

# COMPUTER OPERATING SYSTEMS / ADVANCED COMPUTER OPERATING SYSTEMS

## Academic Standards and Indicators (Alignment Reference)

### English and Language Arts

#### **SC Standard A1. Reading: Literary Text**

##### **Reading-Literary Text: Principles of Reading (P)**

Standard 1: Demonstrate understanding of the organization and basic features of print.

Standard 2: Demonstrate understanding of spoken words, syllables, and sounds.

Standard 3: Know and apply grade-level phonics and word analysis skills when decoding words.

Standard 4: Read with sufficient accuracy and fluency to support comprehension.

##### **Reading-Literary Text: Meaning and Context (MC)**

Standard 5: Determine meaning and develop logical interpretations by making predictions, inferring, drawing conclusions, analyzing, synthesizing, providing evidence, and investigating multiple interpretations.

Standard 6: Summarize key details and ideas to support analysis of thematic development.

Standard 7: Analyze the relationship among ideas, themes, or topics in multiple media and formats, and in visual, auditory, and kinesthetic modalities.

##### **Reading-Literary Text: Language, Craft, and Structure (LCS)**

Standard 9: Interpret and analyze the author's use of words, phrases, and conventions, and how their relationships shape meaning and tone in print and multimedia texts.

Standard 10: Apply a range of strategies to determine and deepen the meaning of known, unknown, and multiple-meaning words, phrases, and jargon; acquire and use general academic and domain-specific vocabulary.

Standard 12: Analyze and critique how the author uses structures in print and multimedia texts to shape meaning and impact the reader.

##### **Reading-Literary Text: Range and Complexity (RC)**

Standard 13: Read independently and comprehend a variety of texts for the purposes of reading for enjoyment, acquiring new learning, and building stamina; reflect and respond to increasingly complex text over time.

#### **SC Standard A2. Reading: Informational Text (RI)**

##### **Reading-Informational Text: Principles of Reading (P)**

Standard 1: Demonstrate understanding of the organization and basic features of print.

Standard 2: Demonstrate understanding of spoken words, syllables, and sounds.

Standard 3: Know and apply grade-level phonics and word analysis skills when decoding words.

Standard 4: Read with sufficient accuracy and fluency to support comprehension.

##### **Reading-Informational Text: Meaning and Context (MC)**

Standard 5: Determine meaning and develop logical interpretations by making predictions, inferring, drawing conclusions, analyzing, synthesizing, providing evidence, and investigating multiple interpretations.

Standard 6: Summarize key details and ideas to support analysis of central ideas.

##### **Reading-Informational Language, Craft, and Structure (LCS)**

Standard 9: Apply a range of strategies to determine and deepen the meaning of known, unknown, and multiple-meaning words, phrases, and jargon; acquire and use general academic and domain-specific vocabulary.

Standard 10: Analyze and provide evidence of how the author's choice of purpose and perspective shapes content, meaning, and style.

Standard 11: Analyze and critique how the author uses structures in print and multimedia texts to craft informational and argument writing.

**Reading-Informational Text: Range and Complexity (RC)**

Standard 12: Read independently and comprehend a variety of texts for the purposes of reading for enjoyment, acquiring new learning, and building stamina; reflect and respond to increasingly complex text over time.

**SC Standard A3. Reading: Building Vocabulary**

**Reading-Informational Text: Principles of Reading (P)**

Standard 2: Demonstrate understanding of spoken words, syllables, and sounds

Standard 3: Know and apply grade-level phonics and word analysis skills when decoding words.

**Reading-Informational Text: Language, Craft, and Structure (LCS)**

Standard 9: Interpret and analyze the author's use of words, phrases, and conventions, and how their relationships shape meaning and tone in print and multimedia texts.

**SC Standard A4. Writing: Developing Written Communications (W)**

**Writing: Meaning, Context, and Craft (MCC)**

Standard 1: Write arguments to support claims with clear reasons and relevant evidence.

Standard 2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

**SC Standard A5. Writing: Producing Written Communications in a Variety of Forms**

**Writing: Meaning, Context, and Craft (MCC)**

Standard 3: Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.

**Writing: Language (L)**

Standard 4: Demonstrate command of the conventions of standard English grammar and usage when writing and speaking.

Standard 5: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

**Writing: Range and Complexity (RC)**

Standard 6: Write independently, legibly, and routinely for a variety of tasks, purposes, and audiences over short and extended time frames.

**SC Standard A6. Researching: Applying the Skills of Inquiry and Oral Communication**

**Inquiry-Based Literacy Standards (I)**

Standard 1: Formulate relevant, self-generated questions based on interests and/or needs that can be investigated.

Standard 2: Transact with texts to formulate questions, propose explanations, and consider alternative views and multiple perspectives.

Standard 3: Construct knowledge, applying disciplinary concepts and tools, to build deeper understanding of the world through exploration, collaboration, and analysis.

Standard 4: Synthesize information to share learning and/or take action.

Standard 5: Reflect throughout the inquiry process to assess metacognition, broaden understanding, and guide actions, individually and collaboratively.

### **Reading-Informational Text: Meaning and Context (MC)**

Standard 7: Analyze the relationship among ideas, themes, or topics in multiple media and formats, and in visual, auditory, and kinesthetic modalities.

### **Communication: Meaning and Context (MC)**

Standard 1: Interact with others to explore ideas and concepts, communicate meaning, and develop logical interpretations through collaborative conversations; build upon the ideas of others to clearly express one's own views while respecting diverse perspectives.

Standard 2: Articulate ideas, claims, and perspectives in a logical sequence using information, findings, and credible evidence from sources.

Standard 3: Communicate information through strategic use of multiple modalities and multimedia to enrich understanding when presenting ideas and information.

### **Language, Craft, and Structure (LCS)**

Standard 4: Critique how a speaker addresses content and uses stylistic and structural craft techniques to inform, engage, and impact audiences.

Standard 5: Incorporate craft techniques to engage and impact audience and convey messages.

## **MATHEMATICS ACADEMIC STANDARDS**

**Elementary Algebra (Algebra 1, Foundations in Algebra, Intermediate algebra, Algebra 2)**  
**SC Standard A7.** The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation. **(SCEA-1)**

### **Arithmetic with Polynomials and Rational Expressions**

AAPR.1\* 1A.AAPRI\* A2.AAPR.1\* Add, subtract, and multiply polynomials and understand that polynomials are closed under these operations.

### **Creating Equations**

A1ACE.1\* FA.ACE.1\* 1A.ACE.1\* Create and solve equations and inequalities in one variable that model real-world problems involving linear, quadratic, simple rational, and exponential relationships. Interpret the solutions and determine whether they are reasonable.

### **Reasoning with Equations and Inequalities**

A1.AREI.4\* IAAREI.4\* A2.AIEI.1\* Solve mathematical and real-world problems involving quadratic equations in one variable.

### **Structure and Expressions**

A1.ASE.1\* FA.ASE.1\* IA.ASE.1\* A2.ASE.1\* Interpret the meanings of coefficients, factors, terms, and expressions based on their real-world contexts. Interpret complicated expressions as being composed of simpler expressions.

### **Interpreting Data**

A1SPID.7\* FA.SPID.7\* Create a linear function to graphically model data from a real-world problem and interpret the meaning of the slope and intercept(s) in the context of the given problem.

**SC Standard A8.** The student will demonstrate through the mathematical processes an understanding of relationships and functions. (SCEA-3)

### **Building Functions**

FBF.1\* Write a function that describes a relationship between two quantities.

- b. Combine functions using the operations addition, subtraction, multiplication, and division to build new functions that describe the relationship between two quantities in mathematical and real-world situations.

### **Interpreting Functions**

FIF.2\* Evaluate functions and interpret the meaning of expressions involving function notation from a mathematical perspective and in terms of the context when the function describes a real-world situation.

### **Probability and Statistics**

**SC Standard A12.** The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation. (SCPS-1)

#### **Conditional Probability and Rules of Probability**

SPCR.1 Describe events as subsets of a sample space and

- a. Use Venn diagrams to represent intersections, unions, and complements.
- b. Relate intersections, unions, and complements to the words and, or, and not.
- c. Represent sample spaces for compound events using Venn diagrams.

**SC Standard A15.** The student will demonstrate through the mathematical processes and understanding of basic statistical methods of analyzing data. (SCPS-4)

#### **Using Probability to Make Decisions**

PS.SPMD.4\* Use probability to evaluate outcomes of decisions by finding expected values and determine if decisions are fair.

PS.SPMD.5\* Use probability to evaluate outcomes of decisions. Use probabilities to make fair decisions. PS.SPMD.6\* Analyze decisions and strategies using probability concepts.

## **SCIENCE ACADEMIC STANDARDS**

### **Biology**

**SC Standard A16.** The student will demonstrate an understanding of how scientific inquiry and technological design, including mathematical analysis, can be used appropriately to pose questions. (SC B-1)

Standard H.B.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

### **Physics**

**SC Standard A22.** The student will demonstrate an understanding of how scientific inquiry and technological design, including mathematical analysis, can be used appropriately to pose questions, seek answers, and develop solutions. (SC P-1)

Standard H.P.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

Standard H.P.2: The student will demonstrate an understanding of how the interactions among objects and their subsequent motion can be explained and predicted using the concept of forces.  
Standard H.P.3: The student will demonstrate an understanding of how the interactions among objects can be explained and predicted using the concept of the conservation of energy.

## SOCIAL STUDIES ACADEMIC STANDARDS

None

## TECHNOLOGY STANDARDS

### **Empowered Learner**

**SC Standard A36.** Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. **(ISTE-1)**

- Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
- Build networks and customize their learning environments in ways that support the learning process.
- Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

### **Digital Citizen**

**SC Standard A37.** Students recognize the rights, responsibilities, and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. **(ISTE-2)**

- Cultivate and manage their digital identify and reputation and are aware of the permanence of their actions in the digital world.
- Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
- Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
- Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

### **Knowledge Constructor**

**SC Standard A38.** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. **(ISTE-3)**

- Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
- Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

- Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
- Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

### **Innovative Designer**

**SC Standards A39.** Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. **(ISTE-4)**

- Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- Develop, test, and refine prototypes as part of a cyclical design process.
- Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

### **Computational Thinker**

**SC Standard A40.** Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. **(ISTE-5)**

- Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- Break problems into component parts, extract key information, and develop descriptive models to understand complex systems to facilitate problem-solving.
- Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

### **Creative Communicator**

**SC Standard A41.** Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals. **(ISTE-6)**

- Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
- Create original works or responsibly repurpose or remix digital resources into new creations.
- Communicate complete ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.
- Publish or present content that customizes the message and medium for their intended audiences.

## **Global Collaborator**

**SC Standard A42.** Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. (ISTE-7)

- Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- Use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.
- Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

NETS for Students:

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## **SECRETARY'S SKILLS ON ACHIEVING NECESSARY COMPETENCIES (SCANS) SKILLS**

**SC Standard A43. Resources:** Identifies, organizes, plans, and allocates resources

- Time--Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules
- Money--Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
- Material and Facilities--Acquires, stores, allocates, and uses materials or space efficiently
- Human Resources--Assesses skills and distributes work accordingly, evaluates performance and provides feedback

**SC Standard A44. Interpersonal:** Works with others

- Participates as Member of a Team--contributes to group effort
- Teaches Others New Skills
- Serves Clients/Customers--works to satisfy customers' expectations
- Exercises Leadership--communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies
- Negotiates--works toward agreements involving exchange of resources, resolves divergent interests
- Works with Diversity--works well with men and women from diverse backgrounds

**SC Standard A45. Information:** Acquires and uses information

- Acquires and Evaluates Information
- Organizes and Maintains Information
- Interprets and Communicates Information
- Uses Computers to Process Information

**SC Standard A46. Systems:** Understands complex inter-relationships

- Understands Systems--knows how social, organizational, and technological systems work and operates effectively with them
- Monitors and Corrects Performance--distinguishes trends, predicts impacts on systems operations, diagnoses deviations in systems' performance and corrects malfunctions
- Improves or Designs Systems--suggests modifications to existing systems and develops new or alternative systems to improve performance

**SC Standard A47. Technology:** Works with a variety of technologies

- Selects Technology--chooses procedures, tools or equipment including computers and related technologies
- Applies Technology to Task--Understands overall intent and proper procedures for setup and operation of equipment
- Maintains and Troubleshoots Equipment--Prevents, identifies, or solves problems with equipment, including computers and other technologies

**SC Standard A48. THE FOUNDATION:** Competence requires

- Basic Skills: reading, writing, arithmetic and mathematics, speaking and listening
- Thinking Skills: thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn, and reasoning
- Personal Qualities: individual responsibility, self-esteem, sociability, self-management and integrity

Tables excerpted from [\*What Work Requires of Schools: A SCANS Report for America 2000\*](#), U.S. Department of Labor, June 1991, pp. xvii-xviii