Alabama Course of Study

Technology Education

Basic Operations and Concepts
Technology Problem-Solving and Decision-Making Tools
Technology Research Tools
Technology Communications Tools
Technology Productivity Tools
Social, Ethical, and Human Issues

Technology Literacy

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ALABAMA DEPARTMENT OF EDUCATION
Bulletin 2002, No. 21
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Dear Educator:

The goal of the Alabama Course of Study: Technology Education (Bulletin 2002, No. 21) is technology literacy 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, and encouraging critical thinking. In the future, utilization of technology tools will enable students to function effectively whether the technology be 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 will be the keys to students’ 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 sincerely support the K-12 technology curriculum for students as outlined in this course of study. I believe this document provides strong direction for a solid technology education program that will equip students with the necessary technological skills for the competitive global marketplace.

ED RICHARDSON
State Superintendent of Education
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PREFACE

The Alabama Course of Study: Technology Education (Bulletin 2002, No. 21) provides the framework for the K-12 study of technology in Alabama’s public schools. Content standards in this document define the minimum requirements according to 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/or activities.

The 2001-2002 Technology Education Task Force made extensive use of the National Educational Technology Standards for Students–Connecting Curriculum and Technology, published by the International Society for Technology. In addition, Task Force members reviewed Professional Competency Continuum: Professional Skills for the Digital Age Classroom, published by Milken Exchange on Educational Technology; Apple Classroom of Tomorrow, published by Apple Computers; and other states’ technology curricula and read articles in professional journals and magazines during the development of the minimum required content.

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 Task Force reached consensus that the standards contained herein provide a sound technology curriculum for Alabama’s students.
The document was developed by the 2001-2002 Technology Education Task Force composed of early childhood, middle school, high school, and college educators appointed by the State Superintendent of Education. The Task Force began work in June 2001, and the State Board of Education approved this document at its February 2002 meeting.

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Roger Mac Adkins, Ed.D. provided the graphic illustration for the front cover and Richard O. Murphy, Jr. provided the graphic illustrations found within the document.
Alabama’s K-12 Technology Education Curriculum
An 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 exist without it. Alabama students should be at the forefront of exploring these technological opportunities and possibilities.

A technology literate student demonstrates basic technological operations and concepts; understands social, ethical, and human issues related to technology; and utilizes technology productivity, communication, research, and problem-solving skills. Technology literacy 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 need for achieving technology literacy. 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/or activities, which, by design, are not contained in this document.

The National Educational Technology Standards for Students produced by the International Society for Technology in Education (ISTE) has established technology literacy as a national goal, and it continues to be a goal for Alabama students. Technology literacy enables students to use technology processes and products in everyday life to make informed decisions. A solid foundation in technology helps to develop and strengthen many of the skills that students use daily such as solving problems creatively, thinking critically, and working cooperatively in teams. The technologically literate 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 literacy 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

The Conceptual Framework

Students use technology competencies as tools for learning across all content areas. Achieving the content standards in this document will provide the opportunity for students to become effective technology users by developing a knowledge base, building a repertoire of strategies, and applying these strategies in various contexts. The Conceptual Framework on page 4 is a graphic model of Alabama’s K-12 technology program. The six strands as defined by the International Society for Technology in Education (ISTE) are: (1) basic operations and concepts, (2) social, ethical, and human issues, (3) technology productivity tools, (4) technology communications tools, (5) technology research tools, and (6) technology problem-solving and decision-making tools. Integrating these into meaningful classroom activities provides opportunities for students to obtain and communicate information, to respond to communication, to use technology for learning and reflecting, and to apply critical- and creative-thinking skills for solving problems. The division of the content into standards that support the overall goal of technology literacy provides assistance to teachers for planning technology-based activities.

Technology Foundation Standards for Students

1. Basic operations and concepts
   • Students demonstrate a sound understanding of the nature and operation of technology systems.
   • Students are proficient in the use of technology.

2. Social, ethical, and human issues
   • Students understand the ethical, cultural, and societal issues related to technology.
   • Students practice responsible use of technology systems, information, and software.
   • Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

3. Technology productivity tools
   • Students use technology tools to enhance learning, increase productivity, and promote creativity.
   • Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

4. Technology communications tools
   • Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
   • Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
5. Technology research tools
   - Students use technology to locate, evaluate, and collect information from a variety of sources.
   - Students use technology tools to process data and report results.
   - Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

6. Technology problem-solving and decision-making tools
   - Students use technology resources for solving problems and making informed decisions.
   - Students employ technology in the development of strategies for solving problems in the real world.

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TECHNOLOGY LITERACY
POSITION STATEMENTS

Scope of Content

The division of the content into standards that support the overall goal of technology literacy provides assistance to teachers for planning technology-based activities. Key components of the curriculum are knowing and applying technology issues and applications for a variety of purposes. The six major technology literacy strands as defined by the International Society for Technology in Education (ISTE) are (1) basic operations and concepts, (2) social, ethical, and human issues, (3) technology productivity tools, (4) technology communications tools, (5) technology research tools, and (6) technology problem-solving and decision-making tools. Integrating these strands into meaningful classroom activities provides opportunities for K-12 students to obtain and communicate information, to respond to communication, to use technology for learning and reflecting, and to apply critical- and creative-thinking skills for solving problems.

Integration Across the Curriculum

Technology is a tool for learning and increasing productivity. The technology content standards included in this document are designed to be used to enhance learning within and across all curricula. The Grades K-8 content standards are grouped into grade range clusters to be integrated across the curriculum. Although Grades 9-12 content standards are intended to be used for developing the required Computer Applications course, the Grades 9-12 standards in this section are also intended to be used as a guide for integrating technology across the curriculum.

The International Society for Technology in Education presents the curricular integration of technology as follows: “Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions— as accessible as all other classroom tools.” (National Educational Technology Standards for Students, p. 6)
Instructional Environment

When teachers create classroom communities characterized by equity and excellence, all students learn. These conditions are achieved when teachers hold high expectations for students regardless of technical, linguistic, religious, ethnic, or cultural backgrounds and create authentic learning activities that integrate technology competencies. Effective teachers use a variety of strategies to accommodate individual learning. Projects, mini-lectures, demonstrations, and cooperative small groups are some of the strategies that best facilitate students’ acquisition of the knowledge, skills, and attitudes they need to become lifelong learners and effective technology users. In addition to traditional assessment tools, teachers use current research-based methods to authentically measure what students know and are able to do using technology. These methods include informal and formal observations, performance assessments, and student portfolios.

Lab Utilization

Although technology skills are best learned when technology is integrated across the curriculum, certain teaching tasks may be best accomplished in a computer lab setting. For example, students can utilize a lab to learn a software application. Occasionally, after classroom instruction, students need access to a computer for individual or project-based assignments with teachers as facilitators. A fully utilized computer laboratory provides a place for more than remedial or enrichment activities.

Computer labs are recommended for every school, although integration of technology into the classroom does not require a computer lab setting. In classrooms with one computer, placing the computer in a central location available to all learners is recommended. With three to five computers in the classroom, creating computer stations with two chairs around each computer is recommended. This arrangement encourages collaboration and cooperative learning. For greatest accessibility by students, computers are available for use in each classroom and in the library media center as well as in the computer lab.

Keyboard Utilization

Limited or no keyboarding skills may diminish a student’s ability to operate a computer. It is not the intent of this document to advocate the teaching of keyboard utilization concepts in a formal keyboarding course. However, the keyboard is an important and efficient tool for inputting information into the computer.

Although exceptions exist, the suggested age for effective keyboard instruction is 10-12 years of age (Elementary/Middle School Keyboarding Strategies Guide, 1992). Keyboarding is a kinesthetic skill acquired through systematic, repetitive instruction in touch typing. To appropriately instruct students in keying skills, it is recommended that students be taught by a teacher who has knowledge of proper keyboarding techniques rather than solely relying on a software program for skill development. Repetitive drill and practice exercises are necessary for successful instruction. Sporadic access to a computer does not develop the needed level of skill for the student. Levels of keyboard utilization are included in each grade cluster of this document. Local school systems are encouraged to plan, design, and implement a scope and sequence plan for appropriate skill development.
**Ergonomics**

Ergonomic considerations are included as a focal point for instructing students in all grade clusters about proper posture and positioning while using computers. Correct and healthy techniques for the use of computers create good, healthy habits that reduce the risk of computer-related injuries.

Adjustable computer workstations are one option schools can use to ensure ergonomic concepts are employed. There are low-cost solutions for those schools on a nonexistent or small budget. Schools should provide students with comfortable and safe workstations. Teachers should help students develop good computer work habits and provide students with strategies to adjust computer workstations according to individual needs. Visuals demonstrating proper posture and positioning at a workstation and solutions for adjusting workstations to accommodate personal needs can be found in the grade cluster sections of this document.

**Assessment**

The content standards contained in this document have an impact on the assessment of technology instruction as well as on the assessment of student learning. Assessment should inform teachers not only of student competency levels but also of the adequacy of various instructional strategies.

Teachers use assessment data to plan instruction. During instruction, teachers collect additional data about student learning that direct revision of instructional strategies and guidance of student learning. Assessment techniques reflect learning that occurs at the cognitive, affective, and psychomotor levels. Consequently, the content standards in this document intertwine the knowledge, processes, and applications of technology. This intertwining of standards necessitates a variety of assessment methods to ensure that all students, including students with disabilities, acquire not only knowledge of technology but also skills of technology use. Assessment must go beyond simple paper-and-pencil tests to include skills-based assessment and the use of a variety of assessment instruments. These instruments should include multiple-choice items, pre- and post-exams of performance, checklists, open-ended essay items, journals, lab reports, creative dramatics, verbal explanations, portfolios, and projects.
Directions for Interpreting the Minimum Required Content

1. **CONTENT STANDARDS** are statements that define what students should know and be able to do. In this document, the curriculum content is listed as content standards. The order in which content standards are listed within a grade or course is not intended to convey a sequence for instruction. Content standards may address concepts or skills that will be addressed throughout the school year.

2. Content standards describe what students should know and be able to do at the conclusion of a grade or course. Each content standard contains a **STEM** that completes the phrase “Students will . . .”

   **Students will:**
   
   Demonstrate respect for the work of others.
   
   (Grades K-2 – Content Standard 9)

3. Additional minimum required content may be listed under a content standard stem and is denoted by a bullet. This **ADDITIONAL CONTENT** provides further specificity for the standard.

   **Students will:**
   
   Identify legal and ethical behaviors when using information and technology.
   - Copyright laws and fair use guidelines
   - Acceptable use policy
   - Internet use
   
   (Grades 3-5 – Content Standard 8)

4. **EXAMPLES** clarify content standards. They do not provide an exhaustive list of the content that completes the stem. Examples clarify various portions of the stem or bulleted content.

   **Students will:**
   
   Utilize an operating system efficiently.
   - Start up and shut down
   - Menu items and commands/options
     - Examples: file, edit, view, help
   
   (Computer Applications Course – Content Standard 4)
Five-, six-, and seven-year-olds are developing self-concepts, motor skills, and social relationships. They need opportunities for firsthand experiences in solving problems and manipulating real objects. Their vocabulary is expanding and they are learning at an exponential rate.

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.

Multimedia Internet content provides broad experiences through video-clips, images, and sounds from around the world. Open-ended software allows students to practice problem solving in a safe environment. The use of interactive books sparks interest in reading and develops decoding and comprehension skills. Written and verbal expression is enhanced through multimedia slide show 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 on-line curriculum projects, electronic databases, and other technology resources supported by productivity software such as graphing and drawing tools. Responsible use of hardware is modeled by the teacher and internalized by students at this early stage of their educational careers.

The inherent motivation created by computers and other technologies can be exploited by teachers to increase students’ interest and excitement for learning while equipping them with technological tools that will enhance not only their formal educational years but also their professional and personal lives.
By the end of second grade students will:

**Basic Operations and Concepts**

1. Demonstrate optimal posture and position at the computer workstation.
   - Eyes level with the text on the monitor
   - Shoulders down, arms relaxed
   - Elbows level with keyboard
   - Feet and lower back supported
   - Fingers curved
   - Wrists slightly elevated

2. Communicate about technology using developmentally appropriate and accurate terminology.
   - Examples: “press,” not “hit,” keys; open file, save

3. Identify the basic parts of a computer.
   - Examples: keyboard, monitor, printer

4. Use input, output, and storage devices to successfully operate computers, VCRs, audiotapes, and other technologies.
   - Examples: input–mouse, remote control;
     output–monitor, printer, speakers, headphones;
     storage–floppy disks, CDs

5. Use developmentally appropriate keyboard techniques.
   - Examples: left hand for left side keys and right hand for right side keys, special keys such as space bar, enter/return, backspace, shift, delete

6. Demonstrate correct procedures for opening, closing, and saving files using menu options and commands in grade-appropriate software.

**Social, Ethical, and Human Issues**

7. Demonstrate proper care of equipment and media.
   - Examples: clean hands, treatment of peripherals, clean work area, no magnets around computer station

8. Practice responsible use of technology systems and software.
   - Examples: using personal login, maintaining settings

9. Demonstrate respect for the work of others.
Technology Productivity Tools

10. Use a variety of media and technology resources for directed and independent learning activities across the curriculum.
    Examples: word processor, drawing tools, learning software

11. Produce developmentally appropriate multimedia products.
    Examples: autobiography or story using word processor or digital presentation software

12. Use electronic resources to access and retrieve information.
    Examples: Alabama Virtual Library (AVL); multimedia dictionaries, encyclopedias, almanacs; electronic card catalog

Technology Communications Tools

13. Use telecommunications and other media to collaborate and interact with peers and other audiences, following appropriate laws and regulations.
    Example: on-line curriculum projects such as describing the environment

Technology Research Tools

14. Identify the Internet as a resource for information.

15. Utilize information from a locally approved Internet web site.
    Example: research project on dinosaurs, dental health, or rain forests

Technology Problem-Solving and Decision-Making Tools

16. Use technology resources for problem solving.
    Examples: puzzles, logical thinking programs, solutions for a class-defined problem
GRADES 3-5 OVERVIEW

Students in Grades 3-5 begin to expand their horizons and exercise more independent thought and action. Many opportunities utilizing technology should be provided for students to work collaboratively to accomplish authentic tasks. Research conducted through on-line communities and interaction with experts in specialized fields of study sharpens skills needed across all curriculum areas, such as analysis of data, problem solving, reading for meaning, organizing information, and drawing conclusions. Students begin to use the World Wide Web more independently to conduct searches required for completing assignments. This naturally leads to discussions of legal and ethical use of information and judgments as to the value of information found on the Internet.

Activities using information drawn from the World Wide Web lend structure to projects while remaining open-ended enough to encourage critical thinking and allow for pursuit of individual student interests. Students at this age are becoming more literate regarding use of a variety of software applications that enable them to express themselves through original compositions and illustrations. A natural extension of this self-expression is publishing content for the World Wide Web, thereby allowing students to become a part of a greater community of learners.

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 GRADE-FIFTH GRADE

By the end of fifth grade students will:

Basic Operations and Concepts

1. Demonstrate optimal posture and position at the computer workstation.
   • Eyes level with the text on the monitor
   • Shoulders down, arms relaxed
   • Elbows level with keyboard
   • Feet and lower back supported
   • Fingers curved
   • Wrists slightly elevated

2. Communicate about technology using developmentally appropriate and accurate terminology.

3. Use common input and output devices efficiently and effectively.

4. Use developmentally appropriate keyboard techniques.
   Example: home row finger placement

5. Describe correct procedures for troubleshooting simple hardware and software problems.
   Examples: adding printer paper, rebooting system, following classroom troubleshooting guides

Social, Ethical, and Human Issues

6. Discuss common uses of technology in daily life and the advantages and disadvantages associated with each.

7. Discuss basic issues related to responsible use of technology and information including personal consequences of inappropriate use.

8. Identify legal and ethical behaviors when using information and technology.
   • Copyright laws and fair use guidelines
   • Acceptable use policy
   • Internet use

9. Identify areas in which technology has impacted human lives.
   Examples: transportation, communication, nutrition, sanitation, health care, entertainment
Technology Productivity Tools

10. Demonstrate basic operations of a word processor.
   • Selecting text
   • Font type and size
   • Alignment
   • Line spacing
   • Tabs
   • Spell checker
   • Thesaurus
   • Graphics

11. Utilize general purpose productivity tools to facilitate learning throughout the curriculum.
    Examples: authoring and presentation software, web tools, digital cameras, scanners

12. Use a variety of media and technology resources to create and communicate knowledge products across the curriculum.
    Example: individual and collaborative writing, presenting, and publishing

Technology Communications Tools

13. Use telecommunications and other media to collaborate and interact with peers and other audiences following appropriate laws and regulations.
    Example: on-line curriculum projects such as cultural exchanges, discussions with experts

Technology Research Tools

14. Use the Internet to locate information.
    Examples: search engines, Alabama Virtual Library (AVL), on-line encyclopedias

15. Determine appropriate keywords for finding information using a web search.

16. Evaluate the relevance and appropriateness of electronic information sources.

17. Relate search results to class or individual assignments.

Technology Problem-Solving and Decision-Making Tools

18. Use technology resources for problem solving.
    Examples: data, probability, and relationship analysis; science experimentation; expert opinion comparison

19. Select appropriate technology tools and resources to address a variety of tasks and problems.
    Examples: Internet portals, calculators, software
Students in Grades 6-8 possess a wide range of intellectual abilities, learning styles, talents, and interests. These students are going through a transitional period that includes physical, social, emotional, and intellectual changes. They are developing the skills to solve complex verbal and hypothetical problems.

In an increasingly information-oriented world, demands upon students to think on higher levels are steadily increasing. Technology tools help to augment and optimize their ability to process information. Students are provided with technological tools and knowledge needed to synthesize information from across the curriculum efficiently and appropriately.

The technology content standards for Grades 6-8 are designed to complement all areas of the academic curriculum. The integration of technology enhances middle school students’ emerging abilities to analyze, synthesize, and evaluate information. Students can use productivity/multimedia tools to demonstrate and communicate curriculum concepts to audiences more effectively. Students can also evaluate the accuracy, comprehensiveness, and bias of electronic information sources concerning real-world problems.
SIXTH GRADE-EIGHTH GRADE

By the end of eighth grade students will:

Basic Operations and Concepts

1. Demonstrate optimal posture and position at the computer workstation. 
   - Eyes level with the text on the monitor
   - Shoulders down, arms relaxed
   - Elbows level with keyboard
   - Feet and lower back supported
   - Fingers curved
   - Wrists slightly elevated

2. Communicate regarding technology using developmentally appropriate and accurate terminology.

3. Demonstrate keyboarding proficiency in technique and posture while building speed.

4. Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.

5. Utilize an operating system efficiently.
   Examples: proper shut down, file management

Social, Ethical, and Human Issues

6. Describe current changes in information technologies and the effect those changes have on the workplace and society.

7. Analyze ways in which technology has influenced the course of history.
   Examples: revolutions in agriculture, manufacturing, medicine, warfare, transportation, communication

8. Identify examples of copyright violations, computer fraud, and possible penalties.
   Examples: unauthorized use, computer hacking, software piracy, virus dissemination, fines

9. Cite electronic sources properly.
   Example: using MLA or APA style manuals
**Technology Productivity Tools**

10. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, communication, and learning throughout the curriculum.

11. Follow procedures to design, develop, publish, and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
    - Examples: web pages, videotapes

12. Integrate word processing skills across the curriculum.
    - Examples: reports, letters, brochures

13. Identify examples of spreadsheets and databases.
    - Examples: spreadsheets—budgets, checkbook; databases—phone book, recipe book

    - Examples: spreadsheets—discover patterns, track spending; databases—manage data

**Technology Communications Tools**

15. Use telecommunications and other media to collaborate and interact with peers and other audiences following appropriate laws and regulations.
    - Example: on-line curriculum projects such as cost of living comparison

**Technology Research Tools**

16. Apply content-specific tools, software, and simulations to support learning and research.
    - Examples: environmental probes, graphing calculators, exploratory environments, web tools including AVL

17. Evaluate the accuracy, comprehensiveness, and bias of electronic information sources concerning real-world problems.

18. Use Boolean operators to execute complex searches.
    - Examples: AND, NOT, +, -

**Technology Problem-Solving and Decision-Making Tools**

19. Use appropriate tools and technology resources to resolve information conflicts by validating information through research and comparison of data.
    - Example: defending a position on political or social issues
GRADES 9-12 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 developing 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 to seek opportunities for developing 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 the ability to respect differences and to develop skills necessary for becoming productive adults.

The Computer Applications course is designed to provide students with the basic concepts and skills regarding knowledge of computer operations. Additional components of the course are responsible use of computers, efficient use of computers to enhance productions and presentations, and use of computers to access information. Competent computer utilization fosters students’ problem-solving and critical-thinking skills and enables students to become competitive workers in the twenty-first century.

The content standards in this course are designed around content organizers that emphasize hands-on, practical activities that extend beyond the computer classroom or laboratory. Course content should be 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, the benefits of using these tools for researching, analyzing, and synthesizing information beyond the classroom become evident. Technology literate students realize that technology tools and resources enhance not only educational endeavors but also personal and professional success as well.
COMPUTER APPLICATIONS

BASIC OPERATIONS AND CONCEPTS

Students will:

Terminology

1. Utilize appropriate vocabulary to communicate effectively in a technological society.

Computer Hardware

2. Identify computer hardware components and peripheral devices.
   Examples: CPU, monitor, printer, digital camera, scanners

3. Appraise computer hardware to determine software compatibility.
   Examples: RAM, processing speed, hard drive, video card

Operating Systems

4. Utilize an operating system efficiently.
   • Start up and shut down
   • Menu items and commands/options
     Examples: file, edit, view, help

5. Differentiate among operating systems.

Networking

6. Describe uses of a networked computer.
   Examples: security, file sharing, collaboration, centralized database

7. Assess the impact of networks on society.
**File Management**

8. Identify advantages of creating an organized file structure.

9. Arrange an organized file structure.

10. Modify file structure.

11. Identify various storage and backup options.
    Examples: floppy disks, CD-RW, DVD, network folders

**Basic Trouble Shooting**

12. Apply strategies for identifying and solving routine hardware and software problems that occur in everyday use.
    Examples: checking plug, switch, connections, video, and sound; rebooting, using help sources

**SOCIAL, ETHICAL, AND HUMAN ISSUES**

**Information Ownership**

13. Interpret copyright laws and policies with regard to ownership and use of information.
    • Obtaining permission to use electronic media sources/products
    • Determining considerations necessary to use electronic media sources/products
      Examples: fair use (educational and personal), software licensing
    • Explaining consequences of copyright violations

**Responsible Use**

    Examples: hacking, spreading viruses, threats, unauthorized access

15. Explain consequences of the misuse of technology.

16. Evaluate the accuracy, appropriateness, and bias of electronic information.

17. Cite electronic sources properly.
    Example: using MLA or APA style manuals

18. Recognize practices that are not in keeping with netiquette.
    Examples: slamming, spamming, flaming
Implications of Technology Use

19. Identify factors that affect access to technology.
   Examples: socio-economic level, political climate, geographic location

20. Explain types of tasks for which technology may be used in school, home, and business.
   Examples: E-learning, E-commerce, telecommuting

21. Evaluate the effect technology has on the workplace and society.
   Examples: improved communication, increased productivity

TECHNOLOGY PRODUCTIVITY TOOLS

Word Processing

22. Explain uses and advantages of word processing.

23. Apply appropriate techniques for producing word processing documents.
   • Creating and opening documents
   • Using save and save as
   • Using print options
     Examples: preview, entire file, selected parts
   • Formatting text, paragraphs, and pages
     Examples: text justification, indents, line spacing, tabs, margins, headers, footers, pagination, page orientation
   • Cutting, copying, pasting, and deleting text
   • Using spell check and thesaurus features
   • Using find and replace features

Spreadsheets

24. Explain uses and advantages of spreadsheets.

25. Apply appropriate techniques for producing spreadsheets.
   • Creating and opening documents
   • Using save and save as
   • Using print options
     Examples: preview, entire file, selected parts
   • Identifying columns and rows
   • Setting cell attributes
   • Entering data
   • Editing data
   • Creating formulas
   • Using functions
   • Sorting data
   • Filtering data
   • Creating charts
Databases

26. Explain uses and advantages of databases.

27. Apply appropriate techniques for producing databases.
   - Planning data structure
   - Creating and opening documents
   - Using save and save as
   - Using print options
     - Examples: preview, entire file, selected parts
   - Naming fields
   - Setting field attributes
   - Entering data
   - Editing data
   - Sorting data
   - Filtering data
   - Querying data
   - Merging data
   - Creating and printing reports

Multimedia Authoring

28. Explain uses, advantages, and options of multimedia authoring.

29. Apply appropriate techniques for producing multimedia products.
   - Examples: brochures, newspapers, slide presentations, web pages, digital or video presentations

TECHNOLOGY COMMUNICATIONS TOOLS

Communications Applications

30. Explain uses and advantages of telecommunications.

31. Explain ways technology is used for transfer of information.
   - Examples: E-mail, listserv, video conferencing, Internet

32. Demonstrate ways technology is used for transfer of information.
   - E-mail
   - Internet
Presentations

33. Demonstrate proficiency in presenting digital information.
   Example: web pages, video segments, multimedia presentations, publications

TECHNOLOGY RESEARCH TOOLS

Digital Media

34. Use appropriate on-line resources for research.
   Examples: on-line databases, electronic card catalog, search engines, AVL

35. Apply appropriate techniques for information retrieval.
   • Boolean operators
     Examples: AND, NOT, +, -
   • Key words

36. Identify useful information from a search.

37. Take notes and paraphrase from a search.

TECHNOLOGY PROBLEM-SOLVING AND DECISION-MAKING TOOLS

37. Utilize technology for solving problems and making data-driven decisions.
   Examples: assembling a plan for purchasing a computer given a basic set of
   circumstances, making projections
APPENDIX A

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 seeking the Alternate Adult High School Diploma shall complete the prescribed credits for the Alabama High School Diploma and pass the test of General Education Development (GED).

<table>
<thead>
<tr>
<th>COURSE REQUIREMENTS</th>
<th>Alabama High School Diploma Credits</th>
<th>Alabama High School Diploma with Advanced Academic Endorsement Credits</th>
<th>Alternate Adult High School Diploma Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGLISH LANGUAGE ARTS</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 9</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>English 10</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>English 11</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>English 12</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>MATHEMATICS</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algebra I</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Geometry</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Algebra II with Trigonometry</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mathematics Elective(s)</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>SCIENCE</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A physical science</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Science Electives</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SOCIAL STUDIES*</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 9 Social Studies</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grade 10 Social Studies</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grade 11 Social Studies</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grade 12 Social Studies</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PHYSICAL EDUCATION</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>HEALTH EDUCATION</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>ARTS EDUCATION</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>COMPUTER APPLICATIONS**</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>FOREIGN LANGUAGE***</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ELECTIVES</td>
<td>5.5</td>
<td>3.5</td>
<td>5.5</td>
</tr>
</tbody>
</table>

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.
*** 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.
1. **COURSE REQUIREMENTS**

Effective for students with disabilities as defined by the Individuals with Disabilities Education Act (Public Law 101-476) who begin the tenth grade in the 1997-98 school year, students must earn the course credits outlined in Ala. Admin. Code r. 290-3-1-.02(8)(g) and successfully complete an approved occupational portfolio in order to be awarded the Alabama Occupational Diploma.

<table>
<thead>
<tr>
<th>COURSE REQUIREMENTS</th>
<th>Alabama Occupational Diploma Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENGLISH LANGUAGE ARTS</strong></td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
</tr>
<tr>
<td>Employment English I</td>
<td>1</td>
</tr>
<tr>
<td>Employment English II</td>
<td>1</td>
</tr>
<tr>
<td>Employment English III</td>
<td>1</td>
</tr>
<tr>
<td>Applied Employment English IV</td>
<td>1</td>
</tr>
<tr>
<td><strong>MATHEMATICS</strong></td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
</tr>
<tr>
<td>Job Skills Math I</td>
<td>1</td>
</tr>
<tr>
<td>Job Skills Math II</td>
<td>1</td>
</tr>
<tr>
<td>Job Skills Math III</td>
<td>1</td>
</tr>
<tr>
<td>Applied Job Skills Math IV</td>
<td>1</td>
</tr>
<tr>
<td><strong>SCIENCE</strong></td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
</tr>
<tr>
<td>Life Skills Science I</td>
<td>1</td>
</tr>
<tr>
<td>Life Skills Science II</td>
<td>1</td>
</tr>
<tr>
<td>Life Skills Science III</td>
<td>1</td>
</tr>
<tr>
<td>Applied Life Skills Science IV</td>
<td>1</td>
</tr>
<tr>
<td><strong>SOCIAL STUDIES</strong></td>
<td>4</td>
</tr>
<tr>
<td>Four credits to include the equivalent of:</td>
<td></td>
</tr>
<tr>
<td>Career Preparation I</td>
<td>1</td>
</tr>
<tr>
<td>Career Preparation II</td>
<td>1</td>
</tr>
<tr>
<td>Career Preparation III</td>
<td>1</td>
</tr>
<tr>
<td>Applied Career Preparation IV</td>
<td>1</td>
</tr>
<tr>
<td><strong>CAREER/TECHNICAL EDUCATION</strong></td>
<td>2</td>
</tr>
<tr>
<td>*Cooperative Career/Technical Education</td>
<td>1</td>
</tr>
<tr>
<td><strong>HEALTH EDUCATION</strong></td>
<td>0.5</td>
</tr>
<tr>
<td><strong>PHYSICAL EDUCATION</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>ARTS EDUCATION</strong></td>
<td>0.5</td>
</tr>
<tr>
<td><strong>ELECTIVES</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

Existing laws require LEAs to offer arts education, physical education, wellness education, career/technical education, and driver education as electives.

**TOTAL CREDITS** 24

*May be a part of the two credits for Career/Technical Education. The designated one credit for Cooperative Education will then be added to the electives, making a total of four electives.

2. **ASSESSMENT REQUIREMENTS**

Complete successfully an approved Alabama Occupational Diploma Portfolio for graduation.
APPENDIX B

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 (§16-1-1 Code of Alabama).

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.

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Grades 1-3</th>
<th>Grades 4-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Arts</td>
<td>150 minutes daily</td>
<td>120 minutes daily</td>
</tr>
<tr>
<td>Mathematics</td>
<td>60 minutes daily</td>
<td>60 minutes daily</td>
</tr>
<tr>
<td>Science</td>
<td>30 minutes daily</td>
<td>45 minutes daily</td>
</tr>
<tr>
<td>Social Studies</td>
<td>30 minutes daily</td>
<td>45 minutes daily</td>
</tr>
<tr>
<td>Physical Education</td>
<td>30 minutes daily*</td>
<td>30 minutes daily*</td>
</tr>
<tr>
<td>Health</td>
<td>60 minutes weekly</td>
<td>60 minutes weekly</td>
</tr>
<tr>
<td>Computer Education</td>
<td>60 minutes weekly</td>
<td>60 minutes weekly</td>
</tr>
<tr>
<td>Character Education</td>
<td>10 minutes daily</td>
<td>10 minutes daily</td>
</tr>
<tr>
<td>Arts Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dance</td>
<td>Daily instruction with Arts specialists in each of the Arts disciplines is the most desirable schedule. However, schools unable to provide daily Arts instruction in each discipline are encouraged to schedule in Grades 1 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 Arts specialists are not available.</td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theatre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Arts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Kindergarten

In accordance with Alabama Administrative Code r. 290-5-1-.01(5) Minimum Standards for Organizing Kindergarten Programs in Alabama Schools, 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.

In accordance with Alabama Administrative Code r. 290-5-1-.01(6), the official guide for program planning in kindergarten is Alabama Kindergartens, Bulletin 1987, No. 28. Criteria to be used in scheduling are listed on pages 45-46 of this guide. The full-day program should 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**
A minimum of 140 clock hours of instruction is required for one unit of credit and a minimum of 70 clock hours of instruction is required for one-half unit of credit.

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 an understanding of homework objectives and their role in the total learning experience. Homework reflects practices that have been taught in the classroom and provides reinforcement and/or remediation for students. Homework should be student-managed, and the amount should be age-appropriate. Homework should encourage learning through problem solving and practice. 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)

Homework is an important component of each 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. 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.
Print materials:


Internet sites:

http://www.orosha.org/cegos/whatodo1.html

www.iste.org