning Priority:

C. Transfer knowledge to emerging technology.

Indicator(s) for grades K-2:

1. Apply and adapt knowledge of existing technology, including AI, to the substitution-based use of new technologies to support learning.

Concept: **Digital Citizen (DC)**

Competency: Students manage their digital identity in a safe, positive, and proactive way.

Standard:

DC1. Recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world; act and model in ways that are safe, legal and ethical.

Learning Priority:

A. Cultivate and manage your digital identity and reputation, and be aware of the permanence of your actions in the digital world.

Indicator(s) for grades K-2:

1. Understand what it means to be a positive influence offline and how that could relate to being positive online.
2. Show awareness that when something is put on the internet (websites, social media, apps) it can leave a trail online (digital footprint).

Learning Priority:

B. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

Indicator(s) for grades K-2:

1. Choose appropriate websites, and understand to seek help from a trusted adult when faced with problems online related to safety.
2. Understand that what is online has positive and negative consequences, and relate the understanding to behaviors offline.

Learning Priority:

C. Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

Indicator(s) for grades K-2:

1. Understand usernames and passwords, and understand why these are not shared with others.
2. Navigate to trusted websites and know how to search for websites in a safe manner with awareness that not all websites are safe.

Standard:

DC2. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Learning Priority:

A. Use information, media and digital resources in a responsible manner.

Indicator(s) for grades K-2:

1. Identify acceptable use of the internet and other digital resources.
2. With guidance and support, notice one way an online program (including simple AI-supported tools) can help learning and one way it can be mistaken; always check with a trusted adult.

Learning Priority:

B. Respect intellectual property rights.

Indicator(s) for grades K-2:

1. Recognize that everyone has different ideas in creating their own work (intellectual property).
2. Show respect for others' intellectual property with positive words.
3. Understand not to copy someone else's work (intellectual property).
4. Understand that someone else's creations found on the internet or shared in person, cannot be used without permission, and the creator should be given credit.

Concept: **Knowledge Constructor (KC)**

Competency: Students use various digital tools to find information and make meaning.

Standard:

KC1. Students critically curate a variety of resources using digital tools to construct knowledge.

Learning Priority:

A. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

Indicator(s) for grades K-2:

1. Use teacher-guided keyword searches or visual search tools to find basic information about a topic.
2. Use age-appropriate digital resources, reference strategies, apps, and other guided tools such as videos, websites, apps, and AI-supported tools with teacher support to find and locate information.
3. Use teacher-selected digital resources to find answers to questions and learn about a topic.

Learning Priority:

B. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

Indicator(s) for grades K-2:

1. Classify websites or apps, with teacher support, to understand their purpose and establish relevance in search results (learn, watch, play).
2. Compare information on the same topic across multiple digital resources.

Learning Priority:

C. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

Indicator(s) for grades K-2:

1. Save and organize simple digital items (pictures, drawings, recordings) with teacher support.
2. Group similar digital items into simple collections (e.g., animals, shapes, weather).

Standard:

KC2. Produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.

Learning Priority:

A. Produce creative artifacts.

Indicator(s) for grades K-2:

1. Use digital tools to create simple artifacts to share their learning (drawings, recordings, photos, digital stories).

Learning Priority:

B. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Indicator(s) for grades K-2:

1. Use a variety of digital resources (ex.: website, video clip, photos) to explore and report on real world issues.

Concept: Innovative Designer (ID)

Competency: Students use a variety of technologies to design and create.

Standard:

ID1. Use a variety of technologies to identify and solve authentic real-world problems.

Learning Priority:

A. Find authentic real-world problems in local and global contexts.

Indicator(s) for grades K-2:

1. Use technology to identify a problem in the school or home environment with guidance and support.
2. Describe the problem, using technology, and explain why it is problematic.

Learning Priority:

B. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

Indicator(s) for grades K-2:

1. Demonstrate perseverance when working to complete a challenging task.

Standard:

ID2. Use a variety of technologies within a design process to create new, useful and imaginative solutions.

Learning Priority:

A. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

Indicator(s) for grades K-2:

1. Use a design process (ex.: creative thinking spiral) to ask questions, suggest solutions, test ideas to solve problems, and share their learning, with guidance and support.

Learning Priority:

B. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

Indicator(s) for grades K-2:

1. Use a variety of age-appropriate digital tools to design something, with guidance and support.

Learning Priority:

C. Develop, test and refine prototypes as part of a cyclical design process.

Indicator(s) for grades K-2:

1. Use a design process to develop ideas or creations, test their design, and redesign if necessary.

Concept: Computational Thinker (CT)

Competency: Students understand sequences and use them to develop solutions to problems.

Standard:

CT1. Develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Learning Priority:

A. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

Indicator(s) for grades K-2:

1. Identify a problem and choose the appropriate digital tools to explore and find solutions to the problem through the use of a step-by-step plan, with guidance and support.

Learning Priority:

B. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

Indicator(s) for grades K-2:

1. Utilize an age-appropriate digital tool to collect, organize, and represent data (ex.: online surveys, spreadsheets, graphs, charts, etc); students will use this data to look for similarities and identify patterns and categories within the data set (ex.: simple data mining), with guidance and support.

Learning Priority:

C. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Indicator(s) for grades K-2:

1. Break a problem into smaller parts, identify key information, and use age-appropriate digital tools to help with problem solving (ex.: online whiteboard, online mindmapping tools, digital outline), with guidance and support.

Learning Priority:

D. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Indicator(s) for grades K-2:

1. Define and give examples of automation (ex.: thermostat controls temperature, buttons pressed on toys make various sounds).
2. Complete a simple coding task with at least 3-5 coded actions (ex: block-based coding and/or tangible coding resources), with guidance and support.

Standard:

CT2. Apply strategies for understanding and solving problems by using technological methods to develop and test solutions.

Learning Priority:

A. Use resources to collect, analyze, and represent data.

Indicator(s) for grades K-2:

1. Use digital tools to ask questions and digitally collect data, with guidance and support.

Learning Priority:

B. Deconstruct components to understand systems and facilitate problem-solving.

Indicator(s) for grades K-2:

1. Use digital tools to identify patterns in order to solve problems, with guidance and support.

Learning Priority:

C. Create and test automated solutions.

Indicator(s) for grades K-2:

1. Use digital tools to identify and create algorithms, with guidance and support.

Concept: **Creative Communicator (CC)**

Competency: Students communicate clearly and express themselves with a variety of digital tools.

Standard:

CC1. Communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals, audience and task.

Learning Priority:

A. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Indicator(s) for grades K-2:

1. Introduce and use age appropriate digital tools (ex.: art creation programs, video production, photography, presentations, video media, green screen, stop motion animation) for producing new creations or published communications using appropriate digital etiquette with guidance and support.

Learning Priority:

B. Create original works or responsibly repurpose and/or remix digital resources into new creations.

Indicator(s) for grades K-2:

1. Use age appropriate digital tools to create original and remixed work, with respect to intellectual property with guidance and support.

Learning Priority:

C. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

Indicator(s) for grades K-2:

1. Observe and participate in the communication of ideas using a variety of digital tools (ex.: video reflections, interactive notebooks, audio recording, as well as visual representation) with guidance and support.

Standard:

CC2. Publish and present content customized for their audience(s), purpose, and task.

Learning Priority:

A. Publish and present content that customizes the message and medium for their intended audiences.

Indicator(s) for grades K-2:

1. Explore a variety of digital tools (ex.: drawing/ art programs, video production, green screen, digital art). to create and communicate an idea to a variety of audiences with guidance and support.
2. Discuss different audiences and how presentations can change based on audience.

Concept: Global Collaborator (GC)

Competency: Students use digital tools to connect with learners inside and outside of their classroom.

Standard:

GC1. Use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Learning Priority:

A. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

Indicator(s) for grades K-2:

1. With guidance and support, use digital tools (e.g., translation features, virtual field trips, video conferencing, teacher-moderated class blogs or class-to-class exchanges) to explore and understand similarities and differences among people in their school, community, and beyond.

Learning Priority:

B. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Indicator(s) for grades K-2:

1. With guidance and support, use collaborative digital tools (e.g., shared creation spaces, collaborative digital whiteboards) to share tasks, give age-appropriate feedback (e.g., emojis, audio comments, or simple written responses) to peers, and complete digital projects together.

Learning Priority:

C. Contribute to the exchange of ideas within and beyond the learning community.

Indicator(s) for grades K-2:

1. With guidance and support, use safe, moderated digital spaces (e.g., class blogs, digital portfolios, AI-assisted story platforms) to share ideas and multimodal creations with others.

Standard:

GC2. Use digital tools to connect with a global network of learners and engage with issues that impact local and global communities.

Learning Priority:

A. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

Indicator(s) for grades K-2:

1. With guidance and support, use interactive digital tools (e.g., interactive maps/globes, teacher-guided AI question tools, translation tools) to explore school, community, and global topics such as weather, animals, or traditions from multiple perspectives.

Learning Priority:

B. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

Indicator(s) for grades K-2:

1. With guidance and support, use digital tools (e.g., collaborative digital whiteboards, simple design tools, AI-powered idea generators) to brainstorm and share ideas that help improve their classroom, school, community, and beyond.

Kentucky Academic Standards (KAS) for Technology Intermediate (Grades 3-5)

Intermediate (3-5) KAS for Technology

Overview for Intermediate (3-5):

The technology standards at the intermediate level continue to lay the foundation of necessary knowledge, skills, and competencies that equip students for a successful future. This goal requires the understanding of content that helps: empower learners, create responsible digital citizens, facilitate knowledge construction, design and innovate for learning, think computationally, communicate creatively, and collaborate with a global mindset.

Application of the technology standards at the intermediate level should focus on active learning and integrating the identified skills into other disciplines. These standards provide a clear progression of skills, and students develop a broad conceptual understanding of technology. All content teachers should provide opportunities for students to apply the skills and knowledge identified.

Concept: **Empowered Learner (EL)**

Competency: Students use technology to take an active role in their learning.

Standard:

EL1. Leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

Learning Priority:

A. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

Indicator(s) for grades 3-5:

1. Set, monitor, and reflect on personal learning goals, selecting and evaluating digital tools (including AI-supported tools) that best support progress toward these goals.
2. Use digital tools including AI-supported tools to reflect on learning progress, analyze feedback and performance data, and revise strategies to improve future learning.

Learning Priority:

B. Build networks and customize their learning environments in ways that support the learning process.

Indicator(s) for grades 3-5:

1. Build and participate in safe, purposeful digital learning networks to connect with experts, peers, and resources that support personal interests and academic growth.

Learning Priority:

C. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

Indicator(s) for grades 3-5:

1. Seek and interpret feedback from teachers, peers, and digital tools to inform and improve learning across disciplines.
2. Apply feedback to revise and enhance digital and non-digital products, demonstrating growth through iterative improvement.

Learning Priority:

D. Understanding the fundamental concepts of how to use technology (technology operations).

Indicator(s) for grades 3-5:

1. Select and apply digital tools, including those that are AI-supported, strategically across contexts to collect, create, and communicate information effectively.
2. Apply understanding of technology concepts and operations to adapt and problem-solve in new or changing digital environments.
3. Use knowledge of technology systems and problem-solving strategies to independently troubleshoot and resolve basic technical challenges.

Standard:

EL2. Apply the fundamental concepts of technology operations and demonstrate the ability to choose, use, and/or troubleshoot current technologies.

Learning Priority:

A. Demonstrate learning with the use of technology.

Indicator(s) for grades 3-5:

1. Identify age-appropriate digital tools to produce and publish information for an identified target audience.
2. Demonstrate efficient ability to communicate a message with digital input strategies (ex.: typing/keyboarding, voice to text, video or audio).

Learning Priority:

B. Apply functions and concepts of technology operations; demonstrate the ability to choose, use and troubleshoot current technologies.

Indicator(s) for grades 3-5:

1. Choose technology appropriate to their task and purpose.

Learning Priority:

C. Transfer knowledge to emerging technology.

Indicator(s) for grades 3-5:

1. Apply and adapt knowledge of existing technology to the augmentative use of new technologies.

Concept: **Digital Citizen (DC)**

Competency: Students manage their digital identity in a safe, positive, and proactive way.

Standard:

DC1. Recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world; act and model in ways that are safe, legal and ethical.

Learning Priority:

A. Cultivate and manage your digital identity and reputation, and be aware of the permanence of your actions in the digital world.

Indicator(s) for grades 3-5:

1. Model positive behaviors in online communication at school and apply those behaviors to online activities outside of school.
2. Show awareness and understand they are creating a digital footprint, and can identify positive and negative online activity.

Learning Priority:

B. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

Indicator(s) for grades 3-5:

1. Collaborate online with peers and educators in a positive manner, and begin to recognize online behaviors can have positive or negative consequences.
2. Understand that decisions and behaviors online can affect others in both negative and positive and hurtful and helpful ways.

Learning Priority:

C. Manage personal data to maintain digital privacy and security and are aware of data-collection technology used to track navigation online.

Indicator(s) for grades 3-5:

1. Create and know usernames and passwords, and understand why these and other personal information are not shared with others online and offline.
2. Search websites understanding that some sites are not safe without adult permission.

Standard:

DC2. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Learning Priority:

A. Use information, media, and digital resources in a responsible manner.

Indicator(s) for grades 3-5:

1. Demonstrate acceptable use of the internet and identify acceptable use of social media and other digital media.

Learning Priority:

B. Respect intellectual property rights.

Indicator(s) for grades 3-5:

1. Value other's intellectual property by showing appreciation and respect (including those that use artificial intelligence).
2. Give positive and constructive feedback on others' intellectual property with respect.

Learning Priority:

C. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Indicator(s) for grades 3-5:

1. Use others' creations (intellectual property) with permission (public domain, creative commons, or copyright owner's permission).
2. Create their own intellectual property in digital projects.

Concept: Knowledge Constructor (KC)

Competency: Students use various digital tools to find information and make meaning.

Standard:

KC1. Students critically curate a variety of resources using digital tools to construct knowledge.

Learning Priority:

A. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

Indicator(s) for grades 3-5:

1. Filter searches to gather specific information on a subject or research topic (ex.: searching "food sources for Beluga whales" instead of searching "whales" or "Beluga whales").
2. Use a variety of digital reference resources (ex.: digital encyclopedia, digital atlas/maps) to locate information related to a research topic.

Learning Priority:

B. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

Indicator(s) for grades 3-5:

1. Identify criteria to analyze information presented in a digital resource to determine its accuracy, perspective, credibility, and relevance.
2. Explore different media types (ex.: infographics, videos, graphs, text) and how they might influence an audience.
3. Compare information presented across different domain extensions (ex.: .com, .net, .gov, .edu) to help evaluate accuracy, perspective, credibility, and relevance of information.

Learning Priority:

C. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

Indicator(s) for grades 3-5:

1. Collect information (ex.: images, diagrams, maps, graphs, infographics, videos, animations) using digital tools from resources to clarify and add to knowledge of a topic.
2. Organize gathered artifacts into themed collections with subcategories (ex.: Famous African-Americans: Scientists, Politicians, Athletes; Favorite Cartoon Characters: Disney, Nickelodeon, Looney Tunes).

Standard:

KC2. Produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.

Learning Priority:

A. Produce creative artifacts.

Indicator(s) for grades 3-5:

1. Use digital tools to create artifacts that connect similar information found in various digital resources.

Learning Priority:

B. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Indicator(s) for grades 3-5:

1. Use a variety of digital resources (ex.: website, video clip, photos) to explore and collaborate with others on real-world issues.

Concept: **Innovative Designer (ID)**

Competency: Students use a variety of technologies to design and create.

Standard:

ID1. Use a variety of technologies to identify and solve authentic real-world problems.

Learning Priority:

A. Find authentic real-world problems in local and global contexts.

Indicator(s) for grades 3-5:

1. Use technology to identify real-world problems in their community then analyze the conditions that make it a problem.

Learning Priority:

B. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

Indicator(s) for grades 3-5:

1. Demonstrate perseverance when working with authentic, open-ended problems by analyzing the failure, choosing a new strategy, and trying again to improve or solve the problem.

Standard:

ID2. Use a variety of technologies within a design process to create new, useful and imaginative solutions.

Learning Priority:

A. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

Indicator(s) for grades 3-5:

1. Explore and practice how a deliberate design process (ex.: design thinking) works to generate ideas, consider solutions, test theories, plan to solve a problem, or create innovative products to share with others.

Learning Priority:

B. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

Indicator(s) for grades 3-5:

1. Use a variety of digital tools to plan and manage a design process, with consideration to design constraints and risks.

Learning Priority:

C. Develop, test and refine prototypes as part of a cyclical design process.

Indicator(s) for grades 3-5:

1. Use digital and non-digital tools to complete a cyclical design process by first considering the needs of the end-user to define the problem, developing and testing a prototype, and then seeking and applying feedback to refine the solution.

Concept: Computational Thinker (CT)

Competency: Students understand sequences and use them to develop solutions to problems.

Standard:

CT1. Develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Learning Priority:

A. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

Indicator(s) for grades 3-5:

1. Plan and implement a design process in which they explore solutions to a problem and use digital tools, including optional AI-supported tools, to analyze data, create models, and represent collected data (ex.: spreadsheets, graphs, charts, tables, presentations, infographics) in a way that can be shared with others, with guidance.

Learning Priority:

B. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

Indicator(s) for grades 3-5:

1. Select and utilize an age-appropriate digital tool to represent data (ex.: spreadsheets, digital graphs/charts), with guidance and support from adults.
2. Use data to analyze findings and communicate conclusions, incorporating digital tools, optionally including AI-assisted tools, when appropriate to support synthesis and visualization.

Learning Priority:

- C. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Indicator(s) for grades 3-5:

1. Break a problem into smaller parts, identify patterns and key information, and use age-appropriate digital tools to brainstorm a problem solving plan (ex.: online whiteboard, online mindmapping tools, digital outline), optionally utilizing AI-powered tools to assist in pattern identification or decomposition either collaboratively or independently.

Learning Priority:

- D. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Indicator(s) for grades 3-5:

1. Complete a coding task with coded actions (ex.: html, block-based coding, python) either collaboratively or independently, optionally utilizing AI-powered tools for testing or debugging the solution.

Standard:

CT2. Apply strategies for understanding and solving problems by using technological methods to develop and test solutions.

Learning Priority:

- A. Use resources to collect, analyze, and represent data.

Indicator(s) for grades 3-5:

1. Use digital tools to ask questions and digitally collect data.

Learning Priority:

- B. Deconstruct components to understand systems and facilitate problem-solving.

Indicator(s) for grades 3-5:

1. Use digital tools to find patterns in order to solve complex problems.

Learning Priority:

- C. Create and test automated solutions.

Indicator(s) for grades 3-5:

1. Use digital tools to identify and create algorithms.

Concept: **Creative Communicator (CC)**

Competency: *Students communicate clearly and express themselves with a variety of digital tools.*

Standard:

CC1. Communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals, audience and task.

Learning Priority:

A. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Indicator(s) for grades 3-5:

1. Evaluate and utilize the features of a variety of digital tools (ex.: including, but not limited to: adding video/audio, digital collaboration tools, tools affecting the aesthetics of the piece, as well as methods for sharing/publishing) for producing new creations or communications with teacher support, following appropriate digital etiquette.

Learning Priority:

B. Create original works or responsibly repurpose and/or remix digital resources into new creations.

Indicator(s) for grades 3-5:

1. Learn and apply strategies to responsibly remix creative work, respecting digital citizenship (copyright), both collaboratively and independently.

Learning Priority:

C. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

Indicator(s) for grades 3-5:

1. Create digital artifacts (ex.: presentations, data collection, models, audio/video, websites, and digital art) to display knowledge and communicate ideas clearly to a variety of audiences, both collaboratively and independently.

Standard:

CC2. Publish and present content customized for their audience(s), purpose, and task.

Learning Priority:

A. Publish and present content that customizes the message and medium for their intended audiences.

Indicator(s) for grades 3-5:

1. Utilize digital tools to create, share, communicate, and publish work effectively (ex.: video/ audio creation, social media, spreadsheets, blogs, presentation platforms, word processing, and digital art platforms).
2. Identify the intended audience and select appropriate platform (medium) when creating digital pieces, presenting, and collaborating to communicate ideas to the audience.

Concept: **Global Collaborator (GC)**

Competency: Students use digital tools to connect with learners inside and outside of their classroom.

Standard:

GC1. Use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Learning Priority:

A. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

Indicator(s) for grades 3-5:

1. Use digital tools and resources giving students voice and choice (ex.: presentations, videos, and various digital media platforms) to connect and collaborate with authentic audiences from a variety of backgrounds and cultures to enrich learning experiences.

Learning Priority:

B. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Indicator(s) for grades 3-5:

1. Use digital tools to collaborate with team members in a digital workspace (ex.: sharing and respecting digital work within a team workspace, assuming team roles and working together to create video/ green screen production, stop-motion animation, and various other forms of digital creations). Use digital tools and take on a variety of roles to contribute to team projects with guidance and support.

Learning Priority:

C. Contribute to the exchange of ideas within and beyond the learning community.

Indicator(s) for grades 3-5:

1. Use a variety of digital resources to collaborate with mutual respect (ex.: video conferencing, commenting tools, slide decks, and documents).

Standard:

GC2. Use digital tools to connect with a global network of learners and engage with issues that impact local and global communities.

Learning Priority:

A. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

Indicator(s) for grades 3-5:

1. Use digital tools to collaborate with peers, experts, and community members to examine problems from multiple viewpoints (ex.: video/voice conferencing).

Learning Priority:

B. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

Indicator(s) for grades 3-5:

1. Collaborate digitally with others to understand multiple perspectives while exploring both local and global issues to solve problems with guidance and support (ex.: project-based learning and community problem solving).

Kentucky Academic Standards (KAS) for Technology Middle School (Grades 6-8)

Middle School (6-8) KAS for Technology

Overview for Middle School (6-8):

The technology standards at the middle school level expand upon the framework of necessary knowledge, skills, and competencies that equip students for a successful future. This goal requires the understanding of content that helps: empower learners, create responsible digital citizens, facilitate knowledge construction, design and innovate for learning, think computationally, communicate creatively and collaborate with a global mindset.

Application of the technology standards at the middle school level should focus on active learning and integrating the identified skills into other disciplines. These standards provide a clear progression of skills, and students develop a broad conceptual understanding of technology. All content teachers should provide opportunities for students to apply the skills and knowledge identified.

Concept: **Empowered Learner (EL)**

Competency: Students use technology to take an active role in their learning.

Standard:

EL1. Leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

Learning Priority:

A. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

Indicator(s) for grades 6-8:

1. Set personal learning goals and select and manage digital tools that will best support individualized learning (ex.: use collaborative documents to revise and reflect on the writing process).
2. Reflect on successes, areas of improvement, and make necessary revisions to improve the learning over time (ex.: using digital writing portfolio and reflection log/journal).

Learning Priority:

B. Build networks and customize their learning environments in ways that support the learning process.

Indicator(s) for grades 6-8:

1. Collaborate with a network of self-selected global partners (ex.: students, teachers, professionals, and the global community) to customize and support the individual learning process.

Learning Priority:

C. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

Indicator(s) for grades 6-8:

1. Seek feedback from an authentic audience and from features embedded in digital tools (ex.: share documents with teachers and peers asking for feedback on writing).
2. Use feedback, including AI-generated feedback, to analyze data and adjust learning based on the input.

Learning Priority:

D. Understanding the fundamental concepts of how to use technology (technology operations).

Indicator(s) for grades 6-8:

1. Understand the fundamental use of technology tools to consider how to use technology to promote creativity, communication, collaboration, and critical thinking.
2. Choose and troubleshoot technology tools, including the use of AI when appropriate, to suit the purpose.
3. Transfer the knowledge of existing technology to explore new technologies, including AI.

Standard:

EL2. Apply the fundamental concepts of technology operations and demonstrate the ability to choose, use, and/or troubleshoot current technologies.

Learning Priority:

A. Demonstrate learning with the use of technology.

Indicator(s) for grades 6-8:

1. Evaluate the effectiveness of different digital tools to communicate information with multiple audiences.
2. Demonstrate fluency of no fewer than two input strategies and/or programs to communicate information.

Learning Priority:

B. Apply functions and concepts of technology operations; demonstrate the ability to choose, use and troubleshoot current technologies.

Indicator(s) for grades 6-8:

1. Choose functions and operations appropriate to their task and purpose.

Learning Priority:

C. Transfer knowledge to emerging technology.

Indicator(s) for grades 6-8:

1. Apply and adapt knowledge of existing technology to the modification-based use of new technologies, including AI.

Concept: **Digital Citizen (DC)**

Competency: Students manage their digital identity in a safe, positive, and proactive way.

Standard:

DC1. Recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world; act and model in ways that are safe, legal and ethical.

Learning Priority:

A. Cultivate and manage your digital identity and reputation, and be aware of the permanence of your actions in the digital world.

Indicator(s) for grades 6-8:

1. Recognize behaviors, habits, and actions, including interactions with AI tools and the input provided to them, that create, maintain, and influence both positive and negative digital identities, reputations, and footprints in the digital world.
2. Build awareness of the public and permanent nature of online actions and the possible present and future consequences in personal, academic, and professional lives.

Learning Priority:

B. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

Indicator(s) for grades 6-8:

1. Recognize and demonstrate responsible behaviors that are safe, ethical, and legal, including when interacting or utilizing AI tools, across a variety of devices, platforms, and settings while considering possible consequences for themselves and/or others.
2. Understand how to be respectful to others online while interacting, communicating, and collaborating and know strategies in order to avoid and/or combat cyberbullying.

Learning Priority:

C. Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

Indicator(s) for grades 6-8:

1. Distinguish between information that is public and personal/private and develop and utilize strategies to secure and protect personal/private data and user accounts. Avoid the input of sensitive or personal information into AI systems that may use or share the information with unauthorized parties/individuals.
2. Understand that data-collection technology is used to track online navigation and recognize and avoid online scams and phishing, as well as evaluating whether AI tools are utilizing data as payment.

Standard:

DC2. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Learning Priority:

A. Use information, media and digital resources in a responsible manner.

Indicator(s) for grades 6-8:

1. Demonstrate acceptable use of the internet, information, media and digital resources, including social media and generative AI tools, according to user agreements, policies, and laws.

Learning Priority:

- B. Respect intellectual property rights.

Indicator(s) for grades 6-8:

1. Recognize and respect different intellectual property classifications, including those that are copyrighted, subject to fair use, public domain properties, and/or have creative commons licenses, understanding that AI systems use data and content for training and generation of content, which raises complex intellectual property concerns.

Learning Priority:

- C. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Indicator(s) for grades 6-8:

1. Recognize and seek permission to use the intellectual property of others appropriately.
2. Use and share the intellectual property of others with proper citation and attribution elements including accurately citing and attributing the use of AI tools as a source or collaborator.

Concept: **Knowledge Constructor (KC)**

Competency: Students use various digital tools to find information and make meaning.

Standard:

KC1. Students critically curate a variety of resources using digital tools to construct knowledge.

Learning Priority:

- A. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

Indicator(s) for grades 6-8:

1. Demonstrate effective digital search techniques (ex.: filtering searches using advanced settings/tools, keyword/term choices, or phases) to locate information or other resources to gather specific information on a subject or research topic.
2. Practice research strategies that outline a process for locating information digitally (ex.: tools and effective search techniques).

Learning Priority:

- B. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

Indicator(s) for grades 6-8:

1. Select a method, tool, or strategy to evaluate source(s) for credibility, relevance, authority, accuracy, and perspective.
2. Analyze digital information, media, data, and materials for credibility, relevance, authority, accuracy, and perspective.

Learning Priority:

C. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

Indicator(s) for grades 6-8:

1. Combine various tools (ex.: spreadsheet, database, saved files) and methods (ex.: concept mapping, flow charting and outlining software) to classify information, observations, or experiments digitally.
2. Compile information from digital resources (ex.: search engines, online periodical databases, virtual library/online catalogs, interactive video conferencing).

Standard:

KC2. Produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.

Learning Priority:

A. Produce creative artifacts.

Indicator(s) for grades 6-8:

1. Demonstrate the ability to create new ideas/concepts or products with digital tools.

Learning Priority:

B. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Indicator(s) for grades 6-8:

1. Build knowledge by generating and testing solutions for exploring real world issues using a variety of technology (ex.: data collection tools, models, videos, podcast, simulations, forms).

Concept: Innovative Designer (ID)

Competency: Students use a variety of technologies to design and create.

Standard:

ID1. Use a variety of technologies to identify and solve authentic real-world problems.

Learning Priority:

A. Find authentic real-world problems in local and global contexts.

Indicator(s) for grades 6-8:

1. Collaborate with others in and out of the classroom using digital tools, including AI-supported applications, to research and analyze data to identify authentic real-world problems and propose a solution that affects the local and global community.

Learning Priority:

B. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

Indicator(s) for grades 6-8:

1. Demonstrate the ability to investigate and make sense of complex, open-ended problems by leveraging AI-supported tools to generate, evaluate, and refine potential solution pathways, thereby strengthening their perseverance in solving them.

Standard:

ID2. Use a variety of technologies within a design process to create new, useful and imaginative solutions.

Learning Priority:

A. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

Indicator(s) for grades 6-8:

1. Explore and choose appropriate processes and use a deliberate design process, including the use of AI-supported tools for advanced ideation, rapid prototyping/simulation, and iterative refinement, when generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.

Learning Priority:

B. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

Indicator(s) for grades 6-8:

1. Investigate and use meaningful digital tools, including AI-driven planning and simulation applications, to model, manage, and optimize a design process that accounts for complex design constraints and calculated risks.

Learning Priority:

C. Develop, test and refine prototypes as part of a cyclical design process.

Indicator(s) for grades 6-8:

1. Create, develop, and test prototypes using AI-supported tools for rapid data analysis and scenario modeling; understand that AI-driven feedback loops accelerate learning, and appreciate failures as essential opportunities for growth and improvement.

Concept: Computational Thinker (CT)

Competency: Students understand sequences and use them to develop solutions to problems.

Standard:

CT1. Develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Learning Priority:

A. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

Indicator(s) for grades 6-8:

1. Ask questions, gather data, create/observe abstract models, and think of different processes while finding solutions to real-world problems.

Learning Priority:

B. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

Indicator(s) for grades 6-8:

1. Solve problems and make decisions by collecting data or identifying relevant data sets, using digital tools such as surveys to collect information and data spreadsheet applications to analyze and represent their findings through various ways, potentially employing AI-powered tools when appropriate.

Learning Priority:

C. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Indicator(s) for grades 6-8:

1. Break problems into parts, extract key information, and develop descriptive models to understand complex systems or lead problem solving tasks.

Learning Priority:

D. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Indicator(s) for grades 6-8:

1. Use digital tools to collect data, conduct analysis, and discuss findings or possible solutions.

Standard:

CT2. Apply strategies for understanding and solving problems by using technological methods to develop and test solutions.

Learning Priority:

A. Use resources to collect, analyze, and represent data.

Indicator(s) for grades 6-8:

1. Use digital tools to ask questions to an audience and digitally collect data, and analyze the findings.

Learning Priority:

B. Deconstruct components to understand systems and facilitate problem-solving.

Indicator(s) for grades 6-8:

1. Use technology-assisted methods to break problems down into smaller, more manageable parts by finding patterns or other methods of decomposition.

Learning Priority:

C. Create and test automated solutions.

Indicator(s) for grades 6-8:

1. Use algorithm design to develop step-by-step instructions for solving a problem, and explore how automated or AI-supported tools might be employed to carry out or enhance these instructions.

Concept: **Creative Communicator (CC)**

Competency: Students communicate clearly and express themselves with a variety of digital tools.

Standard:

CC1. Communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals, audience and task.

Learning Priority:

A. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Indicator(s) for grades 6-8:

1. Choose from available platforms and tools to meet the designated objectives of their creation or communication.

Learning Priority:

B. Create original works or responsibly repurpose and/or remix digital resources into new creations.

Indicator(s) for grades 6-8:

1. Create original works or remix digital resources, optionally using AI-assisted tools, while demonstrating responsible digital citizenship, including intellectual property rights, copyright, and ethical AI use and attribution.

Learning Priority:

C. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

Indicator(s) for grades 6-8:

1. Create or incorporate digital content to communicate complex ideas clearly and effectively to a variety of audiences.

Standard:

CC2. Publish and present content customized for their audience(s), purpose, and task.

Learning Priority:

A. Publish and present content that customizes the message and medium for their intended audiences.

Indicator(s) for grades 6-8:

1. Publish or present original content to a predetermined audience that appropriately customizes the message and medium.

Concept: **Global Collaborator (GC)**

Competency: Students use digital tools to connect with learners inside and outside of their classroom.

Standard:

GC1. Use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Learning Priority:

A. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

Indicator(s) for grades 6-8:

1. Use digital and emerging technologies, which could include AI tools, to connect and collaborate with authentic audiences from diverse backgrounds and cultures to broaden mutual understanding and learning, while demonstrating ethical and responsible digital citizenship.

Learning Priority:

B. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Indicator(s) for grades 6-8:

1. Select and use digital and emerging technologies, which could include AI tools, in diverse collaborative teams, locally or globally, assuming roles and responsibilities, valuing perspectives other than your own, and contributing ethically and effectively toward a shared goal.

Learning Priority:

C. Contribute to the exchange of ideas within and beyond the learning community.

Indicator(s) for grades 6-8:

1. Select and use digital and emerging technologies, which could include AI tools, to collaborate with diverse teams locally and globally, assuming roles and responsibilities, valuing perspectives other than their own, and contributing ethically and effectively to the exchange of ideas within and beyond the learning community.

Standard:

GC2. Use digital tools to connect with a global network of learners and engage with issues that impact local and global communities.

Learning Priority:

A. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

Indicator(s) for grades 6-8:

1. Use collaborative and emerging technologies, which may include AI tools, to work with peers, experts, and community members locally and globally to examine issues and problems from multiple viewpoints and to contribute ethically to shared understanding.

Learning Priority:

B. Explore local and global issues and use collaborative technologies to work with others to

investigate solutions.

Indicator(s) for grades 6-8:

1. Use collaborative and emerging technologies, which may include AI tools, to work with others to explore local and global issues, investigate multiple perspectives, and develop potential solutions while participating ethically in digital collaboration.

Kentucky Academic Standards (KAS) for Technology High School (Grades 9-12)

High School (9-12) KAS for Technology

Overview for High School (9-12):

The technology standards at the high school level serve as a culmination of the necessary knowledge, skills, and competencies that equip students for a successful future. This goal requires the understanding of content that helps: empower learners, create responsible digital citizens, facilitate knowledge construction, design and innovate for learning, think computationally, communicate creatively and collaborate with a global mindset.

Application of the technology standards at the high school level should focus on active learning and integrating the identified skills into other disciplines. These standards provide a clear progression of skills, and students develop a broad conceptual understanding of technology. All content teachers should provide opportunities for students to apply the skills and knowledge identified.

Concept: **Empowered Learner (EL)**

Competency: Students use technology to take an active role in their learning.

Standard:

EL1. Leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

Learning Priority:

A. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

Indicator(s) for grades 9-12:

1. Set and articulate personal learning goals and develop strategies leveraging digital tools (including AI-supported tools for setting and achieving goals) to achieve those goals.
2. Reflect on successes, areas of improvement, and make necessary revisions to improve the learning over time and adjust for future learning.

Learning Priority:

B. Build networks and customize their learning environments in ways that support the learning process.

Indicator(s) for grades 9-12:

1. Initiate collaboration with a network of global partners (ex.: students, teachers, professionals, AI partner tools, or the global community) to support and enhance the learning process.

Learning Priority:

C. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

Indicator(s) for grades 9-12:

1. Seek feedback independently through the use of technology (ex.: use video chat or AI-supported tools to share and reflect upon a learning process or product.)
2. Use feedback to effectively demonstrate learning in a variety of ways.

Learning Priority:

D. Understanding the fundamental concepts of how to use technology (technology operations).

Indicator(s) for grades 9-12:

1. Understand the fundamental use of technology tools to embrace creativity, communication, collaboration, and critical thinking.
2. Choose and effectively troubleshoot technology tools to suit purpose.
3. Transfer and extend the knowledge of existing technology to explore new technologies.

Standard:

EL2. Apply the fundamental concepts of technology operations and demonstrate the ability to choose, use, and/or troubleshoot current technologies.

Learning Priority:

A. Demonstrate learning with the use of technology.

Indicator(s) for grades 9-12:

1. Select appropriate digital resources (including those that are AI-supported) to develop, implement and/or evaluate communication with an authentic audience.

Learning Priority:

B. Apply functions and concepts of technology operations; demonstrate the ability to choose, use and troubleshoot current technologies.

Indicator(s) for grades 9-12:

1. Choose efficient functions and concepts appropriate to their task and purpose.
2. Apply an understanding of devices to troubleshoot current technology and adjust for future events.

Learning Priority:

C. Transfer knowledge to emerging technology.

Indicator(s) for grades 9-12:

1. Apply and adapt knowledge of existing technology to the innovative redefinition-based use of new technologies.

Concept: Digital Citizen (DC)

Competency: Students manage their digital identity in a safe, positive, and proactive way.

Standard:

DC1. Recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world; act and model in ways that are safe, legal and ethical.

Learning Priority:

A. Cultivate and manage your digital identity and reputation, and be aware of the permanence of your actions in the digital world.

Indicator(s) for grades 9-12:

1. Actively develop and maintain a positive, authentic digital identity and presence across digital platforms, including the ethical and transparent use of AI.
2. Comprehend the permanence and visibility of all digital actions, data inputs, and outputs created through AI tools, recognizing their potential consequences for future careers and relationships.

Learning Priority:

B. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

Indicator(s) for grades 9-12:

1. Make responsible, ethical, and thoughtful decisions when interacting and collaborating online, including with AI-supported tools, by carefully considering risks, benefits, safety, and the impact of your actions on yourself and others.
2. Understand the mental and legal ramifications of cyber bullying and harassment; employ strategies to avoid and/or combat cyberbullying and harassment.

Learning Priority:

C. Manage personal data to maintain digital privacy and/or security, and be aware of data-collection technology used to track your navigation online.

Indicator(s) for grades 9-12:

1. Think critically about the information you share online or input into third-party AI systems to protect sensitive personal data, ensure security, and comply with privacy laws.
2. Comprehend the presence and ramifications of online data collection, including data gathered by AI systems, and understand how it is used to track online behavior and influence consumer decisions.

Standard:

DC2. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Learning Priority:

A. Use information, media and digital resources in a responsible manner.

Indicator(s) for grades 9-12:

1. Understand the need for, and comply with, acceptable user policies and agreements.
2. Make responsible decisions in the use of information, media, social media and other digital resources in accordance with acceptable user policies and agreements.

Learning Priority:

B. Respect intellectual property rights.

Indicator(s) for grades 9-12:

1. Respect the importance of intellectual property by encouraging thought, design, innovation and/or creation.
2. Use, share, and/or interact with intellectual property, including content created or

influenced by AI, in accordance with the rights, permissions, and proper citation as required by the owner.

Learning Priority:

C. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

Indicator(s) for grades 9-12:

1. Apply understanding of 'fair use' and copyright laws when sharing the intellectual property of others, as well as when producing new intellectual property, including content created or influenced by AI tools.
2. Seek permission and properly cite the use of intellectual property created by others, including content generated or influenced by AI tools.

Concept: **Knowledge Constructor (KC)**

Competency: Students use various digital tools to find information and make meaning.

Standard:

KC1. Students critically curate a variety of resources using digital tools to construct knowledge.

Learning Priority:

A. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

Indicator(s) for grades 9-12:

1. Utilize a variety of digital resources effectively and safely by applying a variety of search strategies (ex.: filtering searches, advanced settings/tools, file types, database/source selection).
2. Plan and use multiple research strategies to locate information from digital resources for a variety of purposes.

Learning Priority:

B. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

Indicator(s) for grades 9-12:

1. Evaluate digital sources for accuracy of information; compare and consider the perspectives of the sources; determine usefulness, and assess the credibility of the sources.

Learning Priority:

C. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

Indicator(s) for grades 9-12:

1. Use multiple digital tools to select, organize, and communicate information from digital sources including AI-supported tools.
2. Utilize digital tools to communicate information in real world applications, to address or solve a problem, or to make meaningful connections.

Standard:

KC2. Produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.

Learning Priority:

A. Produce creative artifacts.

Indicator(s) for grades 9-12:

1. Choose and use digital tools including AI-supported tools to create products that exhibit choice and creativity.
2. Create products independently and collaboratively that incorporate creative elements, and communicate to multiple audiences.

Learning Priority:

B. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Indicator(s) for grades 9-12:

1. Select and use digital tools including AI-supported tools to create products that demonstrate meaningful connections or conclusions.
2. Create products independently and collaboratively that explore real-world issues and problems and engage in discussion around current issues.

Concept: **Innovative Designer (ID)**

Competency: Students use a variety of technologies to design and create.

Standard:

ID1. Use a variety of technologies to identify and solve authentic real-world problems.

Learning Priority:

A. Find authentic real-world problems in local and global contexts.

Indicator(s) for grades 9-12:

1. Use a variety of task-appropriate digital and/or AI-supported tools to research and analyze data to identify authentic real-world problems and propose a solution that affects the local and global community.

Learning Priority:

B. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

Indicator(s) for grades 9-12:

1. Use a variety of technologies, including task-appropriate AI-supported tools, to strengthen independent perseverance when working to solve problems that are ambiguous and/or open-ended.

Standard:

ID2. Use a variety of technologies within a design process to create new, useful and imaginative solutions.

Learning Priority:

A. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

Indicator(s) for grades 9-12:

1. Self-select and use a variety of task-appropriate AI and/or digital tools to design and implement a deliberate process for generating ideas, researching, and testing ideas for solving problems or creating original products that demonstrate understanding.

Learning Priority:

B. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

Indicator(s) for grades 9-12:

1. Self-select and use task-appropriate digital and/or AI-supported tools to manage work and create original products that take into consideration project constraints, obstacles, and outcomes.

Learning Priority:

C. Develop, test and refine prototypes as part of a cyclical design process.

Indicator(s) for grades 9-12:

1. Select and use a variety of task-specific digital and/or AI-supported tools to aid in working collaboratively or independently to create, test and refine prototypes, drafts and concepts based on self-initiated feedback and reflection in design cycles.

Concept: Computational Thinker (CT)

Competency: Students understand sequences and use them to develop solutions to problems.

Standard:

CT1. Develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Learning Priority:

A. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

Indicator(s) for grades 9-12:

1. Precisely define a problem and develop a solution using digital tools, including collecting data, conducting data analysis, creating abstract models, and employing algorithmic thinking.

Learning Priority:

B. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

Indicator(s) for grades 9-12:

1. Use digital tool(s) to effectively collect, organize, and manipulate data to test, verify, and present possible solutions to a problem.

Learning Priority:

C. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Indicator(s) for grades 9-12:

1. Evaluate the steps of a problem-solving process and deconstruct the related data to develop an effective solution to a real-world problem.

Learning Priority:

D. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Indicator(s) for grades 9-12:

1. Utilize automation and logic to develop and test automated solutions, and evaluate digital tools such as AI that generate automated responses.

Standard:

CT2. Apply strategies for understanding and solving problems by using technological methods to develop and test solutions.

Learning Priority:

A. Use resources to collect, analyze, and represent data.

Indicator(s) for grades 9-12:

1. Use digital tools to collect relevant data, conduct analysis, and prepare data for presentation to facilitate problem-solving and decision-making.

Learning Priority:

B. Deconstruct components to understand systems and facilitate problem-solving.

Indicator(s) for grades 9-12:

1. Use technology-assisted methods to more easily identify key information by breaking down data to facilitate problem-solving.

Learning Priority:

C. Create and test automated solutions.

Indicator(s) for grades 9-12:

1. Use digital tools and algorithmic thinking to develop automated systems to test solutions.

Concept: Creative Communicator (CC)

Competency: Students communicate clearly and express themselves with a variety of digital tools.

Standard:

CC1. Communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals, audience and task.

Learning Priority:

A. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Indicator(s) for grades 9-12:

1. Evaluate and determine appropriate platforms and digital tools to create or share digital content with an authentic audience for a desired purpose.

Learning Priority:

B. Create original works or responsibly repurpose and/or remix digital resources into new creations.

Indicator(s) for grades 9-12:

1. Create original works or remix digital resources, optionally using AI-assisted tools, for an authentic audience and desired purpose that reflects a responsible repurposing of digital media or resources.

Learning Priority:

C. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

Indicator(s) for grades 9-12:

1. Analyze and communicate complex ideas, data, or solutions to an authentic audience for a desired purpose using digital tools.

Standard:

CC2. Publish and present content customized for their audience(s), purpose, and task.

Learning Priority:

A. Publish and present content that customizes the message and medium for their intended audiences.

Indicator(s) for grades 9-12:

1. Present an idea or creative work that expresses ideas or content that is published for a range of authentic audiences outside of the classroom.

Concept: Global Collaborator (GC)

Competency: Students use digital tools to connect with learners inside and outside of their classroom.

Standard:

GC1. Use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Learning Priority:

A. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

Indicator(s) for grades 9-12:

1. Evaluate and use digital collaboration tools to connect with others from a variety of local and global backgrounds/cultures in order to exchange ideas, develop an understanding of diverse perspectives, display culturally-minded engagement, and encourage learning.

Learning Priority:

B. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Indicator(s) for grades 9-12:

1. Use digital tools, including AI-powered learning applications, to contribute to a project team, determine their role and responsibility within the group and work toward a common goal or a solution to a problem.

Learning Priority:

C. Contribute to the exchange of ideas within and beyond the learning community.

Indicator(s) for grades 9-12:

1. Select digital tools, including AI-powered learning applications, that show an understanding of context and audience to share and exchange interests, ideas and experiences with others from within and beyond the local learning community.

Standard:

GC2. Use digital tools to connect with a global network of learners and engage with issues that impact local and global communities.

Learning Priority:

A. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

Indicator(s) for grades 9-12:

1. Use collaborative technologies to work with others (peers, experts, community members) to gain knowledge about issues through various perspectives and opinions and to find solutions for social change.

Learning Priority:

B. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

Indicator(s) for grades 9-12:

1. Explore and critically analyze local and global issues and use collaborative digital tools to investigate, develop a plan and recommend solutions.

References

International Society for Technology in Education. (2016). ISTE standards for students.
Retrieved from <https://www.iste.org/standards/for-students>

Wisconsin Department of Public Instruction. (2017). Wisconsin Standards for Information and Technology Literacy. Retrieved from <https://dpi.wi.gov/imt/it-literacy-standards>

APPENDIX

Appendix A: Connection to Graduation

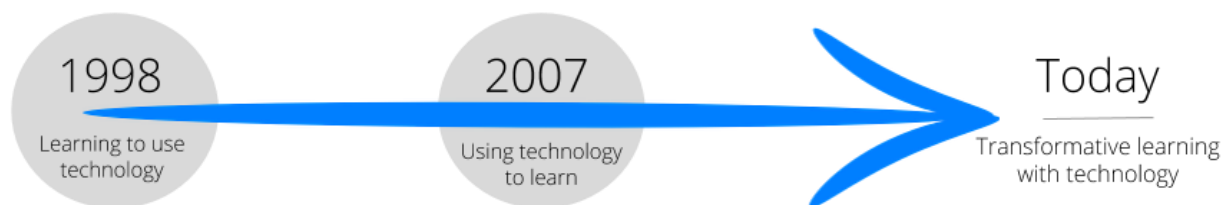
Technology Connected Grad-Requirement

(704 KAR 3:305)

On April 5, 2019, Kentucky's minimum high school graduation requirements became law, [704 KAR 3:305](#). One of the stated requirements is centered on a students' demonstrated performance-based competency in technology prior to graduating.

Key Points:

- The KAS for Technology assists in defining competencies.
- KY Academic Standards for Technology (i.e. Technology Standards) are required for ALL students (via min. Grad requirements), per 704 KAR 3:305. Whereas CS Standards are elective.
- Technology Standards are very broad. Whereas CS Standards are targeted and very specific.
- Modern Technology standards have a completely different focus than early technology standards. New Technology Standards have modernized how we think about these skills and have evolved over time.
- Our Regulation modernization needs to reflect this evolution.



Requirement: *Demonstrated performance-based competency in technology*
(This was progressive at the time it was first initiated - and still is. However, with updated definitions of technology competencies, clearly articulated and modern definitions of ways to “demonstrate” are needed.)

Guidance: Successfully demonstrate performance-based competency *in transformative learning with technology* as defined by the *Kentucky Academic Standards for Technology*. In order to award-successful performance-based competencies, districts (and schools) must establish a policy for student demonstration in performance-based competency in technology that:

- provides procedures for developing successful demonstrations of performance-based technology competency awards
- identifies successful performance descriptors and/or demonstrations of transformative learning with technology
- establishes evaluation and reporting procedures
- addresses content standards as addressed in *Kentucky Academic Standards for Technology*
- identifies the extent (if at all) to which integration of performance-based competency in technology is embedded in other content area competency demonstrations.
- allows students to demonstrate competency and earn credit for learning acquired outside of school or in prior learning experiences
- allows students to pursue work-based learning experiences through internships, externships, apprenticeships, cooperative learning experiences and other learning experiences in the school and community
- allows for students meeting computer science standards to be considered as successful in meeting the demonstration of performance-based competency in technology.

Performance-based competency in technology may be awarded for courses, credits, or programs with the following characteristics:

- technology standards-based student technology leadership program(s), work-based learning experiences including internship, cooperative-learning experience, technology-related CTE pathway completion (including relevant certifications), technology-related apprenticeship, or other supervised learning experiences in the school and the community where learning with technology is demonstrated.
- technology standards-based portfolios, a collection of shared student-created digital products that demonstrate performance-based competency in technology (transformative learning with technology), including 8th grade, senior year or capstone projects
- course work and/or structured content that leads to demonstration and performance of learning competencies in technology
 - technology standards-based online or other technology-mediated courses
 - technology standards-based dual credit or other equivalency courses
 - technology standards-based recognized certifications

Appendix B: Writing and Review Committees

The writing team, composed of current teachers and education professionals, represented both rural and urban settings – including representation from large, medium and small districts from all regions of the state. While these teachers taught a variety of courses and grade levels throughout their careers, the selected committee members were currently teaching or leading areas related to the standards development process. Additionally, the selected writers served in many roles in their schools, technology community and a wide variety of professional organizations. To ensure fidelity to the standards, the writing committee provided feedback at all stages of the development process. The writing and review committee members listed below represented Kentucky’s best as evidenced by their countless qualifications.

Writing Team Members

Amanda Ball, East Bernstadt Independent Schools
Andrew Castle, Johnson County Schools
Ashley Faulkner, Fayette County Schools
Ashley Marker, Bullitt County Schools
Billie Smith, Owen County Schools
Brian Hobbs, Pikeville Independent Schools
Brittany Ramage, Marshall County Schools
Charlene Owens, Johnson County Schools
Christie Turbeville, Bullitt County Schools
Dana Dowdy, Graves County Schools
Danita Cobble, Bullitt County Schools
Don Bacon, Jefferson County Schools
Katelin King, Monroe County Schools
Kelly Fischer, Fayette County Schools
Krista Jackson, Simpson County Schools
LeeAnn Barnett, Owensboro Independent Schools
Lisa Salyer, Johnson County Schools
Mary Heimlich, Harrison County Schools
Mechelle Gattis, Marshall County Schools
Mechelle Morgan, Murray Independent Schools
Melissa Tobin, Caverna Independent Schools
Molly Goodman, McCracken County Schools
Rhonda Thompson, Jackson County Schools
Sandra Adams, Woodford County Schools
Sarah Blackburn, Pikeville Independent Schools
Teresa Nicholas, Pulaski County Schools
Tracy Huelsman, Jefferson County Schools
Valorie Atcher, Spencer County Schools

Review and Feedback Team Members

Ashley Judd, Southeast Southcentral Coop

Carla Kersey, Wilderness Education Program
Erica Snow, Woodford County Schools
Gerry Swan, University of Kentucky
James Ramsey, Danville Independent Schools
Jennifer Devine, Parent and Technology Project Manager
Jennifer Turley, Clark County Schools

Appendix C: Standards Progression Chart



Performance Indicator Progression Chart: Empowered Learner

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Empowered Learner - Students use technology to take an active role in their learning.	1. Skill / Concept Development Leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.	A. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.	EL1.A.1	Set personal learning goals and use digital tools, including AI-powered learning applications for youth, to achieve those goals, with guidance and support (ex.: increase reading fluency by recording and reflecting upon student reading).	Set, monitor, and reflect on personal learning goals, selecting and evaluating digital tools (including AI-supported tools) that best support progress toward these goals.	Set personal learning goals and select and manage digital tools that will best support individualized learning (ex.: use collaborative documents to revise and reflect on the writing process).	Set and articulate personal learning goals and develop strategies leveraging digital tools (including AI-supported tools for setting and achieving goals) to achieve those goals.
			EL1.A.2	Reflect on the learning process to improve learning over time, with guidance and support (ex.: using digital writing portfolio and reflection log/journal). Students will also learn how AI-powered tools provide feedback and adjust to their progress, while reflecting on how these responses help them grow as learners.	Use digital tools including AI-supported tools to reflect on learning progress, analyze feedback and performance data, and revise strategies to improve future learning.	Reflect on successes, areas of improvement, and make necessary revisions to improve the learning over time (ex.: using digital writing portfolio and reflection log/journal).	Reflect on successes, areas of improvement, and make necessary revisions to improve the learning over time and adjust for future learning.
		B. Build networks and customize their learning environments in ways that support the learning process.	EL1.B.1	Participate in teacher-led explorations utilizing digital tools to expand learning spaces beyond the classroom (ex.: expert video channels, video conferencing with professionals, authors' blogs). Students will also explore, with guidance, how some tools use artificial intelligence to personalize learning experiences (ex.: suggesting new books or adjusting difficulty levels) and discuss how these features support their learning.	Build and participate in safe, purposeful digital learning networks to connect with experts, peers, and resources that support personal interests and academic growth.	Collaborate with a network of self-selected global partners (ex.: students, teachers, professionals, and the global community) to customize and support the individual learning process.	Initiate collaboration with a network of global partners (ex.: students, teachers, professionals, AI partner tools, or the global community) to support and enhance the learning process.
			EL1.C.1	Recognize and use technology, including AI-powered tools, to seek feedback as a valued component of the learning process.	Seek and interpret feedback from teachers, peers, and digital tools to inform and improve learning across disciplines.	Seek feedback from an authentic audience and from features embedded in digital tools (ex.: share documents with teachers and peers asking for feedback on writing).	Seek feedback independently through the use of technology (ex.: use video chat or AI-supported tools to share and reflect upon a learning process or product).
		C. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.	EL1.C.2	Use feedback, including AI-generated feedback, to improve the demonstration of learning (ex.: students use interactive software with immediate feedback to guide their performance).	Apply feedback to revise and enhance digital and non-digital products, demonstrating growth through iterative improvement.	Use feedback, including AI-generated feedback, to analyze data and adjust learning based on the input.	Use feedback to effectively demonstrate learning in a variety of ways.
			EL1.D.1	Explore a variety of digital tools and discover how they work based on fundamental concepts of technology operations (ex.: switching between devices, navigating apps, selecting tools within a program). Students discover that some tools use AI to personalize experiences based on the user's actions or inputs.	Select and apply digital tools, including those that are AI-supported, strategically across contexts to collect, create, and communicate information effectively.	Understand the fundamental use of technology tools to consider how to use technology to promote creativity, communication, collaboration, and critical thinking.	Understand the fundamental use of technology tools to embrace creativity, communication, collaboration, and critical thinking.
		D. Understanding the fundamental concepts of how to use technology (technology operations).	EL1.D.2	Transfer conceptual knowledge of technology operations in multiple contexts, with guidance and support (ex.: A student has learned to use a smartphone, and they use what they know about smartphones to use a different device). Students explore AI features and discuss how to use them safely (ex.: voice-to-text, spelling, or grammar checkers).	Apply understanding of technology concepts and operations to adapt and problem-solve in new or changing digital environments.	Choose and troubleshoot technology tools, including the use of AI when appropriate, to suit the purpose.	Choose and effectively troubleshoot technology tools to suit purpose.
			EL1.D.3	Students recognize that some digital tools use AI to make choices or respond to users (ex.: adaptive learning programs). With guidance, students learn how to employ these tools to support their learning.	Use knowledge of technology systems and problem-solving strategies to independently troubleshoot and resolve basic technical challenges.	Transfer the knowledge of existing technology to explore new technologies, including AI.	Transfer and extend the knowledge of existing technology to explore new technologies.
	2. Application Apply the fundamental concepts of technology operations and demonstrate the ability to choose, use, and/or troubleshoot current technologies.	A. Demonstrate learning with the use of technology.	EL2.A.1	Use age-appropriate digital resources, including AI-supported tools, to produce and publish information (ex.: creating and illustrating a story or project using digital tools).	Identify age-appropriate digital tools to produce and publish information for an identified target audience.	Evaluate effectiveness of different digital tools to communicate information with multiple audiences.	Select appropriate digital resources (including those that are AI-supported) to develop, implement and/or evaluate communication with an authentic audience.
			EL2.A.2	Demonstrate basic ability to communicate a message with digital input strategies (ex.: typing/keyboarding, voice to text, video or audio, images). With guidance, students use AI-supported tools to enhance expression and discuss how to ensure their message represents their own ideas.	Demonstrate efficient ability to communicate a message with digital input strategies (ex.: typing/keyboarding, voice to text, video or audio).	Demonstrate fluency of no fewer than two input strategies and/or programs to communicate information.	
		B. Apply functions and concepts of technology operations; demonstrate the ability to choose, use and troubleshoot current technologies.	EL2.B.1	Choose technology appropriate to task and purpose, with guidance and support. Students begin to recognize when AI-supported tools are helpful and when they are not needed.	Choose technology appropriate to their task and purpose.	Choose functions and operations appropriate to their task and purpose.	Choose efficient functions and concepts appropriate to their task and purpose.
			EL2.B.2	With guidance and support, students choose digital tools, including those with AI features, to complete tasks.			Apply an understanding of devices to troubleshoot current technology and adjust for future events.
		C. Transfer knowledge to emerging technology.	EL2.C.1	Apply and adapt knowledge of existing technology, including AI, to the substitution-based use of new technologies to support learning.	Apply and adapt knowledge of existing technology to the augmentative use of new technologies.	Apply and adapt knowledge of existing technology to the modification-based use of new technologies, including AI.	Apply and adapt knowledge of existing technology to the innovative redefinition based use of new technologies.



Kentucky Academic Standards (KAS) for Technology

Performance Indicator Progression Chart: Digital Citizen

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Digital Citizen - Students manage their digital identity in a safe, positive, and proactive way.	1. Skill / Concept Development Recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world; act and model in ways that are safe, legal and ethical.	A. Cultivate and manage your digital identity and reputation, and be aware of the permanence of your actions in the digital world.	DC1.A.1	Understand what it means to be a positive influence offline and how that could relate to being positive online.	Model positive behaviors in online communication at school and apply those behaviors to online activities outside of school.	Recognize behaviors, habits, and actions, including interactions with AI tools and the input provided to them, that create, maintain, and influence both positive and negative digital identities, reputations, and footprints in the digital world.	Actively develop and maintain a positive, authentic digital identity and presence across digital platforms, including the ethical and transparent use of AI.
			DC1.A.2	Show awareness that when something is put on the internet (websites, social media, apps) it can leave a trail online (digital footprint).	Show awareness and understand they are creating a digital footprint, and can identify positive and negative online activity.	Build awareness of public and permanent nature of online actions and the possible present and future consequences in personal, academic, and professional lives.	Comprehend the permanence and visibility of all digital actions, data inputs, and outputs created through AI tools, recognizing their potential consequences for future careers and relationships.
		B. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.	DC1.B.1	Choose appropriate websites, and understand to seek help from a trusted adult when faced with problems online related to safety.	Collaborate online with peers and educators in a positive manner, and begin to recognize online behaviors can have positive or negative consequences.	Recognize and demonstrate responsible behaviors that are safe, ethical, and legal, including when interacting or utilizing AI tools, across a variety of devices, platforms, and settings while considering possible consequences for themselves and/or others.	Make responsible, ethical, and thoughtful decisions when interacting and collaborating online, including with AI-supported tools, by carefully considering risks, benefits, safety, and the impact of your actions on yourself and others.
			DC1.B.2	Understand that some online programs (including those that use artificial intelligence) have positive and negative consequences and can make mistakes — ask a trusted adult when something seems wrong.	Understand that decisions and behaviors online can affect others in both negative and positive and hurtful and helpful ways.	Understand how to be respectful to others online while interacting, communicating, and collaborating and know strategies in order to avoid and/or combat cyberbullying.	Understand the mental and legal ramifications of cyber bullying and harassment; employ strategies to avoid and/or combat cyberbullying and harassment.
		C. Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.	DC1.C.1	Understand usernames and passwords, and understand why these are not shared with others.	Create and know usernames and passwords, and understand why these and other personal information are not shared with others online and offline.	Distinguish between information that is public and personal/private and develop and utilize strategies to secure and protect personal/private data and user accounts. Avoid the input of sensitive or personal information into AI systems that may use or share the information with unauthorized parties/individuals.	Think critically about the information you share online or input into third-party AI systems to protect sensitive personal data, ensure security, and comply with privacy laws.
			DC1.C.2	Navigate to trusted websites and know how to search for websites in a safe manner with awareness that not all websites are safe.	Search websites understanding that some sites are not safe without adult permission.	Understand that data-collection technology is used to track online navigation and recognize and avoid online scams and phishing, as well as evaluating whether AI tools are utilizing data as payment.	Comprehend the presence and ramifications of online data collection, including data gathered by AI systems, and understand how it is used to track online behavior and influence consumer decisions.
	2. Application Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.	A. Use information, media and digital resources in a responsible manner.	DC2.A.1	Identify acceptable use of internet and other digital resources.	Demonstrate acceptable use of the internet and identify acceptable use of social media and other digital media.	Demonstrate acceptable use of the internet, information, media and digital resources, including social media and generative AI tools, according to user agreements, policies, and laws.	Understand the need for, and comply with, acceptable user policies and agreements.
			DC2.A.2	With guidance and support, notice one way an online program (including simple AI-supported tools) can help learning and one way it can be mistaken; always check with a trusted adult.			Make responsible decisions in the use of information, media, social media and other digital resources in accordance with acceptable user policies and agreements.
		B. Respect intellectual property rights.	DC2.B.1	Recognize that everyone has different ideas in creating their own work (intellectual property).	Value other's intellectual property by showing appreciation and respect (including those that use artificial intelligence).	Recognize and respect different intellectual property classifications, including those that are copyrighted, subject to fair use, public domain properties, and/or have creative commons licenses, understanding that AI systems use data and content for training and generation of content, which raises complex intellectual property concerns.	Respect the importance of intellectual property by encouraging thought, design, innovation and/or creation.
			DC2.B.2	Show respect for others' intellectual property with positive words.	Give positive and constructive feedback on others' intellectual property with respect.		Use, share, and/or interact with intellectual property, including content created or influenced by AI, in accordance with the rights, permissions, and proper citation as required by the owner.
			DC2.B.3	Understand not to copy someone else's work (intellectual property).			
			DC2.B.4	Understand that someone else's creations found on the internet or shared in person, cannot be used without permission, and the creator should be given credit.			
		C. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.	DC2.C.1		Use others' creations (intellectual property) with permission (public domain, creative commons, or copyright owner's permission).	Recognize and seek permission to use the intellectual property of others appropriately.	Apply understanding of 'fair use' and copyright laws when sharing the intellectual property of others, as well as when producing new intellectual property, including content created or influenced by AI tools.
			DC2.C.2		Create their own intellectual property in digital projects.	Use and share the intellectual property of others with proper citation and attribution elements including accurately citing and attributing the use of AI tools as a source or collaborator.	Seek permission and properly cite the use of intellectual property created by others, including content generated or influenced by AI tools.



Performance Indicator Progression Chart: Knowledge Constructor

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Knowledge Constructor - Students use various digital tools to find information and make meaning.	1. Skill / Concept Development Students critically curate a variety of resources using digital tools to construct knowledge.	A. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.	KC1.A.1	Use teacher-guided keyword searches or visual search tools to find basic information about a topic.	Filter searches to gather specific information on a subject or research topic (ex.: searching "food sources for Beluga whales" instead of searching "whales" or "Beluga whales").	Demonstrate effective digital search techniques (ex.: filtering searches using advanced settings/tools, keyword/term choices, or phases) to locate information or other resources to gather specific information on a subject or research topic.	Utilize a variety of digital resources effectively and safely by applying a variety of search strategies (ex.: filtering searches, advanced settings/tools, file types, database/source selection).
			KC1.A.2	Use age-appropriate digital resources, reference strategies, apps, and other guided tools such as videos, websites, apps, and AI-supported tools with teacher support to find and locate information.	Use a variety of digital reference resources (ex.: digital encyclopedia, digital atlas/maps) to locate information related to a research topic.	Practice research strategies that outline a process for locating information digitally (ex.: tools and effective search techniques).	Plan and use multiple research strategies to locate information from digital resources for a variety of purposes.
			KC1.A.3	Use teacher-selected digital resources to find answers to questions and learn about a topic.			
		B. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.	KC1.B.1	Classify websites or apps, with teacher support, to understand their purpose and establish relevance in search results (learn, watch, play).	Identify criteria to analyze information presented in a digital resource to determine its accuracy, perspective, credibility, and relevance.	Select a method, tool, or strategy to evaluate source(s) for credibility, relevance, authority, accuracy, and perspective.	Evaluate digital sources for accuracy of information; compare and consider the perspectives of the sources; determine usefulness, and assess the credibility of the sources.
			KC1.B.2	Compare information on the same topic across multiple digital resources.	Explore different media types (ex.: infographics, videos, graphs, text) and how they might influence an audience.	Analyze digital information, media, data, and materials for credibility, relevance, authority, accuracy, and perspective.	
			KC1.B.3		Compare information presented across different domain extensions (ex.: .com, .net, .gov, .edu) to help evaluate accuracy, perspective, credibility, and relevance of information.		
		C. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.	KC1.C.1	Save and organize simple digital items (pictures, drawings, recordings) with teacher support.	Collect information (ex.: images, diagrams, maps, graphs, infographics, videos, animations) using digital tools from resources to clarify and add to knowledge of a topic.	Combine various tools (ex.: spreadsheet, database, saved files) and methods (ex.: concept mapping, flow charting and outlining software) to classify information, observations, or experiments digitally.	Use multiple digital tools to select, organize, and communicate information from digital sources including AI-supported tools.
			KC1.C.2	Group similar digital items into simple collections (e.g., animals, shapes, weather).	Organize gathered artifacts into themed collections with subcategories (ex.: Famous African-Americans: Scientists, Politicians, Athletes; Favorite Cartoon Characters: Disney, Nickelodeon, Looney Tunes).	Compile information from digital resources (ex.: search engines, online periodical databases, virtual library/online catalogs, interactive video conferencing).	Utilize digital tools to communicate information in real world applications, to address or solve a problem, or to make meaningful connections.
	2. Application Produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.	A. Produce creative artifacts.	KC2.A.1	Use digital tools to create simple artifacts to share their learning (drawings, recordings, photos, digital stories).	Use digital tools to create artifacts that connect similar information found in various digital resources.	Demonstrate the ability to create new ideas/concepts or products with digital tools.	Choose and use digital tools including AI-supported tools to create products that exhibit choice and creativity.
			KC2.A.2				Create products independently and collaboratively that incorporate creative elements, and communicate to multiple audiences.
		B. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.	KC2.B.1	Use a variety of digital resources (ex.: website, video clip, photos) to explore and report on real world issues.	Use a variety of digital resources (ex.: website, video clip, photos) to explore and collaborate with others on real-world issues.	Build knowledge by generating and testing solutions for exploring real world issues using a variety of technology (ex.: data collection tools, models, videos, podcast, simulations, forms).	Select and use digital tools including AI-supported tools to create products that demonstrate meaningful connections or conclusions.
			KC2.B.2				Create products independently and collaboratively that explore real-world issues and problems and engage in discussion around current issues.



Performance Indicator Progression Chart: Innovative Designer

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Innovative Designer - Students use a variety of technologies to design and create.	1. Skill / Concept Development Use a variety of technologies to identify and solve authentic real-world problems.	A. Find authentic real-world problems in local and global contexts.	ID1.A.1	Use technology to identify a problem in the school or home environment with guidance and support.	Use technology to identify real-world problems in their community then analyze the conditions that make it a problem.	Collaborate with others in and out of the classroom using digital tools, including AI-supported applications, to research and analyze data to identify authentic real-world problems and propose a solution that affects the local and global community.	Use a variety of task-appropriate digital and/or AI-supported tools to research and analyze data to identify authentic real-world problems and propose a solution that affects the local and global community.
			ID1.A.2	Describe the problem, using technology, and explain why it is problematic.			
		B. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.	ID1.B.1	Demonstrate perseverance when working to complete a challenging task.	Demonstrate perseverance when working with authentic, open-ended problems by analyzing the failure, choosing a new strategy, and trying again to improve or solve the problem.	Demonstrate the ability to investigate and make sense of complex, open-ended problems by leveraging AI-supported tools to generate, evaluate, and refine potential solution pathways, thereby strengthening their perseverance in solving them.	Use a variety of technologies, including task-appropriate AI-supported tools, to strengthen independent perseverance when working to solve problems that are ambiguous and/or open-ended.
	2. Application Use a variety of technologies within a design process to create new, useful and imaginative solutions.	A. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.	ID2.A.1	Use a design process (ex.: creative thinking spiral) to ask questions, suggest solutions, test ideas to solve problems, and share their learning, with guidance and support.	Explore and practice how a deliberate design process (ex.: design thinking) works to generate ideas, consider solutions, test theories, plan to solve a problem, or create innovative products to share with others.	Explore and choose appropriate processes and use a deliberate design process, including the use of AI-supported tools for advanced ideation, rapid prototyping/simulation, and iterative refinement, when generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.	Self-select and use a variety of task-appropriate AI and/or digital tools to design and implement a deliberate process for generating ideas, researching, and testing ideas for solving problems or creating original products that demonstrate understanding.
		B. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.	ID2.B.1	Use a variety of age-appropriate digital tools to design something, with guidance and support.	Use a variety of digital tools to plan and manage a design process, with consideration to design constraints and risks.	Investigate and use meaningful digital tools, including AI-driven planning and simulation applications, to model, manage, and optimize a design process that accounts for complex design constraints and calculated risks.	Self-select and use task-appropriate digital and/or AI-supported tools to manage work and create original products that take into consideration project constraints, obstacles, and outcomes.
		C. Develop, test and refine prototypes as part of a cyclical design process.	ID2.C.1	Use a design process to develop ideas or creations, test their design, and redesign if necessary.	Use digital and non-digital tools to complete a cyclical design process by first considering the needs of the end-user to define the problem, developing and testing a prototype, and then seeking and applying feedback to refine the solution.	Create, develop, and test prototypes using AI-supported tools for rapid data analysis and scenario modeling; understand that AI-driven feedback loops accelerate learning, and appreciate failures as essential opportunities for growth and improvement.	Select and use a variety of task-specific digital and/or AI-supported tools to aid in working collaboratively or independently to create, test and refine prototypes, drafts and concepts based on self-initiated feedback and reflection in design cycles.



Performance Indicator Progression Chart: Computational Thinker

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Computational Thinker - Students understand sequences and use them to develop solutions to problems.	1. Skill / Concept Development Develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.	A. Formulate problem definitions suited for technology- assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.	CT1.A.1	Identify a problem and choose the appropriate digital tools to explore and find solutions to the problem through the use of a step-by-step plan, with guidance and support.	Plan and implement a design process in which they explore solutions to a problem and use digital tools, including optional AI-supported tools, to analyze data, create models, and represent collected data (ex.: spreadsheets, graphs, charts, tables, presentations, infographics) in a way that can be shared with others, with guidance.	Ask questions, gather data, create/observe abstract models, and think of different processes while finding solutions to real-world problems.	Precisely define a problem and develop a solution using digital tools, including collecting data, conducting data analysis, creating abstract models, and employing algorithmic thinking.
		B. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem- solving and decision- making.	CT1.B.1	Utilize an age-appropriate digital tool to collect, organize, and represent data (ex.: online surveys, spreadsheets, graphs, charts, etc); students will use this data to look for similarities and identify patterns and categories within the data set (ex.: simple data mining), with guidance and support.	Select and utilize an age-appropriate digital tool to represent data (ex.: spreadsheets, digital graphs/charts), with guidance and support from adults.	Solve problems and make decisions by collecting data or identifying relevant data sets, using digital tools such as surveys to collect information and data spreadsheet applications to analyze and represent their findings through various ways, potentially employing AI-powered tools when appropriate.	Use digital tool(s) to effectively collect, organize, and manipulate data to test, verify, and present possible solutions to a problem.
			CT1.B.2		Use data to analyze findings and communicate conclusions, incorporating digital tools, optionally including AI-assisted tools, when appropriate to support synthesis and visualization.		
		C. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem- solving.	CT1.C.1	Break a problem into smaller parts, identify key information, and use age-appropriate digital tools to help with problem solving (ex.: online whiteboard, online mindmapping tools, digital outline), with guidance and support.	Break a problem into smaller parts, identify patterns and key information, and use age-appropriate digital tools to brainstorm a problem solving plan (ex.: online whiteboard, online mindmapping tools, digital outline), optionally utilizing AI-powered tools to assist in pattern identification or decomposition either collaboratively or independently.	Break problems into parts, extract key information, and develop descriptive models to understand complex systems or lead problem solving tasks.	Evaluate the steps of a problem- solving process and deconstruct the related data to develop an effective solution to a real-world problem.
		D. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.	CT1.D.1	Define and give examples of automation (ex.: thermostat controls temperature, buttons pressed on toys make various sounds).	Complete a coding task with coded actions (ex.: html, block-based coding, python) either collaboratively or independently, optionally utilizing AI-powered tools for testing or debugging the solution.	Use digital tools to collect data, conduct analysis, and discuss findings or possible solutions.	Utilize automation and logic to develop and test automated solutions, and evaluate digital tools such as AI that generate automated responses.
			CT1.D.2	Complete a simple coding task with at least 3-5 coded actions (ex: block-based coding and/or tangible coding resources), with guidance and support.			
	2. Application Apply strategies for understanding and solving problems by using technological methods to develop and test solutions.	A. Use resources to collect, analyze, and represent data.	CT2.A.1	Use digital tools to ask questions and digitally collect data, with guidance and support.	Use digital tools to ask questions and digitally collect data.	Use digital tools to ask questions to an audience and digitally collect data, and analyze the findings.	Use digital tools to collect relevant data, conduct analysis, and prepare data for presentation to facilitate problem-solving and decision-making.
		B. Deconstruct components to understand systems and facilitate problem- solving.	CT2.B.1	Use digital tools to identify patterns in order to solve problems, with guidance and support.	Use digital tools to find patterns in order to solve complex problems.	Use technology-assisted methods to break problems down into smaller, more manageable parts by finding patterns or other methods of decomposition.	Use technology-assisted methods to more easily identify key information by breaking down data to facilitate problem-solving.
		C. Create and test automated solutions.	CT2.C.1	Use digital tools to identify and create algorithms, with guidance and support.	Use algorithm design to develop step-by-step instructions for solving a problem, and explore how automated or AI-supported tools might be employed to carry out or enhance these instructions.	Use algorithm design to develop step-by-step instructions for solving a problem.	Use digital tools and algorithmic thinking to develop automated systems to test solutions.



Performance Indicator Progression Chart: Creative Communicator

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Creative Communicator - Students communicate clearly and express themselves with a variety of digital tools.	1. Skill / Concept Development Communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals, audience and task.	A. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	CC1.A.1	Introduce and use age appropriate digital tools (ex.: art creation programs, video production, photography, presentations, video media, green screen, stop motion animation) for producing new creations or published communications using appropriate digital etiquette with guidance and support.	Evaluate and utilize the features of a variety of digital tools (ex.: including, but not limited to: adding video/audio, digital collaboration tools, tools affecting the aesthetics of the piece, as well as methods for sharing/publishing) for producing new creations or communications with teacher support, following appropriate digital etiquette.	Choose from available platforms and tools to meet the designated objectives of their creation or communication.	Evaluate and determine appropriate platforms and digital tools to create or share digital content with an authentic audience for a desired purpose.
		B. Create original works or responsibly repurpose and/or remix digital resources into new creations.	CC1.B.1	Use age appropriate digital tools to create original and remixed work, with respect to intellectual property with guidance and support.	Learn and apply strategies to responsibly remix creative work, respecting digital citizenship (copyright), both collaboratively and independently.	Create original works or remix digital resources, optionally using AI-assisted tools, while demonstrating responsible digital citizenship, including intellectual property rights, copyright, and ethical AI use and attribution.	Create original works or remix digital resources, optionally using AI-assisted tools, for an authentic audience and desired purpose that reflects a responsible repurposing of digital media or resources.
		C. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.	CC1.C.1	Observe and participate in the communication of ideas using a variety of digital tools (ex.: video reflections, interactive notebooks, audio recording, as well as visual representation) with guidance and support.	Create digital artifacts (ex.: presentations, data collection, models, audio/video, websites, and digital art) to display knowledge and communicate ideas clearly to a variety of audiences, both collaboratively and independently.	Create or incorporate digital content to communicate complex ideas clearly and effectively to a variety of audiences.	Analyze and communicate complex ideas, data, or solutions to an authentic audience for a desired purpose using digital tools
	2. Application Publish and present content customized for their audience(s), purpose, and task.	A. Publish and present content that customizes the message and medium for their intended audiences.	CC2.A.1	Explore a variety of digital tools (ex.: drawing/ art programs, video production, green screen, digital art). to create and communicate an idea to a variety of audiences with guidance and support.	Utilize digital tools to create, share, communicate, and publish work effectively (ex.: video/ audio creation, social media, spreadsheets, blogs, presentation platforms, word processing, and digital art platforms).	Publish or present original content to a predetermined audience that appropriately customizes the message and medium.	Present an idea or creative work that expresses ideas or content that is published for a range of authentic audiences outside of the classroom.
			CC2.A.2	Discuss different audiences and how presentations can change based on audience.	Identify the intended audience and select appropriate platform (medium) when creating digital pieces, presenting, and collaborating to communicate ideas to the audience.		



Kentucky Academic Standards (KAS) for Technology

Performance Indicator Progression Chart: Global Collaborator

Concept and Competency	Standard	Learning Priority	Standard Identifier	Grades K-2 (P) By the end of Grade 2, students will be able to...	Grades 3-5 (I) By the end of Grade 5, students will be able to...	Grades 6-8 (M) By the end of Grade 8, students will be able to...	Grades 9-12 (H) By the end of Grade 12, students will be able to...
Global Collaborator - Students use digital tools to connect with learners inside and outside of their classroom.	1. Skill / Concept Development Use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.	A. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.	GC1.A.1	With guidance and support, use digital tools (e.g., translation features, virtual field trips, video conferencing, teacher-moderated class blogs or class-to-class exchanges) to explore and understand similarities and differences among people in their school, community, and beyond.	Use digital tools and resources giving students voice and choice (ex.: presentations, videos, and various digital media platforms) to connect and collaborate with authentic audiences from a variety of backgrounds and cultures to enrich learning experiences.	Use digital and emerging technologies, which could include AI tools, to connect and collaborate with authentic audiences from diverse backgrounds and cultures to broaden mutual understanding and learning, while demonstrating ethical and responsible digital citizenship.	Evaluate and use digital collaboration tools to connect with others from a variety of local and global backgrounds/cultures in order to exchange ideas, develop an understanding of diverse perspectives, display culturally-minded engagement, and encourage learning.
		B. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.	GC1.B.1	With guidance and support, use collaborative digital tools (e.g., shared creation spaces, collaborative digital whiteboards) to share tasks, give age-appropriate feedback (e.g., emojis, audio comments, or simple written responses) to peers, and complete digital projects together.	Use digital tools to collaborate with team members in a digital workspace. (ex.: sharing and respecting digital work within a team workspace, assuming team roles and working together to create video/ green screen production, stop-motion animation, and various other forms of digital creations). Use digital tools and take on a variety of roles to contribute to team projects with guidance and support.	Select and use digital and emerging technologies, which could include AI tools, in diverse collaborative teams, locally or globally, assuming roles and responsibilities, valuing perspectives other than your own, and contributing ethically and effectively toward a shared goal.	Use digital tools, including AI-powered learning applications, to contribute to a project team, determine their role and responsibility within the group and work toward a common goal or a solution to a problem.
		C. Contribute to the exchange of ideas within and beyond the learning community.	GC1.C.1	With guidance and support, use safe, moderated digital spaces (e.g., class blogs, digital portfolios, AI-assisted story platforms) to share ideas and multimodal creations with others.	Use a variety of digital resources to collaborate with mutual respect (ex.: video conferencing, commenting tools, slide decks, and documents).	Select and use digital and emerging technologies, which could include AI tools, to collaborate with diverse teams locally and globally, assuming roles and responsibilities, valuing perspectives other than their own, and contributing ethically and effectively to the exchange of ideas within and beyond the learning community.	Select digital tools, including AI-powered learning applications, that show an understanding of context and audience to share and exchange interests, ideas and experiences with others from within and beyond the local learning community.
	2. Application Use digital tools to connect with a global network of learners and engage with issues that impact local and global communities.	A. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.	GC2.A.1	With guidance and support, use interactive digital tools (e.g., interactive maps/ globes, teacher-guided AI question tools, translation tools) to explore school, community, and global topics such as weather, animals, or traditions from multiple perspectives.	Use digital tools to collaborate with peers, experts, and community members to examine problems from multiple viewpoints. (ex.: video/voice conferencing).	Use collaborative and emerging technologies, which may include AI tools, to work with peers, experts, and community members locally and globally to examine issues and problems from multiple viewpoints and to contribute ethically to shared understanding.	Use collaborative technologies to work with others (peers, experts, community members) to gain knowledge about issues through various perspectives and opinions and to find solutions for social change.
		B. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.	GC2.B.1	With guidance and support, use digital tools (e.g., collaborative digital whiteboards, simple design tools, AI-powered idea generators) to brainstorm and share ideas that help improve their classroom, school, community, and beyond.	Collaborate digitally with others to understand multiple perspectives while exploring both local and global issues to solve problems with guidance and support. (ex.: project-based learning and community problem solving).	Use collaborative and emerging technologies, which may include AI tools, to work with others to explore local and global issues, investigate multiple perspectives, and develop potential solutions while participating ethically in digital collaboration.	Explore and critically analyze local and global issues and use collaborative digital tools to investigate, develop a plan and recommend solutions.

