Program of Studies – 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 Program of Studies 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 program of studies 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

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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

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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.

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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