KENTUCKY
ACADEMIC STANDARDS

TECHNOLOGY

Education Goals

These capacity and goal statements of the Kentucky Education Reform Act of 1990, as found in Kentucky Revised Statute (KRS) 158.645 and KRS 158.6451, are the basis for instructional programs in Kentucky public schools. 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
- 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
- Skills to enable students to compete favorably with students in other states and other parts of the world

Furthermore, schools shall

- expect a high level of achievement from all students.
- develop their students' abilities to:
  - use basic communication and mathematics skills for purposes and situations they
  - will encounter throughout their lives
  - apply core concepts and principles from mathematics, science, arts and humanities,
  - social studies, English/language arts, health, mathematics, practical living, including,
  - physical education, to situations they will encounter throughout their lives
  - become self-sufficient individuals
  - become responsible members of a family, work group or community as well as an
  - effective participant 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

- increase student attendance rates
- 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

Legal Base

The following Kentucky Revised Statutes (KRS) and Kentucky Administrative Regulations (KAR) provide a legal base 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, the Kentucky Board of Education 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.

Administrative regulations shall be promulgated for:

- Courses of study for the different grades and kinds of common schools; and
- The minimum requirements for high school graduation.

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, including the requirements for the graduating class of 2012.

704 KAR 3:303   Required Kentucky Academic Standards
This administrative regulation adopts into law the *Kentucky Academic Standards February 2010.*

PRIMARY TECHNOLOGY

Kentucky Academic Standards – Technology – Primary

Technology use in the 21st century has become a vital component of all aspects of life. For students in Kentucky to be contributing citizens, they must receive an education that incorporates technology literacy at all levels. Technology literacy is the ability of students to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21st century. The Technology Kentucky Academic Standards provides a framework for integrating technology into all content areas. It reflects the basic skills required for each student to be competitive in the global economy.

For students to gain the technology competencies, it is essential that they have access to technology during the school day in all grade levels. Instruction should provide opportunities for students to gain and demonstrate technology skills that build primary through grade 12.

The technology content standards should be integrated into each curricular discipline. The purpose of integrating technology is to help students make useful connections between what they learn in each content area and the real world. Technology knowledge, concepts and skills should be interwoven into lessons or units and taught in partnership with other content areas. Technology lends itself to curriculum integration and team teaching. Technology can enhance learning for all students, and for some it is essential for access to learning.

The technology content standards are organized by grade spans: primary, intermediate, middle, and high. The technology Kentucky Academic Standards at the primary level includes beginning competencies related to technology literacy. Students are involved in the use of technology for communicating and collaborating with others and in developing ideas and opinions. Students interact with developmentally appropriate applications (e.g., interactive books, graphic organizers, reading and writing assistants, mathematical and scientific tools).
Through this experience, students gain a positive view of technology as tools for learning.

The technology content standards at the primary grade span are directly aligned with Kentucky's **Academic Expectations**. Technology standards are organized around three Big Ideas that are important to the discipline of technology. The three Big Ideas in technology are: **1) Information, Communication and Productivity; 2) Safety and Ethical/Social Issues;** and **3) Research, Inquiry/Problem-Solving and Innovation**. The Big Ideas are conceptual organizers for technology. Each grade level span ensures students have multiple opportunities throughout their school careers to develop skills and concepts linked to the Big Ideas.

Under each Big Idea are statements of *Enduring Knowledge/Understandings* that represent overarching generalizations linked to the Big Ideas of Technology. The understandings represent the desired results--what learning will focus upon and what knowledge students will be able to explain or apply. *Understandings* can be used to frame development of units of study and lesson plans.

Skills and Concepts describe ways that students demonstrate their learning and are specific to each grade level span. The skills and concepts for technology are fundamental to technology literacy, safe use and inquiry.

Big Idea: Information, Communication and Productivity

Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, to increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.

Academic Expectations
1.11 Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.
1.16 Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.
3.3 Students demonstrate the ability to be adaptable and flexible through appropriate tasks or projects.
6.1 Students connect knowledge and experiences from different subject areas.
6.3 Students expand their understanding of existing knowledge by making connections with new knowledge, skills and experiences.

Primary Enduring Knowledge – Understandings
Students will understand that
- technology is used in all content areas to support directed and independent learning.
- appropriate terminology, computer operations and applications assist in gaining confidence in the use of technology.
- technology requires proper care and maintenance to be used effectively.
- technology is used to communicate in a variety of ways.

Primary Skills and Concepts – Information
Students will

- investigate different technology devices and systems (e.g., computer processor unit, monitor, keyboard, disk drive, printer, mouse, digital cameras, interactive white boards)
- use and care for technology (e.g., computers, cell phones, digital cameras, scanners, multimedia)
  at home, school and community
- use appropriate technology terms (e.g., hardware, software, CD, hard drive)
- demonstrate proper keyboarding techniques, optimal posture and correct hand placement (e.g., left hand for left side keys and right hand for right side keys, special keys such as space bar, enter/return, backspace, shift, delete)

Primary Skills and Concepts – Communication
Students will
- use technology to communicate in a variety of modes (e.g., recordings, speech to text, print, media)
- participate in group projects and learning activities using technology communications

Primary Skills and Concepts – Productivity
Students will
- explain how information can be published and presented in different formats
- create a variety of tasks using technology devices and systems to support authentic learning

Big Idea: Safety and Ethical/Social Issues

Students understand safe and ethical/social issues related to technology. Students practice and engage in safe, responsible and ethical use of technology. Students develop positive attitudes toward technology use that supports lifelong learning, collaboration, personal pursuits and productivity.

Academic Expectations
2.17 Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.
3.6 Students demonstrate the ability to make decisions based on ethical values.
4.3 Students individually demonstrate consistent, responsive and caring behavior.
4.4 Students demonstrate the ability to accept the rights and responsibilities for self and others.
4.5 Students demonstrate an understanding of, appreciation for, and sensitivity to a multi-cultural
and world view.

Primary Enduring Knowledge – Understandings
Students will understand that
- responsible and ethical use of technology is necessary to ensure safety.
- technology enhances collaboration to contribute to a learning community.
- acceptable technology etiquette is essential to respectful social interactions and good citizenship.
- technology is used in jobs and careers to support the needs of the community.
- assistive technology supports learning to ensure equitable access to a productive life.

Primary Skills and Concepts – Safety
Students will
- explain the importance of safe Internet use (e.g., iSafe skills)
- use safe behavior when using technology

Primary Skills and Concepts – Ethical Issues
Students will
- use responsible and ethical behavior in using technology
- adhere to the Acceptable Use Policy (AUP) as well as other state and federal laws

Primary Skills and Concepts – Social Issues
Students will
- work cooperatively with peers, family members and others when using technology
- collaborate with peers, family members and others when using technology
- explain how technology is used in jobs and careers

Big Idea: Research, Inquiry/Problem-Solving and Innovation

Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.

Academic Expectations

1.1 Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.

2.3 Students identify and analyze systems and the ways their components work together or affect each other.

5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.

5.2 Students use creative thinking skills to develop or invent novel, constructive ideas or products.

5.4 Students use a decision-making process to make informed decisions among options.

5.5 Students use problem-solving processes to develop solutions to relatively complex problems.

6.1 Students connect knowledge and experiences from different subject areas.

Primary Enduring Knowledge – Understandings

Students will understand that

- technology assists in gathering, organizing and evaluating information from a variety of sources to answer an essential question.
- technology is used to analyze real world data and support critical thinking skills through inquiry/problem-solving in order to produce results and make informed decisions.

Primary Skills and Concepts – Research

Students will

- use teacher-directed Internet sources as a resource for information
- use electronic resources to access and retrieve information

Primary Skills and Concepts – Inquiry/Problem-solving

Students will

- gather technology information/data and use for problem solving in all content areas
- describe at least one strategy for problem solving while using technology (e.g., inquiry/problem-solving software, troubleshooting technology issues)

Primary Skills and Concepts – Innovation

Students will

- use technology for original creations/innovation in classroom
- express creativity both individually and collaboratively using technology

INTERMEDIATE TECHNOLOGY

Kentucky Academic Standards – Technology – Intermediate

Technology use in the 21st century has become a vital component of all aspects of life. For students in Kentucky to be contributing citizens, they must receive an education that incorporates technology literacy at all levels. Technology literacy is the ability of students to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21st century. The Technology Kentucky Academic Standards provides a framework for integrating technology into all content areas. It reflects the basic skills required for each student to be competitive in the global economy.

For students to gain the technology competencies, it is essential that they have access to technology during the school day in all grade levels. Instruction should provide opportunities for students to gain and demonstrate technology skills that build primary through grade 12.

The technology content standards should be integrated into each curricular discipline. The purpose of integrating technology is to help students make useful connections between what they learn in each content area and the real world. Technology knowledge, concepts and skills should be interwoven into lessons or units and taught in partnership with other content areas. Technology lends itself to curriculum integration and team teaching. Technology can enhance learning for all students, and for some it is essential for access to learning.

The technology content standards are organized by grade spans: primary, intermediate, middle, and high. The technology Kentucky Academic Standards at the intermediate level builds upon primary experiences. It continues to build competencies related to technology literacy. Students interpret critique and evaluate digital texts, synthesize information and solve problems. Students create and use technology for developing ideas and opinions, for communicating and collaborating with others and for personal fulfillment. These experiences enhance and extend students' technology skills.

The technology content standards at the intermediate grade span are directly aligned with Kentucky's **Academic Expectations**. Technology standards are organized around three Big Ideas that are important to the discipline of technology. The three Big Ideas in technology are: **1) Information, Communication and Productivity; 2) Safety and Ethical/Social Issues;** and **3) Research, Inquiry/Problem-Solving and Innovation**. The Big Ideas are conceptual organizers for technology. Each grade level span ensures students have multiple opportunities throughout their school careers to develop skills and concepts linked to the Big Ideas.

Under each Big Idea are statements of *Enduring Knowledge/Understandings* that represent overarching generalizations linked to the Big Ideas of Technology. The understandings represent the desired results--what learning will focus upon and what knowledge students will be able to explain or apply. *Understandings* can be used to frame development of units of study and lesson plans.

Skills and Concepts describe ways that students demonstrate their learning and are specific to each grade level span. The skills and concepts for technology are fundamental to technology literacy, safe use and inquiry. The skills and concepts build on prior learning.

Big Idea: Information, Communication and Productivity

Students demonstrate a sound understanding of the nature and operations of technology systems.
Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.

Academic Expectations

1.11 Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.

1.16 Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.

3.3 Students demonstrate the ability to be adaptable and flexible through appropriate tasks or projects.

6.1 Students connect knowledge and experiences from different subject areas.

6.3 Students expand their understanding of existing knowledge by making connections with new knowledge, skills, and experiences.

Intermediate Enduring Knowledge – Understandings

Students will understand that

- appropriate terminology, computer operations and applications assist in gaining confidence in the use of technology.
- technology requires proper care and maintenance to be used effectively.
- a variety of media is used to support directed and independent learning.
- technology is used to communicate in a variety of ways including global communications.
- technology (e.g. keyboarding, word processing, spreadsheets, presentation) is used effectively and efficiently to accomplish a task*.*

Intermediate Skills and Concepts – Information

Students will

- investigate different technology devices (e.g., CPU, monitor, keyboard, disk drive, printer, mouse)
- describe the uses of technology (e.g., computers, telephones, cell phones, digital and video cameras, Internet) at home, school and workplace
- use appropriate technology terms (e.g., hardware, software, CD, hard drive)
- explain the use of networks and the need for login procedures (e.g., stand alone, network, file server, LANs network resources)
- demonstrate proper keyboarding techniques, optimal posture and correct hand placement (e.g., home row finger placement) at the computer workstation

Intermediate Skills and Concepts – Communication

Students will

- use technology to communicate in a variety of modes (e.g., audio, speech to text, print, media)
- participate in online group projects and learning activities using technology communications
- create a variety of tasks using technology devices and systems to support authentic learning
- use technology to collect data for content area assignments/projects
- use a variety of tools and formats (oral presentations, journals and multimedia presentations) to summarize and communicate the results of observations and investigations
- use online collaborative tools (e.g., email, videoconferencing)

Intermediate Skills and Concepts – Productivity

Students will

- develop, publish and present information in print and digital formats
- use productivity tools to produce content area assignments/projects

Big Idea: Safety and Ethical/Social Issues

Students understand safe, ethical and social issues related to technology. Students practice and engage in safe, responsible and ethical use of technology. Students develop positive attitudes toward technology use that supports lifelong learning, collaboration, personal pursuits and productivity.

Academic Expectations
2.17   Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.
3.6   Students demonstrate the ability to make decisions based on ethical values.
4.3   Students individually demonstrate consistent, responsive, and caring behavior.
4.4   Students demonstrate the ability to accept the rights and responsibilities for self and others.
4.5   Students demonstrate an understanding of, appreciation for, and sensitivity to a multi- cultural and world view.

Intermediate Enduring Knowledge – Understandings
Students will understand that
- responsible and ethical use of technology is necessary to ensure safety.
- technology is used in collaborative and interactive projects to enhance learning.
- acceptable technology etiquette is essential to respectful social interactions and good citizenship.
- technology is used in jobs and careers to support the needs of the local and global community.
- assistive technology supports learning to ensure equitable access to a productive life.

Intermediate Skills and Concepts – Safety
Students will
- explain the importance of safe Internet use (e.g., iSafe skills)
- apply safe behavior when using technology

Intermediate Skills and Concepts – Ethical Issues
Students will
- investigate basic issues related to responsible use of technology and describe personal consequences of inappropriate use (e.g., plagiarism, intellectual property, copyright and the conditions of Acceptable Usage Policy)
- explore, investigate and practice the use of technology in an appropriate, safe and responsible manner
- use ethical behavior while using technology in personal and community contexts

Intermediate Skills and Concepts – Social Issues
Students will
- use technology to collaborate and engage in interactive projects with others (e.g., local, national and global) and credit all participants for their contribution to the work
- use proper social etiquette with any technology (e.g., email, blogs, IM, telephone, help desk)
- investigate how assistive technologies supports learning
- explain how technology has had an influence on our world
- explain how technology supports career options and lifelong learning

Big Idea: Research, Inquiry/Problem-Solving and Innovation

Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.

Academic Expectations

1.1 Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.

2.3 Students identify and analyze systems and the ways their components work together or affect each other.

5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.

5.2 Students use creative thinking skills to develop or invent novel, constructive ideas or products.

5.4 Students use a decision-making process to make informed decisions among options.

5.5 Students use problem-solving processes to develop solutions to relatively complex problems.

6.1 Students connect knowledge and experiences from different subject areas.

Intermediate Enduring Knowledge – Understandings

Students will understand that

- technology assists in gathering, organizing and evaluating information from a variety of sources to answer essential questions.
- technology supports critical thinking skills used in inquiry/problem solving to make informed decisions.
- technology is used to produce an innovative product or system.

Intermediate Skills and Concepts – Research

Students will

- gather and use accurate information from a variety of electronic sources (e.g. teacher-selected web sites, CDROM, encyclopedias and automated card catalog, online virtual library; word processing, database, spreadsheet) in all content areas
- correctly cite sources
- evaluate the accuracy, relevance, appropriateness, comprehensiveness and bias of electronic information sources
- use technology tools to process data and report results
- use content-specific tools to enhance understanding of content (e.g., environmental probes, sensors, robotics, simulation software and measuring devices)

Intermediate Skills and Concepts – Inquiry/Problem-solving

Students will

- determine which technology is useful and select the appropriate tool(s) (e.g., calculators, data collection probes, videos, educational software) to inquire/problem- solve in self-directed and extended learning
- use technology to solve problems using critical thinking and problem-solving strategies
- solve content-specific problems using a combinations of technologies

Intermediate Skills and Concepts – Innovation

Students will

- use technology to organize and develop creative solutions, ideas or product

MIDDLE LEVEL TECHNOLOGY

Kentucky Academic Standards – Technology – Middle School

Technology use in the 21st century has become a vital component of all aspects of life. For students in Kentucky to be contributing citizens, they must receive an education that incorporates technology literacy at all levels. Technology literacy is the ability of students to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21st century. The Technology Kentucky Academic Standards provides a framework for integrating technology into all content areas. It reflects the basic skills required for each student to be competitive in the global economy.

For students to gain the technology competencies, it is essential that they have access to technology during the school day in all grade levels. Instruction should provide opportunities for students to gain and demonstrate technology skills that build primary through grade 12.

The technology content standards should be integrated into each curricular discipline. The purpose of integrating technology is to help students make useful connections between what they learn in each content area and the real world. Technology knowledge, concepts and skills should be interwoven into lessons or units and taught in partnership with other content areas. Technology lends itself to curriculum integration and team teaching. Technology can enhance learning for all students, and for some it is essential for access to learning.

The technology content standards are organized by grade spans: primary, intermediate, middle, and high. The technology Kentucky Academic Standards at the middle level builds upon primary and intermediate experiences and includes students demonstrating competencies in technology literacy. Students use word processing, database, spreadsheet, browser, presentation and other tools. Students know the purpose and function of technology to enable them to select the appropriate tools to create original innovative work. By the end of middle school, students apply and demonstrate technology competencies across all curriculum areas. This experience will prepare them in meeting the minimum technology requirements needed for high school graduation.

The technology content standards at the middle grade span are directly aligned with Kentucky's Academic Expectations. Technology standards are organized around three Big Ideas that are important to the discipline of technology. The three Big Ideas in technology are: 1) Information, Communication and Productivity; 2) Safety and Ethical/Social Issues; and 3) Research, Inquiry/Problem-Solving and Innovation. The Big Ideas are conceptual organizers for technology. Each grade level span ensures students have multiple opportunities throughout their school careers to develop skills and concepts linked to the Big Ideas.

Under each Big Idea are statements of Enduring Knowledge/Understandings that represent overarching generalizations linked to the Big Ideas of Technology. The understandings represent the desired results--what learning will focus upon and what knowledge students will be able to explain or apply. Understandings can be used to frame development of units of study and lesson plans.

Skills and Concepts describe ways that students demonstrate their learning and are specific to each grade level span. The skills and concepts for technology are fundamental to technology literacy, safe use and inquiry. The skills and concepts build on prior learning.

Big Idea: Information, Communication and Productivity

Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.

Academic Expectations
1.11 Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.
1.16 Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.
3.3 Students demonstrate the ability to be adaptable and flexible through appropriate tasks or projects.
6.1 Students connect knowledge and experiences from different subject areas.
6.3 Students expand their understanding of existing knowledge by making connections with new knowledge, skills, and experiences.

Middle Enduring Knowledge – Understandings
Students will understand that
appropriate terminology, proper keyboarding, computer operations and applications assist to gain confidence in the use of technology.
technology (e.g. keyboarding, word processing, spreadsheets, databases, hardware, scanners, digital and video cameras) is used effectively and efficiently to accomplish a task.
technology is used to communicate in a variety of ways.
productivity tools are used effectively and efficiently to accomplish a task.

Middle Skills and Concepts – Information
Students will
use a variety of technology (e.g., probeware, handhelds, digital and video cameras, scanners) to collect, analyze and present in all content areas
recognize, discuss and use terms/concepts related to the protection of computers, networks and information (e.g., virus protection, network security, passwords, firewalls, privacy laws)
use proper keyboarding techniques, optimal posture and correct hand placement (e.g., continue appropriate finger reaches and building speed)

Middle Skills and Concepts – Communication
Students will
use technology to communicate in a variety of modes (e.g., audio, speech to text, print, media)
select and use appropriate technology to collect, analyze and share information
use online collaboration and interactive projects (e.g., email, videoconferencing) to communicate with others (e.g., experts, mentors)
use a variety of electronic formats (e.g., web publishing, oral presentations, journals and multimedia presentations) to summarize and communicate results

Middle Skills and Concepts – Productivity
Students will
use productivity tools to complete content assignments and projects
construct and publish information in printed and digital formats (e.g., printed reports, resumes, brochures, charts, multimedia presentations, videos and websites) for authentic audiences
use technology to develop innovative and creative products

Big Idea: Safety and Ethical/Social Issues

Students understand safety and ethical/social issues related to technology. Students practice and engage in safe, responsible and ethical use of technology. Students develop positive attitudes toward technology use that supports lifelong learning, collaboration, personal pursuits and productivity.

Academic Expectations
2.17 Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.
3.6 Students demonstrate the ability to make decisions based on ethical values.
4.3 Students individually demonstrate consistent, responsive and caring behavior.
4.4 Students demonstrate the ability to accept the rights and responsibilities for self and others.
4.5 Students demonstrate an understanding of, appreciation for and sensitivity to a multi-cultural
and world view.

Middle Enduring Knowledge – Understandings
Students will understand that
collaborative and interactive projects use technology to enhance learning.
acceptable technology etiquette is essential to respectful social interactions and good citizenship.
ethical use of technology is necessary to ensure safety, privacy and legal issues.
technology is used in occupations as a basic skill to be successful and productive in a global society.
assistive technology supports learning to ensure equitable access to a productive life.

Middle Skills and Concepts – Safety
Students will
explain the importance of safe Internet use (e.g., iSafe skills)
apply safe behavior when using technology

Middle Skills and Concepts – Ethical Issues
Students will
describe intellectual property issues related to technology
practice responsible (e.g., virus protection, passwords) use of technology adhering to the Acceptable Use Policy (AUP) as well as other state and federal laws
model ethical behavior relating to security, privacy, passwords and personal information and recognize possible consequences of misuse
use legal and ethical practices when completing digital projects/school work and credit all participants for their contribution to the work
investigate basic issues related to responsible use of technology and describe personal consequences of inappropriate use
investigate software piracy, its impact on the technology industry and possible repercussions to individuals and/or the school district

Middle Skills and Concepts – Human Issues
Students will
use appropriate behavior related to computers, networks, digital information (e.g., security, privacy, passwords, personal information)
use proper social etiquette with any technology (e.g., email, blogs, IM, telephone, help desk) while collaborating with peers, experts and others
use technology to engage in interactive projects in the classroom
describe how societal expectations drive the acceptance and use of new products and systems
investigate how the use of technology affects humans in various ways (e.g., safety, comfort, choices and attitudes)
explore how technology is used in different occupations
engage technology to support learning (e.g., online courses, online assessments)
conclude that assistive technology supports learning to ensure equitable access to a productive life

Big Idea: Research, Inquiry/Problem-Solving and Innovation

Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.

Academic Expectations
1.1 Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.
2.3 Students identify and analyze systems and the ways their components work together or affect each other.
5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.
5.2 Students use creative thinking skills to develop or invent novel, constructive ideas or products.
5.4 Students use a decision-making process to make informed decisions among options.
5.5 Students use problem-solving processes to develop solutions to relatively complex problems.
6.1 Students connect knowledge and experiences from different subject areas.

Middle Enduring Knowledge – Understandings
Students will understand that
technology supports creative thinking and implementation of new ideas to reach goals.
technology supports critical thinking skills used in inquiry/problem solving to make informed decisions.
technology assists in researching, analyzing and evaluating information obtained from a variety of sources to answer an essential question across all content areas.
technology is used to analyze real world data through inquiry/problem solving in order to produce results.
technology problem solving strategies is applied to innovative design for authentic, creative and real-world applications.

Big Idea: Research, Inquiry/Problem-Solving and Innovation – Continued

Middle Skills and Concepts - Research

Students will

demonstrate an understanding of the strengths and limitations of the Internet

apply a research process model (e.g., Big6, Research Cycle) to conduct online research

locate and collect information from a variety of electronic resources (e.g. search engines, CDROM, online periodical databases, Virtual library/online catalogs, interactive video conferencing) and correctly cite sources

evaluate the accuracy and appropriateness of electronic information

organize information that is collected using a variety of tools (e.g., spreadsheet, database, saved files)

communicate results of research and learning with others using the most appropriate tools (e.g., desktop-published or word-processed report, multimedia presentation)

manipulate data using charting tools and graphic organizers (e.g., concept mapping, flow charting and outlining software) to connect ideas and organize information

Middle Skills and Concepts – Inquiry/Problem-solving

Students will

use appropriate technology and strategies to solve content-specific problems in the real-world

determine which technology is useful and select the appropriate tool(s) (e.g., calculators, data collection probes, videos, educational software) to inquire/problem- solve in self-directed and extended learning

apply strategies for identifying and solving minor hardware and software problems

use technology to solve problems using critical thinking and problem-solving strategies

explore how inquiry/problem-solving impact science, technology, engineering and mathematics (STEM) (e.g., design, programming, robotics)

Middle Skills and Concepts – Innovation

Students will

use technology to express creativity in all content areas

design, develop, publish and present original, innovative products (e.g., Web pages, video, robotics, online content)

collaborate with peers, experts and others to develop solutions and innovative products (e.g., design/CAD, troubleshooting, helpdesk, models, systems)

describe how technological innovation often results when ideas, knowledge or skills are shared within a technology

HIGH SCHOOL TECHNOLOGY

Kentucky Academic Standards – Technology – High School

Technology use in the 21st century has become a vital component of all aspects of life. For students in Kentucky to be contributing citizens, they must receive an education that incorporates technology literacy at all levels. Technology literacy is the ability of students to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21st century. The Technology Kentucky Academic Standards provides a framework for integrating technology into all content areas. It reflects the basic skills required for each student to be competitive in the global economy.

For students to gain the technology competencies, it is essential that they have access to technology during the school day in all grade levels. Instruction should provide opportunities for students to gain and demonstrate technology skills that build primary through grade 12.

The technology content standards should be integrated into each curricular discipline. The purpose of integrating technology is to help students make useful connections between what they learn in each content area and the real world. Technology knowledge, concepts and skills should be interwoven into lessons or units and taught in partnership with other content areas. Technology lends itself to curriculum integration and team teaching. Technology can enhance learning for all students, and for some it is essential for access to learning.

The technology content standards are organized by grade spans: primary, intermediate, middle, and high. Throughout high school, students continue to develop and demonstrate the skills gained from primary, intermediate and middle grade levels. The technology Kentucky Academic Standards at the high level includes more opportunities for students to apply technology in their course work, thus becoming more adept in using technology. As the high school curriculum demands more complicated learning tasks, students discover more advanced capabilities in applications. Students will develop an appreciation for the capabilities of technology resources and an understanding of how these can be used for career and lifelong learning. By the end of high school, students will apply technology across all curriculum areas and demonstrate competencies needed for high school graduation.

The technology content standards at the high school grade span are directly aligned with Kentucky's **Academic Expectations**. Technology standards are organized around three Big Ideas that are important to the discipline of technology. The three Big Ideas in technology are: **1) Information, Communication and Productivity; 2) Safety and Ethical/Social Issues;** and **3) Research, Inquiry/Problem-Solving and Innovation**. The Big Ideas are conceptual organizers for technology. Each grade level span ensures students have multiple opportunities throughout their school careers to develop skills and concepts linked to the Big Ideas.

Under each Big Idea are statements of *Enduring Knowledge/Understandings* that represent overarching generalizations linked to the Big Ideas of Technology. The understandings represent the desired results--what learning will focus upon and what knowledge students will be able to explain or apply. *Understandings* can be used to frame development of units of study and lesson plans.

Skills and Concepts describe ways that students demonstrate their learning and are specific to each grade level span. The skills and concepts for technology are fundamental to technology literacy, safe use and inquiry. The skills and concepts build on prior learning.

Big Idea: Information, Communication and Productivity

Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.

Academic Expectations
1.11 Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.
1.16 Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.
3.3 Students demonstrate the ability to be adaptable and flexible through appropriate tasks or projects.
6.1 Students connect knowledge and experiences from different subject areas.
6.3 Students expand their understanding of existing knowledge by making connections with new knowledge, skills, and experiences.

High Enduring Knowledge – Understandings
Students will understand that
- proficient use of emerging technology is needed for competitive entry into the workforce.
- technology allows the exchange of information and ideas to enable participation in the global society.
- collaborative online projects impact life-long learning and global interactions.
- productivity tools are used effectively and efficiently to enhance lifelong learning.

High Concepts and Skills - Information
Students will
- apply, consolidate and extend the skills, knowledge and experiences acquired earlier to exhibit competence in the use of technology
- use appropriate technology terminology
- apply basic care and maintenance when using technology
- explore and analyze the impact of current and emerging technology

High Concepts and Skills – Communication
Students will
- use technology to communicate in a variety of modes (e.g., audio, speech to text, print, media)
- participate in electronic communities (e.g., virtual learning) as learners, initiators, contributors and mentors
- use online collaboration and interactive projects (e.g., email, videoconferencing) to communicate with others (e.g., experts, mentors)
- select and use appropriate technology to collect, analyze present information

High Concepts and Skills – Productivity
Students will
- use and apply a repertoire of technology skills regularly in the preparation of content assignments and authentic projects
- use a variety of formats (web publishing, oral presentations, journals and multimedia presentations) to summarize and communicate the results
- create professional electronic products (e.g., resumes, letters of applications, portfolios) for employment and post-secondary education

Big Idea: Safety and Ethical/Social Issues

Students understand safe and ethical/social issues related to technology. Students practice and engage in safe, responsible and ethical use of technology. Students develop positive attitudes toward technology use that supports lifelong learning, collaboration, personal pursuits and productivity.

Academic Expectations

2.17 Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.
3.6 Students demonstrate the ability to make decisions based on ethical values.
4.3 Students individually demonstrate consistent, responsive, and caring behavior.
4.4 Students demonstrate the ability to accept the rights and responsibilities for self and others.
4.5 Students demonstrate an understanding of, appreciation for, and sensitivity to a multi-cultural
and world view.

High Enduring Knowledge – Understandings
Students will understand that

- interactive technology projects and online courses enhance learning to ensure global awareness.
- acceptable social technology practices is essential to post-secondary career choices.
- ethical use of technology is necessary to ensure safety, privacy and legal issues.
- new technology development and deployment creates social, cultural, political and economic issues that requires citizens to make informed decisions.
- positive attitudes and practices towards technology support lifelong learning.
- assistive technology supports learning to ensure equitable access to a productive life.

High Concepts and Skills – Safety
Students will

- explain the importance of safe Internet use (e.g., iSafe skills)
- apply safe behavior when using technology

High Concepts and Skills – Ethical Issues
Students will

- describe intellectual property issues related to technology
- practice responsible, ethical and safe behavior (e.g., security, privacy, passwords, personal information virus protection and iSafe skills) while using technology and adhering to the Acceptable Use Policy (AUP) as well as other state and federal laws
- investigate basic issues related to responsible use of technology and describe personal consequences of inappropriate use
- use legal and ethical practices when completing digital projects/schoolwork and credit all participants for their contribution to the work
- investigate software piracy, its impact on the technology industry and possible repercussions to individuals and/or the school district

High Concepts and Skills – Social Issues
Students will

- forecast the impact of technological products and systems in a global society
- use appropriate etiquette when interacting with global environments (e.g., video conferencing, IM)
- analyze economic, political and cultural issues influenced by the development and use of technology
- investigate how technology supports their interests and career opportunities
- engage with technology to support lifelong learning (e.g., online courses, online assessments, interactive video conferencing)
- describe/ explain how assistive technology supports learning to ensure equitable access to a productive life
- explain how emerging technology is exponential and shapes economic factors and cultural influences

Big Idea: Research, Inquiry/Problem-Solving and Innovation

Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.

Academic Expectations

1.1 Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.

2.3 Students identify and analyze systems and the ways their components work together or affect each other.

5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.

5.2 Students use creative thinking skills to develop or invent novel, constructive ideas or products.

5.4 Students use a decision-making process to make informed decisions among options.

5.5 Students use problem-solving processes to develop solutions to relatively complex problems.

6.1 Students connect knowledge and experiences from different subject areas.

High Enduring Knowledge – Understandings

Students will understand that

- technology supports critical thinking skills used in inquiry/problem solving to make informed decisions for independent learning.
- technology can assist in researching, analyzing and evaluating information obtained from a variety of sources to answer an essential question across all content areas.
- technology supports research and development to solve problems and produce results in authentic situations.
- ideas, solutions and designs (e.g., intellectual property) created through technology are used in a knowledge-based economy.

Big Idea: Research, Inquiry/Problem-Solving and Innovation – Continued

High Skills and Concepts – Research
Students will

- apply a research process model (e.g., Big6, Research Cycle) to conduct online research
- select and evaluate appropriateness of information (authenticity) from a variety of resources, including online research databases, online catalogs/virtual library and web sites to answer the essential questions
- evaluate the accuracy and appropriateness of electronic information and correctly note the appropriate citations (e.g., APA, MLA)
- organize information that is collected using a variety of tools (e.g., spreadsheet, database, saved files)
- manipulate data using charting tools and graphic organizers (e.g., concept mapping, flow charting and outlining software) to connect ideas and organize information
- express and synthesize digital information collected in research effectively and accurately to produce original work (e.g., desktop-published or word-processed report, multimedia presentation, engineering design)

High Skills and Concepts – Inquiry/Problem-solving
Students will

- select and apply technology in content learning to solve authentic problems and make informed decisions
- apply teamwork and critical thinking strategies to solve technology problems
- explain how technology can be used for problem solving and creativity (e.g., simulation software, environmental probes, computer-aided design, geographic information systems, dynamic geometric software, graphing calculators, art and music composition software)
- analyze and troubleshoot software and hardware problems
- investigate and apply expert systems and simulations in real-world situations
- identify open-ended, unresolved problems and select and use appropriate technology to develop solutions
- explore how inquiry/problem-solving impact science, technology, engineering and mathematics (STEM) (e.g., design, programming, robotics)

High Skills and Concepts – Innovation
Students will

- use technology to express creativity in all content areas
- design, develop, publish and present original innovative products (e.g., Web pages, video, robotics, online content)
- produce an innovative product or system using an engineering design process
- collaborate with peers, experts and others to develop solutions and innovative products (e.g., design/CAD, troubleshooting, helpdesk, models, systems)
- recognize that innovative ideas, products and skills lead to intellectual property and copyrights
- describe how technological innovation leads to entrepreneurial opportunities