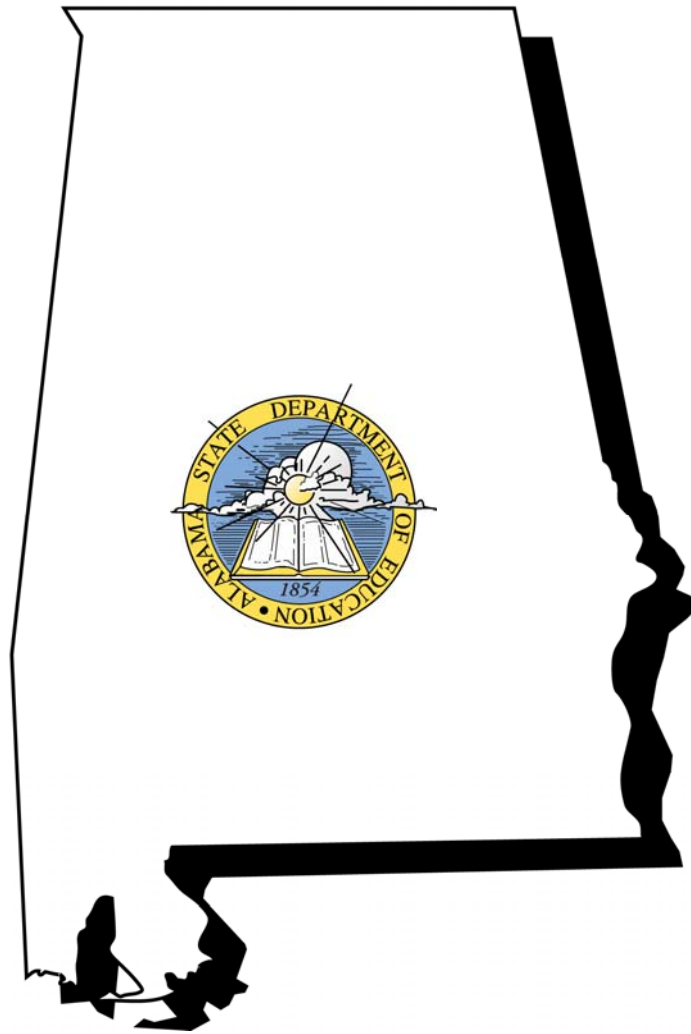# Alabama Course of Study
Technology Education

Joseph B. Morton
State Superintendent of Education
ALABAMA DEPARTMENT OF EDUCATION

SUPERINTENDENT
OF EDUCATION'S MESSAGE

Dear Educator:

The goal of the *Alabama Course of Study: Technology Education* is technology fluency for all students. The Information Age in which Alabama students live is a challenging and ever-changing time in history. Alabama students must be provided with instruction that integrates the use of a variety of technologies for accessing information, sharpening problem-solving skills, encouraging critical thinking, and working collaboratively. Utilization of technology tools enables students to function effectively whether the technology is used for productive work, enhanced communication, knowledge acquisition, or personal enjoyment.

Local school system teachers and administrators will notice that this new K-12 document contains a challenging set of standards to be mastered by students. Local school systems should develop local curriculum plans that incorporate these statements of what students should know and be able to do and make local decisions regarding how students will meet and perhaps go beyond the scope of these standards.

Local system leadership, school leadership, and effective classroom instruction are key to student success. Important local decisions include **how** students will accomplish these standards, in **what sequence** teachers will address them, and **how much time** will be given to the various components. These decisions are as significant as the identification of **what** students need to know and be able to do.

I believe a sound program of instruction has been developed to guide local school systems in the implementation of their technology education curricula. Using this new course of study as the foundation, let us work together to equip every student with the necessary technological skills for the competitive global marketplace and for a bright and promising future.

JOSEPH B. MORTON
State Superintendent of Education

Alabama Course of Study: Technology Education

Table of Contents

Preface

The *Alabama Course of Study: Technology Education* provides the framework for the Grades K-12 study of technology in Alabama's public schools. Content standards in this document define the minimum requirements according to the *Code of Alabama* (1975), §16-35-4. They are fundamental and specific but not exhaustive. When developing local curriculum, school systems may include additional content standards to reflect local philosophies and may add implementation guidelines, resources, and activities.

The 2007-2008 Technology Education Course of Study Committee and Task Force made extensive use of the *National Educational Technology Standards for Students: The Next Generation*, published by the International Society for Technology in Education (ISTE). In addition, Committee and Task Force members reviewed other states' technology curricula and read articles in professional journals and magazines during the development of the minimum required content.

Committee and Task Force members attended state and national conferences, listened to and read suggestions from interested individuals and groups throughout Alabama, and discussed each issue and standard among themselves. The Committee and Task Force reached consensus that the standards contained herein provide a sound technology curriculum for Alabama's students.

Acknowledgments

This document was developed by the 2007-2008 Technology Education Course of Study Committee and Task Force composed of elementary, middle school, high school, and college educators appointed by the State Board of Education and business and professional persons appointed by the Governor (*Code of Alabama*; (1975), §16-35-1). The Committee and Task Force began work in March 2007 and submitted the document to the State Board of Education for adoption at the March 2008 meeting.

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Alabama's K-12 Technology Education Curriculum

General Introduction

Alabama students live in one of the most exciting and ever-changing times in human history, the "Information Age." Indeed, the Information Age may be as influential in directing the course of human advancement as was the Industrial Revolution. As educators, we must ensure that our students are active participants during this time of phenomenal human progress. Although technology is not a panacea for solving all instructional problems, it equips students with tools that have not existed in the past. Technology offers students opportunities and possibilities that would not be available without it. Alabama students should be at the forefront of exploring these technological opportunities and possibilities.

A technology-fluent student demonstrates basic technological operations and concepts; understands human, cultural, and societal issues related to technology; and utilizes technology productivity, communication, collaboration, research, and problem-solving skills. Technology fluency for all Alabama students is the goal of Alabama's K-12 Technology Education program. The *Alabama Course of Study: Technology Education* defines the **minimum required content** that students should know and be able to do to learn effectively and live productively in an increasingly digital world. Content standards in this document are minimum and required as specified in the *Code of Alabama* (1975), §16-35-4. They are fundamental but not exhaustive. In developing local curriculum, school systems may include additional content standards to reflect local philosophies and add implementation guidelines, resources, and activities, which, by design, are not contained in this document.

The *National Educational Technology Standards for Students: The Next Generation* produced by the ISTE has established technology fluency as a national goal, and it continues to be a goal for Alabama students. Technology fluency enables students to use technology processes and products in everyday life to make informed decisions. A solid foundation in technology helps students develop and strengthen many of the skills they use daily such as solving problems creatively, thinking critically, and working cooperatively in teams. The technology-fluent person is more likely to face the challenges of a dynamic global society with confidence. Moreover, the economic productivity of Alabama is linked to the technological requirements of the workforce. To help students achieve technology fluency and make informed decisions, the K-12 Technology Education program places a renewed emphasis on the importance of authentic integration of technology every day in every grade and subject.

Alabama's K-12 Technology Education Curriculum

Conceptual Framework

Technology fluency, as depicted across the center of the globe on the conceptual framework graphic on page 3, is the overall goal of Alabama's Technology Education curriculum. The goal appears in a prominent position to reflect its importance in directing the structure and content of this course of study to ensure the best possible technology education program for all Alabama students. Technology-fluent students are proficient in operating technology systems and in conducting research using digital tools. In addition, they are able to use digital tools to solve real-world problems, collaborate with others, and create simulations.

The conceptual framework graphic succinctly summarizes the structure and goal of technology education in Alabama. Links radiating from the highlighted state of Alabama represent a digital connection of Alabama's students to other parts of the world. The circuit board, serving as the background for the framework, is the foundation for all technology systems. Likewise, the academic content standards in this course of study serve as the foundation for Alabama students to become technologically fluent.

To face the many challenges of a global society, Alabama students must be given every opportunity to achieve technology fluency. The need for Alabama students to succeed in an increasingly digital world is represented by the global impression on the graphic representation of the conceptual framework. The technology content standards are organized into six distinct strands—**Technology Operations and Concepts**; **Digital Citizenship**; **Research and Information Fluency**; **Communication and Collaboration**; **Critical Thinking, Problem Solving, and Decision Making**; **and Creativity and Innovation**. These strands are symbolized in the conceptual framework on the flexible cable that wraps around the globe—a symbol that represents the interconnectedness of the strands. Just as cables are one or more fibers bound together with a common sheath, or for a common purpose, the strands represented in this document are bound together for the common goal of student achievement of technology fluency. As it is often necessary for cables to be flexible, it is necessary to be flexible in teaching the content standards in this document, which by design are not listed in sequential order, but rather, grouped by strands.

Content standards build on each succeeding grade level, eliminating repetition from one grade or course to another. For example, standards in the Creativity and Innovation strand progress from designing original works using digital tools in Grades K-2 and creating a product using digital tools in Grades 3-5 to using digital tools to generate new ideas, products, or processes in Grades 6-8, and creating an interactive, digital product using programming logic in the Grades 9-12 Computer Applications course. Similar progressions are found in each of the other five strands. While students achieve technology fluency at varying degrees throughout the grades, the content standards establish the minimum required content that all students should must master.

The goal for the technology education curriculum is interwoven throughout the six strands of the technology education content standards. The standards address each level of instruction with an increase in depth and rigor from the primary grades through high school. This curriculum, when combined with effective instruction, enables students to achieve the overall goal for technology education in Alabama, *technology fluency.*

Conceptual Framework
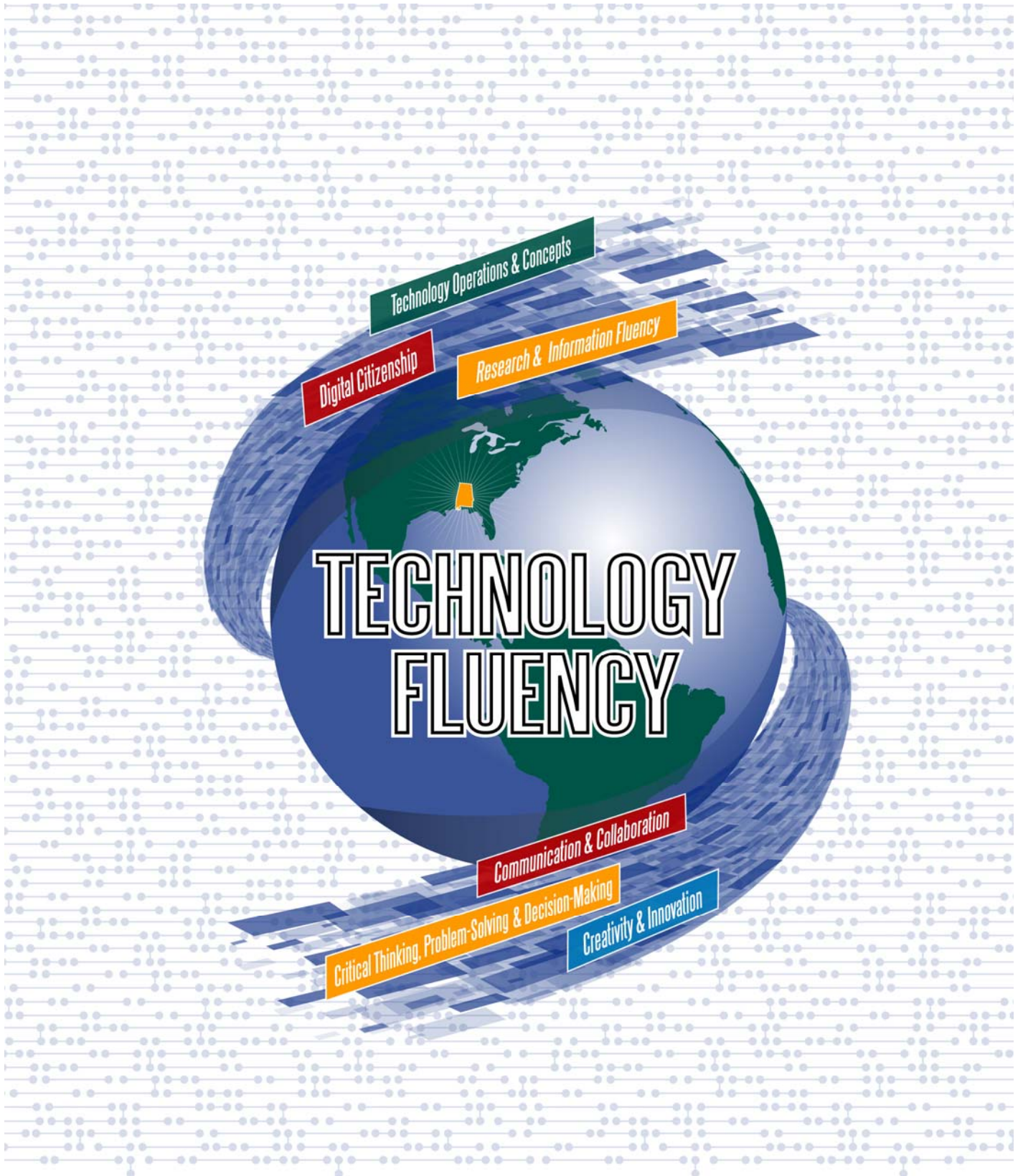
Position Statements

Keyboard Utilization

Students must be able to use computers and other technologies as tools for productivity and creativity; therefore, keyboarding skills emphasizing accuracy and technique must be introduced in Grades K-2 with keyboarding proficiency demonstrated by the completion of Grade 8. Although new and emerging technology systems are not limited to the traditional computer keyboard, inadequate keyboarding skills may diminish a student's ability to operate some technology systems. Keyboarding is a kinesthetic skill acquired through systematic, repetitive instruction in touch-typing. Therefore, sporadic access to a computer hinders the development of keyboarding skills.

Various levels of keyboard utilization are included in the *Alabama Course of Study: Technology Education*. Local school systems are encouraged to use this document in designing and implementing a scope and sequence plan for appropriate skill development.

Global Awareness

It is essential that today's students possess technology skills needed to compete in an increasingly competitive global marketplace marked by rapid change. In order to become global citizens in a highly technological society, students must be given every opportunity to become technologically fluent. The *Alabama Course of Study: Technology Education* document provides the foundation for students to acquire these skills.

Professional Development

Content standards in this course of study illustrate the need for well-trained, highly-qualified classroom teachers who design, develop, and facilitate effective learning in technology. Skills required for mastering the rigor contained in these standards can most successfully be modeled for Alabama's students by teachers who possess a strong technological foundation. Local school systems should provide opportunities for ongoing professional development opportunities for all teachers. In addition, teachers are encouraged to continue to update technology skills through active participation in local, state, and national technology organizations as well as serve as mentors to those new to the profession. Alabama students deserve capable educators who have a deep and broad understanding of technology and who seek to continue their professional growth.

Local Waivers for the Computer Applications Course

Local education agencies (LEAs) may waive the required Computer Applications course for students who demonstrate to qualified staff the competencies outlined in the Grade 9-12 content standards of the 2008 *Alabama Course of Study: Technology Education*. LEAs offering waiver should design and implement effective, meaningful assessments, such as comprehensive portfolios of digital works that include simulations and other student projects, for determining student proficiency in the competencies. In addition, LEAs are encouraged to offer advanced-level technology education courses not only for students demonstrating the competencies outlined in the Computer Application course, but for all students desiring to maintain fluency in technology and keep pace with rapidly

occurring changes in technology with the goal of achieving technology proficiency for lifelong learning pursuits.

Cyber Safety

The Internet is an important education resource that has become commonplace in America's classrooms. Teachers, when assigning Internet research, have the added responsibility of teaching cyber safety. The *Alabama Course of Study: Technology Education* document provides cyber safety standards in each cluster to address protection of personal information and avoidance of online predators and cyberbullying. LEAs should establish and strictly enforce local guidelines for Internet use by students. With these guidelines in mind, students and teachers can make optimal use of technology in learning.

Equitable Access

Technology education offers powerful opportunities for reaching, motivating, and teaching all students in all grades. Regardless of background or ability, all students deserve an opportunity to become technologically fluent. Frequent and reliable access to current and emerging technologies and digital resources should be provided for ALL students in Alabama.

Integration of Technology

Alabama's goal of technology fluency for every student necessitates the seamless integration of technology and twenty-first century skills throughout the curricula. The immersion of technology into the curriculum provides an engaging means for students to locate, assemble, and apply relevant information to make connections with essential knowledge. Effectively integrating technology can extend learning beyond the classroom to ensure that all students achieve the technology fluency necessary to succeed in a global society.

Assessment

Twenty-first century skills are not adequately measured using twentieth-century assessments such as paper and pencil objective tests. Technology skills are inherently performance skills and must be evaluated through project- or problem-based assessments, which could be included in a digital portfolio format. While it is important for students to demonstrate technology fluency through performance to meet the high school graduation requirement for one-half credit in computer applications, it is more important for students to apply technology knowledge and skills to problem solving to be better prepared for tomorrow's workforce.

Directions for Interpreting the Minimum Required Content

1. **CONTENT STANDARDS** are statements that define what students should know and be able to do at the conclusion of a course or grade. Content standards in this document contain minimum required content. The order in which standards are listed within a course or grade is not intended to convey a sequence for instruction. Each content standard completes the phrase "*Students will*."

Students will:

Critique digital content for validity, accuracy, bias, currency, and relevance.

(Computer Applications – Content Standard 11)

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2. **BULLETS** denote content that is related to the standards and required for instruction. Bulleted content is listed under a standard and identifies additional minimum required content.

Students will:

Identify common hardware and software problems.
- Determining basic troubleshooting strategies to correct hardware and software problems

(Third-Fifth Grade – Content Standard 3)

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3. **EXAMPLES** clarify certain components of content standards or bullets. They are illustrative but not exhaustive.

Students will:

Describe advances in technology and the effects of each on the workplace and society.
Examples: agriculture, manufacturing, medicine, warfare, transportation, communication, education

(Sixth-Eighth Grade – Content Standard 10)

Kindergarten – Second Grade Overview

Students in primary grades are developing self-concepts, motor skills, and social relationships. They need opportunities for first-hand experiences in solving problems and manipulating real objects. Language development is an integral part of their learning experience.

Young students learn best through exploration and interaction with peers and adults. Technology lends itself to this style of learning. Developmentally appropriate activities should be planned to provide students with opportunities to utilize technology skills as they accomplish curriculum objectives.

Digital media content provides broad experiences through video, images, and sounds from around the world. Open-ended software allows students to practice problem solving in safe, creative environments. The use of interactive Web sites creates interest in reading and develops decoding and comprehension skills. Written and verbal expression is enhanced through multimedia presentations; desktop publishing of students' creative writing; and videotaping of show and tell, drama, and poetry recitations. Students become accustomed to utilizing technology tools when technology is integrated into a variety of learning situations.

Effective teachers help students construct knowledge from information gathered from online curriculum projects, electronic databases, and other technology resources supported by productivity software such as graphing and drawing tools. Responsible, ethical, and safe use of technology systems is modeled by the teacher and internalized by students as they begin their journey into the global community as digital citizens.

The inherent motivation created by using digital tools can increase students' interest and excitement for learning. Technology education equips them with skills that enhance not only their formal educational years but also their professional and personal lives.

Kindergarten – Second Grade

Technology Operations and Concepts

Students will:

1. Identify basic parts of various technology systems.
   - Naming input and output devices
     Examples: input—keyboard, stylus
     output—printer

2. Identify applications and operations of various technology systems.
   Examples: applications—word processing, multimedia presentation software
   operations—opening, closing, and saving files

   - Using accurate terminology related to technology
     Example: "press," not "hit," keys
   - Using input devices to enter letters, numbers, and symbols
   - Using special functions of input devices
     Example: keyboard shortcuts
   - Labeling storage media
   - Removing storage media safely

3. Demonstrate correct posture and finger placement while using a technology system.

Digital Citizenship

4. Identify safe use of technology systems and applications.
   Examples: protecting personal information online, avoiding inappropriate sites, exiting
   inappropriate sites

5. Practice responsible use of technology systems and applications.
   Example: maintaining proper settings

   - Demonstrating care of digital equipment and media
     Examples: washing hands before use, cleaning work area before and after use
   - Distinguishing between ethical and unethical use of others' work
     Examples: avoiding plagiarism, avoiding manipulation of others' work without
     permission

6. Identify uses of technology systems in daily living.

Research and Information Fluency

7. Use digital tools to access and retrieve information.
    Examples: online libraries, multimedia dictionaries, search engines, directories

    - Evaluating accuracy of digital content
        Example: determining fact versus opinion

Communication and Collaboration

8. Use digital environments to exchange ideas with individuals or groups.
    Examples: other states, other countries

    - Producing digital works collaboratively
        Examples: developing shared writing projects, creating language experience
                   stories

Critical Thinking, Problem Solving, and Decision Making

9. Identify digital tools used for problem solving.
    Examples: spell check, digital graphic organizers, electronic drawing programs,
               simulation software

Creativity and Innovation

10. Design original works using digital tools.
    Examples: tools—digital drawing tools, music software, word processing software,
                digital cameras

Third – Fifth Grade Overview

Students in Grades 3-5 begin to expand their horizons and exercise more independent thoughts and actions. Many opportunities to utilize technology should be provided for students to work collaboratively and independently to accomplish authentic tasks. Research conducted through digital communities and interaction with experts in specialized fields of study sharpens skills needed across all curriculum areas, including analyzing data, solving problems, reading for meaning, organizing information, and drawing conclusions. Students begin to use digital resources more independently to conduct searches required for completing task assignments. This naturally leads to discussion of safe, legal, and ethical use of information and judgments regarding the value of information found in digital sources.

Activities using information drawn from digital sources lend structure to projects while remaining open-ended enough to encourage critical thinking and allow for pursuit of individual interests. Students at this age are becoming more literate regarding the use of a variety of technology that enables them to express themselves through original compositions and illustrations.

A technology-infused curriculum cultivates an atmosphere rich with motivation and interest in which students thrive intellectually and emotionally. Technology and academic skills mastered at this level provide the basis for future learning experiences.

Third – Fifth Grade

Technology Operations and Concepts

Students will:

1. Use input and output devices of technology systems.
   Examples: input—recording devices, keyboards, touchscreens
   output—printers

   - Demonstrating ergonomics relative to technology systems
   - Demonstrating correct keyboarding techniques
   - Demonstrating safe removal of storage media

2. Use various technology applications, including word processing and multimedia software.
   - Using navigational features commonly found in technology applications
   - Identifying digital file types

3. Identify common hardware and software problems.
   - Determining basic troubleshooting strategies to correct hardware and software problems

4. Identify various operating systems of technology devices.

Digital Citizenship

5. Practice safe use of technology systems and applications.
   Examples: protecting personal information online, avoiding inappropriate sites, exiting inappropriate sites

6. Describe social and ethical behaviors related to technology use.
   Examples: social—developing positive attitudes for using technology collaboratively
   ethical—citing sources of text and digital content, avoiding plagiarism, avoiding manipulation of others' work without permission

   - Describing the global nature of the Internet
   - Following local acceptable-use policies regarding technology
   - Identifying intrusive applications, including worms, viruses, spyware, and pop-up advertisements

7. Explain the influence of technology on society.
   Examples: multiple digital communities, medical and agricultural advancements

Research and Information Fluency

8. Collect information from a variety of digital sources.
   Examples: online libraries, multimedia dictionaries

   - Using technology tools to organize information
   - Demonstrating efficient Internet search strategies
     Example: keyword search
   - Evaluating electronic resources for reliability based on publication date, bias, accuracy, and source credibility

9. Use technology tools to organize, interpret, and display data.
   Examples: spreadsheets, databases, electronic graphing tools

Communication and Collaboration

10. Use digital environments to collaborate and communicate.
    Examples: publishing online journals, sharing presentations, contributing to online discussions, communicating with experts

    - Producing digital works collaboratively
      Examples: developing shared writing projects and group multimedia projects

Critical Thinking, Problem Solving, and Decision Making

11. Use digital tools to analyze authentic problems.
    Examples: electronic graphing tools, concept-mapping software

Creativity and Innovation

12. Create a product using digital tools.
    Examples: products—digital story, podcast, digital artwork

Alabama Course of Study: Technology Education

Sixth – Eighth Grade Overview

Students in Grades 6-8 possess a wide range of intellectual abilities, learning styles, talents, and interests. These students are experiencing a transitional period that includes physical, social, emotional, and intellectual changes. In addition, students are developing skills to function in a technological society.

The technology content standards for Grades 6-8 are designed to complement all areas of the academic curriculum. In a world where information increases exponentially, students are expected to develop and use critical-thinking and decision-making skills. Digital tools enhance middle school students' emerging abilities to analyze, synthesize, and evaluate information. The integration of technology systems expands and optimizes their ability to use information and to communicate and collaborate with diverse individuals. It is critical for students at these grade levels to expand the knowledge and skills necessary for solving both hypothetical and authentic problems.

In a global world community, students are expected to be responsible digital citizens who practice safe, legal, and responsible use of technology systems and digital media. Students must comprehend the impact of technology on the cultural, social, economic, environmental, and political aspects of society. Positive attitudes toward technology use are essential to support collaboration, learning, and productivity for success in the twenty-first century.

Sixth – Eighth Grade

Technology Operations and Concepts

Students will:

1. Appraise technology systems to determine software and hardware compatibility.

2. Publish digital products that communicate curriculum concepts.
    Examples: Web pages, videos, podcasts, multimedia presentations

3. Explain how network systems are connected and used.
    Examples: file sharing, collaborating, wireless networking

4. Determine basic troubleshooting strategies to correct common hardware and software problems.
    Examples: checking connections, restarting equipment, creating a backup copy of digital data

    -   Describing the importance of antivirus and security software

5. Use basic features of word processing, spreadsheets, databases, and presentation software.
    Examples: word processing—reports, letters, brochures
    spreadsheets—discovering patterns, tracking spending, creating budgets
    databases—contact list of addresses and telephone numbers
    presentation software—slideshow

6. Select specific digital tools for completing curriculum-related tasks.
    Examples: spreadsheet for budgets, word processing software for essays, probes for data collection

7. Demonstrate correct keyboarding techniques.

Digital Citizenship

8. Identify safe uses of social networking and electronic communication.
    -   Recognizing dangers of online predators
    -   Protecting personal information online

9. Practice responsible and legal use of technology systems and digital content.
    Examples: avoiding plagiarism; complying with acceptable-use policies, copyright laws, and fair use standards; recognizing secure Web sites

    -   Identifying examples of computer crime and related penalties
        Examples: computer crime—phishing, spoofing, virus and worm dissemination, cyberbullying
        penalties—fines, incarceration
    -   Citing sources of digital content

10. Describe advances in technology and effects of each on the workplace and society.
    Examples: agriculture, manufacturing, medicine, warfare, transportation, communication, education

Research and Information Fluency

11. Use digital tools and strategies to locate, collect, organize, evaluate, and synthesize information.
    Examples: locating—Boolean searches, graphic organizers, spreadsheets, databases
    collecting—probeware, graphing calculators
    organizing—graphic organizers, spreadsheets
    evaluating—reviewing publication dates, determining credibility
    synthesizing—word processing software, concept-mapping software

Communication and Collaboration

12. Use digital tools to communicate and collaborate at all levels from interpersonal to global.
    Examples: instant messages, e-mail, blogs, wikis, collaborative authoring tools, online learning communities

- Demonstrating digital file transfer
    Examples: attaching, uploading, downloading

Critical Thinking, Problem Solving, and Decision Making

13. Use digital tools to formulate solutions to authentic problems.
    Examples: electronic graphing tools, probes, spreadsheets

Creativity and Innovation

14. Use digital tools to generate new ideas, products, or processes.
    Examples: ideas—predictions, trends
    products—animation, video
    processes—models, simulations

Ninth – Twelfth Grade Overview

Students in Grades 9-12 experience significant growth and development as they assume more complex responsibilities such as working and making career choices. They are continuing to develop unique personalities and are making important life decisions. High school students are strengthening and practicing leadership and interpersonal communication skills in the school and community that facilitate entrance into adulthood. They continue to experience physical and emotional changes as well as seek opportunities for realizing independence and individuality.

Grades 9-12 students have broadened their perspective regarding the importance of existing and developing technologies and have an understanding of the scope of technology in today's world. As students progress through the high school years, they are able to address a variety of problems on a variety of topics in a logical manner. Technology offers students an efficient means by which many types of problems may be solved.

Because of cultural and ideological diversity in a technologically-advanced global society, many students have opportunities to interact with others whose backgrounds are different from their own. As the use of technology brings humankind closer together, concepts and skills addressed in the Computer Applications course will assist students in developing skills necessary for becoming productive adults.

The Computer Applications course is designed to provide students with technology fluency appropriate for the twenty-first century. Fluency includes the knowledge of current technology systems as well as skills and attitudes necessary to adopt new technologies and systems as they emerge. Additional components of the course equip students with the ability to conduct research and solve problems; demonstrate creative thinking; develop innovative products; practice safe, ethical, and legal use of technology systems; and use technology and information to communicate and collaborate at all levels from interpersonal to global.

Content standards in this course include hands-on, practical pursuits that extend beyond the computer classroom or laboratory. Course content is integrated into other curricular areas to allow students to reinforce and expand technology competencies. As students become proficient users of computers and other technologies in the classroom, benefits of using these tools for researching, analyzing, and synthesizing information beyond the classroom become evident. Technology-fluent students realize technology tools and resources enhance not only educational endeavors, but also personal and professional success as well.

Computer Applications

Technology Operations and Concepts

Students will:

1. Explain data encryption procedures.

2. Diagnose hardware and software problems.
   Examples: viruses, error messages

   - Applying strategies to correct malfunctioning hardware and software
   - Performing routine hardware maintenance
   - Describing the importance of antivirus and security software

3. Demonstrate advanced technology skills, including compressing, converting, importing, exporting, and backing up files.
   - Transferring data among applications
   - Demonstrating digital file transfer
        Examples: attaching, uploading, downloading

4. Utilize advanced features of word processing software, including outlining, tracking changes, hyperlinking, and mail merging.

5. Utilize advanced features of spreadsheet software, including creating charts and graphs, sorting and filtering data, creating formulas, and applying functions.

6. Utilize advanced features of multimedia software, including image, video, and audio editing.

7. Utilize advanced features of database software, including merging data, sorting, filtering, querying, and creating reports.

8. Practice safe uses of social networking and electronic communication.
   - Recognizing dangers of online predators
   - Protecting personal information online
        Example: recognizing risk of identity theft

Digital Citizenship

9. Practice ethical and legal use of technology systems and digital content.
   - Explaining consequences of illegal and unethical use of technology systems and digital content
        Examples: cyberbullying, plagiarism
   - Interpreting copyright laws and policies with regard to ownership and use of digital content
   - Citing sources of digital content using a style manual
        Examples: Modern Language Association (MLA), American Psychological Association (APA)

10. Analyze capabilities and limitations of current and emerging technologies.
   - Assessing effects of technology on culture, economics, politics, and the environment
   - Comparing capabilities of various technologies to address personal, social, lifelong learning, and career needs

Research and Information Fluency

11. Critique digital content for validity, accuracy, bias, currency, and relevance.

Communication and Collaboration

12. Use digital tools to publish curriculum-related content.
   Examples: Web page authoring software, coding software, wikis, blogs, podcasts

13. Demonstrate collaborative skills using curriculum-related content in digital environments.
   Examples: completing assignments online; interacting with experts and peers in a structured, online learning environment

Critical Thinking, Problem Solving, and Decision Making

14. Use digital tools to defend solutions to authentic problems.
   Example: disaggregating data electronically

Creativity and Innovation

15. Forecast technology innovations based on trends.

16. Create a product that integrates information from multiple software applications.
   Example: pasting spreadsheet-generated charts into a presentation

17. Create an interactive digital product using programming logic.
   Examples: products—digital games, interactive learning tools
   programming logic—"if-then" statements, authoring software

Alabama High School Graduation Requirements

(*Alabama Administrative Code* 290-3-1-02(8)(a) (b) and (c))

1. **COURSE REQUIREMENTS**

   The Alabama courses of study shall be followed in determining minimum required content in each discipline. Students seeking the Alabama High School Diploma with Advanced Academic Endorsement shall complete advanced level work in the core curriculum. Students receiving the Alabama High School Diploma with Credit-Based Endorsement shall complete the prescribed credits, including at least one Career and Technical Education course, for the Alabama High School Diploma and pass three of the five sections of the Alabama High School Graduation Exam, including the Mathematics section, Reading section, and one additional section.

COURSE REQUIREMENTS	Alabama High School Diploma Credits	Alabama High School Diploma with Advanced Academic Endorsement Credits	Alabama High School Diploma with Credit-Base Endorsement Credits
ENGLISH LANGUAGE ARTS	**4**	**4**	**4**
Four credits to include the equivalent of:			
English 9	1	1	1
English 10	1	1	1
English 11	1	1	1
English 12	1	1	1
MATHEMATICS	**4**	**4**	**4**
Four credits to include the equivalent of:			
Algebra I	1	1	1
Geometry	1	1	1
Algebra II with Trigonometry		1	
Mathematics Elective(s)	2	1	2
SCIENCE	**4**	**4**	**4**
Four credits to include the equivalent of:			
Biology	1	1	1
A physical science	1	1	1
Science Electives	2	2	2
SOCIAL STUDIES*	**4**	**4**	**4**
Four credits to include the equivalent of:			
Grade 9 Social Studies	1	1	1
Grade 10 Social Studies	1	1	1
Grade 11 Social Studies	1	1	1
Grade 12 Social Studies	1	1	1
PHYSICAL EDUCATION	**1**	**1**	**1**
HEALTH EDUCATION	**0.5**	**0.5**	**0.5**
ARTS EDUCATION	**0.5**	**0.5**	**0.5**
COMPUTER APPLICATIONS**	**0.5**	**0.5**	**0.5**
FOREIGN LANGUAGE**		**2**	
ELECTIVES	**5.5**	**3.5**	**5.5**
Local boards shall offer foreign languages, fine arts, physical education, wellness education, career/technical education, and driver education as electives.			
TOTAL CREDITS	**24**	**24**	**24**

   *   All four required credits in Social Studies shall comply with the current *Alabama Course of Study*.

   **   May be waived if competencies outlined in the computer applications course are demonstrated to qualified staff in the local school system. The designated one-half credit shall then be added to the electives credits, making a total of six electives credits for the Alabama High School Diploma and the Alabama High School Diploma with Credit Based Endorsement or four electives credits for the Alabama High School Diploma with Advanced Academic Endorsement.

  ***   Students earning the diploma with the advanced academic endorsement shall successfully complete two credits in the same foreign language.

2. **ASSESSMENT REQUIREMENTS**

   Pass the required statewide assessment for graduation

Alabama High School Graduation Requirements (continued)
(*Alabama Administrative Code* **290-3-1-.02(8)(g)1.**)

Course and assessment requirements specified below must be satisfied in order to earn the Alabama Occupational Diploma.

1. **COURSE REQUIREMENTS**
   Effective for students with disabilities as defined by the *Individuals with Disabilities Education Act,* students must earn the course credits outlined in *Alabama Administrative Code* r. 290-3-1-.02(8)(g)1.

COURSE REQUIREMENTS	Alabama Occupational Diploma Credits
ENGLISH LANGUAGE ARTS	**4**
*Four credits to include the equivalent of:	
English I	1
English II	1
English III	1
English IV	1
MATHEMATICS	**4**
*Four credits to include the equivalent of:	
Math I	1
Math II	1
Math III	1
Math IV	1
SCIENCE	**4**
*Four credits to include the equivalent of:	
Science I	1
Science II	1
Science III	1
Science IV	1
SOCIAL STUDIES	**4**
*Four credits to include the equivalent of:	
Social Studies I	1
Social Studies II	1
Social Studies III	1
Social Studies IV	1
CAREER AND TECHNICAL EDUCATION	**2**
COORDINATED STUDIES OR TRANSITIONAL SERVICES	**1**
COOPERATIVE CAREER AND TECHNICAL EDUCATION	**1**
HEALTH EDUCATION	**0.5**
PHYSICAL EDUCATION	**1**
ARTS EDUCATION	**0.5**
ELECTIVES	**2**
Existing laws require LEAs to offer arts education, physical education, wellness education, career/technical education, and driver education as electives.	
TOTAL CREDITS	**24**

* All AOD credits shall comply with the current curriculum guides designated for AOD implementation. Local Education Agencies may add additional credits or requirements.

2. **ASSESSMENT REQUIREMENTS**
   Take the required statewide assessment for graduation at least once (during the spring of the eleventh-grade year).

Guidelines and Suggestions for
Local Time Requirements and Homework

Total Instructional Time

The total instructional time of each school day in all schools and at all grade levels shall be not less than 6 hours or 360 minutes, exclusive of lunch periods, recess, or time used for changing classes (*Code of Alabama,* 1975, §16-1-1).

Suggested Time Allotments for Grades 1 - 6

The allocations below are based on considerations of a balanced educational program for Grades 1-6. Local school systems are encouraged to develop a general plan for scheduling that supports interdisciplinary instruction. Remedial and/or enrichment activities should be a part of the time schedule for the specific subject area.

Subject Area	Grades 1-3	Grades 4-6
Language Arts	150 minutes daily	120 minutes daily
Mathematics	60 minutes daily	60 minutes daily
Science	30 minutes daily	45 minutes daily
Social Studies	30 minutes daily	45 minutes daily
Physical Education	30 minutes daily*	30 minutes daily*
Health	60 minutes weekly	60 minutes weekly
Technology Education (Computer Applications)	60 minutes weekly	60 minutes weekly
Character Education	10 minutes daily**	10 minutes daily**
Arts Education		

Dance	*Daily instruction with certified arts specialists in each of the arts disciplines*
Music	*is the most desirable schedule. However, schools unable to provide daily arts*
Theatre	*instruction in each discipline are encouraged to schedule in Grades 1*
Visual Arts	*through 3 two 30- to 45-minute arts instruction sessions per week and in Grades 4 through 6 a minimum of 60 minutes of instruction per week. Interdisciplinary instruction within the regular classroom setting is encouraged as an alternative approach for scheduling time for arts instruction when certified arts specialists are not available.*

* Established by the State Department of Education in accordance with *Code of Alabama*, 1975, §16-40-1

** Established by the State Department of Education in accordance with *Code of Alabama*, 1975, §16-6B-2(h)

Kindergarten

In accordance with *Alabama Administrative Code* r. 290-5-1-.01(5) <u>Minimum Standards for Organizing Kindergarten Programs in Alabama Schools</u>, the daily time schedule of the kindergartens shall be the same as the schedule of the elementary schools in the systems of which they are a part since kindergartens in Alabama operate as full-day programs. There are no established time guidelines for individual subject areas for the kindergarten classroom. The emphasis is on large blocks of time that allow children the opportunity to explore all areas of the curriculum in an unhurried manner.

It is suggested that the full-day kindergarten program be organized utilizing large blocks of time for large group, small groups, center time, lunch, outdoor activities, snacks, transitions, routines, and afternoon review. Individual exploration, small-group interest activities, interaction with

peers and teachers, manipulation of concrete materials, and involvement in many other real-world experiences are needed to provide a balance in the kindergarten classroom.

Grades 7-12

One credit may be granted in Grades 9-12 for required or elective courses consisting of a minimum of 140 instructional hours or in which students demonstrate mastery of Alabama course of study content standards in one credit courses without specified instructional time. (*Alabama Administrative Code* r. 290-3-1-.02 (9)(a))

In those schools where Grades 7 and 8 are housed with other elementary grades, the school may choose the time requirements listed for Grades 4-6 or those listed for Grades 7-12.

Character Education

For all grades, not less than 10 minutes instruction per day shall focus upon the students' development of the following character traits: courage, patriotism, citizenship, honesty, fairness, respect for others, kindness, cooperation, self-respect, self-control, courtesy, compassion, tolerance, diligence, generosity, punctuality, cleanliness, cheerfulness, school pride, respect of the environment, patience, creativity, sportsmanship, loyalty, and perseverance.

Homework

Homework is an important component of every student's instructional program. Students, teachers, and parents should have a clear understanding of the objectives to be accomplished through homework and the role it plays in meeting curriculum requirements. Homework reflects practices that have been taught in the classroom and provides reinforcement and/or remediation for students. It should be student-managed, and the amount should be age-appropriate, encouraging learning through problem solving and practice.

At every grade level, homework should be meaning-centered and mirror classroom activities and experiences. Independent and collaborative projects that foster creativity, problem-solving abilities, and student responsibility are appropriate. Parental support and supervision reinforce the quality of practice or product as well as skill development.

Each local board of education shall establish a policy on homework consistent with the State Board of Education resolution adopted February 23, 1984 (Action Item #F-2).

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Glossary

Antivirus Program – A software utility program that searches digital media for programs or pieces of code that are loaded onto technology systems and run without user knowledge or permission.

Blog – An online journal comprised of links and postings in reverse chronological order that is intended to be viewed or commented on by others.

Cyberbullying – Using technologies, including e-mail, Web sites, instant messages, and cellular telephones, to deliberately harass, threaten, or intimidate someone.

Data – Discrete pieces of information that can be organized for analysis or used for decision making.

Data Encryption – Converting data into a code that cannot be easily understood by unauthorized individuals.

Digital Media – 1. Any form of information, including text, graphics, audio, and video, that is stored on a technology system or device. 2. Any storage device that holds digital content, including Universal Series Bus (USB) drives, music player (MP) 3 devices, compact diskettes (CDs), and digital video diskettes (DVDs).

Digital Tools – Hardware or software that aids in gathering data, organizing information, and creating products. Examples: word-processing software, concept-mapping tools, spreadsheet software, probes, personal digital assistants.

Ergonomics – The applied science of equipment design intended to maximize productivity by reducing user fatigue and discomfort. Something that is ergonomic is designed for safe, comfortable, and efficient use.

Digital Citizenship – The responsible, ethical, legal, and safe use of technology systems by individuals as members of society and citizens of the global community.

Global Awareness – A conceptual understanding of global and cultural perspectives, including social, economic, cultural, political, and environmental factors.

Handheld Device – A portable computing device that can easily be used in-hand and typically consists of a small visual display screen for output and a miniature keyboard, touch screen, or stylus for user input. Examples: cellular telephones, MP3 devices, personal digital assistants.

Input Device – Any device that feeds data into a computer. Examples: keyboard, mouse, stylus, touch screen.

Instant Messaging (**IM**) – Exchanging text messages between two or more individuals through a software application in real-time.

Multimedia Presentation – Using any combination of text, graphics, audio, or video to present information.

Network – Technology systems connected together to share information.

Networked Technology System – Any technology system that includes hardware, software, or peripherals and connects with other technological systems using cables or wireless frequencies.

Operating System – The first software program to load into a technology system's main memory when the device is turned on. It manages all other programs of a technology system.

Output Device – Any device capable of representing information from a technology system. Examples: printer, plotter, display screen.

Podcast – A digital media file or collection of digital media files distributed over the Internet for playback on portable media players and other technology systems.

Simulation Software – Programs that imitate real phenomena. The programs model real-world situations and processes such as weather conditions, chemical reactions,

construction models, economic trends, and management of virtual businesses; can be used to design and test equipment without actually building the equipment.

Social Networking – Online communities of people who share interests and activities, or who are interested in exploring the interests and activities of others.

Technology System – Any technology device that includes hardware, software, or peripherals. Examples: computers, cellular telephones, personal digital assistants, MP3 devices.

Touch Screen – A display screen sensitive to human touch that allows a user to interact with the technology system by touching graphics or text on the screen.

Touchpad – A stationary pointing device with a small, flat surface over which a user slides a finger using the same movements as when using a mouse. The pad's surface can be tapped as an alternative to pressing one of the touchpad keys.

Troubleshoot – To analyze a technology system that is not operating correctly and then apply strategies to solve problems.

Virus – A program or piece of code that is loaded onto a technology system and runs without user knowledge or permission.

Wiki – Server software that allows users to collaboratively create, edit, and link Web pages using any Web browser.

Worm – A program or algorithm that replicates itself over a network without user knowledge or permission and performs malicious actions, including depleting system resources or shutting down system.

Alabama Course of Study: Technology Education