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BALTIMORE COUNTY PUBLIC SCHOOLS

DATE: March 11, 2008

TO: **BOARD OF EDUCATION**

FROM: Dr. Joe A. Hairston, Superintendent

SUBJECT: **CONSIDERATION OF THE SCOPES AND SEQUENCES FOR CORE AREAS OF MATHEMATICS, SCIENCE, ENGLISH/LANGUAGE ARTS, AND SOCIAL STUDIES**

ORIGINATOR: Dr. Sonia Diaz, Chief Academic Officer

RESOURCE PERSON(S): Dale R. Rauenzahn, Yvonne Barhight, Jean Wilson, Rex Shepard, Heather Miller, George Newberry, and Pat Baltzley

RECOMMENDATION

That the Board of Education approve, as reviewed by the Board's Curriculum Committee, the Language Arts, Mathematics, Social Studies, and Science scopes and sequences that align these content areas to national, state, and local standards and which show the knowledge, skills, and processes that students will learn from PreK through Grade 12 as required by Policy 8130 and as required by Policy 6000.

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Attachment I – Scope and Sequence Packet
Appendix

BALTIMORE COUNTY PUBLIC SCHOOLS
Joe A. Hairston, Superintendent 6901 Charles Street Towson, Maryland 21204-3711

PREK - 12 SCOPES AND SEQUENCES for Core Areas of
Language Arts
Social Studies
Science
Mathematics

Enclosed please find the first installment of major curriculum development work in progress in the Baltimore County Public Schools. It includes summaries of the Scopes and Sequences for the four major core content areas: English, science, mathematics, and social studies, and corresponding Articulated Instruction Module objectives. The Scopes and Sequences address one of the recommendations identified in the PDK Curriculum Audit. They form the fundamental basis of instruction for existing and newly-revised curriculum in the content areas to be presented to the Board of Education for approval during the next several months. Detailed grade level and content area Scopes and Sequences will also provide direct guidance to curriculum writers who have been selected through a rigorous and uniform selection process. Using the Scopes and Sequences, the curriculum writers will review, revise, and refine the curriculum projects as defined by our response to the PDK audit. Subsequent curriculum revisions will be delivered to the Board of Education Curriculum Committee members as well as to the full board for approval.

We acknowledge the sense of urgency created by the PDK audit, and we are pleased to report that the work in Curriculum and Instruction is progressing in an organized, coordinated manner. This curriculum work is supported by well-considered short and long-range plans for implementation, professional development, student assessment, and cyclical revision. We welcome feedback to ensure that the format being used to exhibit and present the current and revised curriculum guides provides appropriate and adequate information to board members. Consequently, board members will make informed decisions regarding the approval of the curriculum as directed under policies 8130 and 6000. It is our expectation that schools and teachers will have the requisite tools they need to ensure students achieve at higher levels through the quality of curriculum we are providing and through the processes and protocols defined by the Curriculum Management Plan.

The following materials have been created by the Division of Curriculum and Instruction under the direction of Dr. Sonia Diaz, Chief Academic Officer.

The staff from the Department of Humanities includes:

Yvonne Barhight, Acting Assistant Superintendent for Humanities
Jean Wilson, Principal on Assignment
Heather Miller, Coordinator of Secondary Language Arts
Rex Shepard, Coordinator of Social Studies

The staff from the Department of STEM includes:

Dale Rauenzahn, Acting Assistant Superintendent for STEM
George Newberry, Director of Science
Pat Baltzley, Director of Mathematics

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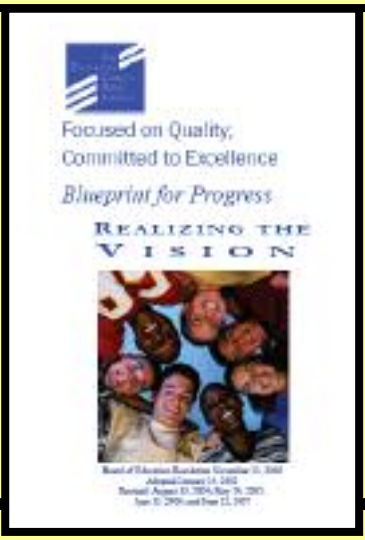
PreK-12 Standards in the SCOPE and SEQUENCE



National Council for the Social Studies
/ National Content Standards

National Science Foundation

NCTM NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

NCTE The National Council of Teachers of English

Voluntary State Curriculum

The Voluntary State Curriculum defines what students should know and be able to do at each grade level in these content areas:

- *Mathematics*
- *Science*
- *Fine Arts*
- *Health & PE*
- *Reading/English Language Arts*
- *Social Studies*
- *Foreign Language*
- *English Language Proficiency*
- *Technology Education*

Executive Summary of PreK-12
Scope and Sequence

By definition, a *scope and sequence* is a clearly stated set of K-12 learning objectives that reflects local, state, and national expectations and the order in which those objectives are taught. To say that differently, a scope and sequence is a resource that demonstrates the breadth and depth of content and skills as prescribed by external standards and presents them in the logical, developmentally appropriate sequence by which they should be taught. As such, a scope and sequence provides a clear map of the learning path for students and gives teachers a clear picture of the learning that most students will have mastered upon coming into their classes (Nichols, Shidaker, Johnson, and Singer, 2006, p. 16). These documents are used by content offices, curriculum writers, and classroom teachers.

Development of a scope and sequence has been completed in response to the Phi Delta Kappa audit recommendation that each content area provide a comprehensive PreK - Grade 12 overview of the scope of content and skills that students will be expected to know and be able to do by grade level. By responding to this recommendation, each curriculum area has effected an immediate improvement in the following ways:

- The content-specific scopes and sequences provide documentation of prerequisite skills by grade level or course.
- Scope and sequence documents further verify the strength of the BCPS curriculum alignment to the external standards (national, state, local, and industry) that guide curriculum development and subsequent instruction and assessment. Additionally, because the BCPS scope and sequence documents were back-loaded (Nichols, Shidaker, Johnson, and Singer, 2006, p. 53) from the Maryland Voluntary State Curriculum and Core Learning Goals, they are also congruent with the information that appears in Articulated Instruction Module (AIM).

The respective content scopes and sequences have been developed from an analysis of what students are expected to know and be able to do based on external standards and assessments. Because of this alignment, the scope and sequence documents serve as frameworks for development of curriculum. Additionally, because these documents offer a look at the before, during, and after skill and knowledge indicators, BCPS scopes and sequences also provide context for classroom instruction and assessment. Teachers use the scope and sequence documents to determine pre-requisite skills and knowledge that students bring with them into a grade level or course; frame the current grade level or course by identifying the knowledge and skill indicators that students will be expected to master by the end of the year; and to help them meet the target not only for the degree of preparation students need for the subsequent grade level or course, but also for assessments of content mastery.

The scopes and sequences for the four core areas are very similar in construction. Any differences they contain are reflective of the different contents and respective disciplines.

- The scope and sequence for PreK-12 mathematics is based on standards adopted by the National Council of Teachers of Mathematics which are also reflected in the Maryland Mathematics Core Learning Goals (Numbers and Operations, Algebra, Geometry and Measurement, and Data Analysis and Probability).
- The scope and sequence for PreK-12 social studies is based on national content standards and corresponding state standards from the Maryland Voluntary State Curriculum (History, Economics, Political Systems, Geography, and Peoples of the Nations and World).

- The scope and sequence for language arts is organized according to standards recognized by the National Council of Teachers of English. At the elementary level, there are seven standards (General Reading Processes, Comprehension of Informational Text, Comprehension of Literary Text, Writing, Controlling Language, Listening, and Speaking); and at the secondary level, there are six standards (Comprehension of Text, Analysis of Text, Composition, Controlling Language, Speaking, and Listening). The elementary language arts scope and sequence will also contain 2 supplementary components – a document that showcases 18 reading skills that are scaffolded along a continuum in relation to Bloom's Taxonomy and a document for the specific grammar skills taught in Grades K through 8.
- The scope and sequence for PreK-12 science is organized according to the National Science Standards, which are reflected in Maryland Science Core Learning Goals 1 through 6 (Skills and Processes of Science, Earth/Space Science, Life Science, Chemistry, Physics, and Environmental Science).

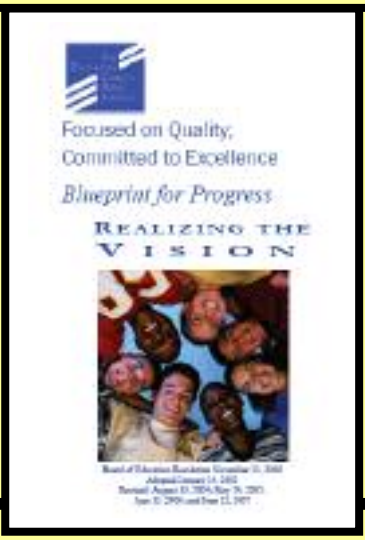
The scope and sequence documents serve as frameworks for existing BCPS curricula and any curriculum work that the content offices will undertake in the future; therefore, staff are seeking the approval of the Board of Education Curriculum Committee.

Curriculum Guide

Writing

Understanding of Informational Text	**Controlling Language**
General Reading Processes	**Understanding of Literary Text**
Listening	**Speaking**

LANGUAGE ARTS PreK-12 Standards in the SCOPE and SEQUENCE



NCTE | The National Council of Teachers of English

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- *English Language Proficiency*
- *Technology Education*

Summary of PreK-12
Language Arts
Scope and Sequence

STANDARD 1: GENERAL READING PROCESSES

Students must utilize a variety of strategies in order to comprehend, interpret, evaluate, and appreciate texts. They must rely upon their past experiences, interactions with other readers and writers, and knowledge of word meaning and other texts. Students need to draw upon word identification strategies and understanding of text such as letter-sound correspondence, sentence structure, context, and graphics. Different skills are emphasized at various stages of a student's reading development; however, all components are needed and used by fluent readers as they interact with text. Students in prekindergarten acquire the critical early skills that assist them in *learning to read* and typically progress by Grade 3 to the stage of *reading to learn*. At this stage students interact with more complex text and apply more sophisticated reading strategies to deepen their knowledge of the world around them. Standard 1 encompasses the following components:

Phonemic Awareness:

In the early elementary grades, students learn to read by mastering the ability to hear, identify, and manipulate individual sounds in spoken words. They discriminate sounds, produce rhyming words and alliteration, blend sounds and syllables to form words and segment and manipulate sounds in spoken words.

Phonics:

Phonics is the understanding of the sound-symbol relationship in written language. In the early elementary grades, students apply their knowledge of letter-sound relationships and word structure to decode unfamiliar words. They identify letters and corresponding sounds, combine sounds to form letter combinations, and decode words in grade-level texts.

Fluency:

Fluency is the ability to read a text with automaticity, accuracy, and expression to support comprehension. Once students are able to read printed words confidently, they are better able to concentrate on reading for understanding. To build fluency, students read from familiar texts and use word meaning, visual clues, punctuation, and intonation to convey meaning and read fluently.

Vocabulary:

Students who develop a rich and varied vocabulary have a greater capacity for understanding the text they read. They acquire new vocabulary through listening to and reading a variety of grade-appropriate text, by discussing, words and word meanings as they are encountered in texts, instruction, and conversation, asking questions to clarify meaning, and by connecting unfamiliar words to prior knowledge to enhance meaning.

Comprehension:

Understanding the meaning embedded in text is the primary reason for reading. Students use a variety of strategies to understand what they read and construct meaning. They listen to, read, and discuss text representing diversity in content, culture, authorship, and perspective. Students learn how to use strategies to prepare for reading, to make meaning during reading, and demonstrate their understanding of text after reading.

In middle school, general reading processes focus on fluency and accuracy with grade level texts. Emphasis is placed on vocabulary and comprehension, using appropriate reading strategies to demonstrate meaning and understanding. Vocabulary is addressed in context. By the time the student reaches high school, general reading processes should have been mastered.

PreK-Grade 5	Grades 6-8	Grades 9-12
• Understand the concepts of print • Hear, identify and manipulate individual sounds in words (phonemic awareness) • Apply knowledge of letter-sound relationships to read words (phonics) • Read with automaticity, accuracy, and expression (fluency) • Acquire and use new vocabulary • Use strategies such as drawing conclusions, making inferences, and analyzing important ideas to comprehend text	• Discuss words and word meanings as they are encountered in texts, instruction or conversation • Explain relationships between/among words • Read with automaticity, accuracy, and expression (fluency) • Acquire and use new vocabulary • Use strategies to analyze and evaluate important ideas to comprehend text	• Determine the meaning of above grade level words, multiple meaning words, colloquialisms, idioms, and other words and phrases as they are used in context • Apply knowledge of common words that signal relationships

STANDARD 2: COMPREHENSION OF INFORMATIONAL TEXT

In elementary school students read a variety of nonfiction materials such as textbooks, trade books, reference materials, and magazines to gain information and content knowledge. They are taught to identify and use text features to facilitate their understanding. They also learn about a variety of organizational patterns and structures in informational text. Another key focus is to identify an author's use of language. This enables young readers to think critically about the text and to evaluate the information.

By the time the students reach middle school they are reading a variety of print and non-print text including electronic media. They continue and build upon the examination of text features and organizational structures that were initiated in elementary school. In addition, middle school students analyze and evaluate informational text for important ideas, messages and use of language. This process is further developed and continued in high school where students examine the relationship among format, structure, and meaning of informational texts. In addition, high school students continue to critically analyze and evaluate the credibility of information in texts.

PreK-Grade 5	Grades 6-8	Grades 9-12
• Read a variety of self-selected and assigned informational text • Use text features to facilitate understanding • Identify organizational patterns • Determine important ideas and messages • Identify and explain the author's use of language • Evaluate the text	• Analyze how text features contribute to meaning • Use text features to facilitate understanding • Analyze organizational patterns of text • Analyze and evaluate text for important ideas, messages, and use of language	• Apply the text features, structure, rhetorical devices, and content of informational texts to perform tasks, answer questions, or solve problems • Determine the extent to which the format and structure of the text contribute to the meaning and purpose • Evaluate the credibility of information in text

STANDARD 3: COMPREHENSION OF LITERARY TEXT

This standard focuses on comprehension of fiction, including literature, poetry, and drama, and their historical and cultural contexts. The organization of literary text is quite different from informational text. In the early grades students learn about story structure and elements of text such as plot, characters and theme to enable them to determine important ideas and messages. They are taught to identify and describe the author's use of language. Students are expected to analyze and interpret a variety of genres, relating them to their own experience and knowledge.

In middle school, students analyze the elements of a variety of literary texts to facilitate understanding and interpretation. In addition, they analyze and evaluate important ideas, messages, and use of language in literary texts. In high school students continue and build upon this process with classical and contemporary texts. Author's purpose is analyzed through organization, structure, syntax, and stylistic elements.

PreK-Grade 5	Grades 6-8	Grades 9-12
• Read a variety of self-selected and assigned literary text • Identify and use text features to facilitate understanding • Use elements of narrative texts including characters, setting, problem, and solution to facilitate understanding • Determine important ideas and messages • Identify and explain the author's use of language • Summarize the text • Evaluate the text	• Analyze the interactions among the narrative elements and their contribution to meaning • Use text features to facilitate understanding and interpretation • Analyze main ideas and universal themes • Evaluate important ideas, messages, and author's use of language	• Determine the significance of plot, plot sequence, foreshadowing, flashback, cause/effect relationships, character traits, and setting as they contribute to the meaning of text • Determine and/or explain the experiences, emotions and issues in a text that give rise to universal literary themes • Analyze author's purpose through organization, structure, syntax, and stylistic elements

STANDARD 4: WRITING

By reading diverse selections of fiction and nonfiction, classic and contemporary pieces, students have exposure to excellent writing techniques and begin to acquire the skills to express themselves in writing. The goal of writing instruction in all grades is to enable each student to write clearly and effectively. In order to do this, students must analyze and synthesize information so that they may not only communicate, but also present solutions.

Writing is a complex task that involves learning language systems and structures and using them effectively to convey meaning through text. Students receive instruction on writing for different audiences and for various purposes, specifically to express personal ideas, to inform, and to persuade. While final drafts should be mechanically correct, writing instruction involves other key traits: development of ideas, organization, sentence fluency, word choice, and voice. Writers incorporate these writing traits as they progress recursively through the five major stages of the writing process: prewriting, drafting, revising, editing, and publishing.

Students' proficiency with writing begins with oral composing and then develops into shared writing experiences and simple paragraphs in the primary elementary grades. It is expected that students compose oral, written, and visual presentations in the upper elementary grades. Students leaving elementary school should typically be able to express personal ideas in a variety of forms and use techniques suited for the topic, audience, and purpose. They should be able to write to inform, using relevant support and appropriate organizational structures. Students' persuasive writing should support their positions with convincing arguments.

Prewriting, drafting, revising, and editing strategies continue to be emphasized in middle school. Students further develop their skills composing oral, written, and visual presentations to express personal ideas, inform and persuade. In addition, students analyze the effectiveness of language choice, detail, organizational patterns, syntax, figurative language and rhetorical devices. They evaluate how changes in text affect tone, meaning, and purpose. Various informational sources are examined for research.

In high school, priority is placed upon composing effective informative, expository, and persuasive texts. Research and media presentations are emphasized. Additionally, students continue to be expected to use the prewriting, drafting, revising, and editing strategies of effective writers and speakers.

STANDARD 4: WRITING

PreK-Grade 5	Grades 6-8	Grades 9-12
• Compose written and visual representations that express personal ideas, inform, and persuade • Compose texts using prewriting and drafting strategies • Refine text by using the revising and editing strategies	• Compose written and visual representations that express personal ideas • Compose to inform using relevant support and appropriate organizational structures • Compose to persuade by supporting, modifying or disagreeing with the position, using rhetorical strategies • Analyze the effectiveness of language choice, detail, organizational patterns, syntax, figurative language, and rhetorical devices	• Compose written and visual representations that express personal ideas • Compose to inform using relevant support and appropriate organizational structures • Compose to persuade by supporting, modifying or disagreeing with the position, using rhetorical strategies • Analyze the effectiveness of language choice, detail, organizational patterns, syntax, figurative language, and rhetorical devices • Use an organizational structure that clarifies and advances the writing purpose • Use an organizational structure that demonstrates the logic being used to argue or persuade

STANDARD 5: CONTROLLING LANGUAGE

To ensure that oral and written compositions are clearly understood by their listeners and readers, students need a working knowledge of the systems and structures of language. In elementary school, students are taught to recognize, recall, and use basic elements of grammar to express ideas clearly. They are expected to comprehend and apply Standard English usage in oral and written language. Students are taught Standard English punctuation, capitalization, and conventional spelling and are asked to apply this knowledge in their writing.

Recognition of elements of grammar in personal and academic reading, as well as application of grammar skills and concepts to oral and written language, is stressed in middle school. Students are instructed to explain and justify the use of mechanics to clarify meaning in reading and writing, and to apply Standard English punctuation and capitalization in written language. They should be able to explain editorial choices in mechanics. Spelling is addressed through recognition of conventional spelling in personal and academic reading, as well as, application of conventional spelling in written language. Students at all levels should produce handwriting that is legible to the audience and developmentally-appropriate.

High school students learn to control language by applying Standard English in writing and speaking and making language choices. In addition, they are expected to be able to apply knowledge of the history and development of the English language in order to analyze and explain its dynamic nature. Students will determine the relationship among meaning, position, form, function, and the grammatical classification of words.

PreK-Grade 5	Grades 6-8	Grades 9-12
• Identify, recall, and use basic grammar concepts and skills to express ideas clearly • Identify and apply Standard English usage in oral and written language • Apply Standard English punctuation and capitalization in written language • Recognize and apply conventional spelling	• Recognize the meaning, position, form, and function of words when identifying grammatical concepts • Identify and apply Standard English usage in oral and written language • Explain editorial choices • Apply Standard English punctuation and capitalization in written language • Recognize and apply conventional spelling	• Determine the relationship among meaning, position, form, function, and the grammatical classification of words • Modify the position or form of words and phrases to strengthen or clarify the relationships between ideas in sentences • Assess situations for the appropriateness of formal versus informal language • Apply knowledge of the history and development of the English language in order to analyze and explain its dynamic nature

STANDARD 6: LISTENING

Listening is a process whereby students make connections, monitor understanding, and evaluate information. Students are taught to demonstrate active listening strategies by attending to the speaker, asking appropriate questions, contributing relevant comments, and relating prior knowledge. Students then must comprehend and analyze what is heard by determining the speaker's purpose and identifying how the language of the presentation contributes to its meaning and effect. In order to demonstrate an understanding of what is heard, students are taught to retell, ask questions, relate prior knowledge, and summarize.

Middle school students are expected to demonstrate listening skills, comprehension, and literary analysis strategies appropriately for a variety of listening purposes and settings. In high school, emphasis is placed on applying listening skills and strategies to gather and interpret verbal messages. The high school student will demonstrate understanding of information and ideas communicated orally and will analyze the effect of nonverbal cues on oral communication.

PreK-Grade 5	Grades 6-8	Grades 9-12
• Demonstrate active listening strategies • Comprehend and analyze what is heard • Speak in a variety of settings in order to be understood	• Ask relevant questions concerning speaker's content, delivery, and purpose • Provide constructive feedback to speakers concerning the coherence and logic of the speech's content, delivery and impact on audience	• Respond to messages by asking questions, challenging assertions, or offering examples that confirm the message and speaker's attitude toward the subject • Identify key points and important details by listening for specific rhetorical strategies and taking notes, outlining, or self-questioning • Restate the thesis of a speech and the elements that developed it

STANDARD 7: SPEAKING

Speaking is the process of transmitting and exchanging information, ideas, and emotions using oral language. Effective speaking involves carefully selecting a topic, organizing one's thoughts, and developing the language and delivery techniques appropriate for the audience and situation. Additionally, students must demonstrate appropriate volume, articulation, enunciation, intonation, pacing, timing, and stress in oral presentations. They need to use appropriate non-verbal techniques to enhance communication. Students should state a position and support it with convincing reasons. It is important for all students to be competent, informed, and sensitive oral communicators.

In middle school speaking instruction focuses on demonstrating appropriate organizational strategies and delivery techniques for oral presentations. Students speak to persuade by including a well-defined thesis, differentiating fact from opinion, and support arguments with detailed evidence, examples, reasoning and persuasive language.

High school students use tone, diction, rate, and nonverbal techniques appropriate to the text, audience and purpose. The high school student is expected to use appropriate props, visual aids, and electronic media to enhance accuracy and audience appeal.

PreK-Grade 5	Grades 6-8	Grades 9-12
• Speak using organization and delivery strategies at an appropriate level • Make oral presentations	• Speak to persuade by including a thesis, supporting arguments, detailed examples, reasons and persuasive language	• Support assertions and judgments with a variety of evidence to clarify the main points of speech and to attend to audience needs and interest • Use proper eye contact, speaking rate, volume, enunciation and gestures to communicate ideas clearly and effectively

Note: The content of scope and sequence is based on content in MSDE's *Voluntary State Curriculum*, Core Learning Goals, or other national standards.

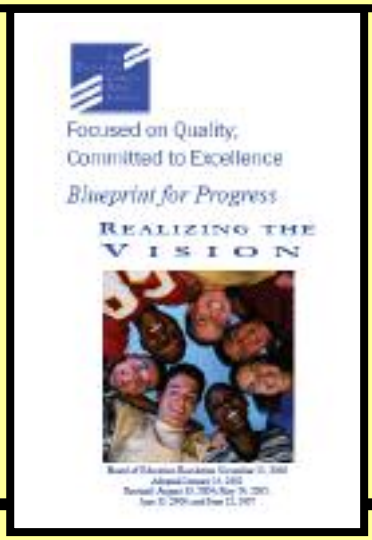
Curriculum Guide

History

Geography | **Economics**

Political Science or Systems | **Peoples of the Nation and World**

SOCIAL STUDIES PreK-12 Standards in the SCOPE and SEQUENCE



National Council for the Social Studies/National Content Standards

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Summary of PreK-12
Social Studies
Scope and Sequence

The scope and sequences of social studies programs in the Baltimore County Public Schools is guided by the definition of social studies developed by the National Council of Social Studies:

> Social studies is the integrated study of the social sciences and humanities to promote civic competence. Within the school program, social studies provides coordinated, systematic study drawing upon such disciplines as anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences. The primary purpose of social studies is to help young people develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world.

As implied by this definition, social studies instruction is organized by disciplines such as political science, geography, economics, and history. Accordingly, scope and sequences for the students in the general population and students in Advanced Placement, International Baccalaureate, and Law and Public Policy programs are organized by content-based standards. Content standards refer to organization of essential knowledge within a specific discipline. In Maryland, these standards are housed within the Voluntary State Curriculum (VSC). In this document, the standards and goals are demonstrated by representative samples.

As demonstrated by the samples, there are increasingly demanding expectations for students as they advance through the grade levels.
For example, informed decision makers require knowledge and skills related to the foundations and function of government, a category within the political science content standard. These concepts are developed by analysis of principles of democracy, case studies from the past and the present in the United States and the world, and opportunities to evaluate the degree to which people in a variety of settings adhere to those principles. This statement summarizes a set of indicators and objectives within our elementary and middle school social studies program that are aligned to standards in the voluntary state curriculum. These experiences prepare students to, in the context of American Government, meet the demands of the Government High School Assessment that requires them to evaluate how the principles of government assist or impede the functioning of government.

In addition to preparing students for the High School Assessment, the content standards act as a frame of reference for more advanced courses in high school, including electives and advanced placement offerings, as well as the afore-mentioned goal of civic competence. Similar patterns of establishing and then meaningfully applying knowledge are found within peoples of the nation and the world, geography, economics, and history. In summary, the framework of content standards and goals facilitates program structures that continually build upon previous experiences. This enables curriculum writers and teachers to develop programs of study that mutually reinforce content acquisition, analysis, and application.

1.0 CONTENT STANDARD: POLITICAL SCIENCE- students will understand the historical development and current status of the fundamental concepts and processes of authority, power, and influence, with particular emphasis on the democratic skills and attitudes necessary to become responsible citizens.

The following indicators are examples of how students acquire, process, and apply information within the political science content standard. Reading across the rows demonstrates the expanding nature of the social studies across time, space, and complexity.

Elementary (PreK – 5)	Middle (6 – 8)	High (9 – 12)
Students will identify symbols and practices associated with the United States of America. (1)	Students will analyze key events and documents during the American Revolution in order to evaluate their impact on the war. (8)	Students will assess the effect of Enlightenment thought on independence movements in Europe and the Americas in order to determine factors relating to the acquisition and loss of power. (10)
Students will analyze the historic events, documents, and practices that are the foundations of our political systems. (5)	Students will analyze the documents that established the framework of American government in order to evaluate their consistency with historic ideals of government. (8)	Students will analyze historical documents in order to determine principles that served as precedents for the United States Constitution. (9)

2.0 CONTENT STANDARD: PEOPLES OF THE NATION AND WORLD – Students will understand the diversity and commonality, human interdependence, and global cooperation of the people of Maryland, the United States and the World through both a multicultural and historic perspective.

The following indicators are examples of how students acquire, process, and apply information within the peoples of the nation and the world content standard. Reading across the rows demonstrates the expanding nature of the social studies across time, space, and complexity.

Elementary (PreK – 5)	Middle (6 – 8)	High (9 – 12)
Students explain how groups of people interact. (1)	Students will analyze interactions between Europeans and Native Americans in order to determine their impact on indigenous cultures. (8)	Students will analyze regional relationships in Africa, Japan, China, and feudal Europe in order to determine the extent to which they promoted continuity and change. (10)
Students will analyze elements of two different cultures and how each meets their human needs and contributes to the community. (2)	Students will investigate culture in order to apply the framework of anthropology to analyze culture. (6)	Students will analyze political, religious, and scientific changes in Europe in order to determine that region's ability to initiate global change. (10)

3.0 CONTENT STANDARD: GEOGRAPHY – Students will use geographic concepts and processes to examine the role of culture, technology, and the environment in the location and distribution of human activities and spatial connections throughout time.

The following indicators are examples of how students acquire, process, and apply information within the geography content standard. Reading across the rows demonstrates the expanding nature of the social studies across time, space, and complexity.

Elementary (PreK – 5)	Middle (6 – 8)	High (9 – 12)
Students will classify places and regions in an environment using geographic characteristics. (2)	Students will interpret, analyze, and construct maps of the Middle East to draw conclusions about how the selection of criteria can change the definition of region. (7)	Students will analyze the transformation of the West in order to determine how it impacted settlers and Native Americans. (11)
Students will explain how people modify, protect, and adapt to their environment. (3)	Students will analyze the issue of deforestation of the South American rainforest in order to formulate recommendations for protecting the environment while meeting human needs. (6)	Students will evaluate roles and policies that the United States government has assumed in order to develop resolutions for public policy issues. (9)

4.0 CONTENT STANDARD: ECONOMICS – Students will develop economic reasoning to understand the historical development and current status of economic principles, institutions, and processes needed to be effective citizens, consumers, and workers participating in local communities, the nation, and the world.

The following indicators are examples of how students acquire, process, and apply information within the economics content standard. Reading across the rows demonstrates the expanding nature of the social studies across time, space, and complexity.

Elementary (PreK – 5)	Middle (6 – 8)	High (9 – 12)
Students will describe how goods and services are acquired. (1)	Students will identify the types of goods and services traded between South Asia and other parts of the world in order to describe examples of economic interdependency among world communities. (6)	Students will examine market forces in order to determine the relationships of each within the United States economy. (12)
Students will identify goods and services provided by the government and paid for by taxes. (3)	Students will examine mercantilism in order to analyze economic interdependence between England and England's colonies. (8)	Students will apply fundamental economic concepts in order to evaluate the effectiveness of government policy in achieving economic goals. (9)

5.0 CONTENT STANDARD: HISTORY-Students will examine significant ideas, beliefs, and themes; organize patterns and events; and analyze how individuals and societies have changed over time in Maryland, the United States and around the world.

The following indicators are examples of how students acquire, process, and apply information within the history content standard. Reading across the rows demonstrates the expanding nature of the social studies across time, space, and complexity.

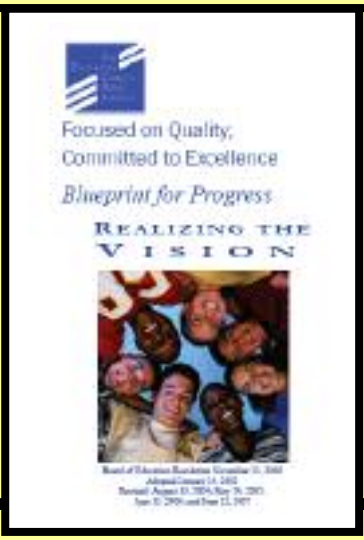
Elementary (PreK – 5)	Middle (6 – 8)	High (9 – 12)
Students will analyze the growth and development of colonial America. (5)	Students will investigate the establishment of European colonies in order to evaluate the factors that contributed to their successes and failures. (8)	Students will analyze interactions between Europe and the Americas in order to form generalizations regarding increasing global interaction. (10)
Students will analyze the causes of the American Revolution. (5)	Students will analyze the Palestinian-Israeli conflict from different perspectives to draw conclusions about possible solutions that demonstrate respect and support for the rights of both Palestinians and Israelis. (7)	Students will analyze the Vietnam War in order to determine its impact on Americans at home and abroad. (11)

Note: The content of scope and sequence is based on content in MSDE's *Voluntary State Curriculum*, Core Learning Goals, or other national standards.

Curriculum Guide

Physics	**Environmental Sciences**
Life Sciences	**Chemistry**
Skills and Processes of Science and Technology	**Earth and Space Science**

SCIENCE PreK-12 Standards in the SCOPE and SEQUENCE



National Science Foundation

Voluntary State Curriculum

The Voluntary State Curriculum defines what students should know and be able to do at each grade level in these content areas:

- *Mathematics*
- *Science*
- *Fine Arts*
- *Health & PE*
- *Reading/English Language Arts*
- *Social Studies*
- *Foreign Language*
- *English Language Proficiency*
- *Technology Education*

Summary of PreK-12
Science
Scope and Sequence

The fundamental abilities and concepts that underlie the National Science Education Standards and Maryland High School Core Learning Goals are provided by grade level bands below.

GOAL 1: SKILLS AND PROCESSES OF SCIENCE

Even from Kindergarten, students experience hands-on, minds-on science in ways that lie within their developmental capabilities. Science is presented in a form that engages them in the active construction of ideas and explanations and enhances their opportunity for *doing* science. Students are encouraged to ask questions about the things in their environment; and, when questions arise, they are asked to design investigations to try things out to see what happens. At the elementary level, students are introduced to the idea of a "fair test" in which only one variable is changed (the concept of controlled variables). Through time, they develop a richer, deeper, and more complex and sophisticated perspective of scientific thinking, learning to think critically and logically, making predictions, selecting appropriate tools and procedures for investigations that they design, using mathematics and technology, collecting evidence, formulating or revising scientific explanations or models based on the evidence they collect, acknowledging the existence of alternative explanations, and defending explanations with arguments supported by logic and facts. Core Learning Goal 1.0 deals with the *how* of doing science. Throughout the year, students also study science as a human endeavor and examine the history and nature of science. Goal 1.0 weaves in and out of all science subjects and serves as a unifying thread.

In Grades PreK through 4, students:	In Grades 5 through 8, students:	In Grades 9 through 12, students:
• Ask questions about objects, organisms, and events in the environment • Plan and conduct simple investigations • Employ simple equipment and tools to gather data and extend their senses • Use data (evidence collected during an experiment) to construct a reasonable explanation • Communicate with others about their investigations and explanations for the questions they are testing • Science as a human endeavor • Science and technology in local challenges	• Identify questions that can be answered through scientific investigations • Design and conduct a scientific investigation • Use appropriate tools and techniques to gather, analyze, and interpret data • Develop descriptions, explanations, predictions, and models using evidence • Think critically and logically to make the relationships between evidence and explanations • Nature of science • History of science • Science and technology in society	• Identify questions and concepts that guide scientific investigations • Design and conduct scientific investigations • Use technology and mathematics to improve investigations and communications • Formulate and revise scientific explanations and models using logic and evidence • Recognize and analyze alternative explanations and models • Communicate and defend a scientific argument • Nature of scientific knowledge • Historical perspectives • Science and technology in local, national, and global challenges

TECHNOLOGY and its relationship to the content and processes of science are also addressed in **Goal 1.0**. Throughout all of science, students implement the scientific method. BCPS science is designed to be inquiry based. Students are not taught to follow a rigid *scientific method* but to think and act as scientists. They are taught to assess each situation in a logical manner that begins with observations and ends with a presentation of the evidence-based conclusion. From the primary grades throughout high school, students employ technology in investigations to collect and analyze evidence. This skill evolves over time to include principles of engineering.

Students in Grades PreK through 4, investigate:	Students in Grades 5 through 8, investigate:	Students in Grades 9 through 12, investigate:
• Abilities of technological design o Identify a simple problem o Propose a solution o Implement a proposed solution o Evaluate a product or design o Communicate a problem, design, and solution • Understanding about science and technology o People have always had questions about the world o People have always had problems and invented tools and techniques to solve problems o Scientists and engineers often work in teams o Women and men of all ages, backgrounds, and groups engage in a variety of scientific and technological work o Tools help scientists make better observations, measurements, and equipment for investigations • Abilities to distinguish between natural objects and objects made by humans o Some objects occur in nature while others have been designed and made by people to solve problems and enhance the quality of life	• Abilities of technological design o Identify appropriate problems for technological design o Design a solution or product o Implement a proposed solution o Evaluate completed technological designs or products o Communicate the process of technological design • Understandings about science and technology o Scientific inquiry and technological design have similarities and differences o Many different people in different cultures have made and continue to make contributions to science and technology o Science and technology are reciprocal o Perfectly designed solutions do not exist o Technological designs have constraints o Technological solutions have intended benefits and unintended consequences	• Abilities of technological design o Identify a problem or design an opportunity o Propose designs and choose between alternative solutions o Implement a proposed solution o Evaluate the solution and its consequences o Communicate the problem, process, and solution • Understandings about science and technology o Scientists in different disciplines ask different questions, use different methods, and accept different types of evidence to support their explanations o Science often advances with the introduction of new technologies o Creativity, imagination, and a good knowledge base are all required in the work of science and engineering o Science and technology are pursued for different purposes – either a desire to understand the natural world or the desire to meet human needs

GOAL 2: EARTH AND SPACE SCIENCE

The abilities and understandings of Earth and Space Science are addressed in **Goal 2.0** of the Maryland Voluntary State Curriculum (Concepts of Earth and Space Science). Children are naturally interested in soil, rocks, streams, rain, snow, clouds, rainbows, sun, moon, and stars. In everyday life, they observe cyclic changes, such as night and day and the seasons; less consistent changes, such as weather and meteor showers; slow changes, such as erosion; and rapid changes, such as the flow of water in a stream. Their natural curiosity invites them to wonder about these things and to ask why and how questions. In earth and space science, children investigate the properties of the objects and phenomena around them, attempt to make generalizations, and then test those generalizations by comparing natural phenomena against the laws and principles which govern them. As they move through the grades, their understanding of the earth is enriched as they study the processes that formed and continually change the earth. They begin to see the earth as part of a *system* that incorporates living, physical, chemical, and environmental components. In Earth and Space Science, students study concepts from the fields of geology, meteorology, oceanography, plate tectonics, volcanism, and astronomy. VSC Goal 2.0 culminates in an Earth/Space Science course at the high school level.

Students in Grades PreK through 4, investigate:	Students in Grades 5 through 8, investigate:	Students in Grades 9 through 12, investigate:
• Properties of earth materials (soil, rocks, minerals, water, air) • Objects in the sky • Changes in the earth and sky (weather, erosion, plate tectonics, glaciation) • Types of resources • Changes in environments	• The structure of the earth system • Earth's geologic history • The earth and its place and role in the Solar System	• Energy in the earth system • Natural resources • Meteorology • The oceans • Geology and geochemical cycles • The origin and evolution of the earth system • The origin and evolution of the Universe

GOALS 3.0 and 6.0: LIFE and ENVIRONMENTAL SCIENCES

The abilities and understandings of the life and environmental sciences are addressed in two goals of the Maryland Voluntary State Curriculum: **Goal 3.0** (Concepts of Life Science) and **Goal 6.0** (Concepts of Environmental Science). Among all of the things with which children interact in their early years, nothing fascinates them or stimulates their curiosity more than the *living* world around them. In elementary school, students build understandings of biological concepts through direct experience with living things, their life cycles, and their habitats. Making sense of the way organisms live in their environments helps to develop understanding of the great diversity and interdependencies of life and their place and role in it. Students begin by examining the differences between living and non-living and move to an understanding of the characteristics and life cycles of the organisms they encounter at home, at school, and in their immediate environment. They observe and interact with the organisms and ask questions. Students learn that form and function are inextricably linked. As they move through the grades, life science becomes less focused on the whole organism and more focused on its parts. Students begin to examine the functions of life and how those functions are regulated by internal and external factors. They also understand that life is organized into a hierarchy that ranges in magnitude from the unbelievably minute world of molecules and cell organelles to the enormity of the biosphere. They learn that the quality we know as *life* is attributable to the chemical interactions of amazing macromolecules like amino acids and DNA, which further leads them to a study of heredity and the theory of evolution. Environmental topics also have a direct bearing on and relationship to life science. Throughout school, students examine the principles of ecology. The study of ecology begins simply by asking students to examine organisms in their environments and becomes more sophisticated as students ultimately study the interdependencies of living organisms on each other and their environment and impact of human beings on the natural order of things. Life science culminates in high school Biology (an HSA course) and/or Environmental Science. Students who want to go deeper into either of these topics also have the option of several elective courses such as Biotechnology, Paramedical Biology, and Anatomy and Physiology, or Field and Wildlife Biology, Aquatic Science, and Ecology of Maryland the Chesapeake Bay, to name a few.

Students in Grades PreK through 4, investigate:	Students in Grades 5 through 8, investigate:	Students in Grades 9 through 12, investigate:
• The characteristics of organisms (living vs. non-living) • Life cycles of organisms • Organisms and environments • Characteristics and changes in populations	• The structure and function in living systems • Reproduction and heredity • Regulation and behavior • Populations and ecosystems • Diversity and adaptations of organisms • Populations, resources, and environments • Natural hazards	• Biochemistry • Matter, energy, and organization in living systems • Cellular biology • The molecular basis of heredity • Biological evolution • The interdependence of organisms • The behavior of organisms • Population growth • Environmental quality • Natural and human-induced hazards

GOALS 4.0 and 5.0: THE PHYSICAL SCIENCES

The abilities and understandings of the physical sciences are addressed in **Goals 4.0** and **5.0** of the Maryland Voluntary State Curriculum (Concepts of Chemistry and Concepts of Physics, respectively). What child is not excited about learning about the *things* they encounter everyday – objects, mysterious forces, things they see on TV or read about in books, moving things, things that make noise? What child has not asked *what* or *why* or *how*? Their natural curiosity leads them to explore the world by observing and manipulating common objects and materials in their environment. Their natural curiosity also leads them to compare, describe, and sort as they work to form explanations about their world. Through time, the science of these goals moves from simple observations of physical attributes, such as shape, size, position, and motion, to analyses of why and how things change and explanations of the scientific phenomena behind those changes. Observations and analyses move from external to internal, from concrete to abstract, from macro to micro, from actual to theoretical. In the process, students learn about the interactions of matter and energy and the laws of nature which govern those interactions. They also learn to generalize and apply principles and knowledge learned to find solutions to problems. The content of Goals 4.0 and 5.0 is integrated with other science topics throughout the elementary and middle school grades and culminates in courses in Chemistry and Physics at the high school level.

In Grades K through 4, students investigate:	In Grades 5 through 8, students investigate:	In Grades 9 through 12, students investigate:
• The chemical and physical properties of objects and materials • The position and motion of objects • The concepts of light, heat, electricity, and magnetism • Simple machines	• The properties and states of matter • The characteristics of chemical and physical changes • Motions and forces • The transfer of energy (energy can change forms) • Waves	• Atomic structure • The structure and properties of matter (intrinsic and extrinsic properties) • Chemical reactions • Motions and forces (velocity, speed, direction, inertia, momentum; measurements and mathematical manipulations) • The laws governing conservation of energy and matter • The concept of increase in disorder • The interactions of energy and matter

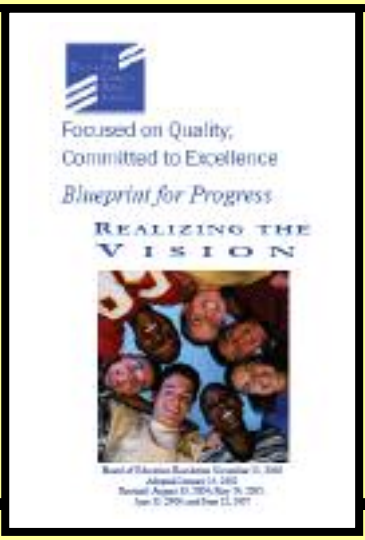
Note: The content of scope and sequence is based on content in MSDE's *Voluntary State Curriculum*, Core Learning Goals, or other national standards.

Curriculum Guide

Data analysis and Probability

Geometry	**Measurement**
Numbers and Operations	**Algebra**

MATHEMATICS PreK-12 Standards in the SCOPE and SEQUENCE



NCTM NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

Voluntary State Curriculum

The Voluntary State Curriculum defines what students should know and be able to do at each grade level in these content areas:

- *Mathematics*
- *Science*
- *Fine Arts*
- *Health & PE*
- *Reading/English Language Arts*
- *Social Studies*
- *Foreign Language*
- *English Language Proficiency*
- *Technology Education*

Summary of PreK-12
Mathematics
Scope and Sequence Summary

The mathematical understandings and competencies that Baltimore County Public School students should know and be able to do as they progress through prekindergarten through Grade 12 are encompassed by five content standards: Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability. These standards, as outlined by the National Council of Teachers of Mathematics and incorporated by the Voluntary State Curriculum, explicitly describe the mathematics that all students should have the opportunity to learn.

As students instructionally travel through each grade band of PreK-2, 3-5, 6-8, and 9-12, the emphases of these standards will vary. The major emphasis at the PreK-2 grade band is on number and geometry with a smaller amount of instructional time spent on measurement and data analysis and probability. Algebra is simply introduced during this grade band. Number continues to be the major emphasis during Grades 3-5 with additional emphases equally split amongst algebra, geometry, measurement, and data analysis and probability standards. In the middle grades, the majority of the instructional time would address algebra and geometry with some emphasis placed in the other three content strands. At the high school level, the major emphasis is on algebra with some emphasis on geometry and with number and measurement receiving the least instructional attention.

The scope and sequence for Mathematics PreK-12 outlines how a student reaches a certain level of understanding of the concepts in each standard by specified points in the curriculum. Instruction from year to year builds on this expectation of understanding and fluency. This PreK-12 Scope and Sequence provides the depth and breadth of the mathematics curriculum in Baltimore County. The curriculum guides for each course will describe the instructional paths needed to progress from the standards and objectives towards the targeted assessments created for that course. Each curriculum guide will include the portion of the scope and sequence for the grade/course before the course, the course itself, and the grade/course that follows in order for teachers to see the path of instruction and the importance of the current course objectives in the schema of mathematics. AIM provides the lens through which the mathematics curriculum can be viewed for each course by the teachers, the parents, or other interested stakeholders.

Listed on the next pages are representative items of the content standards, their major emphases, and the expectations across each grade band: These content expectations are adapted from the *Principles and Standards of School Mathematics* (Reston, VA: National Council of Teachers of Mathematics, 2000), aligned with the *Voluntary State Curriculum*, and represented in AIM.

Number and Operations Standard: Development of deep and fundamental understanding of, and proficiency with, counting, numbers, and arithmetic, as well as an understanding of number systems, and their structures. Instructional programs from prekindergarten through grade 12 should enable all students to:

- Understand numbers, way of representing numbers, relationship among numbers, and number systems.
- Understand meanings of operations and how they relate to one another.
- Compute fluently and make reasonable estimates.

PreK-5 In prekindergarten through 5 all students should:	**Grades 6-8** In Grades 6-8 all students should:	**Grades 9-12** In Grades 9-12 all students should:
• Understand the place value structure of the base-ten number system and be able to represent and compare whole numbers and decimals. • Develop and understanding of fractions as parts of unit wholes as parts of a collection, as locations on number lines, and as division of whole numbers. • Develop and use strategies for whole-number computations using a variety of methods and tools to compute, including objects, mental computation. • Develop fluency in adding, subtracting, multiplying, dividing whole numbers. • Develop and use strategies to estimate computations involving fractions and decimals. • Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil.	• Work flexibly with fractions, decimals, and percents. • Understand and use ratios and proportions • Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation. • Develop meaning for integers and represent and compare quantities with them. • Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers. • Understand and use the inverse relationship of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems. • Develop and use strategies to estimate the results of rational number computation and judge the reasonableness of the results. • Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.	• Develop a deeper understanding of very large and very small numbers and of various representations of them. • Compare and contrast the properties of numbers and number systems including the rational and real numbers, and understand complex numbers as solutions to quadratic equations that do not have real solutions. • Judge the effects of such operations as multiplication, division, and computing powers and roots on the magnitudes of quantities. • Develop an understanding of properties of, and representations for, the additional and multiplication of vectors and matrices. • Develop fluency in operation with real numbers, vectors, and matrices, using mental computation or paper-and-pencil calculations for simple cases and technology for more-complicated cases. • Judge the reasonableness of numerical computations and their results.

Algebra Standard: Development of the understanding of relationships among quantities, including functions, ways of representing mathematical relationships, including the use of symbolic notation, and the analysis of change. Instructional programs from prekindergarten through Grade 12 should enable all students to:

- Understand patterns, relations, and functions.
- Represent and analyze mathematics situations and structures using algebraic symbols.
- Use mathematical models to represent and understand quantitative relationships.
- Analyze change in various contexts.

PreK-5 In prekindergarten through 5 all students should:	**Grades 6-8** In Grades 6-8 all students should:	**Grades 9-12** In Grades 9-12 all students should:
• Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another. • Describe, extend, and make generalizations about geometric and numeric patterns. • Represent and analyze patterns and functions, using words, tables, and graphs. • Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations. • Represent the idea of a variable as an unknown quantity using a letter or a symbol. • Express mathematical relationships using equations. • Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions. • Investigate how a change in one variable relates to a change in a second variable. • Identify and describe situations with constant or varying rates of change and compare them.	• Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and when possible, symbolic rules. • Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations. • Explore relationships between symbolic expressions and graphs of line, paying particular attention to the meaning of intercept and slope. • Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships. • Model and solve contextual problems using various representations, such as graphs, tables, and equations. • Use graphs to analyze the nature of changes in quantities in linear relationships.	• Analyze functions of one variable by investigating rates of change, intercepts, zeros, asymptotes, and local and global behavior. • Understand and compare the properties of classes of functions, including exponential, polynomial, rational, logarithmic, and periodic functions. • Write equivalent forms of equations, inequalities, and systems of equations and solve them with fluency—mentally or with paper and pencil in simple cases and using technology in all cases. • Use symbolic algebra to represent and explain mathematical relationships. • Use symbolic expressions, including iterative and recursive forms, to represent relationships arising from various contexts. • Approximate and interpret rates of change from graphical and numerical data.

Geometry Standard: Development of the understanding of geometric shapes and structures, the analysis of their characteristics and relationships, spatial visualization (building and manipulating mental representations of two-and three-dimensional objects and perceiving an object from different perspectives); and reasoning and justification skills. Instructional programs from prekindergarten through Grade 12 should enable all students to:

- Analyze characteristics and properties of two- and three-dimensional geometric shape and develop mathematical arguments about geometric relationships.
- Specify locations and describe spatial relationships using coordinate geometry and other representational systems.
- Apply transformations and use symmetry to analyze mathematical situation.
- Use visualization, spatial reasoning, and geometric modeling to solve problems.

PreK-5 In prekindergarten through 5 all students should:	**Grades 6-8** In Grades 6-8 all students should:	**Grades 9-12** In Grades 9-12 all students should:
• Describe attributes and parts of two- and three-dimensional shapes. • Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes. • Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids. • Describe, name, and interpret relative positions in space and apply ideas about relative position. • Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance. • Make and use coordinate systems to specify locations and to describe paths. • Recognize and apply slides, flips, and turns. • Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs. • Recognize and represent shapes from different perspectives. • Identify and build a three-dimensional object from two-dimensional representations of that object. • Use geometric models to solve problems in other areas of mathematics, such as number and measurement.	• Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects. • Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship. • Use coordinate geometry to represent and examine the properties of geometric shapes. • Use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides. • Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling. • Examine the congruence, similarity, and line or rotational symmetry of objects using transformations. • Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume. • Use geometric models to represent and explain numerical and algebraic relationships.	• Analyze properties and determine attributes of two- and three-dimensional objects. • Establish the validity of geometric conjectures using deduction, prove theorems, and critique arguments made by others. • Use Cartesian coordinates and other coordinate systems, such as navigational, polar, or spherical systems, to analyze geometric situations. • Investigate conjectures and solve problems involving two- and three-dimensional objects represented with Cartesian coordinates. • Understand and represent translations, reflections, rotations, and dilations of objects in the plane by using sketches, coordinates, vectors, function notation, and matrices. • Use various representations to help understand the effects of simple transformations and their compositions. • Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools. • Visualize three-dimensional objects and spaces from different perspectives and analyze their cross sections.

Measurement Standard: Development of the understanding of measurable attributes and the units and processes used in measuring attributes. Instructional programs from prekindergarten through Grade 12 should enable all students to: • Understand measurable attributes and the units, systems, and processes of measurement. • Apply appropriate techniques, tools, and formulas to determine measurements.		
PreK-5 In prekindergarten through 5 all students should:	**Grades 6-8** In Grades 6-8 all students should:	**Grades 9-12** In Grades 9-12 all students should:
• Recognize the attributes of length, volume, weight, area, and time. • Select an appropriate unit and tool for the attribute being measured. • Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems. • Carry out simple unit conversions, such as from centimeters to meters, within a system of measurement. • Use tools to measure. • Develop common referents for measures to make comparisons and estimates. • Develop strategies for estimating the perimeters, areas, and volumes of irregular shapes. • Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.	• Understand both metric and customary systems of measurement. • Understand relationships among units and convert from one unit to another within the same system. • Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume. • Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes. • Solve problems involving scale factors, using ratio and proportion.	• Make decisions about units and scales that are appropriate for problem situations involving measurement. • Analyze precision, accuracy, and approximate error in measurement situations. • Understand and use formulas for the area, surface area, and volume of geometric figures, including cones, spheres, and cylinders.

Data Analysis and Probability Standard: Development of the understanding of gathering, organizing, displaying and using data wisely, of the basic concepts and applications of probability, and of how probability and statistics are related. Instructional programs from prekindergarten through Grade 12 should enable all students to:

- Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.
- Select and use appropriate statistical methods to analyze data.
- Develop and evaluate inference and predictions that are based on data.
- Understand and apply basic concepts of probability.

PreK-5 In prekindergarten through 5 all students should:	**Grades 6-8** In Grades 6-8 all students should:	**Grades 9-12** In Grades 9-12 all students should:
• Pose questions and gather data about themselves and their surroundings. • Sort and classify objects according to their attributes and organize data about the objects. • Collect data using observations, surveys, and experiments. • Represent data using tables and graphs such as line plots, bar graphs, and line graphs. • Describe parts of the data and the set of data as a whole to determine what the data show. • Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed. • Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set. • Discuss events related to students' experiences as likely or unlikely. • Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions. • Predict the probability of outcomes of simple experiments and test the predictions.	• Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population. • Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots. • Find, use, and interpret measures of center and spread, including mean and interquartile range. • Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots. • Make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit. • Use conjectures to formulate new questions and plan new studies to answer them. • Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations. • Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.	• Know the characteristics of well-designed studies, including the role of randomization in surveys and experiments. • Understand histograms, parallel box plots, and scatterplots and use them to display data. • Compute basic statistics and understand the distinction between a statistic and a parameter. • Be able to display the distribution, describe its shape, and select and calculate summary statistics for univariate measurement data/ • Be able to display a scatterplot, describe its shape, and determine regression coefficients, regression equations, and correlation for bivariate measurement data coefficients using technological tools. • Use simulations to explore the variability of sample statistics from a known population and to construct sampling distributions. • Evaluate published reports that are based on data by examining the design of the study, the appropriateness of the data analysis, and the validity of conclusions. • Understand the concepts of sample space and probability distribution and construct sample spaces and distributions in simple cases. • Understand the concepts of conditional probability and independent events. • Understand how to compute the probability of a compound event.

Note: The content of scope and sequence is based on content in MSDE's *Voluntary State Curriculum*, Core Learning Goals, or other national standards.

Appendix

Articulated Instruction Module

Objective List

Subject Area : Reading/English Language Arts
Course : ENGLISH 10 (1010000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-1 The student will use pre-reading strategies appropriate to both the text and purpose for reading by surveying the text, accessing prior knowledge, formulating questions, setting purpose(s), and making predictions.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Identify an appropriate purpose for reading the text.
- KSI-B Identify questions a reader would expect to be answered by reading the text.
- KSI-C Identify topics of discussion that may enhance a reader's understanding of a text.
- KSI-D Recognize and analyze the implications of text features.
- KSI-E Synthesize appropriate experiences and prior knowledge about the topic, author, or type of material to the text.

O-2 The student will use during-reading strategies appropriate to both the text and purpose for reading by visualizing, making connections, and using fix-up strategies such as reading, questioning, and summarizing.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Make connections between ideas within the text and relevant prior knowledge.
- KSI-B Appraise similarities or differences in organizational patterns, text/author's purpose, and relevant prior knowledge within or across texts.
- KSI-C Identify the meaning of above-grade-level words as they are used in context.
- KSI-D Identify the appropriate meaning of multiple-meaning words as they are used in context.
- KSI-E Predict the development of ideas that might logically be included in the text.

O-3 The student will use after-reading strategies appropriate to both the text and purpose for reading, by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Summarize, compare, contrast, and synthesize significant ideas in a text.
- KSI-B Summarize or synthesize significant ideas across texts and draw conclusions based on the information in more than one text.
- KSI-C Draw conclusions based upon information from the text.
- KSI-D Predict the development, topics, or ideas that might logically be included if the text were extended.

O-4 The student will apply reading strategies when comparing, making connections, and drawing conclusions about non-print text.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Recognize and analyze the implications of non-print text such as photographs, posters, art reproductions, cartoons, and stills from film or stage productions.
- KSI-B Evaluate non-print text as it relates to a print-text.
- KSI-C Summarize, compare, draw conclusions about, and synthesize significant ideas between print and non-print text.

Objectives / Knowledge and Skill Indicators

O-5 The student will consider the contributions of plot, character, setting, conflict, and point of view when constructing the meaning of a text.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Examine and determine the significance of plot sequence as it contributes to the meaning of a text.
- KSI-B Examine and determine the significance of characters' defining traits as they contribute to the meaning of a text.
- KSI-C Examine and determine the significance of details that provide clues to the setting and mood.
- KSI-D Examine and determine the significance of conflict as it contributes to the meaning of a text.
- KSI-E Examine and determine the significance of point of view and multiple narrators as they contributes to the meaning of a text.

O-6 The student will determine how the speaker, organization, sentence structure, word choice, tone, rhythm, and imagery reveal an author’s purpose.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Identify and/or explain the significance of a particular speaker as it contributes to the author’s purpose.
- KSI-B Identify and/or explain the significance of the arrangement of ideas, words, or phrases in conveying the author's purpose.
- KSI-C Identify and/or explain the significance of syntax that creates rhythm to reveal meaning.

O-7 The student will explain the effectiveness of stylistic elements in a text that communicate an author’s purpose.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Identify and explain the effect and/or effectiveness of repetition and/or exaggeration as it contributes to the author's purpose
- KSI-B Identify and explain the effect and/or effectiveness of parallelism, allusion, and/or analogy as they contribute to the author's purpose.
- KSI-C Identify and explain the effect and/or effectiveness of transitions and/or choice of details as it contributes to the author's purpose.
- KSI-D Identify and explain the effect and/or effectiveness of syntax, organizational patterns, and/or structural features as they contribute to the author's purpose.

O-8 The student will identify and/or explain connections between and among themes and/or styles of two or more texts.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Analyze the similarities or differences in styles of two or more texts.
- KSI-B Analyze the similarities or differences in themes of two or more texts.
- KSI-C Analyze the ways in which different texts illustrate a similar theme.

Subject Area : Reading/English Language Arts
Course : ENGLISH 10 (1010000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-9 The student will extend or further develop meaning by explaining the implications of the text for the reader or contemporary society.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Identify and/or explain ideas and issues of a text or across texts that may have implications for readers or contemporary society.
- KSI-B Extend ideas found in a text or across texts by connecting them to personal or societal relevance.

O-10 The student will identify features of language that create tone and voice.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Analyze the effects of certain words and phrases on the tone or voice of a text or across texts.
- KSI-B Identify similarities or differences in the overall tone created by language choices throughout a text or across texts.

O-11 The student will explain how common and universal experiences serve as the source of literary themes that cross time and cultures.

Goal 1 Reading, Reviewing and Responding to Texts - The student will demonstrate the ability to respond to a text by employing personal experiences and critical analysis. (Source : Core Learning Goals)

- KSI-A Identify the experiences, emotions, issues and ideas in a text or across texts that give rise to universal themes.
- KSI-B Evaluate the influence, effect, or impact of historical, cultural, or biographical information on a text.

O-12 The student will compose to inform by using appropriate types of prose.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Compose to explain an idea or examine a topic.
- KSI-B Compose to meet the criteria of the ECR rubric.

O-13 The student will compose persuasive texts that support, modify, or refute a position and include effective rhetorical strategies.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Compose to state and support, refute, or modify a position using description to support the writing purpose.
- KSI-B Compose to state and support, refute, or modify a position using personal ideas to support the writing purpose.
- KSI-C Compose to meet the criteria of the ECR rubric.

O-14 The student will use a variety of prewriting strategies to generate and develop ideas.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Identify an appropriate prewriting strategy for a specific purpose or topic.
- KSI-B Identify relevant sources of information.

Subject Area : Reading/English Language Arts
Course : ENGLISH 10 (1010000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-15 The student will select and organize ideas for specific audiences and purposes.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Select a logical sequence of ideas or sentences.
- KSI-B Determine an appropriate organizational structure emphasizing purpose and/or audience.
- KSI-C Select or delete information to suit a given purpose or audience.
- KSI-D Identify the logical placement of a sentence or paragraph within a text.

O-16 The student will revise and edit texts for clarity, completeness, and effectiveness.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Complete or expand ideas with logical coordination of ideas, subordination to replace excessive coordination, and conciseness.
- KSI-B Attend to audience with elaboration or support sentences, transitional devices between sentences and paragraphs, and word choice.
- KSI-C Control language structures with clear placement of modifiers; shifts in person, number, and tone; misplaced and dangling modifiers.

O-17 The student will determine grammatical classification of words by using meaning, position, form, and function.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Use the position and form to determine the function or classification of words and phrases (subjects and objects: noun, pronoun, gerund, infinitive, appositive, simple, compound).
- KSI-B Use the position and form to determine the function or classification of words and phrases (predicates: verb, verb phrase, simple, compound).
- KSI-C Use the position and form to determine the function or classification of words and phrases (modifiers: adjective (including pronouns used as adjectives), adverb, prepositional phrase, participle, infinitive, article).
- KSI-D Use the position and form to determine the function or classification of words and phrases (conjunctions: coordinating, subordinating, correlative and conjunctive adverbs).

O-18 The student will differentiate grammatically complete sentences from non-sentences.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Identify sentence fragments.
- KSI-B Identify run-on sentences, including fused sentences and comma splices.
- KSI-C Complete inappropriate sentence fragments.

O-19 The student will compound various sentence elements—subjects, predicates, and modifiers, phrases, and clauses—to link or contrast related ideas.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Combine sentences through the use of logical coordination.
- KSI-B Combine sentences through the use of logical and effective subordination.
- KSI-C Combine sentences through the use of logical sequencing of ideas.

Objectives / Knowledge and Skill Indicators

O-20 The student will expand sentences by positioning phrases and clauses to accomplish.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Expand sentences by using correctly placed modifiers, including appositives, verbals, dependent clauses, and restrictive or nonrestrictive clauses.

O-21 The student will edit texts for spelling, capitalization, and punctuation.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Use internalized knowledge to identify and correct errors in the spelling of commonly confused words.
- KSI-B Use internalized knowledge to identify and correct errors in commas in a series, after introductory elements, setting off appositives and parenthetical statements, in dates and places, and before coordinating conjunctions in compound sentences.
- KSI-C Use internalized knowledge to identify and correct errors in semicolons between closely-related main clauses.
- KSI-D Use internalized knowledge to identify and correct errors in semicolons and commas in compound sentence with a conjunctive adverb.
- KSI-E Use internalized knowledge to identify and correct errors in apostrophes.

O-22 The student will use available resources to correct or confirm revisions and/or editorial choices.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Use a resource for standard English usage: agreement of subject and verb.
- KSI-B Use a resource for standard English usage: agreement of pronoun and antecedent.
- KSI-C Use a resource for standard English usage: appropriate case of nouns and pronouns.
- KSI-D Use a resource for standard English usage: appropriate and consistent verb tenses.
- KSI-E Use a resource for standard English in place of nonstandard English and slang.

O-23 The student will state and explain a personal response to a given text.

Goal 4 Evaluating the Content, Organization, and Language Use of Texts - The student will demonstrate the ability to evaluate the content, organization, and language use of texts. (Source : Core Learning Goals)

- KSI-A Explain the effectiveness of text(s) in accomplishing a purpose.
- KSI-B Explain the connections within or between texts.
- KSI-C Select and explain appropriate textual evidence that supports a personal response: specific words and phrases, details, scenes, images, and symbols.

O-24 The student will assess the effectiveness of diction that reveals an author’s purpose.

Goal 4 Evaluating the Content, Organization, and Language Use of Texts - The student will demonstrate the ability to evaluate the content, organization, and language use of texts. (Source : Core Learning Goals)

- KSI-A Evaluate the author’s choice of words, phrases, sentences, and word order for a particular audience.
- KSI-B Evaluate the author’s choice of words, phrases, sentences, and word order for a given purpose.
- KSI-C Evaluate the author’s choice of words, phrases, sentences, and word order to extend meaning in a context.
- KSI-D Evaluate the author’s choice of words, phrases, sentences, and word order to provide emphasis.

Objectives / Knowledge and Skill Indicators

O-25 The student will alter the tone of a text by revising its diction.

Goal 4 Evaluating the Content, Organization, and Language Use of Texts - The student will demonstrate the ability to evaluate the content, organization, and language use of texts. (Source : Core Learning Goals)

- KSI-A Select the appropriate revisions of words and phrases: tone (e.g., humorous, urgent, official, authoritative, more or less critical, commanding, diplomatic, detached, resentful, sympathetic, formal, informal).
- KSI-B Select the appropriate revisions of words and phrases: purpose (inform, persuade, express personal ideas).
- KSI-C Select the appropriate revisions of words and phrases: audience (e.g., peer, adult, child, official authority).

O-26 The student will use suitable traditional and electronic resources to refine presentations and edit texts for effective and appropriate use of language and conventions.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Use resources to avoid the use of trite expressions and clichés.
- KSI-B Use resources to create smooth and informative transitions.
- KSI-C Arrange parallel elements appropriately and effectively.
- KSI-D Select appropriate use of active or passive voice.
- KSI-E Select appropriate word for a given purpose.

O-27 The student will identify sources of information on a self-selected and/or given topic and assess their appropriateness to accomplish a purpose.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Determine the appropriateness of a resource to accomplish a purpose, such as: dictionary, thesaurus, encyclopedia, magazines, newspapers, fiction and non-fiction, card catalogue, and on-line websites.

O-28 The student will use a systematic process for recording and documenting information.

Goal 2 Composing in a Variety of Modes - The student will demonstrate the ability to compose in a variety of modes by developing content, employing specific forms, and selecting language appropriate for a particular audience and purpose. (Source : Core Learning Goals)

- KSI-A Assess the advantages, disadvantages, or limitations of sources of information (e.g. comprehensiveness, honesty, reliability, bias, accuracy, availability, variety, currency, multiple points of view.)
- KSI-B Identify information to include or exclude in a reference citation when using either traditional or electronic sources of information.
- KSI-C Determine information that should be documented.

O-29 The student will differentiate connotative from denotative meanings of words.

Goal 3 Controlling Language - The student will demonstrate the ability to control language by applying the conventions of Standard English in writing and speaking. (Source : Core Learning Goals)

- KSI-A Determine implied meanings(s) or image(s) associated with a particular word or phrase.

Articulated Instruction Module

Objective List

Subject Area : Social Studies
Course : AMERICAN GOVERNMENT (1509000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-1 Students will analyze situations in order to draw conclusions about the relevance and purpose of government in their lives.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A identify the need and purposes for government in a society
- KSI-B establish the relevancy of government to our daily lives
- KSI-C analyze the benefits and responsibilities of citizenship

O-2 Students will analyze recent United States policies regarding international trade, alliances, and humanitarian efforts in order to prioritize foreign policy decisions.

Goal 2 Peoples Of The Nation And World - The student will demonstrate an understanding of the history, diversity, and commonality of the peoples of the nation and world, the reality of human interdependence, and the need for global cooperation, through a perspective that is both historical and multicultural. (Source : Core Learning Goals)

- KSI-A describe foreign policy goals and issues that affect international relationships
- KSI-B investigate United States actions which promote foreign policy goals
- KSI-C assess the impact that international, national, and regional interests can have on environmental policy

O-3 Students will analyze political systems in order to evaluate their effectiveness.

Goal 2 Peoples Of The Nation And World - The student will demonstrate an understanding of the history, diversity, and commonality of the peoples of the nation and world, the reality of human interdependence, and the need for global cooperation, through a perspective that is both historical and multicultural. (Source : Core Learning Goals)

- KSI-A identify various systems of government
- KSI-B analyze various types of government
- KSI-C analyze the characteristics of authoritarian government
- KSI-D compare various forms of democracy

O-4 Students will apply fundamental economic concepts in order to evaluate the effectiveness of government policy in achieving economic goals.

Goal 4 Economics - The student will demonstrate an understanding of the historical development and current status of economic principles, institutions, and processes needed to be effective citizens, consumers, and workers. (Source : Core Learning Goals)

- KSI-A analyze the role of government in managing the budget
- KSI-B analyze key economic indicators used to measure the economy
- KSI-C apply the tools of fiscal policy
- KSI-D apply the tools of monetary policy

O-5 Students will analyze how governments answer the basic economic questions in order to evaluate decisions of what to produce, how to produce, and for whom to produce.

Goal 4 Economics - The student will demonstrate an understanding of the historical development and current status of economic principles, institutions, and processes needed to be effective citizens, consumers, and workers. (Source : Core Learning Goals)

- KSI-A examine three basic economic questions
- KSI-B analyze how various types of governments answer each economic question

Subject Area : Social Studies
Course : AMERICAN GOVERNMENT (1509000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-6 Students will analyze historical documents in order to determine principles that served as precedents for the United States Constitution.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A define individual and group values
- KSI-B analyze primary source documents: Magna Carta, English Bill of Rights, and the Declaration of Independence
- KSI-C identify weaknesses in the Articles of Confederation

O-7 Students will analyze the United States Constitution in order to determine the basic principles of democracy.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A analyze the Preamble of the Constitution
- KSI-B draw conclusions about the structure of American government
- KSI-C analyze the process used to amend the Constitution
- KSI-D evaluate the distribution of powers between the national and state governments
- KSI-E determine the relationships between democratic values and the principles in the Constitution, the Bill of Rights, and Amendments

O-8 Students will analyze real world scenarios in order to determine how democratic values and principles affect Americans.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A assess the degree to which democratic principles assist or impede the rights of individuals and groups
- KSI-B analyze legal means of dissent and protest
- KSI-C analyze disparities between American ideals and the realities of governing in a democratic society

O-9 Students will investigate the roles and powers of the president in order to draw conclusions about the changing role of the presidency.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A identify the constitutional and implied qualifications for the presidency
- KSI-B analyze presidential powers and roles
- KSI-C examine the role and functions of the cabinet

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Course : AMERICAN GOVERNMENT (1509000)

Baltimore County Public Schools
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Objectives / Knowledge and Skill Indicators

O-10 Students will identify and analyze the steps in the process of electing a president in order to evaluate the strategies that drive a presidential campaign.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A analyze the variety of philosophical viewpoints on the political spectrum
- KSI-B evaluate the roles and functions of political parties in the United States
- KSI-C describe the presidential nominating processes
- KSI-D evaluate the electoral process and its impact on campaign strategies
- KSI-E evaluate the role of the media in campaigns and elections

O-11 Students will analyze presidential decisions in order to evaluate their impact on the rights of individuals and groups.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A analyze presidential actions related to civil rights
- KSI-B analyze presidential use of power to maintain order and safety

O-12 Students will examine the executive branch of state and local governments in order to compare and contrast the roles of the executive at each level.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A compare the roles of the governor with those of the president
- KSI-B analyze the organization of the Maryland executive branch
- KSI-C describe executive functions at the local level of government

O-13 Students will describe the organization and powers of legislative bodies in order to determine their role in the legislative process.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A identify congressional powers in the Constitution
- KSI-B analyze the basic structure and roles of Congress
- KSI-C determine how demographics affect the House of Representatives
- KSI-D describe the organization and function of the Maryland General Assembly and local legislative bodies

O-14 Students will analyze the functioning of Congress in order to evaluate the legislative process

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A examine how legislative committees function
- KSI-B analyze the steps of how a bill becomes a law

Articulated Instruction Module

Objective List

Subject Area : Social Studies
Course : AMERICAN GOVERNMENT (1509000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-15 Students will describe the organization, jurisdiction, and powers of the federal and state judiciary in order to analyze how the court system functions.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A describe the principles of the American legal system
- KSI-B analyze the organization and jurisdiction of the federal courts
- KSI-C compare the organization and jurisdiction of Maryland courts and federal courts

O-16 Students will examine judicial review and Supreme Court cases illustrating conflicting interpretations of the Bill of Right and the Fourteenth Amendment in order to evaluate the degree to which those decisions protected rights, maintained order, and achieved the ideal of “Equal Justice under Law.”

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A analyze the impact of Supreme Court cases on due process
- KSI-B analyze the impact of Supreme Court cases on civil liberties
- KSI-C analyze the impact of Supreme Court cases on students’ rights
- KSI-D determine the impact of Supreme Court cases on federalism and separation of powers

O-17 Students will evaluate roles and policies that the United States government has assumed in order to develop resolutions for public policy issues.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A analyze the role of government in public policy issues
- KSI-B analyze competing interests within socio-economic public issues
- KSI-C analyze government involvement in a land use issue
- KSI-D analyze censorship of the media and technology as a public policy issue
- KSI-E evaluate public assistance programs created by the United States government

O-18 Students will investigate the media in order to evaluate its impact on citizens, politics, and public policy.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A determine the reliability of sources of information
- KSI-B assess the impact of the media on politics and public opinion

O-19 Students will analyze public issues in order to determine how individuals can impact the political system.

Goal 1 Political Systems - The student will demonstrate an understanding of the historical development and current status of principles, institutions, and processes of political systems. (Source : Core Learning Goals)

- KSI-A apply the issues analysis model to a selected issue
- KSI-B analyze and take action on a current public issue

Articulated Instruction Module

Objective List

Subject Area : Science
Course : BIOLOGY (2510000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-1 The student will be able to describe the unique characteristics of chemical substances and macromolecules utilized by living systems.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Describe polarity, density, and solvent properties of water.
- KSI-B Compare the structure and function of carbohydrates, lipids, proteins, and nucleic acids.
- KSI-C Explain the roles of minerals and vitamins in cellular processes.

O-2 The student will be able to discuss factors involved in the regulation of chemical activity as part of a homeostatic mechanism.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Use pH scale to explain the effect of pH changes on cells and organisms.
- KSI-B Explain how temperature, pH, and enzyme/substrate concentration have an effect on enzyme activity.

O-3 The student will be able to compare the transfer and use of matter and energy in photosynthetic and non-photosynthetic organisms and identify the factors that regulate this metabolic activity.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Explain how light energy is converted to chemical energy in photosynthesis and how environmental factors can affect the rate of this reaction.
- KSI-B Distinguish between aerobic and anaerobic respiration to explain how glucose and oxygen are used to produce ATP and other energy forms.
- KSI-C Explain how bacteria release energy from inorganic compounds through chemosynthesis.

O-4 The student will explain processes and the related structures found in unicellular and multicellular organisms.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Describe the roles of organelles, tissues and organ systems in order to transport food, water, minerals and waste.
- KSI-B Distinguish between types of asexual reproduction and sexual reproduction.
- KSI-C Explain how homeostasis is maintained through feedback within a cell, between cells, and between cells and their environment.
- KSI-D Identify the cellular structures and their functions that are common to all cell types, as well as those that distinguish one cell type from another.
- KSI-E Identify the functions of the major body systems.

Subject Area : Science
Course : BIOLOGY (2510000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-5 The student will demonstrate that the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Explain the process of meiosis and its affect on chromosome number and new gene combination (crossing over).
- KSI-B Explain how fertilization combines genetic material from two parents.

O-6 The student will illustrate and explain how expressed traits are passed from parent to offspring.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Construct and interpret results of a monohybrid Punnett square including translating genotypes into phenotypes.
- KSI-B Distinguish between inheritance patterns including sex-linked, dominant and recessive.
- KSI-C Interpret a pedigree to determine patterns of inheritance in a family.

O-7 The student will explain how a genetic trait is determined by the code in DNA molecule.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Define a gene as a segment of DNA that codes for protein or DNA.
- KSI-B Describe the process of protein synthesis and the location within the cell of each step.
- KSI-C Explain how the production of proteins determine traits of an individual.

O-8 The student will interpret how the effects of DNA alteration can be beneficial or harmful to the individual, society, and/or the environment.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Describe how environmental factors expecially radiation and toxic substances cause mutations.
- KSI-B Recognize that changes in chromosome number and errors in meiosis can cause genetic abnormalities.
- KSI-C Describe applications of DNA technology including gene splicing, recombinant DNA, cloning and gel electrophoresis.

Subject Area : Science
Course : BIOLOGY (2510000)

Baltimore County Public Schools
Report Date : 02/19/2008

Objectives / Knowledge and Skill Indicators

O-9 The student will explain how differential survival and reproduction affects a population over time.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Recognize that variation within a population arises from sexual reproduction or mutation and is heritable.
- KSI-B Explain how natural selection affects the frequency of traits within a population over time.
- KSI-C Describe how changes in the environment determine whether or not a trait is adaptive.

O-10 The student will estimate degrees of relatedness among organisms or species.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Classify organisms according to the seven level taxonomic system.
- KSI-B Demonstrate relatedness between organisms using anatomical, molecular, and fossil evidence.

O-11 The student will analyze how abiotic and biotic factors affect the diversity of and relationships between organisms within an ecosystem.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Demonstrate that abiotic and biotic factors limit the distribution and abundance of organisms in ecosystems.
- KSI-B Describe how atoms and molecules needed by organisms cycle among the living and nonliving components of the ecosystem.
- KSI-C Describe how specialized interactions and relationships among organisms maintain the stability of an ecosystem.

O-12 The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Identify the roles that organisms have in an ecosystem.
- KSI-B Interpret diagrams to explain how the flow of energy maintains the stability of the ecosystem.
- KSI-C Describe how recovery from an ecosystem disruption occurs in stages and may or may not result in a system representative of the original one.

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O-13 The student will describe how natural and man-made changes in environmental conditions will affect individual organisms and the dynamics of populations.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Explain how natural events such as fire, disease, and food availability affect individuals and populations.
- KSI-B Explain how human activity such as urbanization, habitat destruction, and pollution affect biotic and abiotic components of the ecosystem.

O-14 The student will illustrate how all organisms are part of, and depend on, two major gloobal food webs that are positively or negatively influenced by human activity and technology.

Goal 3 Concepts Of Biology - The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth. (Source : Core Learning Goals)

- KSI-A Construct diagrams to illustrate the interrelationships of organisms within oceanic and terrestrial food webs.
- KSI-B Explain how natural and man-made activities affect the populations within food webs.

O-15 Students will explain why curiosity, honesty, openness, and skepticism are highly regarded in science.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Recognize that real problems have more than one solution and decisions to accept one solution over another are made on the basis of many issues.
- KSI-B Modify or affirm scientific ideas according to accumulated evidence.
- KSI-C Critique arguments that are based on faulty, misleading data or on the incomplete use of numbers.
- KSI-D Recognize data that are biased.
- KSI-E Explain factors that produce biased data (incomplete data, using data inappropriately, conflicts of interest, etc.).

O-16 Students will form scientific questions and suggest investigative approaches to provide answers to questions.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Identify meaningful, answerable scientific questions in order to formulate a working hypothesis.
- KSI-B Discuss the need for verifiable data.
- KSI-C Select appropriate instruments and materials to conduct an investigation.
- KSI-D Identify appropriate methods for conducting an investigation (independent and dependent variables, proper controls, repeat trials, appropriate sample size, etc.).
- KSI-E Use relationships discovered in the lab to explain phenomena observed outside the laboratory.

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O-17 Students will carry out scientific investigations effectively and employ the instruments, systems of measurement, and materials of science appropriately.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Recognize safe laboratory procedures.
- KSI-B Demonstrate skills in using lab and field equipment to perform investigative techniques.
- KSI-C Demonstrate safe handling of the chemicals and materials of science.
- KSI-D Demonstrate the use of new instruments and equipment by following instructions in a manual or from oral direction.

O-18 Students will demonstrate that data analysis is a vital aspect of the process of scientific inquiry and communication.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Organize data appropriately using techniques such as tables, graphs, and webs.
- KSI-B Analyze data to make predictions, decisions, or draw conclusions and use experimental data from various investigators to validate results.
- KSI-C Determine the relationships between quantities and develop the mathematical model that describes these relationships.
- KSI-D Analyze graphs to determine that they do not misrepresent results and describe trends revealed by data.
- KSI-E Analyze data to confirm, modify, or reject a hypothesis and determine the sources of error that limit the accuracy or precision of experimental results.

O-19 Students will use appropriate methods for communicating in writing and orally the processes and results of scientific investigation.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Demonstrate the ability to summarize data and create and/or interpret graphics.
- KSI-B Explain scientific concepts and processes through drawing, writing, and/or oral communication and use tables, graphs, and displays to support arguments and claims in both written and oral communication.
- KSI-C Read a technical selection and interpret it appropriately.
- KSI-D Use, explain, and/or construct various classification systems.
- KSI-E Describe similarities and differences when explaining concepts and/or principles and communicate conclusions derived through a synthesis of ideas.

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O-20 Students will use mathematical processes.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Use ratio and proportion in appropriate situations to solve problems.
- KSI-B Use computers and/or graphing calculators to perform calculations for tables, graphs, or spreadsheets.
- KSI-C Explain and/or compare small and large quantities using scientific notation and relative order of magnitude.
- KSI-D Demonstrate the ability to manipulate quantities and/or numerical values in algebraic equations.
- KSI-E Judge the reasonableness of an answer.

O-21 Students will show that connections exist both within the various fields of science and among science and other disciplines including mathematics, social studies, language arts, fine arts, and technology.

Goal 1 Skills And Processes - The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information. (Source : Core Learning Goals)

- KSI-A Apply the skills, processes, and concepts of biology, chemistry, physics, or earth science to societal issues.
- KSI-B Identify and evaluate the impact of scientific ideas and/or advancements in technology on society.
- KSI-C Recognize mathematics as an integral part of the scientific process.
- KSI-D Investigate career possibilities in the various areas of science.
- KSI-E Explain how development of scientific knowledge leads to the creation of new technology and how technological advances allow for additional scientific accomplishments.

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Subject Area : Mathematics
Course : ALGEBRA I (2021000)

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Objectives / Knowledge and Skill Indicators

O-1 Students will be able to apply the symbols of algebra to solve equations in one variable.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Translate back and forth between verbal sentences and equations.
- KSI-B Solve equations by using addition, subtraction, multiplication, and division.
- KSI-C Solve equations involving more than one operation.
- KSI-D Solve equations with the variable on each side.
- KSI-E Solve equations using grouping symbols.

O-2 Students will factor to solve quadratic equations found in the sciences, business, and other areas of human endeavor.

No standard available.

- KSI-A Find the prime factorization of monomials and fine the greatest common factor of monomials.
- KSI-B Factor polynomials using the Distributive Property.
- KSI-C Solve quadratic equations in the form ax^2+c=0, x^2+bx+c=0, and ax^2+bx+c=0.
- KSI-D Solve quadratic equations that involve the difference of squares and perfect squares using factoring techniques.

O-3 Students will use inductive reasoning to identify, extend, and generalize patterns.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Recognize arithmetic sequences.
- KSI-B Extend and write formulas for arithmetic sequences.
- KSI-C Look for and identify a linear pattern
- KSI-D Write an equation to represent a linear pattern.

O-4 Students will use matrices to organize and interpret data.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Organize data in matrices.
- KSI-B Add or subtract matrices to solve problems.
- KSI-C Multiply a matrix by a scalar to solve problems.

O-5 Students will transform algebraic expressions and equations into equivalent forms using symbols and arithmetic operations.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Evaluate numerical and algebraic expressions using the order of operations.
- KSI-B Add and subtract rational numbers.
- KSI-C Multiply and divide rational numbers.
- KSI-D Solve equations and formulas for given variables.

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Objectives / Knowledge and Skill Indicators

O-6 Students will create and interpret linear graphs in order to solve real-world problems.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Use slope, points, and equations to graph lines on the coordinate plane.
- KSI-B Write and graph linear equations in slope-intercept form.
- KSI-C Use rate of change to solve problems.
- KSI-D Write and graph direct variation equations and solve problems involving direct variation.

O-7 Students will write linear equations in slope-intercept, point-slope, and standard form by using tables and graphs.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Write an equation of a line given the slope and one point on the line or given two points on the line.
- KSI-B Write an equation of a line in point-slope form.
- KSI-C Write linear equations in different form.
- KSI-D Write an equation of a line that passes through a given point, parallel to a given line.
- KSI-E Write an equation of a line that passes through a given point, perpendicular to a given line.

O-8 Students will create and interpret visual representations of algebraic functions and find the line of best fit for scatterplots utilizing the tools of technology.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Interpret points on a scatterplot.
- KSI-B Write equations for lines of best fit.

O-9 Students will represent, solve, and graph inequalities and systems of inequalities using symbolic algebra.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Solve one-variable inequalities using addition, subtraction, multiplication, and division.
- KSI-B Solve multi-step inequalities in one variable.
- KSI-C Solve compound inequalities and write compound inequalities to represent a real-world situation.
- KSI-D Write, solve, and graph inequalities in two variables in satndard form or in slope-intercept form.
- KSI-E Solve a system of inequalities in two variables by graphing.

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O-10 Students will identify the maximum and minimum values, zeros, and the rates of change over specific intervals to describe functions and other nonlinear graphs.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Determine the domain and range of a function from a graph or table.
- KSI-B Use tables, graphs, and equations to identify functions as linear or nonlinear.
- KSI-C Describe the graph of nonlinear functions in terms of increasing/decreasing, maxima/minima, roots, and continuity.
- KSI-D Describe how the graphical model of a nonlinear function represents a given problem.

O-11 Students will represent irrational numbers in equivalent forms using number theory and technology.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Find the absolute values of rational numbers.
- KSI-B Find square roots.
- KSI-C Graph real numbers on a number line.
- KSI-D Classify and order real numbers.

O-12 Students will simplify expressions and solve problems by applying the laws of exponents.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Simplify expressions involving powers of monomials.
- KSI-B Simplify expressions involving quotients of monomials including those with negative exponents.
- KSI-C Express numbers in scientific notation.
- KSI-D Add and subtract polynomials.
- KSI-E Multiply polynomials using the Distributive Property.

O-13 Students will solve systems of equations by using graphing, substitution, and linear combination methods.

Goal 1 Functions and Algebra - The student will demonstrate the ability to investigate, interpret, and communicate solutions to mathematical and real-world problems using patterns, functions, and algebra. (Source : Core Learning Goals)

- KSI-A Solve a system of linear equations by graphing.
- KSI-B Determine if a system of linear equations has 0, 1, or no solution.
- KSI-C Solve a system of linear equations using substitution.
- KSI-D Solve a system of linear equations using linear combination.
- KSI-E Solve real-world problems involving systems of equations.

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Objectives / Knowledge and Skill Indicators

O-14 Students will find and use measures of center and spread to analyze statistical data, make informed decisions, and communicate the use and misuse of statistics.

Goal 3 Data Analysis And Probability - The student will demonstrate the ability to apply probability and statistical methods for representing and interpreting data and communicating results, using technology when needed. (Source : Core Learning Goals)

- KSI-A Analyze data using mean, median, and mode.
- KSI-B Determine whether graphs are misleading.
- KSI-C Determine the best measure of central tendency for a set of data.
- KSI-D Find the range of a set of data.
- KSI-E Find quartiles and the interquartile range of a set of data.

O-15 Students will design statistical experiments using appropriate sampling methods and conduct simulations to determine experimental probabilities.

Goal 3 Data Analysis And Probability - The student will demonstrate the ability to apply probability and statistical methods for representing and interpreting data and communicating results, using technology when needed. (Source : Core Learning Goals)

- KSI-A Define and identify a simple random sample.
- KSI-B Select a probability tool and assign a rule to simulate a situation.
- KSI-C Perform probability simulations to model real-life situations involving uncertainty.

O-16 Students will construct organized lists, tree diagrams, and area models to compute probabilities for simple compound events.

Goal 3 Data Analysis And Probability - The student will demonstrate the ability to apply probability and statistical methods for representing and interpreting data and communicating results, using technology when needed. (Source : Core Learning Goals)

- KSI-A Find the probability of simple events, with and without replacement from a variety of data sources.
- KSI-B Distinguish between experimental and theoretical probability.
- KSI-C Calculate the expected value for an event using theoretical probability.
- KSI-D Count outcomes and find probabilities using tree diagrams or the Fundamental Counting Principle.
- KSI-E Find geometric probabilities of certain events using area models.