STATE MATCH SUPPLEMENT

Alabama Courses of Study

English Language Arts, Mathematics, and Science
Grades 8–12

and

EXPLORE®, PLAN®, the ACT®, and WorkKeys®

April 2010

ACT®

List of Supplement Tables

List of Supplement Tables

List of Supplement Tables

Preface

This document is a supplement to the *State Match Alabama Courses of Study English Language Arts, Mathematics, and Science Grades 8–12 and EXPLORE, PLAN, the ACT, and WorkKeys (April 2010)*. This supplement identifies specific ACT College Readiness Standards that correspond to each Alabama Content Standard in a side-by-side format. The left side of each page presents the Alabama Content Standards (highlighted if measured by ACT's corresponding testing program). The right side of each page presents the specific ACT College Readiness Standard(s) and WorkKeys skill(s) that correspond to each Alabama Standard.

Alabama Content Standards listed here are from the Alabama Courses of Study as presented on the Alabama Department of Education's website in March 2010.

Alabama Courses of Study	Year Adopted
English Language Arts	2007
Mathematics	2009
Science	2005

SUPPLEMENT
TABLES 1A–1G:

ENGLISH LANGUAGE ARTS

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
Reading	
1. Apply strategies, including making inferences to determine theme, confirming or refuting predictions, and using specific context clues, to comprehend eighth-grade recreational reading materials. • Applying self-monitoring strategies for text understanding • Distinguishing fact from fiction to enhance understanding • Determining sequence in recreational reading materials	
2. Evaluate the impact of setting, mood, and characterization on theme in specific literary selections. • Identifying components of plot	**Main Ideas and Author's Approach:** Recognize a clear intent of an author or narrator in uncomplicated literary narratives Identify a clear main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages Recognize a clear function of a part of an uncomplicated passage Locate important details in uncomplicated passages Make simple inferences about how details are used in passages Locate important details in more challenging passages Locate and interpret minor or subtly stated details in uncomplicated passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
	Recognize clear cause-effect relationships described within a single sentence in a passage
	Identify relationships between main characters in uncomplicated literary narratives
	Recognize clear cause-effect relationships within a single paragraph in uncomplicated literary narratives
	Order simple sequences of events in uncomplicated literary narratives
	Identify clear relationships between people, ideas, and so on in uncomplicated passages
	Identify clear cause-effect relationships in uncomplicated passages
	Order sequences of events in uncomplicated passages
	Understand relationships between people, ideas, and so on in uncomplicated passages
	Identify clear relationships between characters, ideas, and so on in more challenging literary narratives
	Understand implied or subtly stated cause-effect relationships in uncomplicated passages
	Identify clear cause-effect relationships in more challenging passages
	Meanings of Words:
	Understand the implication of a familiar word or phrase and of simple descriptive language
	Use context to understand basic figurative language
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages
	Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages
	Generalizations and Conclusions:
	Draw simple generalizations and conclusions about the main characters in uncomplicated literary narratives
	Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw simple generalizations and conclusions using details that support the main points of more challenging passages
	Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives
	Draw generalizations and conclusions about people, ideas, and so on in more challenging passages

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
3. Distinguish among the subcategories of poetry, such as ballads, lyric poems, epics, haiku, and limericks, based on their characteristics. • Identifying rhythm and rhyme scheme	
4. Apply strategies appropriate to type of reading material, including making inferences to determine bias or theme and using specific context clues, to comprehend eighth-grade informational and functional reading materials. • Applying self-monitoring strategies for text understanding • Comparing predicted with actual content in informational and functional reading materials • Distinguishing fact from opinion in informational reading materials • Confirming author's credentials • Determining sequence of steps, events, or information	**Main Ideas and Author's Approach:** Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages Recognize a clear function of a part of an uncomplicated passage Locate important details in uncomplicated passages Make simple inferences about how details are used in passages Locate important details in more challenging passages Locate and interpret minor or subtly stated details in uncomplicated passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages Recognize clear cause-effect relationships described within a single sentence in a passage Identify clear relationships between people, ideas, and so on in uncomplicated passages Identify clear cause-effect relationships in uncomplicated passages Order sequences of events in uncomplicated passages Understand relationships between people, ideas, and so on in uncomplicated passages Understand implied or subtly stated cause-effect relationships in uncomplicated passages Identify clear cause-effect relationships in more challenging passages

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
	Meanings of Words: Understand the implication of a familiar word or phrase and of simple descriptive language Use context to understand basic figurative language Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages **Generalizations and Conclusions:** Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw simple generalizations and conclusions using details that support the main points of more challenging passages Draw generalizations and conclusions about people, ideas, and so on in more challenging passages
Literature	
5. Explain distinguishing characteristics of odes, ballads, epic poetry, historical documents, essays, letters to the editor, and editorials.	
6. Analyze works of literature for character motivation, mood, tone, theme, similarities across texts, and literary devices.	**Main Ideas and Author's Approach:** Recognize a clear intent of an author or narrator in uncomplicated literary narratives Identify a clear main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
	Recognize a clear function of a part of an uncomplicated passage
	Locate important details in uncomplicated passages
	Make simple inferences about how details are used in passages
	Locate important details in more challenging passages
	Locate and interpret minor or subtly stated details in uncomplicated passages
	Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages
	Sequential, Comparative, and Cause-Effect Relationships:
	Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages
	Recognize clear cause-effect relationships described within a single sentence in a passage
	Identify relationships between main characters in uncomplicated literary narratives
	Recognize clear cause-effect relationships within a single paragraph in uncomplicated literary narratives
	Order simple sequences of events in uncomplicated literary narratives
	Identify clear relationships between people, ideas, and so on in uncomplicated passages
	Identify clear cause-effect relationships in uncomplicated passages
	Order sequences of events in uncomplicated passages
	Understand relationships between people, ideas, and so on in uncomplicated passages
	Identify clear relationships between characters, ideas, and so on in more challenging literary narratives
	Understand implied or subtly stated cause-effect relationships in uncomplicated passages
	Identify clear cause-effect relationships in more challenging passages
	Meanings of Words:
	Understand the implication of a familiar word or phrase and of simple descriptive language
	Use context to understand basic figurative language
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages
	Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
	Generalizations and Conclusions: Draw simple generalizations and conclusions about the main characters in uncomplicated literary narratives Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw simple generalizations and conclusions using details that support the main points of more challenging passages Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives Draw generalizations and conclusions about people, ideas, and so on in more challenging passages

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE English College Readiness Standards
Writing and Language	
7. Compose a business letter, including heading, inside address, salutation, body, closing, and signature.	
8. Write in narrative, expository, and persuasive modes with attention to descriptive elements.	
9. Apply mechanics in writing, including using quotation marks, underlining, and italics to punctuate titles and using semicolons, conjunctive adverbs, and commas to join two independent clauses or to correct run-on sentences. • Demonstrating correct sentence structure by avoiding comma splices in writing • Using commas to set off nonessential clauses and appositives in writing	**Sentence Structure and Formation:** Use conjunctions or punctuation to join simple clauses Revise shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences Determine the need for punctuation and conjunctions to avoid awkward-sounding sentence fragments and fused sentences Decide the appropriate verb tense and voice by considering the meaning of the entire sentence Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems Maintain consistent verb tense and pronoun person on the basis of the preceding clause or sentence **Conventions of Usage:** Solve such basic grammatical problems as how to form the past and past participle of irregular but commonly used verbs and how to form comparative and superlative adjectives Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Recognize and use the appropriate word in frequently confused pairs such as *there* and *their*, *past* and *passed*, and *led* and *lead* Use idiomatically appropriate prepositions, especially in combination with verbs (e.g., *long for*, *appeal to*) Ensure that a verb agrees with its subject when there is some text between the two Ensure that a pronoun agrees with its antecedent when the two occur in separate clauses or sentences Identify the correct past and past participle forms of irregular and infrequently used verbs and form present-perfect verbs by using *have* rather than *of* **Conventions of Punctuation:** Delete commas that create basic sense problems (e.g., between verb and direct object) Provide appropriate punctuation in straightforward situations (e.g., items in a series)

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE English College Readiness Standards
	Delete commas that disturb the sentence flow (e.g., between modifier and modified element) Use commas to set off simple parenthetical phrases Delete unnecessary commas when an incorrect reading of the sentence suggests a pause that should be punctuated (e.g., between verb and direct object clause) Use punctuation to set off complex parenthetical phrases Recognize and delete unnecessary commas based on a careful reading of a complicated sentence (e.g., between the elements of a compound subject or compound verb joined by *and*) Use apostrophes to indicate simple possessive nouns Recognize inappropriate uses of colons and semicolons
10. Use prepositional phrases and compound, complex, and compound-complex sentences to vary sentence structure. • Using gerunds, infinitives, and participles in writing • Recognizing active and passive voice in writing • Applying subject-verb agreement rules with collective nouns, nouns compound in form but singular in meaning, compound subjects joined by correlative and coordinating conjunctions, and subjects plural in form but singular in meaning	**Sentence Structure and Formation:** Decide the appropriate verb tense and voice by considering the meaning of the entire sentence **Conventions of Usage:** Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Ensure that a verb agrees with its subject when there is some text between the two
11. Write sentence patterns common to English construction.	
12. Identify the correct use of degrees of comparison, adjectives and adverb forms, and subject-verb agreement with collective nouns when verb forms depend on the rest of the sentence and with compound subjects, including those joined by *or* with the second element as singular or plural. • Recognizing parallelism in phrases and clauses	**Sentence Structure and Formation:** Use conjunctions or punctuation to join simple clauses Determine the need for punctuation and conjunctions to avoid awkward-sounding sentence fragments and fused sentences Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems **Conventions of Usage:** Solve such basic grammatical problems as how to form the past and past participle of irregular but commonly used verbs and how to form comparative and superlative adjectives Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Ensure that a verb agrees with its subject when there is some text between the two

TABLE 1A

ALABAMA Grade 8 English Language Arts Content Standards	EXPLORE College Readiness Standards
Research and Inquiry	
13. Combine all aspects of the research process to compose a report. • Taking notes to gather and summarize information • Using paraphrasing and documentation of sources to avoid plagiarism	
Oral and Visual Communication	
14. Identify characteristics of spoken formal and informal language.	

TABLE 1B

ALABAMA Grade 9 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
Reading	
1. Identify genre, tone, and plot in short stories, drama, and poetry and identify organizational structure in essays and other nonfiction text to comprehend ninth-grade recreational reading materials. • Reading predominantly world literature	
2. Compare the use of language and literary elements and devices, including rhythm, rhyme scheme, tone, and plot, in various selections, cultures, and genres. • Interpreting symbolism and other figurative language • Recognizing foreshadowing to anticipate events • Making inferences about characters and their motives • Determining effectiveness of diction • Recognizing use of analogy	
3. Read with comprehension a variety of ninth-grade informational and functional reading materials, including recognizing tone and propaganda. • Organizing steps of a process and other sequences • Identifying organizational structure • Recognizing fallacies in logic • Following complex written directions	**Main Ideas and Author's Approach:** Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages Recognize a clear function of a part of an uncomplicated passage Locate important details in uncomplicated passages Make simple inferences about how details are used in passages Locate important details in more challenging passages Locate and interpret minor or subtly stated details in uncomplicated passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages

TABLE 1B

ALABAMA Grade 9 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
	Recognize clear cause-effect relationships described within a single sentence in a passage
	Identify clear relationships between people, ideas, and so on in uncomplicated passages
	Identify clear cause-effect relationships in uncomplicated passages
	Order sequences of events in uncomplicated passages
	Understand relationships between people, ideas, and so on in uncomplicated passages
	Understand implied or subtly stated cause-effect relationships in uncomplicated passages
	Identify clear cause-effect relationships in more challenging passages
	Meanings of Words:
	Understand the implication of a familiar word or phrase and of simple descriptive language
	Use context to understand basic figurative language
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages
	Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages
	Generalizations and Conclusions:
	Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw simple generalizations and conclusions using details that support the main points of more challenging passages
	Draw generalizations and conclusions about people, ideas, and so on in more challenging passages

TABLE 1B

ALABAMA Grade 9 English Language Arts Content Standards	EXPLORE Reading College Readiness Standards
Literature	
4. Identify literary components that contribute to authors' styles.	**Main Ideas and Author's Approach:** Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages **Supporting Details:** Recognize a clear function of a part of an uncomplicated passage Make simple inferences about how details are used in passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages
5. Identify persuasive strategies, including propaganda, in world literature selections.	
6. Determine word meaning in world literature selections using word analysis and context clues. • Identifying the etymology of words	

TABLE 1B

ALABAMA Grade 9 English Language Arts Content Standards	EXPLORE English College Readiness Standards
Writing and Language	
7. Write in narrative, expository, and persuasive modes using figurative language and imagery, including simile and metaphor, when effective and appropriate. • Using an abbreviated writing process to write an essay in timed and untimed situations • Using verbals to increase sentence complexity • Using a variety of patterns to organize information in multi-paragraph writings • Developing an effective voice suitable for audience and purpose • Using a variety of sentence patterns • Using active and passive voice when appropriate	
8. Critique paragraphs for logical progression of sentences.	**Organization, Unity, and Coherence:** Use conjunctive adverbs or phrases to show time relationships in simple narrative essays (e.g., *then*, *this time*) Select the most logical place to add a sentence in a paragraph Use conjunctive adverbs or phrases to express straightforward logical relationships (e.g., *first*, *afterward*, *in response*) Add a sentence that introduces a simple paragraph Determine the need for conjunctive adverbs or phrases to create subtle logical connections between sentences (e.g., *therefore*, *however*, *in addition*) Rearrange the sentences in a fairly uncomplicated paragraph for the sake of logic Add a sentence to introduce or conclude the essay or to provide a transition between paragraphs when the essay is fairly straightforward
9. Identify factors that influence the development of language.	
10. Determine correct use of commas with appositives and direct quotations, colons to introduce lists, semicolons with a series of elements separated by commas, and punctuation for a divided quotation.	**Conventions of Punctuation:** Recognize inappropriate uses of colons and semicolons
11. Identify correct use of parallel words; incorrect verb tense shifts within sentences; correct number and tense in verb forms, including regular and irregular verbs; and correct forms of compound nouns, including singular, plural, and possessive forms. • Identifying correct parallelism in phrases and clauses • Identifying incorrect verb tense shifts within paragraphs • Recognizing subject-verb agreement with indefinite pronouns • Using parallel structure with verbals	**Sentence Structure and Formation:** Revise shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences Decide the appropriate verb tense and voice by considering the meaning of the entire sentence Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems Maintain consistent verb tense and pronoun person on the basis of the preceding clause or sentence

TABLE 1B

ALABAMA Grade 9 English Language Arts Content Standards	EXPLORE English College Readiness Standards
	Conventions of Usage: Solve such basic grammatical problems as how to form the past and past participle of irregular but commonly used verbs and how to form comparative and superlative adjectives Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Ensure that a verb agrees with its subject when there is some text between the two Identify the correct past and past participle forms of irregular and infrequently used verbs and form present-perfect verbs by using *have* rather than *of*
12. Apply the correct use of subject-verb agreement with collective nouns when verb forms depend on the rest of the sentence; with compound subjects, including those joined by *or* with the second element as singular or plural; and with the subjunctive mood.	**Conventions of Usage:** Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Ensure that a verb agrees with its subject when there is some text between the two

TABLE 1B

ALABAMA Grade 9 English Language Arts Content Standards	EXPLORE College Readiness Standards
Research and Inquiry	
13. Demonstrate paraphrasing, quoting, and summarizing of primary and secondary sources and various methods of note taking.	
14. Use the research process to locate, select, retrieve, evaluate, and organize information to support a thesis on a nonliterary topic. • Following a style format to standardize the presentation of information • Managing information by using available technology • Using paraphrasing and documentation of sources to avoid plagiarism	
Oral and Visual Communication	
15. Identify persuasive strategies in oral and visual presentations. • Identifying types of propaganda	
16. Evaluate a speech for use of presentation skills, including use of visual aids. • Applying oral presentation skills in formal and informal situations	
17. Use supporting details to present a position and to respond to an argument.	

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN Reading College Readiness Standards
Reading	
1. Apply both literal and inferential comprehension strategies, including drawing conclusions and making inferences about characters, motives, intentions, and attitudes in short stories, drama, poetry, novels, and essays and other nonfiction texts. • Identifying major historical developments in language and literature in America from the beginnings to 1900 • Using context clues to determine meaning • Identifying sequences to enhance understanding • Summarizing passages to share main ideas or events • Drawing other kinds of conclusions from recreational reading texts	**Main Ideas and Author's Approach:** Recognize a clear intent of an author or narrator in uncomplicated literary narratives Identify a clear main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages Infer the main idea or purpose of more challenging passages or their paragraphs **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages Recognize a clear function of a part of an uncomplicated passage Locate important details in uncomplicated passages Make simple inferences about how details are used in passages Locate important details in more challenging passages Locate and interpret minor or subtly stated details in uncomplicated passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages Locate and interpret minor or subtly stated details in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages Recognize clear cause-effect relationships described within a single sentence in a passage Identify relationships between main characters in uncomplicated literary narratives

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN Reading College Readiness Standards
	Recognize clear cause-effect relationships within a single paragraph in uncomplicated literary narratives
	Order simple sequences of events in uncomplicated literary narratives
	Identify clear relationships between people, ideas, and so on in uncomplicated passages
	Identify clear cause-effect relationships in uncomplicated passages
	Order sequences of events in uncomplicated passages
	Understand relationships between people, ideas, and so on in uncomplicated passages
	Identify clear relationships between characters, ideas, and so on in more challenging literary narratives
	Understand implied or subtly stated cause-effect relationships in uncomplicated passages
	Identify clear cause-effect relationships in more challenging passages
	Order sequences of events in more challenging passages
	Understand the dynamics between people, ideas, and so on in more challenging passages
	Understand implied or subtly stated cause-effect relationships in more challenging passages
	Meanings of Words:
	Understand the implication of a familiar word or phrase and of simple descriptive language
	Use context to understand basic figurative language
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages
	Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages
	Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts
	Generalizations and Conclusions:
	Draw simple generalizations and conclusions about the main characters in uncomplicated literary narratives
	Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw simple generalizations and conclusions using details that support the main points of more challenging passages
	Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives
	Draw generalizations and conclusions about people, ideas, and so on in more challenging passages

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN Reading College Readiness Standards
	Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on
2. Identify and interpret literary elements and devices, including analogy, personification, and implied purpose. • Identifying and interpreting figurative language and imagery, including symbolism and metaphors • Interpreting tone from author's word choice	**Main Ideas and Author's Approach:** Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Infer the main idea or purpose of straightforward paragraphs in more challenging passages Infer the main idea or purpose of more challenging passages or their paragraphs **Supporting Details:** Recognize a clear function of a part of an uncomplicated passage Make simple inferences about how details are used in passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Identify clear relationships between people, ideas, and so on in uncomplicated passages Understand relationships between people, ideas, and so on in uncomplicated passages Identify clear relationships between characters, ideas, and so on in more challenging literary narratives Understand the dynamics between people, ideas, and so on in more challenging passages **Meanings of Words:** Understand the implication of a familiar word or phrase and of simple descriptive language Use context to understand basic figurative language Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts **Generalizations and Conclusions:** Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw simple generalizations and conclusions using details that support the main points of more challenging passages

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN Reading College Readiness Standards
	Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives Draw generalizations and conclusions about people, ideas, and so on in more challenging passages Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on
3. Read with literal and inferential comprehension a variety of informational and functional reading materials, including making inferences about effects when passage provides cause; inferring cause when passage provides effect; making inferences, decisions, and predictions from tables, charts, and other text features; and identifying the outcome or product of a set of directions. • Following complex or embedded directions • Distinguishing author's opinion from factual statements • Determining main idea and supporting details in informational and functional reading materials • Summarizing passages of informational and functional reading materials • Determining sequence of events	**Main Ideas and Author's Approach:** Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages Infer the main idea or purpose of more challenging passages or their paragraphs **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages Recognize a clear function of a part of an uncomplicated passage Locate important details in uncomplicated passages Make simple inferences about how details are used in passages Locate important details in more challenging passages Locate and interpret minor or subtly stated details in uncomplicated passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages Locate and interpret minor or subtly stated details in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages Recognize clear cause-effect relationships described within a single sentence in a passage Identify clear relationships between people, ideas, and so on in uncomplicated passages

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN Reading College Readiness Standards
	Identify clear cause-effect relationships in uncomplicated passages
	Order sequences of events in uncomplicated passages
	Understand relationships between people, ideas, and so on in uncomplicated passages
	Understand implied or subtly stated cause-effect relationships in uncomplicated passages
	Identify clear cause-effect relationships in more challenging passages
	Order sequences of events in more challenging passages
	Understand the dynamics between people, ideas, and so on in more challenging passages
	Understand implied or subtly stated cause-effect relationships in more challenging passages
	Meanings of Words:
	Understand the implication of a familiar word or phrase and of simple descriptive language
	Use context to understand basic figurative language
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages
	Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages
	Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts
	Generalizations and Conclusions:
	Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw simple generalizations and conclusions using details that support the main points of more challenging passages
	Draw generalizations and conclusions about people, ideas, and so on in more challenging passages

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN Reading College Readiness Standards
4. Recognize fallacious or illogical thought in essays, editorials, and other informational texts. • Evaluating strength of argument in informational texts • Recognizing propaganda in informational texts	**Generalizations and Conclusions:** Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw simple generalizations and conclusions using details that support the main points of more challenging passages Draw generalizations and conclusions about people, ideas, and so on in more challenging passages Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on
Literature	
5. Compare literary components of various pre-twentieth century American authors' styles. • Identifying examples of differences in language usage among several authors	
6. Determine word meaning in pre-twentieth century American literature using word structure and context clues.	

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN English College Readiness Standards
Writing and Language	
7. Write in persuasive, expository, and narrative modes using an abbreviated writing process in timed and untimed situations. • Critiquing content, literary elements, and word choice, including addressing clear, precise, and vivid language • Using a variety of sentence patterns • Evaluating opinions, including personal opinions, for supporting details and bias • Using active and passive voice when appropriate	
8. Write in a variety of genres for various audiences and occasions, both formal and informal, using an attention-getting opening and an effective conclusion. • Developing an effective voice suitable for audience and purpose	
9. Apply principles of Standard English by adjusting vocabulary and style for the occasion.	**Word Choice in Terms of Style, Tone, Clarity, and Economy:** Revise expressions that deviate from the style of an essay Use the word or phrase most consistent with the style and tone of a fairly straightforward essay Use the word or phrase most appropriate in terms of the content of the sentence and tone of the essay
10. Justify a thesis statement with supporting details from American literature prior to the twentieth century.	
11. Demonstrate correct use of commas with parenthetical expressions and after introductory adverbial clauses and correct use of semicolons before conjunctive adverbs and in compound sentences with no conjunction.	**Conventions of Punctuation:** Use commas to set off simple parenthetical phrases Use punctuation to set off complex parenthetical phrases Recognize inappropriate uses of colons and semicolons Use a semicolon to indicate a relationship between closely related independent clauses
12. Demonstrate correct use of singular and plural collective nouns and words with alternate accepted forms; pronoun-antecedent agreement in number and gender; and nominative, objective, and possessive pronoun cases.	**Conventions of Usage:** Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Ensure that a verb agrees with its subject when there is some text between the two Ensure that a pronoun agrees with its antecedent when the two occur in separate clauses or sentences Ensure that a verb agrees with its subject in unusual situations (e.g., when the subject-verb order is inverted or when the subject is an indefinite pronoun)

TABLE 1C

ALABAMA Grade 10 English Language Arts Content Standards	PLAN English College Readiness Standards
13. Apply the correct use of subject-verb agreement with singular and plural subjects, including subjects compound in form and singular in meaning and subjects plural in form and singular in meaning; intervening prepositional and appositive phrases; and correlative conjunctions.	**Conventions of Usage:** Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts Ensure that a verb agrees with its subject when there is some text between the two Ensure that a verb agrees with its subject in unusual situations (e.g., when the subject-verb order is inverted or when the subject is an indefinite pronoun)
14. Edit for incorrect shifts in verb tense in paragraphs, use of verbals, use of dangling participles and misplaced modifiers, and parallelism in phrases.	**Sentence Structure and Formation:** Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems Use sentence-combining techniques, effectively avoiding problematic comma splices, run-on sentences, and sentence fragments, especially in sentences containing compound subjects or verbs Maintain a consistent and logical use of verb tense and pronoun person on the basis of information in the paragraph or essay as a whole
Research and Inquiry	
15. Use the research process to document and organize information to support a thesis on a literary or nonliterary topic. • Managing information by locating, selecting, retrieving, and evaluating primary and secondary sources while using available technology responsibly • Differentiating among plagiarized, paraphrased, and appropriately cited selections	
16. Explain the purpose and benefits of using predicting, summarizing, underlining, outlining, note taking, and reviewing as part of personal study skills. • Explaining when skimming and scanning are appropriate in studying materials	
Oral and Visual Communication	
17. Critique oral and visual presentations for fallacies in logic	

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT Reading College Readiness Standards
Reading	
1. Analyze authors' use of literary elements, including characterization, theme, tone, setting, mood, plot, and literary point of view, in American short stories, drama, poetry, or essays and other nonfiction literature, predominantly from 1900 to the present. • Identifying major historical developments of language and literature in America from 1900 to the present • Evaluating author technique	
2. Analyze use of figurative language and literary devices, including hyperbole, simile, metaphor, personification, and other imagery, to enhance specific literary passages. • Explaining use of allusions • Analyzing use of analogies for meaning • Interpreting irony • Analyzing poetry for rhythm and rhyme schemes	**Main Ideas and Author's Approach:** Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Infer the main idea or purpose of straightforward paragraphs in more challenging passages Infer the main idea or purpose of more challenging passages or their paragraphs **Supporting Details:** Recognize a clear function of a part of an uncomplicated passage Make simple inferences about how details are used in passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Identify clear relationships between people, ideas, and so on in uncomplicated passages Understand relationships between people, ideas, and so on in uncomplicated passages Identify clear relationships between characters, ideas, and so on in more challenging literary narratives Understand the dynamics between people, ideas, and so on in more challenging passages **Meanings of Words:** Understand the implication of a familiar word or phrase and of simple descriptive language Use context to understand basic figurative language Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts

ALABAMA Grade 11 English Language Arts Content Standards	ACT Reading College Readiness Standards
	Generalizations and Conclusions: Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw simple generalizations and conclusions using details that support the main points of more challenging passages Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives Draw generalizations and conclusions about people, ideas, and so on in more challenging passages Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on
3. Read with comprehension a variety of informational and functional reading materials, including recognizing organizational patterns, evaluating strengths and weaknesses of argument, and identifying directions implied or embedded in a passage. • Recognizing fallacies in logic • Drawing conclusions to determine author intent • Applying advanced knowledge of context clues and structural analysis to determine word meaning • Evaluating quality of writing	**Main Ideas and Author's Approach:** Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages Infer the main idea or purpose of straightforward paragraphs in more challenging passages Summarize basic events and ideas in more challenging passages Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages Infer the main idea or purpose of more challenging passages or their paragraphs **Supporting Details:** Locate basic facts (e.g., names, dates, events) clearly stated in a passage Locate simple details at the sentence and paragraph level in uncomplicated passages Recognize a clear function of a part of an uncomplicated passage Locate important details in uncomplicated passages Make simple inferences about how details are used in passages Locate important details in more challenging passages Locate and interpret minor or subtly stated details in uncomplicated passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages Locate and interpret minor or subtly stated details in more challenging passages

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT Reading College Readiness Standards
	Sequential, Comparative, and Cause-Effect Relationships:
	Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages
	Recognize clear cause-effect relationships described within a single sentence in a passage
	Identify clear relationships between people, ideas, and so on in uncomplicated passages
	Identify clear cause-effect relationships in uncomplicated passages
	Order sequences of events in uncomplicated passages
	Understand relationships between people, ideas, and so on in uncomplicated passages
	Understand implied or subtly stated cause-effect relationships in uncomplicated passages
	Identify clear cause-effect relationships in more challenging passages
	Order sequences of events in more challenging passages
	Understand the dynamics between people, ideas, and so on in more challenging passages
	Understand implied or subtly stated cause-effect relationships in more challenging passages
	Meanings of Words:
	Understand the implication of a familiar word or phrase and of simple descriptive language
	Use context to understand basic figurative language
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages
	Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages
	Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages
	Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts
	Generalizations and Conclusions:
	Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages
	Draw simple generalizations and conclusions using details that support the main points of more challenging passages
	Draw generalizations and conclusions about people, ideas, and so on in more challenging passages

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT Reading College Readiness Standards
Literature	
4. Analyze twentieth and twenty-first century American literary selections for plot structure, cultural significance, and use of propaganda.	
5. Evaluate twentieth and twenty-first century American authors' use of language, including length and complexity of sentences, diction, and Standard English versus dialect.	
6. Determine word meaning in twentieth and twenty-first century American literature using word structure and context clues.	
7. Compare writing styles of two or more American authors or public figures.	

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT English and Writing College Readiness Standards
Writing and Language	
8. Write the text for an oral presentation with attention to word choice, organizational patterns, transitional devices, and tone. • Using a variety of sentence patterns • Developing an effective voice suitable for audience and purpose	**Writing** College Readiness Standards **Organizing Ideas:** Provide unity and coherence throughout the essay, sometimes with a logical progression of ideas Use relevant, though at times simple and obvious, transitional words and phrases to convey logical relationships between ideas Present a somewhat developed introduction and conclusion Provide unity and coherence throughout the essay, often with a logical progression of ideas Use relevant transitional words, phrases, and sentences to convey logical relationships between ideas Present a well-developed introduction and conclusion **Using Language:** Show adequate use of language to communicate by • correctly employing many of the conventions of standard English grammar, usage, and mechanics, but with some distracting errors that may occasionally impede understanding • using appropriate vocabulary • using some varied kinds of sentence structures to vary pace Show competent use of language to communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with a few distracting errors but none that impede understanding • using some precise and varied vocabulary • using several kinds of sentence structures to vary pace and to support meaning Show effective use of language to clearly communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with just a few, if any, errors • using precise and varied vocabulary • using a variety of kinds of sentence structures to vary pace and to support meaning

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT English and Writing College Readiness Standards
9. Analyze writing for parallelism in literary selections and student writing.	**English** College Readiness Standards **Sentence Structure and Formation:** Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems Use sentence-combining techniques, effectively avoiding problematic comma splices, run-on sentences, and sentence fragments, especially in sentences containing compound subjects or verbs Work comfortably with long sentences and complex clausal relationships within sentences, avoiding weak conjunctions between independent clauses and maintaining parallel structure between clauses
10. Edit writings, including student papers, for correct parallel form in clauses in a series and with correlative conjunctions and for correct use of subject-verb agreement with subjects with intervening phrases, collective nouns as subjects, indefinite pronouns as subjects when the verb form depends on the rest of the sentence, and subjects in sentences with correlative conjunctions or in inverted order. • Editing writings for mechanics, usage, grammar, and style • Demonstrating appropriate use of ellipses, parentheses, hyphens and suspended hyphens, hyphenation of number-and-noun modifiers, slashes, and use of commas with subordinate clauses and nominative absolutes	**English** College Readiness Standards **Word Choice in Terms of Style, Tone, Clarity, and Economy:** Revise expressions that deviate from the style of an essay Use the word or phrase most consistent with the style and tone of a fairly straightforward essay Use the word or phrase most appropriate in terms of the content of the sentence and tone of the essay **Sentence Structure and Formation:** Use conjunctions or punctuation to join simple clauses Revise shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences Determine the need for punctuation and conjunctions to avoid awkward-sounding sentence fragments and fused sentences Decide the appropriate verb tense and voice by considering the meaning of the entire sentence Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems Maintain consistent verb tense and pronoun person on the basis of the preceding clause or sentence Use sentence-combining techniques, effectively avoiding problematic comma splices, run-on sentences, and sentence fragments, especially in sentences containing compound subjects or verbs Maintain a consistent and logical use of verb tense and pronoun person on the basis of information in the paragraph or essay as a whole

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT English and Writing College Readiness Standards
	Work comfortably with long sentences and complex clausal relationships within sentences, avoiding weak conjunctions between independent clauses and maintaining parallel structure between clauses
	Conventions of Usage:
	Solve such basic grammatical problems as how to form the past and past participle of irregular but commonly used verbs and how to form comparative and superlative adjectives
	Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts
	Recognize and use the appropriate word in frequently confused pairs such as *there* and *their*, *past* and *passed*, and *led* and *lead*
	Use idiomatically appropriate prepositions, especially in combination with verbs (e.g., *long for*, *appeal to*)
	Ensure that a verb agrees with its subject when there is some text between the two
	Ensure that a pronoun agrees with its antecedent when the two occur in separate clauses or sentences
	Identify the correct past and past participle forms of irregular and infrequently used verbs and form present-perfect verbs by using *have* rather than *of*
	Correctly use reflexive pronouns, the possessive pronouns *its* and *your*, and the relative pronouns *who* and *whom*
	Ensure that a verb agrees with its subject in unusual situations (e.g., when the subject-verb order is inverted or when the subject is an indefinite pronoun)
	Ensure that a verb agrees with its subject when a phrase or clause between the two suggests a different number for the verb
	Conventions of Punctuation:
	Delete commas that create basic sense problems (e.g., between verb and direct object)
	Provide appropriate punctuation in straightforward situations (e.g., items in a series)
	Delete commas that disturb the sentence flow (e.g., between modifier and modified element)
	Use commas to set off simple parenthetical phrases
	Delete unnecessary commas when an incorrect reading of the sentence suggests a pause that should be punctuated (e.g., between verb and direct object clause)
	Use punctuation to set off complex parenthetical phrases
	Recognize and delete unnecessary commas based on a careful reading of a complicated sentence (e.g., between the elements of a compound subject or compound verb joined by *and*)
	Use apostrophes to indicate simple possessive nouns
	Recognize inappropriate uses of colons and semicolons

TABLE 1D

ALABAMA Grade 11 English Language Arts Content Standards	ACT English and Writing College Readiness Standards
	Use commas to set off a nonessential/nonrestrictive appositive or clause **Writing** College Readiness Standards **Using Language:** Show adequate use of language to communicate by • correctly employing many of the conventions of standard English grammar, usage, and mechanics, but with some distracting errors that may occasionally impede understanding • using appropriate vocabulary • using some varied kinds of sentence structures to vary pace Show competent use of language to communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with a few distracting errors but none that impede understanding • using some precise and varied vocabulary • using several kinds of sentence structures to vary pace and to support meaning Show effective use of language to clearly communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with just a few, if any, errors • using precise and varied vocabulary • using a variety of kinds of sentence structures to vary pace and to support meaning
11. Differentiate between the use of active and passive voice.	**English** College Readiness Standards **Sentence Structure and Formation:** Decide the appropriate verb tense and voice by considering the meaning of the entire sentence
Research and Inquiry	
12. Use the research process to manage, document, organize, and present information to support a thesis on a literary topic. • Using paraphrasing and documentation of sources to avoid plagiarism	
Oral and Visual Communication	
13. Compare the use of oral presentation skills of self and others.	
14. Identify propaganda in nonprint media.	

TABLE 1E

ALABAMA Grade 11 English Language Arts Content Standards	WorkKeys Reading for Information Level Skills
Reading	
1. Analyze authors' use of literary elements, including characterization, theme, tone, setting, mood, plot, and literary point of view, in American short stories, drama, poetry, or essays and other nonfiction literature, predominantly from 1900 to the present. • Identifying major historical developments of language and literature in America from 1900 to the present • Evaluating author technique	
2. Analyze use of figurative language and literary devices, including hyperbole, simile, metaphor, personification, and other imagery, to enhance specific literary passages. • Explaining use of allusions • Analyzing use of analogies for meaning • Interpreting irony • Analyzing poetry for rhythm and rhyme schemes	
3. Read with comprehension a variety of informational and functional reading materials, including recognizing organizational patterns, evaluating strengths and weaknesses of argument, and identifying directions implied or embedded in a passage. • Recognizing fallacies in logic • Drawing conclusions to determine author intent • Applying advanced knowledge of context clues and structural analysis to determine word meaning • Evaluating quality of writing	Figure out the correct meaning of a word based on how the word is used Apply straightforward instructions to a new situation that is similar to the one described in the material Apply complex instructions that include conditionals to situations described in the materials Identify implied details Use technical terms and jargon in new situations Figure out the less common meaning of a word based on the context Apply complicated instructions to new situations Figure out the principles behind policies, rules, and procedures Apply general principles from the materials to similar and new situations Explain the rationale behind a procedure, policy, or communication Figure out the definitions of difficult, uncommon words based on how they are used Figure out the meaning of jargon or technical terms based on how they are used Figure out the general principles behind the policies and apply them to situations that are quite different from any described in the materials

TABLE 1E

ALABAMA Grade 11 English Language Arts Content Standards	WorkKeys Reading for Information Level Skills
Literature	
4. Analyze twentieth and twenty-first century American literary selections for plot structure, cultural significance, and use of propaganda.	
5. Evaluate twentieth and twenty-first century American authors' use of language, including length and complexity of sentences, diction, and Standard English versus dialect.	
6. Determine word meaning in twentieth and twenty-first century American literature using word structure and context clues.	
7. Compare writing styles of two or more American authors or public figures.	
Writing and Language	
8. Write the text for an oral presentation with attention to word choice, organizational patterns, transitional devices, and tone. • Using a variety of sentence patterns • Developing an effective voice suitable for audience and purpose	
9. Analyze writing for parallelism in literary selections and student writing.	
10. Edit writings, including student papers, for correct parallel form in clauses in a series and with correlative conjunctions and for correct use of subject-verb agreement with subjects with intervening phrases, collective nouns as subjects, indefinite pronouns as subjects when the verb form depends on the rest of the sentence, and subjects in sentences with correlative conjunctions or in inverted order. • Editing writings for mechanics, usage, grammar, and style • Demonstrating appropriate use of ellipses, parentheses, hyphens and suspended hyphens, hyphenation of number-and-noun modifiers, slashes, and use of commas with subordinate clauses and nominative absolutes	
11. Differentiate between the use of active and passive voice.	
Research and Inquiry	
12. Use the research process to manage, document, organize, and present information to support a thesis on a literary topic. • Using paraphrasing and documentation of sources to avoid plagiarism	
Oral and Visual Communication	
13. Compare the use of oral presentation skills of self and others.	
14. Identify propaganda in nonprint media.	

TABLE 1F

ALABAMA Grade 12 English Language Arts Content Standards	ACT Reading College Readiness Standards
Reading	
1. Compare organizational structure, figurative language, and literary devices, including use of paradox, among predominantly British short stories, drama, poetry, essays, and other nonfiction literature. • Explaining use of allusions • Interpreting irony • Analyzing poetry for rhyme schemes • Identifying use of parody • Analyzing major historical developments in language and literature in the British Isles	
2. Read with comprehension a variety of informational and functional reading materials, including comparing bias and persuasive techniques in passages. • Recognizing faulty logic or organization • Analyzing charts and tables for conclusions	**Main Ideas and Author's Approach:** Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives Infer the main idea or purpose of straightforward paragraphs in more challenging passages Infer the main idea or purpose of more challenging passages or their paragraphs **Supporting Details:** Recognize a clear function of a part of an uncomplicated passage Make simple inferences about how details are used in passages Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages **Sequential, Comparative, and Cause-Effect Relationships:** Identify clear relationships between people, ideas, and so on in uncomplicated passages Understand relationships between people, ideas, and so on in uncomplicated passages Identify clear relationships between characters, ideas, and so on in more challenging literary narratives Understand the dynamics between people, ideas, and so on in more challenging passages **Meanings of Words:** Understand the implication of a familiar word or phrase and of simple descriptive language Use context to understand basic figurative language Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages

TABLE 1F

ALABAMA Grade 12 English Language Arts Content Standards	ACT Reading College Readiness Standards
	Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts **Generalizations and Conclusions:** Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages Draw simple generalizations and conclusions using details that support the main points of more challenging passages Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives Draw generalizations and conclusions about people, ideas, and so on in more challenging passages Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on
Literature	
3. Analyze British literature for style, audience appeal, cultural significance, and plot structure. • Distinguishing between parallel and circular plots	
4. Identify literary elements in British literary selections from various genres.	
5. Determine word meaning in British literature using word structure and context clues.	
6. Compare writing styles of two or more British authors.	

TABLE 1F

ALABAMA Grade 12 English Language Arts Content Standards	ACT English and Writing College Readiness Standards
Writing and Language	
7. Write for a variety of purposes, including critical essays on literary topics, college application essays, résumé cover letters, and résumés. • Editing drafts for appropriate style • Developing an effective voice suitable for audience and purpose	**Writing** College Readiness Standards **Expressing Judgments:** Show understanding of the persuasive purpose of the task by taking a position on the issue in the prompt Show clear understanding of the persuasive purpose of the task by taking a position on the specific issue in the prompt and offering a broad context for discussion Show clear understanding of the persuasive purpose of the task by taking a position on the specific issue in the prompt and offering a critical context for discussion
8. Demonstrate appropriate use of ellipses, parentheses, hyphens and suspended hyphens, hyphenation of number-and-noun modifiers, slashes, and use of commas with subordinate clauses and nominative absolutes.	**English** College Readiness Standards **Conventions of Punctuation:** Delete commas that create basic sense problems (e.g., between verb and direct object) Delete commas that disturb the sentence flow (e.g., between modifier and modified element) Delete unnecessary commas when an incorrect reading of the sentence suggests a pause that should be punctuated (e.g., between verb and direct object clause) Use punctuation to set off complex parenthetical phrases Recognize and delete unnecessary commas based on a careful reading of a complicated sentence (e.g., between the elements of a compound subject or compound verb joined by *and*) **Writing** College Readiness Standards **Using Language:** Show adequate use of language to communicate by • correctly employing many of the conventions of standard English grammar, usage, and mechanics, but with some distracting errors that may occasionally impede understanding • using appropriate vocabulary • using some varied kinds of sentence structures to vary pace Show competent use of language to communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with a few distracting errors but none that impede understanding • using some precise and varied vocabulary • using several kinds of sentence structures to vary pace and to support meaning Show effective use of language to clearly communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with just a few, if any, errors • using precise and varied vocabulary • using a variety of kinds of sentence structures to vary pace and to support meaning

TABLE 1F

ALABAMA Grade 12 English Language Arts Content Standards	ACT English and Writing College Readiness Standards
9. Revise drafts to increase sentence complexity.	**Writing** College Readiness Standards **Using Language:** Show adequate use of language to communicate by • correctly employing many of the conventions of standard English grammar, usage, and mechanics, but with some distracting errors that may occasionally impede understanding • using appropriate vocabulary • using some varied kinds of sentence structures to vary pace Show competent use of language to communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with a few distracting errors but none that impede understanding • using some precise and varied vocabulary • using several kinds of sentence structures to vary pace and to support meaning Show effective use of language to clearly communicate ideas by • correctly employing most conventions of standard English grammar, usage, and mechanics, with just a few, if any, errors • using precise and varied vocabulary • using a variety of kinds of sentence structures to vary pace and to support meaning
Research and Inquiry	
10. Use the research process to manage, document, organize, and present information to support a thesis on a teacher-approved topic of student interest. • Editing drafts to avoid plagiarism	
Oral and Visual Communication	
11. Critique visual communication for effectiveness. • Using available technology for various communication purposes, including multimedia presentations	
12. Evaluate oral presentation skills of self and others for effectiveness.	
13. Analyze nonprint media for use of propaganda.	

TABLE 1G

ALABAMA Grade 12 English Language Arts Content Standards	WorkKeys Reading for Information Level Skills
Reading	
1. Compare organizational structure, figurative language, and literary devices, including use of paradox, among predominantly British short stories, drama, poetry, essays, and other nonfiction literature. • Explaining use of allusions • Interpreting irony • Analyzing poetry for rhyme schemes • Identifying use of parody • Analyzing major historical developments in language and literature in the British Isles	
2. Read with comprehension a variety of informational and functional reading materials, including comparing bias and persuasive techniques in passages. • Recognizing faulty logic or organization • Analyzing charts and tables for conclusions	Apply complex instructions that include conditionals to situations described in the materials Figure out the principles behind policies, rules, and procedures Apply general principles from the materials to similar and new situations Explain the rationale behind a procedure, policy, or communication Figure out the general principles behind the policies and apply them to situations that are quite different from any described in the materials
Literature	
3. Analyze British literature for style, audience appeal, cultural significance, and plot structure. • Distinguishing between parallel and circular plots	
4. Identify literary elements in British literary selections from various genres.	
5. Determine word meaning in British literature using word structure and context clues.	
6. Compare writing styles of two or more British authors.	
Writing and Language	
7. Write for a variety of purposes, including critical essays on literary topics, college application essays, résumé cover letters, and résumés. • Editing drafts for appropriate style • Developing an effective voice suitable for audience and purpose	
8. Demonstrate appropriate use of ellipses, parentheses, hyphens and suspended hyphens, hyphenation of number-and-noun modifiers, slashes, and use of commas with subordinate clauses and nominative absolutes.	
9. Revise drafts to increase sentence complexity.	

TABLE 1G

ALABAMA Grade 12 English Language Arts Content Standards	WorkKeys Reading for Information Level Skills
Research and Inquiry	
10. Use the research process to manage, document, organize, and present information to support a thesis on a teacher-approved topic of student interest. • Editing drafts to avoid plagiarism	
Oral and Visual Communication	
11. Critique visual communication for effectiveness. • Using available technology for various communication purposes, including multimedia presentations	
12. Evaluate oral presentation skills of self and others for effectiveness.	
13. Analyze nonprint media for use of propaganda.	

SUPPLEMENT
TABLES 2A–2V:

MATHEMATICS

TABLE 2A

ALABAMA Pre-Algebra (Grade 8) Content Standards	EXPLORE Mathematics College Readiness Standards
Number and Operations	
1. Use various strategies and operations to solve problems involving real numbers. • Applying GCF, LCM, and prime and composite numbers, including justification for the reasonableness of results, when working with rational numbers • Using vocabulary associated with sets, including union, subsets, empty sets, and intersection • Utilizing alternative representations to solve problems involving rational numbers • Applying proportional reasoning to application-based situations	**Basic Operations & Applications:** Perform one-operation computation with whole numbers and decimals Solve problems in one or two steps using whole numbers Solve routine one-step arithmetic problems (using whole numbers, fractions, and decimals) such as single-step percent Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average **Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor Find and use the least common multiple
2. Apply one or more of the laws of exponents to simplify expressions containing natural number exponents. • Writing numbers using scientific notation	**Numbers: Concepts & Properties:** Work with scientific notation Work with squares and square roots of numbers
3. Use order of operations to evaluate and simplify algebraic expressions. • Applying the substitution principle to evaluate algebraic expressions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions

TABLE 2A

ALABAMA Pre-Algebra (Grade 8) Content Standards	EXPLORE Mathematics College Readiness Standards
Algebra	
4. Graph linear relations by plotting points or by using the slope and *y*-intercept. • Determining slopes and *y*-intercepts of lines • Calculating the slope of a linear relation given as a table or graph • Graphing linear relations by plotting *x*- and *y*-intercepts	**Probability, Statistics, & Data Analysis:** Perform a single computation using information from a table or chart Read tables and graphs Perform computations on data from tables and graphs **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane
5. Solve problems involving linear functions. • Classifying variables in a function as independent or dependent • Classifying relations as linear or nonlinear by examining tables, graphs, or simple equations • Determining if a relation is a function from information in tables, sets of ordered pairs, equations, graphs, or mappings	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph)
6. Solve multistep linear equations, including equations requiring the use of the distributive property.	**Expressions, Equations, & Inequalities:** Solve routine first-degree equations
Geometry	
7. Solve problems using the Pythagorean Theorem. • Verifying the Pythagorean Theorem • Applying the Pythagorean Theorem to determine if a triangle is a right triangle • Applying the Pythagorean Theorem to solve multistep application-based problems • Applying the Triangle Inequality Theorem • Calculating distances on the coordinate plane using the Pythagorean Theorem	
8. Compare quadrilaterals, triangles, and solids using their properties and characteristics. • Formulating mathematical arguments about the relationships among types of quadrilaterals and triangles • Identifying angle bisectors, perpendicular bisectors, congruent angles, and congruent shapes • Constructing congruent and similar polygons, congruent angles, congruent segments, and parallel and perpendicular lines	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)

TABLE 2A

ALABAMA Pre-Algebra (Grade 8) Content Standards	EXPLORE Mathematics College Readiness Standards
Measurement	
9. Determine measures of special angle pairs, including adjacent, vertical, supplementary, complementary angles, and angles formed by parallel lines cut by a transversal.	**Properties of Plane Figures:** Exhibit some knowledge of the angles associated with parallel lines Find the measure of an angle using properties of parallel lines Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
10. Determine the perimeter and area of regular and irregular plane shapes.	**Measurement:** Compute the perimeter of polygons when all side lengths are given Compute the area of rectangles when whole number dimensions are given Compute the area and perimeter of triangles and rectangles in simple problems Compute the area of triangles and rectangles when one or more additional simple steps are required
11. Determine surface area and volume of rectangular prisms, cylinders, and pyramids. • Determining surface area and volume of solid figures, including cones and spheres • Estimating surface area and volume of solid figures, including cones and spheres • Determining appropriate units of measure to describe surface area and volume • Developing formulas for determining surface area and volume of rectangular prisms, cylinders, and pyramids	**Measurement:** Use geometric formulas when all necessary information is given
12. Determine lengths of missing sides and measures of angles in similar and congruent shapes. • Applying proportional reasoning to identify similar and congruent shapes • Using dilations on the coordinate plane to determine measures of similar shapes • Determining ratios of perimeters and areas of similar triangles, trapezoids, and parallelograms	**Basic Operations & Applications:** Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane **Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure **Measurement:** Compute the area of triangles and rectangles when one or more additional simple steps are required

TABLE 2A

ALABAMA Pre-Algebra (Grade 8) Content Standards	EXPLORE Mathematics College Readiness Standards
Data Analysis and Probability	
13. Use given and collected data from samples or populations to construct graphs and interpret data. • Estimating a line of best fit from a scatterplot to make predictions • Determining the measure of central tendency that is the most appropriate for a given situation	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane
14. Determine the theoretical probability of an event. • Calculating the probability of complementary events and mutually exclusive events • Determining the probability of two independent events or two dependent events • Determining the probability of an event through simulation	**Probability, Statistics, & Data Analysis:** Use the relationship between the probability of an event and the probability of its complement Determine the probability of a simple event Compute straightforward probabilities for common situations

TABLE 2B

ALABAMA Algebra I Content Standards	EXPLORE Mathematics College Readiness Standards
Number and Operations	
1. Simplify numerical expressions, including those involving square roots, radical form, and decimal approximations using properties of real numbers and order of operations. • Applying laws of exponents to simplify expressions, including those containing zero and negative integral exponents	**Numbers: Concepts & Properties:** Work with squares and square roots of numbers
Algebra	
2. Analyze linear functions from their equations for their characteristics, including slopes and intercepts. • Determining the slope of a line from its equation or by applying the slope formula • Determining equations of linear functions given two points, a point and the slope, tables of values, graphs, or ordered pairs • Graphing two-variable linear equations and inequalities on the Cartesian plane	**Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane
3. Determine properties of a relation, including domain, range, and whether it is a function, when given graphs, tables of values, mappings, or sets of ordered pairs. • Finding the range of a function when given its domain	**Probability, Statistics, & Data Analysis:** Read tables and graphs **Expressions, Equations, & Inequalities:** Evaluate algebraic expressions by substituting integers for unknown quantities
4. Construct graphs of common relations, including x = constant, y = constant, $y = x$, $y = \sqrt{x}$, $y = x^2$, and $y = \lvert x \rvert$. • Identifying applications modeled by common relations, including x = constant, y = constant, $y = x$, $y = \sqrt{x}$, $y = x^2$, and $y = \lvert x \rvert$	**Probability, Statistics, & Data Analysis:** Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) **Graphical Representations:** Identify the location of a point with a positive coordinate on the number line Locate points on the number line and in the first quadrant Locate points in the coordinate plane
5. Perform operations of addition, subtraction, and multiplication on polynomial expressions. • Dividing a polynomial by a monomial • Evaluating polynomial functions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions
6. Use GCF, difference of squares, perfect square trinomials, and grouping to factor binomials, trinomials, and other polynomials.	

TABLE 2B

ALABAMA Algebra I Content Standards	EXPLORE Mathematics College Readiness Standards
Algebra	
7. Solve multistep equations and inequalities, including linear, radical, absolute value, and literal equations. • Writing the solution of an equation or inequality in set notation • Formulating the design of application-based problems by developing and solving equations and inequalities, including those involving direct and inverse variation, distance, uniform motion, and mixture	**Expressions, Equations, & Inequalities:** Solve routine first-degree equations Solve real-world problems using first-degree equations
8. Solve systems of linear equations and inequalities in two variables graphically and algebraically. • Designing models of application-based problems by developing and solving systems of linear equations and inequalities	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane
9. Solve quadratic equations using the zero product property. • Determining approximate solutions of quadratic equations graphically and numerically • Solving quadratic equations using the quadratic formula and completing the square	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane
Geometry	
10. Calculate length, midpoint, and slope of a line segment when given coordinates of its endpoints on the Cartesian plane. • Deriving distance, midpoint, and slope formulas for line segments • Utilizing the Pythagorean Theorem to solve application-based problems	
Measurement	
11. Solve problems algebraically involving area and perimeter of a polygon, area and circumference of a circle, and volume and surface area of right circular cylinders or right rectangular prisms. • Applying area and volume formulas to solve application-based problems	**Measurement:** Use geometric formulas when all necessary information is given

TABLE 2B

ALABAMA Algebra I Content Standards	EXPLORE Mathematics College Readiness Standards
Data Analysis and Probability	
12. Compare various methods of data reporting, including scatterplots, stem-and-leaf plots, histograms, box-and-whisker plots, and line graphs, to make inferences or predictions. • Determining effects of linear transformations of data • Determining effects of outliers • Critiquing the design of a survey	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs
13. Identify characteristics of a data set, including numerical or categorical and univariate or bivariate.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph)
14. Use a scatterplot and its line of best fit or a specific line graph to determine the correlation existing between two sets of data, including positive, negative, or no correlation.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph)
15. Calculate probabilities given data in lists or graphs. • Comparing theoretical and experimental probabilities for data in lists or graphs	**Probability, Statistics, & Data Analysis:** Use the relationship between the probability of an event and the probability of its complement Determine the probability of a simple event Compute straightforward probabilities for common situations

TABLE 2C

ALABAMA Algebra I Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
1. Simplify numerical expressions, including those involving square roots, radical form, and decimal approximations using properties of real numbers and order of operations. • Applying laws of exponents to simplify expressions, including those containing zero and negative integral exponents	**Numbers: Concepts & Properties:** Work with squares and square roots of numbers Work problems involving positive integer exponents Work with cubes and cube roots of numbers Apply rules of exponents
Algebra	
2. Analyze linear functions from their equations for their characteristics, including slopes and intercepts. • Determining the slope of a line from its equation or by applying the slope formula • Determining equations of linear functions given two points, a point and the slope, tables of values, graphs, or ordered pairs • Graphing two-variable linear equations and inequalities on the Cartesian plane	**Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Exhibit knowledge of slope Determine the slope of a line from points or equations Match linear graphs with their equations
3. Determine properties of a relation, including domain, range, and whether it is a function, when given graphs, tables of values, mappings, or sets of ordered pairs. • Finding the range of a function when given its domain	**Probability, Statistics, & Data Analysis:** Read tables and graphs Interpret and use information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Evaluate algebraic expressions by substituting integers for unknown quantities **Graphical Representations:** Interpret and use information from graphs in the coordinate plane
4. Construct graphs of common relations, including x = constant, y = constant, $y = x$, $y = \sqrt{x}$, $y = x^2$, and $y = \lvert x \rvert$. • Identifying applications modeled by common relations, including x = constant, y = constant, $y = x$, $y = \sqrt{x}$, $y = x^2$, and $y = \lvert x \rvert$	**Probability, Statistics, & Data Analysis:** Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) **Graphical Representations:** Identify the location of a point with a positive coordinate on the number line Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane

TABLE 2C

ALABAMA Algebra I Content Standards	PLAN Mathematics College Readiness Standards
Algebra	
5. Perform operations of addition, subtraction, and multiplication on polynomial expressions. • Dividing a polynomial by a monomial • Evaluating polynomial functions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations
6. Use GCF, difference of squares, perfect square trinomials, and grouping to factor binomials, trinomials, and other polynomials.	**Expressions, Equations, & Inequalities:** Factor simple quadratics (e.g., the difference of squares and perfect square trinomials) Manipulate expressions and equations
7. Solve multistep equations and inequalities, including linear, radical, absolute value, and literal equations. • Writing the solution of an equation or inequality in set notation • Formulating the design of application-based problems by developing and solving equations and inequalities, including those involving direct and inverse variation, distance, uniform motion, and mixture	**Expressions, Equations, & Inequalities:** Solve routine first-degree equations Solve real-world problems using first-degree equations Solve first-degree inequalities that do not require reversing the inequality sign Solve linear inequalities that require reversing the inequality sign Solve absolute value equations
8. Solve systems of linear equations and inequalities in two variables graphically and algebraically. • Designing models of application-based problems by developing and solving systems of linear equations and inequalities	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane
9. Solve quadratic equations using the zero product property. • Determining approximate solutions of quadratic equations graphically and numerically • Solving quadratic equations using the quadratic formula and completing the square	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane

TABLE 2C

ALABAMA Algebra I Content Standards	PLAN Mathematics College Readiness Standards
Geometry	
10. Calculate length, midpoint, and slope of a line segment when given coordinates of its endpoints on the Cartesian plane. • Deriving distance, midpoint, and slope formulas for line segments • Utilizing the Pythagorean Theorem to solve application-based problems	**Graphical Representations:** Exhibit knowledge of slope Determine the slope of a line from points or equations Find the midpoint of a line segment Use the distance formula **Properties of Plane Figures:** Use the Pythagorean theorem
Measurement	
11. Solve problems algebraically involving area and perimeter of a polygon, area and circumference of a circle, and volume and surface area of right circular cylinders or right rectangular prisms. • Applying area and volume formulas to solve application-based problems	**Measurement:** Use geometric formulas when all necessary information is given Compute the perimeter of simple composite geometric figures with unknown side lengths
Data Analysis and Probability	
12. Compare various methods of data reporting, including scatterplots, stem-and-leaf plots, histograms, box-and-whisker plots, and line graphs, to make inferences or predictions. • Determining effects of linear transformations of data • Determining effects of outliers • Critiquing the design of a survey	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs
13. Identify characteristics of a data set, including numerical or categorical and univariate or bivariate.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph)
14. Use a scatterplot and its line of best fit or a specific line graph to determine the correlation existing between two sets of data, including positive, negative, or no correlation.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph)
15. Calculate probabilities given data in lists or graphs. • Comparing theoretical and experimental probabilities for data in lists or graphs	**Probability, Statistics, & Data Analysis:** Use the relationship between the probability of an event and the probability of its complement Determine the probability of a simple event Compute straightforward probabilities for common situations

TABLE 2D

ALABAMA Algebra I Content Standards	WorkKeys Applied Mathematics Level Skills
Number and Operations	
1. Simplify numerical expressions, including those involving square roots, radical form, and decimal approximations using properties of real numbers and order of operations. • Applying laws of exponents to simplify expressions, including those containing zero and negative integral exponents	Solve problems that include nonlinear functions and/or that involve more than one unknown Solve problems that require a single type of mathematics operation (addition, subtraction, multiplication, and division) using whole numbers Add or subtract negative numbers Multiply negative numbers Add three fractions that share a common denominator Multiply a mixed number by a whole number or decimal Divide negative numbers
Algebra	
2. Analyze linear functions from their equations for their characteristics, including slopes and intercepts. • Determining the slope of a line from its equation or by applying the slope formula • Determining equations of linear functions given two points, a point and the slope, tables of values, graphs, or ordered pairs • Graphing two-variable linear equations and inequalities on the Cartesian plane	
3. Determine properties of a relation, including domain, range, and whether it is a function, when given graphs, tables of values, mappings, or sets of ordered pairs. • Finding the range of a function when given its domain	
4. Construct graphs of common relations, including x = constant, y = constant, $y = x$, $y = \sqrt{x}$, $y = x^2$, and $y = \lvert x \rvert$. • Identifying applications modeled by common relations, including x = constant, y = constant, $y = x$, $y = \sqrt{x}$, $y = x^2$, and $y = \lvert x \rvert$	
5. Perform operations of addition, subtraction, and multiplication on polynomial expressions. • Dividing a polynomial by a monomial • Evaluating polynomial functions	
6. Use GCF, difference of squares, perfect square trinomials, and grouping to factor binomials, trinomials, and other polynomials.	

TABLE 2D

ALABAMA Algebra I Content Standards	WorkKeys Applied Mathematics Level Skills
Algebra	
7. Solve multistep equations and inequalities, including linear, radical, absolute value, and literal equations. • Writing the solution of an equation or inequality in set notation • Formulating the design of application-based problems by developing and solving equations and inequalities, including those involving direct and inverse variation, distance, uniform motion, and mixture	Solve problems that require one or two operations Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals Decide what information, calculations, or unit conversions to use to solve the problem Look up a formula and perform single-step conversions within or between systems of measurement Rearrange a formula before solving a problem Use two formulas to change from one unit to another within the same system of measurement Use two formulas to change from one unit in one system of measurement to a unit in another system of measurement Set up and manipulate complex ratios or proportions
8. Solve systems of linear equations and inequalities in two variables graphically and algebraically. • Designing models of application-based problems by developing and solving systems of linear equations and inequalities	Solve problems that include nonlinear functions and/or that involve more than one unknown
9. Solve quadratic equations using the zero product property. • Determining approximate solutions of quadratic equations graphically and numerically • Solving quadratic equations using the quadratic formula and completing the square	
Geometry	
10. Calculate length, midpoint, and slope of a line segment when given coordinates of its endpoints on the Cartesian plane. • Deriving distance, midpoint, and slope formulas for line segments • Utilizing the Pythagorean Theorem to solve application-based problems	
Measurement	
11. Solve problems algebraically involving area and perimeter of a polygon, area and circumference of a circle, and volume and surface area of right circular cylinders or right rectangular prisms. • Applying area and volume formulas to solve application-based problems	Solve problems that require one or two operations Decide what information, calculations, or unit conversions to use to solve the problem Calculate perimeters and areas of basic shapes (rectangles and circles) Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations Find the volume of rectangular solids Calculate multiple areas and volumes of spheres, cylinders, or cones

TABLE 2D

ALABAMA Algebra I Content Standards	WorkKeys Applied Mathematics Level Skills
Data Analysis and Probability	
12. Compare various methods of data reporting, including scatterplots, stem-and-leaf plots, histograms, box-and-whisker plots, and line graphs, to make inferences or predictions. • Determining effects of linear transformations of data • Determining effects of outliers • Critiquing the design of a survey	
13. Identify characteristics of a data set, including numerical or categorical and univariate or bivariate.	
14. Use a scatterplot and its line of best fit or a specific line graph to determine the correlation existing between two sets of data, including positive, negative, or no correlation.	
15. Calculate probabilities given data in lists or graphs. • Comparing theoretical and experimental probabilities for data in lists or graphs	

TABLE 2E

ALABAMA Geometry Content Standards	EXPLORE Mathematics College Readiness Standards
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Determine the equation of a line given two points, a point and a slope, a table of values, a graph, ordered pairs, or the equation of a line parallel or perpendicular to another line through a given point.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions)
Geometry	
2. Prove theorems related to pairs of angles, including vertical, adjacent, complementary, and supplementary, as well as those formed by parallel lines cut by a transversal and perpendicular lines.	**Properties of Plane Figures:** Exhibit some knowledge of the angles associated with parallel lines Find the measure of an angle using properties of parallel lines Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
3. Justify relationships among different classes of polygons by using their properties.	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
4. Apply proportional reasoning to determine missing lengths of sides, measures of angles, and ratios of perimeters and areas of similar polygons.	**Basic Operations & Applications:** Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average **Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure
5. Determine the measure of interior and exterior angles associated with polygons. • Verifying formulas for measures of interior and exterior angles of polygons inductively and deductively	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure **Measurement:** Use geometric formulas when all necessary information is given

TABLE 2E

ALABAMA Geometry Content Standards	EXPLORE Mathematics College Readiness Standards
Geometry	
6. Solve problems, including application-based problems, using properties and theorems related to circles, quadrilaterals, and other geometric shapes. • Determining the center and radius of a circle given its equation • Determining the equation of a circle given its center and radius	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
7. Apply the Pythagorean Theorem and its converse to solve application problems, including expressing answers in simplified radical form or as decimal approximations and using Pythagorean triples where applicable. • Proving the Pythagorean Theorem	**Numbers: Concepts & Properties:** Work with squares and square roots of numbers
8. Apply properties of special right triangles, including 30-60-90 and 45-45-90 triangles, to find missing side lengths.	
9. Determine relationships between two triangles, including proving congruence or similarity of the triangles from given information, using the relationships to solve problems and to establish other relationships. • Calculating the geometric mean to find missing lengths in right triangles	
10. Use inductive reasoning to make conjectures and deductive reasoning to justify conclusions. • Recognizing limitations of a conclusion through inductive reasoning • Using deductive reasoning to prove theorems • Using proof by negation to prove theorems • Writing conditional statements of a given conjecture	
11. Solve for missing measures of sides and angles in right triangles by applying the right triangle ratios of sine, cosine, and tangent.	
12. Determine areas and perimeters of regular polygons, including inscribed or circumscribed polygons, given the coordinates of vertices or other characteristics.	**Measurement:** Compute the perimeter of polygons when all side lengths are given Compute the area of rectangles when whole number dimensions are given Compute the area and perimeter of triangles and rectangles in simple problems Use geometric formulas when all necessary information is given Compute the area of triangles and rectangles when one or more additional simple steps are required Compute the area and circumference of circles after identifying necessary information
13. Apply distance, midpoint, and slope formulas to solve problems and to confirm properties of polygons.	

TABLE 2E

ALABAMA Geometry Content Standards	EXPLORE Mathematics College Readiness Standards
Geometry	
14. Identify coordinates of vertices of the image of a given polygon that is translated, rotated, reflected, or dilated.	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane
15. Classify polyhedra according to properties, including the number of faces. • Identifying Euclidean solids	
Measurement	
16. Calculate measures of arcs and sectors of a circle from given information.	
17. Calculate surface areas and volumes of solid figures, including spheres, cones, and pyramids. • Deriving formulas for surface area and volume of spheres, cones, and pyramids • Calculating specific missing dimensions of solid figures from surface area or volume • Determining the relationship between surface areas of similar figures and volumes of similar figures	**Measurement:** Use geometric formulas when all necessary information is given
Data Analysis and Probability	
18. Calculate probabilities arising in geometric contexts.	

TABLE 2F

ALABAMA Geometry Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Determine the equation of a line given two points, a point and a slope, a table of values, a graph, ordered pairs, or the equation of a line parallel or perpendicular to another line through a given point.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings **Graphical Representations:** Exhibit knowledge of slope Determine the slope of a line from points or equations Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point
Geometry	
2. Prove theorems related to pairs of angles, including vertical, adjacent, complementary, and supplementary, as well as those formed by parallel lines cut by a transversal and perpendicular lines.	**Properties of Plane Figures:** Exhibit some knowledge of the angles associated with parallel lines Find the measure of an angle using properties of parallel lines Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
3. Justify relationships among different classes of polygons by using their properties.	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)
4. Apply proportional reasoning to determine missing lengths of sides, measures of angles, and ratios of perimeters and areas of similar polygons.	**Basic Operations & Applications:** Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average **Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles

TABLE 2F

ALABAMA Geometry Content Standards	PLAN Mathematics College Readiness Standards
Geometry	
5. Determine the measure of interior and exterior angles associated with polygons. • Verifying formulas for measures of interior and exterior angles of polygons inductively and deductively	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure **Measurement:** Use geometric formulas when all necessary information is given
6. Solve problems, including application-based problems, using properties and theorems related to circles, quadrilaterals, and other geometric shapes. • Determining the center and radius of a circle given its equation • Determining the equation of a circle given its center and radius	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles
7. Apply the Pythagorean Theorem and its converse to solve application problems, including expressing answers in simplified radical form or as decimal approximations and using Pythagorean triples where applicable. • Proving the Pythagorean Theorem	**Numbers: Concepts & Properties:** Work with squares and square roots of numbers **Properties of Plane Figures:** Recognize Pythagorean triples Use the Pythagorean theorem
8. Apply properties of special right triangles, including 30-60-90 and 45-45-90 triangles, to find missing side lengths.	**Properties of Plane Figures:** Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles
9. Determine relationships between two triangles, including proving congruence or similarity of the triangles from given information, using the relationships to solve problems and to establish other relationships. • Calculating the geometric mean to find missing lengths in right triangles	**Properties of Plane Figures:** Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles
10. Use inductive reasoning to make conjectures and deductive reasoning to justify conclusions. • Recognizing limitations of a conclusion through inductive reasoning • Using deductive reasoning to prove theorems • Using proof by negation to prove theorems • Writing conditional statements of a given conjecture	
11. Solve for missing measures of sides and angles in right triangles by applying the right triangle ratios of sine, cosine, and tangent.	

TABLE 2F

ALABAMA Geometry Content Standards	PLAN Mathematics College Readiness Standards
Geometry	
12. Determine areas and perimeters of regular polygons, including inscribed or circumscribed polygons, given the coordinates of vertices or other characteristics.	**Graphical Representations:** Interpret and use information from graphs in the coordinate plane **Measurement:** Compute the perimeter of polygons when all side lengths are given Compute the area of rectangles when whole number dimensions are given Compute the area and perimeter of triangles and rectangles in simple problems Use geometric formulas when all necessary information is given Compute the area of triangles and rectangles when one or more additional simple steps are required Compute the area and circumference of circles after identifying necessary information
13. Apply distance, midpoint, and slope formulas to solve problems and to confirm properties of polygons.	**Graphical Representations:** Exhibit knowledge of slope Determine the slope of a line from points or equations Find the midpoint of a line segment Use the distance formula
14. Identify coordinates of vertices of the image of a given polygon that is translated, rotated, reflected, or dilated.	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane
15. Classify polyhedra according to properties, including the number of faces. • Identifying Euclidean solids	
Measurement	
16. Calculate measures of arcs and sectors of a circle from given information.	**Measurement:** Use relationships involving area, perimeter, and volume of geometric figures to compute another measure
17. Calculate surface areas and volumes of solid figures, including spheres, cones, and pyramids. • Deriving formulas for surface area and volume of spheres, cones, and pyramids • Calculating specific missing dimensions of solid figures from surface area or volume • Determining the relationship between surface areas of similar figures and volumes of similar figures	**Measurement:** Use geometric formulas when all necessary information is given Use relationships involving area, perimeter, and volume of geometric figures to compute another measure
Data Analysis and Probability	
18. Calculate probabilities arising in geometric contexts.	

TABLE 2G

Alabama Geometry Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Determine the equation of a line given two points, a point and a slope, a table of values, a graph, ordered pairs, or the equation of a line parallel or perpendicular to another line through a given point.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings **Graphical Representations:** Exhibit knowledge of slope Determine the slope of a line from points or equations Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point
Geometry	
2. Prove theorems related to pairs of angles, including vertical, adjacent, complementary, and supplementary, as well as those formed by parallel lines cut by a transversal and perpendicular lines.	**Properties of Plane Figures:** Exhibit some knowledge of the angles associated with parallel lines Find the measure of an angle using properties of parallel lines Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Draw conclusions based on a set of conditions
3. Justify relationships among different classes of polygons by using their properties.	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Draw conclusions based on a set of conditions

TABLE 2G

Alabama Geometry Content Standards	ACT Mathematics College Readiness Standards
Geometry	
4. Apply proportional reasoning to determine missing lengths of sides, measures of angles, and ratios of perimeters and areas of similar polygons.	**Basic Operations & Applications:** Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average Solve complex arithmetic problems involving percent of increase or decrease and problems requiring integration of several concepts from pre-algebra and/or pre-geometry (e.g., comparing percentages or averages, using several ratios, and finding ratios in geometry settings) **Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles
5. Determine the measure of interior and exterior angles associated with polygons. • Verifying formulas for measures of interior and exterior angles of polygons inductively and deductively	**Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Use several angle properties to find an unknown angle measure Draw conclusions based on a set of conditions **Measurement:** Use geometric formulas when all necessary information is given
6. Solve problems, including application-based problems, using properties and theorems related to circles, quadrilaterals, and other geometric shapes. • Determining the center and radius of a circle given its equation • Determining the equation of a circle given its center and radius	**Graphical Representations:** Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$ **Properties of Plane Figures:** Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles
7. Apply the Pythagorean Theorem and its converse to solve application problems, including expressing answers in simplified radical form or as decimal approximations and using Pythagorean triples where applicable. • Proving the Pythagorean Theorem	**Numbers: Concepts & Properties:** Work with squares and square roots of numbers **Properties of Plane Figures:** Recognize Pythagorean triples Use the Pythagorean theorem
8. Apply properties of special right triangles, including 30-60-90 and 45-45-90 triangles, to find missing side lengths.	**Properties of Plane Figures:** Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles

TABLE 2G

Alabama Geometry Content Standards	ACT Mathematics College Readiness Standards
Geometry	
9. Determine relationships between two triangles, including proving congruence or similarity of the triangles from given information, using the relationships to solve problems and to establish other relationships. • Calculating the geometric mean to find missing lengths in right triangles	**Properties of Plane Figures:** Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles Draw conclusions based on a set of conditions
10. Use inductive reasoning to make conjectures and deductive reasoning to justify conclusions. • Recognizing limitations of a conclusion through inductive reasoning • Using deductive reasoning to prove theorems • Using proof by negation to prove theorems • Writing conditional statements of a given conjecture	**Properties of Plane Figures:** Draw conclusions based on a set of conditions
11. Solve for missing measures of sides and angles in right triangles by applying the right triangle ratios of sine, cosine, and tangent.	**Functions:** Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths Apply basic trigonometric ratios to solve right-triangle problems
12. Determine areas and perimeters of regular polygons, including inscribed or circumscribed polygons, given the coordinates of vertices or other characteristics.	**Graphical Representations:** Interpret and use information from graphs in the coordinate plane Solve problems integrating multiple algebraic and/or geometric concepts **Measurement:** Compute the perimeter of polygons when all side lengths are given Compute the area of rectangles when whole number dimensions are given Compute the area and perimeter of triangles and rectangles in simple problems Use geometric formulas when all necessary information is given Compute the area of triangles and rectangles when one or more additional simple steps are required Compute the area and circumference of circles after identifying necessary information
13. Apply distance, midpoint, and slope formulas to solve problems and to confirm properties of polygons.	**Graphical Representations:** Exhibit knowledge of slope Determine the slope of a line from points or equations Find the midpoint of a line segment Use the distance formula

TABLE 2G

Alabama Geometry Content Standards	ACT Mathematics College Readiness Standards
Geometry	
14. Identify coordinates of vertices of the image of a given polygon that is translated, rotated, reflected, or dilated.	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane **Properties of Plane Figures:** Solve multistep geometry problems that involve integrating concepts, planning, visualization, and/or making connections with other content areas
15. Classify polyhedra according to properties, including the number of faces. • Identifying Euclidean solids	
Measurement	
16. Calculate measures of arcs and sectors of a circle from given information.	**Properties of Plane Figures:** Use relationships among angles, arcs, and distances in a circle **Measurement:** Use relationships involving area, perimeter, and volume of geometric figures to compute another measure
17. Calculate surface areas and volumes of solid figures, including spheres, cones, and pyramids. • Deriving formulas for surface area and volume of spheres, cones, and pyramids • Calculating specific missing dimensions of solid figures from surface area or volume • Determining the relationship between surface areas of similar figures and volumes of similar figures	**Measurement:** Use geometric formulas when all necessary information is given Use relationships involving area, perimeter, and volume of geometric figures to compute another measure Use scale factors to determine the magnitude of a size change
Data Analysis and Probability	
18. Calculate probabilities arising in geometric contexts.	

TABLE 2H

ALABAMA Geometry Content Standards	WorkKeys Applied Mathematics Level Skills
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Determine the equation of a line given two points, a point and a slope, a table of values, a graph, ordered pairs, or the equation of a line parallel or perpendicular to another line through a given point.	
Geometry	
2. Prove theorems related to pairs of angles, including vertical, adjacent, complementary, and supplementary, as well as those formed by parallel lines cut by a transversal and perpendicular lines.	
3. Justify relationships among different classes of polygons by using their properties.	
4. Apply proportional reasoning to determine missing lengths of sides, measures of angles, and ratios of perimeters and areas of similar polygons.	Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals
5. Determine the measure of interior and exterior angles associated with polygons. • Verifying formulas for measures of interior and exterior angles of polygons inductively and deductively	
6. Solve problems, including application-based problems, using properties and theorems related to circles, quadrilaterals, and other geometric shapes. • Determining the center and radius of a circle given its equation • Determining the equation of a circle given its center and radius	Calculate perimeters and areas of basic shapes (rectangles and circles) Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations Calculate multiple areas and volumes of spheres, cylinders, or cones
7. Apply the Pythagorean Theorem and its converse to solve application problems, including expressing answers in simplified radical form or as decimal approximations and using Pythagorean triples where applicable. • Proving the Pythagorean Theorem	
8. Apply properties of special right triangles, including 30-60-90 and 45-45-90 triangles, to find missing side lengths.	
9. Determine relationships between two triangles, including proving congruence or similarity of the triangles from given information, using the relationships to solve problems and to establish other relationships. • Calculating the geometric mean to find missing lengths in right triangles	

TABLE 2H

ALABAMA Geometry Content Standards	WorkKeys Applied Mathematics Level Skills
Geometry	
10. Use inductive reasoning to make conjectures and deductive reasoning to justify conclusions. • Recognizing limitations of a conclusion through inductive reasoning • Using deductive reasoning to prove theorems • Using proof by negation to prove theorems • Writing conditional statements of a given conjecture	
11. Solve for missing measures of sides and angles in right triangles by applying the right triangle ratios of sine, cosine, and tangent.	
12. Determine areas and perimeters of regular polygons, including inscribed or circumscribed polygons, given the coordinates of vertices or other characteristics.	Calculate perimeters and areas of basic shapes (rectangles and circles) Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations Calculate multiple areas and volumes of spheres, cylinders, or cones
13. Apply distance, midpoint, and slope formulas to solve problems and to confirm properties of polygons.	
14. Identify coordinates of vertices of the image of a given polygon that is translated, rotated, reflected, or dilated.	
15. Classify polyhedra according to properties, including the number of faces. • Identifying Euclidean solids	
Measurement	
16. Calculate measures of arcs and sectors of a circle from given information.	
17. Calculate surface areas and volumes of solid figures, including spheres, cones, and pyramids. • Deriving formulas for surface area and volume of spheres, cones, and pyramids • Calculating specific missing dimensions of solid figures from surface area or volume • Determining the relationship between surface areas of similar figures and volumes of similar figures	Decide what information, calculations, or unit conversions to use to solve the problem Rearrange a formula before solving a problem Find the volume of rectangular solids Calculate multiple areas and volumes of spheres, cylinders, or cones
Data Analysis and Probability	
18. Calculate probabilities arising in geometric contexts.	

TABLE 2I

ALABAMA Algebraic Connections Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Create algebraic models for application-based problems by developing and solving equations and inequalities, including those involving direct, inverse, and joint variation.	**Expressions, Equations, & Inequalities:** Solve equations in the form $x + a = b$, where a and b are whole numbers or decimals Solve one-step equations having integer or decimal answers Solve routine first-degree equations Solve real-world problems using first-degree equations Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Solve first-degree inequalities that do not require reversing the inequality sign Write expressions, equations, and inequalities for common algebra settings Solve linear inequalities that require reversing the inequality sign
2. Solve application-based problems by developing and solving systems of linear equations and inequalities.	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings Find solutions to systems of linear equations
3. Use formulas or equations of functions to calculate outcomes of exponential growth or decay.	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Evaluate algebraic expressions by substituting integers for unknown quantities
4. Determine maximum and minimum values of a function using linear programming procedures.	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations **Graphical Representations:** Interpret and use information from graphs in the coordinate plane
5. Determine approximate rates of change of nonlinear relationships from graphical and numerical data. • Creating graphical representations from tables, equations, or classroom-generated data to model consumer costs and to predict future outcomes	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs **Graphical Representations:** Interpret and use information from graphs in the coordinate plane
6. Use the extreme value of a given quadratic function to solve applied problems.	

TABLE 2I

ALABAMA Algebraic Connections Content Standards	PLAN Mathematics College Readiness Standards
Algebra	
7. Use analytical, numerical, and graphical methods to make financial and economic decisions, including those involving banking and investments, insurance, personal budgets, credit purchases, recreation, and deceptive and fraudulent pricing and advertising. • Creating, manually or with technological tools, graphs and tables related to personal finance and economics	**Probability, Statistics, & Data Analysis:** Perform a single computation using information from a table or chart Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings **Graphical Representations:** Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane
Geometry	
8. Determine missing information in an application-based situation using properties of right triangles, including trigonometric ratios and the Pythagorean Theorem.	**Properties of Plane Figures:** Use the Pythagorean theorem
9. Analyze aesthetics of physical models for line symmetry, rotational symmetry, or the golden ratio.	
Measurement	
10. Critique measurements in terms of precision, accuracy, and approximate error.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
11. Use ratios of perimeters, areas, and volumes of similar figures to solve applied problems.	**Properties of Plane Figures:** Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles **Measurement:** Compute the area of triangles and rectangles when one or more additional simple steps are required Use relationships involving area, perimeter, and volume of geometric figures to compute another measure

TABLE 2I

ALABAMA Algebraic Connections Content Standards	PLAN Mathematics College Readiness Standards
Data Analysis and Probability	
12. Create a model of a set of data by estimating the equation of a curve of best fit from tables of values or scatterplots. • Predicting probabilities given a frequency distribution	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Determine the probability of a simple event Manipulate data from tables and graphs Compute straightforward probabilities for common situations Interpret and use information from figures, tables, and graphs Compute a probability when the event and/or sample space are not given or obvious

TABLE 2J

ALABAMA Algebraic Connections Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Create algebraic models for application-based problems by developing and solving equations and inequalities, including those involving direct, inverse, and joint variation.	**Expressions, Equations, & Inequalities:** Solve equations in the form $x + a = b$, where a and b are whole numbers or decimals Solve one-step equations having integer or decimal answers Solve routine first-degree equations Solve real-world problems using first-degree equations Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Solve first-degree inequalities that do not require reversing the inequality sign Write expressions, equations, and inequalities for common algebra settings Solve linear inequalities that require reversing the inequality sign
2. Solve application-based problems by developing and solving systems of linear equations and inequalities.	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings Find solutions to systems of linear equations
3. Use formulas or equations of functions to calculate outcomes of exponential growth or decay.	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Evaluate algebraic expressions by substituting integers for unknown quantities **Functions:** Evaluate polynomial functions, expressed in function notation, at integer values
4. Determine maximum and minimum values of a function using linear programming procedures.	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations **Graphical Representations:** Interpret and use information from graphs in the coordinate plane Solve problems integrating multiple algebraic and/or geometric concepts

TABLE 2J

ALABAMA Algebraic Connections Content Standards	ACT Mathematics College Readiness Standards
Algebra	
5. Determine approximate rates of change of nonlinear relationships from graphical and numerical data. • Creating graphical representations from tables, equations, or classroom-generated data to model consumer costs and to predict future outcomes	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs **Graphical Representations:** Interpret and use information from graphs in the coordinate plane Analyze and draw conclusions based on information from graphs in the coordinate plane
6. Use the extreme value of a given quadratic function to solve applied problems.	**Graphical Representations:** Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$ Solve problems integrating multiple algebraic and/or geometric concepts Analyze and draw conclusions based on information from graphs in the coordinate plane
7. Use analytical, numerical, and graphical methods to make financial and economic decisions, including those involving banking and investments, insurance, personal budgets, credit purchases, recreation, and deceptive and fraudulent pricing and advertising. • Creating, manually or with technological tools, graphs and tables related to personal finance and economics	**Probability, Statistics, & Data Analysis:** Perform a single computation using information from a table or chart Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings **Graphical Representations:** Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Solve problems integrating multiple algebraic and/or geometric concepts Analyze and draw conclusions based on information from graphs in the coordinate plane

TABLE 2J

ALABAMA Algebraic Connections Content Standards	ACT Mathematics College Readiness Standards
Algebra	
Geometry	
8. Determine missing information in an application-based situation using properties of right triangles, including trigonometric ratios and the Pythagorean Theorem.	**Properties of Plane Figures:** Use the Pythagorean theorem **Functions:** Apply basic trigonometric ratios to solve right-triangle problems
9. Analyze aesthetics of physical models for line symmetry, rotational symmetry, or the golden ratio.	**Properties of Plane Figures:** Draw conclusions based on a set of conditions
Measurement	
10. Critique measurements in terms of precision, accuracy, and approximate error.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
11. Use ratios of perimeters, areas, and volumes of similar figures to solve applied problems.	**Properties of Plane Figures:** Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles **Measurement:** Compute the area of triangles and rectangles when one or more additional simple steps are required Use relationships involving area, perimeter, and volume of geometric figures to compute another measure Use scale factors to determine the magnitude of a size change
Data Analysis and Probability	
12. Create a model of a set of data by estimating the equation of a curve of best fit from tables of values or scatterplots. • Predicting probabilities given a frequency distribution	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Determine the probability of a simple event Manipulate data from tables and graphs Compute straightforward probabilities for common situations Interpret and use information from figures, tables, and graphs Compute a probability when the event and/or sample space are not given or obvious

TABLE 2K

ALABAMA Algebraic Connections Content Standards	WorkKeys Applied Mathematics Level Skills
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Create algebraic models for application-based problems by developing and solving equations and inequalities, including those involving direct, inverse, and joint variation.	Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals Decide what information, calculations, or unit conversions to use to solve the problem Look up a formula and perform single-step conversions within or between systems of measurement Rearrange a formula before solving a problem
2. Solve application-based problems by developing and solving systems of linear equations and inequalities.	Solve problems that include nonlinear functions and/or that involve more than one unknown
3. Use formulas or equations of functions to calculate outcomes of exponential growth or decay.	
4. Determine maximum and minimum values of a function using linear programming procedures.	
5. Determine approximate rates of change of nonlinear relationships from graphical and numerical data. • Creating graphical representations from tables, equations, or classroom-generated data to model consumer costs and to predict future outcomes	
6. Use the extreme value of a given quadratic function to solve applied problems.	
7. Use analytical, numerical, and graphical methods to make financial and economic decisions, including those involving banking and investments, insurance, personal budgets, credit purchases, recreation, and deceptive and fraudulent pricing and advertising. • Creating, manually or with technological tools, graphs and tables related to personal finance and economics	Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals Find the best deal using one- and two-step calculations and then comparing results Calculate percentage discounts or markups Solve problems that include nonlinear functions and/or that involve more than one unknown Find the best deal and use the result for another calculation Calculate multiple rates
Geometry	
8. Determine missing information in an application-based situation using properties of right triangles, including trigonometric ratios and the Pythagorean Theorem.	Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations
9. Analyze aesthetics of physical models for line symmetry, rotational symmetry, or the golden ratio.	

TABLE 2K

ALABAMA Algebraic Connections Content Standards	WorkKeys Applied Mathematics Level Skills
Measurement	
10. Critique measurements in terms of precision, accuracy, and approximate error.	
11. Use ratios of perimeters, areas, and volumes of similar figures to solve applied problems.	Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals Calculate perimeters and areas of basic shapes (rectangles and circles) Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations Find the volume of rectangular solids Calculate multiple areas and volumes of spheres, cylinders, or cones
Data Analysis and Probability	
12. Create a model of a set of data by estimating the equation of a curve of best fit from tables of values or scatterplots. • Predicting probabilities given a frequency distribution	

TABLE 2L

ALABAMA Algebra II Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
1. Determine relationships among subsets of complex numbers.	
2. Use order of operations, conjugates, and absolute value to simplify expressions involving complex numbers.	
Algebra	
3. Determine effects of shifts, reflections, and dilations on families of functions, including $y = \frac{k}{x}$ (inverse variation), $y = kx$ (direct variation/linear), $y = x^2$ (quadratic), $y = a^2$ (exponential), and $y = \log_a x$ (logarithmic). • Identifying the domain and range of a relation given its graph, a table of values, or its equation, including those with restricted domains • Identifying application-based situations corresponding to families of functions	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane
4. Determine the nature of solutions of a quadratic equation.	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane
5. Determine approximate real zeros of functions graphically and numerically and exact real zeros of polynomial functions by completing the square and applying the zero product property and the quadratic formula. • Deriving the quadratic formula	**Expressions, Equations, & Inequalities:** Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane
6. Identify characteristics, including maximum and minimum values, of quadratic functions from their roots, graphs, or equations. • Determining a quadratic equation when given its graph or roots • Constructing the graph of a function when given its equation • Using the maximum or minimum value of a quadratic function to solve application-based problems	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane

TABLE 2L

ALABAMA Algebra II Content Standards	PLAN Mathematics College Readiness Standards
Algebra	
7. Perform operations, including addition, subtraction, multiplication, division, and composition of functions, with polynomial and rational expressions containing variables. • Determining the inverse of a function or a relation • Evaluating rational functions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations
8. Apply laws of exponents to simplify expressions, including those containing zero and negative integral exponents. • Applying laws of logarithms to simplify expressions and solve equations	**Numbers: Concepts & Properties:** Work problems involving positive integer exponents Apply rules of exponents **Expressions, Equations, & Inequalities:** Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations
9. Solve equations, inequalities, and applied problems involving rational and irrational exponents, absolute values, radicals, and quadratics over complex numbers, as well as exponential and logarithmic functions with the solution represented as a graph on a number line, set notation, and interval notation.	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve first-degree inequalities that do not require reversing the inequality sign Solve linear inequalities that require reversing the inequality sign Solve absolute value equations Solve quadratic equations **Graphical Representations:** Identify the location of a point with a positive coordinate on the number line Locate points on the number line and in the first quadrant Identify the graph of a linear inequality on the number line Match number line graphs with solution sets of linear inequalities
10. Solve systems of linear equations or inequalities in two and three variables using algebraic techniques, including those involving matrices. • Calculating the determinant of a 2 × 2 and 3 × 3 matrix • Solving two- and three-variable word problems involving application-based situations	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations

TABLE 2L

ALABAMA Algebra II Content Standards	PLAN Mathematics College Readiness Standards
Geometry	
11. Solve coordinate geometry problems using algebraic techniques.	
Measurement	
[No standards in this strand for this course]	
Data Analysis and Probability	
12. Use multiple representations, including graphical, numerical, analytical, and verbal, to compare characteristics of data gathered from two populations. • Identifying characteristics of the design of an experimental study • Describing effects of an experimental study design on its outcome • Predicting population characteristics using sample statistics • Identifying characteristics, including the mean and standard deviation, of a normal distribution	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs
13. Analyze data to determine if a linear or quadratic relationship exists. • Determining an equation of linear regression from a set of data to predict outcomes	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings
14. Calculate probabilities of events using permutations, combinations, the laws of probability, and the binomial theorem. • Calculating conditional probability	**Probability, Statistics, & Data Analysis:** Determine the probability of a simple event Exhibit knowledge of simple counting techniques Compute straightforward probabilities for common situations Apply counting techniques

TABLE 2M

ALABAMA Algebra II Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
1. Determine relationships among subsets of complex numbers.	**Numbers: Concepts & Properties:** Exhibit some knowledge of the complex numbers
2. Use order of operations, conjugates, and absolute value to simplify expressions involving complex numbers.	**Numbers: Concepts & Properties:** Multiply two complex numbers Apply properties of complex numbers
Algebra	
3. Determine effects of shifts, reflections, and dilations on families of functions, including $y = \frac{k}{x}$ (inverse variation), $y = kx$ (direct variation/linear), $y = x^2$ (quadratic), $y = a^2$ (exponential), and $y = \log_a x$ (logarithmic). • Identifying the domain and range of a relation given its graph, a table of values, or its equation, including those with restricted domains • Identifying application-based situations corresponding to families of functions	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
4. Determine the nature of solutions of a quadratic equation.	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
5. Determine approximate real zeros of functions graphically and numerically and exact real zeros of polynomial functions by completing the square and applying the zero product property and the quadratic formula. • Deriving the quadratic formula	**Expressions, Equations, & Inequalities:** Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$

TABLE 2M

ALABAMA Algebra II Content Standards	ACT Mathematics College Readiness Standards
Algebra	
6. Identify characteristics, including maximum and minimum values, of quadratic functions from their roots, graphs, or equations. • Determining a quadratic equation when given its graph or roots • Constructing the graph of a function when given its equation • Using the maximum or minimum value of a quadratic function to solve application-based problems	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
7. Perform operations, including addition, subtraction, multiplication, division, and composition of functions, with polynomial and rational expressions containing variables. • Determining the inverse of a function or a relation • Evaluating rational functions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations **Functions:** Evaluate quadratic functions, expressed in function notation, at integer values Evaluate polynomial functions, expressed in function notation, at integer values Evaluate composite functions at integer values Write an expression for the composite of two simple functions
8. Apply laws of exponents to simplify expressions, including those containing zero and negative integral exponents. • Applying laws of logarithms to simplify expressions and solve equations	**Numbers: Concepts & Properties:** Work problems involving positive integer exponents Apply rules of exponents Exhibit knowledge of logarithms and geometric sequences **Expressions, Equations, & Inequalities:** Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations

TABLE 2M

ALABAMA Algebra II Content Standards	ACT Mathematics College Readiness Standards
Algebra	
9. Solve equations, inequalities, and applied problems involving rational and irrational exponents, absolute values, radicals, and quadratics over complex numbers, as well as exponential and logarithmic functions with the solution represented as a graph on a number line, set notation, and interval notation.	**Numbers: Concepts & Properties:** Exhibit knowledge of logarithms and geometric sequences Apply properties of complex numbers **Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve first-degree inequalities that do not require reversing the inequality sign Solve linear inequalities that require reversing the inequality sign Solve absolute value equations Solve quadratic equations Solve simple absolute value inequalities **Graphical Representations:** Identify the location of a point with a positive coordinate on the number line Locate points on the number line and in the first quadrant Identify the graph of a linear inequality on the number line Match number line graphs with solution sets of linear inequalities Match number line graphs with solution sets of simple quadratic inequalities
10. Solve systems of linear equations or inequalities in two and three variables using algebraic techniques, including those involving matrices. • Calculating the determinant of a 2 × 2 and 3 × 3 matrix • Solving two- and three-variable word problems involving application-based situations	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations
Geometry	
11. Solve coordinate geometry problems using algebraic techniques.	**Graphical Representations:** Solve problems integrating multiple algebraic and/or geometric concepts
Measurement	
[No standards in this strand for this course]	

TABLE 2M

ALABAMA Algebra II Content Standards	ACT Mathematics College Readiness Standards
Data Analysis and Probability	
12. Use multiple representations, including graphical, numerical, analytical, and verbal, to compare characteristics of data gathered from two populations. • Identifying characteristics of the design of an experimental study • Describing effects of an experimental study design on its outcome • Predicting population characteristics using sample statistics • Identifying characteristics, including the mean and standard deviation, of a normal distribution	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs
13. Analyze data to determine if a linear or quadratic relationship exists. • Determining an equation of linear regression from a set of data to predict outcomes	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings Write expressions that require planning and/or manipulating to accurately model a situation
14. Calculate probabilities of events using permutations, combinations, the laws of probability, and the binomial theorem. • Calculating conditional probability	**Probability, Statistics, & Data Analysis:** Determine the probability of a simple event Exhibit knowledge of simple counting techniques Compute straightforward probabilities for common situations Apply counting techniques Exhibit knowledge of conditional and joint probability

TABLE 2N

ALABAMA Algebra II with Trigonometry Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
1. Determine relationships among subsets of complex numbers.	
2. Use order of operations, conjugates, and absolute value to simplify expressions involving complex numbers.	
Algebra	
3. Determine effects of shifts, reflections, and dilations on families of functions, including $y = \frac{k}{x}$ (inverse variation), $y = kx$ (direct variation/linear), $y = x^2$ (quadratic), $y = a^2$ (exponential), and $y = \log_a x$ (logarithmic). • Identifying the domain and range of a relation given its graph, a table of values, or its equation, including those with restricted domains • Identifying application-based situations corresponding to families of functions	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane
4. Determine the nature of solutions of a quadratic equation.	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane
5. Determine approximate real zeros of functions graphically and numerically and exact real zeros of polynomial functions by completing the square and applying the zero product property and the quadratic formula. • Deriving the quadratic formula	**Expressions, Equations, & Inequalities:** Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane
6. Identify characteristics, including maximum and minimum values, of quadratic functions from their roots, graphs, or equations. • Determining a quadratic equation when given its graph or roots • Constructing the graph of a function when given its equation • Using the maximum or minimum value of a quadratic function to solve application-based problems	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane

TABLE 2N

ALABAMA Algebra II with Trigonometry Content Standards	PLAN Mathematics College Readiness Standards
Algebra	
7. Perform operations, including addition, subtraction, multiplication, division, and composition of functions, with polynomial and rational expressions containing variables. • Determining the inverse of a function or a relation • Evaluating rational functions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations
8. Apply laws of exponents to simplify expressions, including those containing zero and negative integral exponents. • Applying laws of logarithms to simplify expressions and solve equations	**Numbers: Concepts & Properties:** Work problems involving positive integer exponents Apply rules of exponents **Expressions, Equations, & Inequalities:** Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations
9. Solve equations, inequalities, and applied problems involving rational and irrational exponents, absolute values, radicals, and quadratics over complex numbers, as well as simple trigonometric, exponential, and logarithmic functions with the solution represented as a graph on a number line, set notation, and interval notation.	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve first-degree inequalities that do not require reversing the inequality sign Solve linear inequalities that require reversing the inequality sign Solve absolute value equations Solve quadratic equations **Graphical Representations:** Identify the location of a point with a positive coordinate on the number line Locate points on the number line and in the first quadrant Identify the graph of a linear inequality on the number line Match number line graphs with solution sets of linear inequalities
10. Solve systems of linear equations or inequalities in two and three variables using algebraic techniques, including those involving matrices. • Calculating the determinant of a 2 × 2 and 3 × 3 matrix • Solving two- and three-variable word problems involving application-based situations	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations
11. Determine specific unit circle coordinates associated with special angles. • Converting angle measures from degrees to radians and from radians to degrees • Graphing angles in standard position • Determining the value of the six trigonometric functions for special angles	

TABLE 2N

ALABAMA Algebra II with Trigonometry Content Standards	PLAN Mathematics College Readiness Standards
Algebra	
12. Graph trigonometric functions of the form $y = a \sin(bx)$, $y = a \cos(bx)$, $y = a \tan(bx)$, $y = a \sec(bx)$, $y = a \csc(bx)$, and $y = a \cot(bx)$. • Determining period and amplitude of sine, cosine, and tangent functions from graphs or basic equations • Graphing angles in standard position	
Geometry	
13. Solve coordinate geometry problems using algebraic techniques.	
14. Define the six trigonometric functions using ratios of the sides of a right triangle, coordinates on the unit circle, and the reciprocal of other functions. • Applying the law of sines and the law of cosines to determine missing measures of triangles	
15. Verify simple trigonometric identities using Pythagorean and reciprocal identities.	
Measurement	
[No standards in this strand for this course]	

TABLE 2N

ALABAMA Algebra II with Trigonometry Content Standards	PLAN Mathematics College Readiness Standards
Data Analysis and Probability	
16. Use multiple representations, including graphical, numerical, analytical, and verbal, to compare characteristics of data gathered from two populations. • Identifying characteristics of the design of an experimental study • Describing effects of an experimental study design on its outcome • Predicting population characteristics using sample statistics • Identifying characteristics, including the mean and standard deviation, of a normal distribution	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs
17. Analyze data to determine if a linear, quadratic, or exponential relationship exists. • Determining an equation of linear regression from a set of data to predict outcomes	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings
18. Calculate probabilities of events using permutations, combinations, the laws of probability, and the binomial theorem. • Calculating conditional probability	**Probability, Statistics, & Data Analysis:** Determine the probability of a simple event Exhibit knowledge of simple counting techniques Compute straightforward probabilities for common situations Apply counting techniques

TABLE 2O

ALABAMA Algebra II with Trigonometry Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
1. Determine relationships among subsets of complex numbers.	**Numbers: Concepts & Properties:** Exhibit some knowledge of the complex numbers
2. Use order of operations, conjugates, and absolute value to simplify expressions involving complex numbers.	**Numbers: Concepts & Properties:** Multiply two complex numbers Apply properties of complex numbers
Algebra	
3. Determine effects of shifts, reflections, and dilations on families of functions, including $y = \frac{k}{x}$ (inverse variation), $y = kx$ (direct variation/linear), $y = x^2$ (quadratic), $y = a^2$ (exponential), and $y = \log_a x$ (logarithmic). • Identifying the domain and range of a relation given its graph, a table of values, or its equation, including those with restricted domains • Identifying application-based situations corresponding to families of functions	**Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Match linear graphs with their equations Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
4. Determine the nature of solutions of a quadratic equation.	**Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
5. Determine approximate real zeros of functions graphically and numerically and exact real zeros of polynomial functions by completing the square and applying the zero product property and the quadratic formula. • Deriving the quadratic formula	**Expressions, Equations, & Inequalities:** Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$

TABLE 2O

ALABAMA Algebra II with Trigonometry Content Standards	ACT Mathematics College Readiness Standards
Algebra	
6. Identify characteristics, including maximum and minimum values, of quadratic functions from their roots, graphs, or equations. • Determining a quadratic equation when given its graph or roots • Constructing the graph of a function when given its equation • Using the maximum or minimum value of a quadratic function to solve application-based problems	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings Solve quadratic equations **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Interpret and use information from graphs in the coordinate plane Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
7. Perform operations, including addition, subtraction, multiplication, division, and composition of functions, with polynomial and rational expressions containing variables. • Determining the inverse of a function or a relation • Evaluating rational functions	**Expressions, Equations, & Inequalities:** Substitute whole numbers for unknown quantities to evaluate expressions Combine like terms (e.g., $2x + 5x$) Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations **Functions:** Evaluate quadratic functions, expressed in function notation, at integer values Evaluate polynomial functions, expressed in function notation, at integer values Evaluate composite functions at integer values Write an expression for the composite of two simple functions
8. Apply laws of exponents to simplify expressions, including those containing zero and negative integral exponents. • Applying laws of logarithms to simplify expressions and solve equations	**Numbers: Concepts & Properties:** Work problems involving positive integer exponents Apply rules of exponents Exhibit knowledge of logarithms and geometric sequences **Expressions, Equations, & Inequalities:** Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations

TABLE 2O

ALABAMA Algebra II with Trigonometry Content Standards	ACT Mathematics College Readiness Standards
Algebra	
9. Solve equations, inequalities, and applied problems involving rational and irrational exponents, absolute values, radicals, and quadratics over complex numbers, as well as simple trigonometric, exponential, and logarithmic functions with the solution represented as a graph on a number line, set notation, and interval notation.	**Numbers: Concepts & Properties:** Exhibit knowledge of logarithms and geometric sequences Apply properties of complex numbers **Expressions, Equations, & Inequalities:** Identify solutions to simple quadratic equations Solve first-degree inequalities that do not require reversing the inequality sign Solve linear inequalities that require reversing the inequality sign Solve absolute value equations Solve quadratic equations Solve simple absolute value inequalities **Graphical Representations:** Identify the location of a point with a positive coordinate on the number line Locate points on the number line and in the first quadrant Identify the graph of a linear inequality on the number line Match number line graphs with solution sets of linear inequalities Match number line graphs with solution sets of simple quadratic inequalities **Functions:** Use trigonometric concepts and basic identities to solve problems
10. Solve systems of linear equations or inequalities in two and three variables using algebraic techniques, including those involving matrices. • Calculating the determinant of a 2 × 2 and 3 × 3 matrix • Solving two- and three-variable word problems involving application-based situations	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations
11. Determine specific unit circle coordinates associated with special angles. • Converting angle measures from degrees to radians and from radians to degrees • Graphing angles in standard position • Determining the value of the six trigonometric functions for special angles	**Functions:** Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths Apply basic trigonometric ratios to solve right-triangle problems Exhibit knowledge of unit circle trigonometry
12. Graph trigonometric functions of the form $y = a \sin(bx)$, $y = a \cos(bx)$, $y = a \tan(bx)$, $y = a \sec(bx)$, $y = a \csc(bx)$, and $y = a \cot(bx)$. • Determining period and amplitude of sine, cosine, and tangent functions from graphs or basic equations • Graphing angles in standard position	**Graphical Representations:** Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$ **Functions:** Exhibit knowledge of unit circle trigonometry Match graphs of basic trigonometric functions with their equations

TABLE 2O

ALABAMA Algebra II with Trigonometry Content Standards	ACT Mathematics College Readiness Standards
Algebra	
Geometry	
13. Solve coordinate geometry problems using algebraic techniques.	**Graphical Representations:** Solve problems integrating multiple algebraic and/or geometric concepts
14. Define the six trigonometric functions using ratios of the sides of a right triangle, coordinates on the unit circle, and the reciprocal of other functions. • Applying the law of sines and the law of cosines to determine missing measures of triangles	**Functions:** Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths Apply basic trigonometric ratios to solve right-triangle problems Use trigonometric concepts and basic identities to solve problems Exhibit knowledge of unit circle trigonometry
15. Verify simple trigonometric identities using Pythagorean and reciprocal identities.	**Properties of Plane Figures:** Use the Pythagorean theorem **Functions:** Use trigonometric concepts and basic identities to solve problems
Measurement	
[No standards in this strand for this course]	

TABLE 2O

ALABAMA Algebra II with Trigonometry Content Standards	ACT Mathematics College Readiness Standards
Data Analysis and Probability	
16. Use multiple representations, including graphical, numerical, analytical, and verbal, to compare characteristics of data gathered from two populations. • Identifying characteristics of the design of an experimental study • Describing effects of an experimental study design on its outcome • Predicting population characteristics using sample statistics • Identifying characteristics, including the mean and standard deviation, of a normal distribution	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs
17. Analyze data to determine if a linear, quadratic, or exponential relationship exists. • Determining an equation of linear regression from a set of data to predict outcomes	**Probability, Statistics, & Data Analysis:** Read tables and graphs Perform computations on data from tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings Write expressions that require planning and/or manipulating to accurately model a situation
18. Calculate probabilities of events using permutations, combinations, the laws of probability, and the binomial theorem. • Calculating conditional probability	**Probability, Statistics, & Data Analysis:** Determine the probability of a simple event Exhibit knowledge of simple counting techniques Compute straightforward probabilities for common situations Apply counting techniques Exhibit knowledge of conditional and joint probability

TABLE 2P

ALABAMA Discrete Mathematics Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
1. Analyze topics from elementary number theory, including perfect numbers and prime numbers, to determine properties of integers.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
2. Determine characteristics of sequences, including the Fibonacci sequence, the triangular numbers, and pentagonal numbers.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
3. Use the recursive process and difference equations to create fractals, population growth models, sequences, series, and compound interest models.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
4. Convert between base ten and other bases.	
Algebra	
5. Determine results of operations upon 3 × 3 and larger matrices, including matrix addition and multiplication of a matrix by a matrix, vector, or scalar.	
6. Analyze determinants and inverses of 2 × 2, 3 × 3, and larger matrices to determine the nature of the solution set of the corresponding system of equations, including solving systems of equations in three variables by echelon row reduction and matrix inverse.	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations
7. Solve problems through investigation and application of existence and nonexistence of Euler paths, Euler circuits, Hamilton paths, and Hamilton circuits. • Developing optimal solutions of application-based problems using existing and student-created algorithms	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs
8. Apply algorithms, including Kruskal's and Prim's, relating to minimum weight spanning trees, networks, flows, and Steiner trees. • Using shortest path techniques to find optimal shipping routes	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs
9. Determine a minimum project time using algorithms to schedule tasks in order, including critical path analysis, the list-processing algorithm, and student-created algorithms.	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs
Geometry	
10. Use vertex-coloring techniques and matching techniques to solve application-based problems.	
11. Solve application-based logic problems using Venn diagrams, truth tables, and matrices.	**Probability, Statistics, & Data Analysis:** Use Venn diagrams in counting Interpret and use information from figures, tables, and graphs
Measurement	
[No standards in this strand for this course]	

TABLE 2P

ALABAMA Discrete Mathematics Content Standards	PLAN Mathematics College Readiness Standards
Data Analysis and Probability	
12. Use combinatorial reasoning and counting techniques to solve application-based problems.	**Probability, Statistics, & Data Analysis:** Exhibit knowledge of simple counting techniques Apply counting techniques
13. Analyze election data to compare election methods and voting apportionment, including determining strength within specific groups.	

TABLE 2Q

ALABAMA Discrete Mathematics Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
1. Analyze topics from elementary number theory, including perfect numbers and prime numbers, to determine properties of integers.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
2. Determine characteristics of sequences, including the Fibonacci sequence, the triangular numbers, and pentagonal numbers.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor
3. Use the recursive process and difference equations to create fractals, population growth models, sequences, series, and compound interest models.	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor Exhibit knowledge of logarithms and geometric sequences
4. Convert between base ten and other bases.	**Numbers: Concepts & Properties:** Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers
Algebra	
5. Determine results of operations upon 3 × 3 and larger matrices, including matrix addition and multiplication of a matrix by a matrix, vector, or scalar.	
6. Analyze determinants and inverses of 2 × 2, 3 × 3, and larger matrices to determine the nature of the solution set of the corresponding system of equations, including solving systems of equations in three variables by echelon row reduction and matrix inverse.	**Expressions, Equations, & Inequalities:** Find solutions to systems of linear equations
7. Solve problems through investigation and application of existence and nonexistence of Euler paths, Euler circuits, Hamilton paths, and Hamilton circuits. • Developing optimal solutions of application-based problems using existing and student-created algorithms	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs
8. Apply algorithms, including Kruskal's and Prim's, relating to minimum weight spanning trees, networks, flows, and Steiner trees. • Using shortest path techniques to find optimal shipping routes	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs
9. Determine a minimum project time using algorithms to schedule tasks in order, including critical path analysis, the list-processing algorithm, and student-created algorithms.	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs

TABLE 2Q

ALABAMA Discrete Mathematics Content Standards	ACT Mathematics College Readiness Standards
Geometry	
10. Use vertex-coloring techniques and matching techniques to solve application-based problems.	**Probability, Statistics, & Data Analysis:** Analyze and draw conclusions based on information from figures, tables, and graphs
11. Solve application-based logic problems using Venn diagrams, truth tables, and matrices.	**Probability, Statistics, & Data Analysis:** Use Venn diagrams in counting Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs
Measurement	
[No standards in this strand for this course]	
Data Analysis and Probability	
12. Use combinatorial reasoning and counting techniques to solve application-based problems.	**Probability, Statistics, & Data Analysis:** Exhibit knowledge of simple counting techniques Apply counting techniques
13. Analyze election data to compare election methods and voting apportionment, including determining strength within specific groups.	**Probability, Statistics, & Data Analysis:** Analyze and draw conclusions based on information from figures, tables, and graphs

TABLE 2R

ALABAMA Mathematics Investigations Content Standards	PLAN Mathematics College Readiness Standards
Number and Operations	
1. Critique ancient numeration systems and applications, including astronomy and the development and use of money and calendars. • Determining relationships among mathematical achievements of ancient peoples, including the Sumerians, Babylonians, Egyptians, Mesopotamians, Chinese, Aztecs, and Incas • Explaining origins of the Hindu-Arabic numeration system	
2. Analyze mathematical relationships in music to interpret frequencies of musical notes and to compare mathematical structures of various musical instruments. • Determining lengths of strings necessary to produce harmonic tones as in Pythagorean tuning	
3. Use special numbers, including *e*, *i*, π and the golden ratio, to solve application-based problems. • Identifying transcendental numbers	**Measurement:** Use geometric formulas when all necessary information is given
4. Explain the development and uses of sets of numbers, including complex, real, rational, irrational, integer, whole, and natural numbers. • Analyzing contributions to the number system by well-known mathematicians, including Archimedes, John Napier, René Descartes, Sir Isaac Newton, Johann Carl Friedrich Gauss, and Julius Wilhelm Richard Dedekind	
Algebra	
5. Identify beginnings of algebraic symbolism and structure through the works of European mathematicians. • Creating a Fibonacci sequence when given two initial integers • Investigating Tartaglia's formula for solving cubic equations	
6. Explain the development and applications of logarithms, including contributions of John Napier, Henry Briggs, and the Bernoulli family.	
7. Justify the historical significance of the development of multiple perspectives in mathematics. • Summarizing the significance of René Descartes' Cartesian coordinate system • Interpreting the foundation of analytic geometry with regard to geometric curves and algebraic relationships	

TABLE 2R

ALABAMA Mathematics Investigations Content Standards	PLAN Mathematics College Readiness Standards
Geometry	
8. Solve problems from non-Euclidean geometry, including graph theory, networks, topology, and fractals.	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs
9. Analyze works of visual art and architecture for mathematical relationships. • Summarizing the historical development of perspective in art and architecture	
10. Determine the mathematical impact of the ancient Greeks, including Archimedes, Eratosthenes, Euclid, Hypatia, Pythagoras, and the Pythagorean Society. • Constructing multiple proofs of the Pythagorean Theorem • Solving problems involving figurate numbers, including triangular and pentagonal numbers	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor **Properties of Plane Figures:** Use the Pythagorean theorem
Measurement	
11. Describe the development of mathematical tools and their applications.	
Data Analysis and Probability	
12. Summarize the history of probability, including the works of Blaise Pascal; Pierre de Fermat; Abraham de Moivre; and Pierre-Simon, marquis de Laplace.	

TABLE 2S

ALABAMA Mathematics Investigations Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
1. Critique ancient numeration systems and applications, including astronomy and the development and use of money and calendars. • Determining relationships among mathematical achievements of ancient peoples, including the Sumerians, Babylonians, Egyptians, Mesopotamians, Chinese, Aztecs, and Incas • Explaining origins of the Hindu-Arabic numeration system	
2. Analyze mathematical relationships in music to interpret frequencies of musical notes and to compare mathematical structures of various musical instruments. • Determining lengths of strings necessary to produce harmonic tones as in Pythagorean tuning	
3. Use special numbers, including *e*, *i*, π and the golden ratio, to solve application-based problems. • Identifying transcendental numbers	**Numbers: Concepts & Properties:** Exhibit some knowledge of the complex numbers Exhibit knowledge of logarithms and geometric sequences **Measurement:** Use geometric formulas when all necessary information is given
4. Explain the development and uses of sets of numbers, including complex, real, rational, irrational, integer, whole, and natural numbers. • Analyzing contributions to the number system by well-known mathematicians, including Archimedes, John Napier, René Descartes, Sir Isaac Newton, Johann Carl Friedrich Gauss, and Julius Wilhelm Richard Dedekind	
Algebra	
5. Identify beginnings of algebraic symbolism and structure through the works of European mathematicians. • Creating a Fibonacci sequence when given two initial integers • Investigating Tartaglia's formula for solving cubic equations	
6. Explain the development and applications of logarithms, including contributions of John Napier, Henry Briggs, and the Bernoulli family.	
7. Justify the historical significance of the development of multiple perspectives in mathematics. • Summarizing the significance of René Descartes' Cartesian coordinate system • Interpreting the foundation of analytic geometry with regard to geometric curves and algebraic relationships	

TABLE 2S

ALABAMA Mathematics Investigations Content Standards	ACT Mathematics College Readiness Standards
Geometry	
8. Solve problems from non-Euclidean geometry, including graph theory, networks, topology, and fractals.	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs **Graphical Representations:** Solve problems integrating multiple algebraic and/or geometric concepts **Properties of Plane Figures:** Draw conclusions based on a set of conditions Solve multistep geometry problems that involve integrating concepts, planning, visualization, and/or making connections with other content areas
9. Analyze works of visual art and architecture for mathematical relationships. • Summarizing the historical development of perspective in art and architecture	
10. Determine the mathematical impact of the ancient Greeks, including Archimedes, Eratosthenes, Euclid, Hypatia, Pythagoras, and the Pythagorean Society. • Constructing multiple proofs of the Pythagorean Theorem • Solving problems involving figurate numbers, including triangular and pentagonal numbers	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers **Properties of Plane Figures:** Use the Pythagorean theorem Draw conclusions based on a set of conditions Solve multistep geometry problems that involve integrating concepts, planning, visualization, and/or making connections with other content areas
Measurement	
11. Describe the development of mathematical tools and their applications.	
Data Analysis and Probability	
12. Summarize the history of probability, including the works of Blaise Pascal; Pierre de Fermat; Abraham de Moivre; and Pierre-Simon, marquis de Laplace.	

TABLE 2T

ALABAMA Precalculus Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
1. Perform vector operations of addition, scalar multiplication, and absolute value. • Determining coincidence, parallelism, collinearity, or perpendicularity of vectors • Using vectors to model application-based and mathematical situations	
2. Define *e* using the limit forms of $\sum_{n=0}^{\infty} \frac{1}{n!}$, $\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n$, and $\lim_{n\to 0}(1+n)^{\frac{1}{n}}$.	
3. Determine numerically, algebraically, and graphically the limits of functions at specific values and at infinity. • Applying limits in problems involving convergence and divergence	
Algebra	
4. Determine characteristics of arithmetic and geometric sequences and series, including those defined with recurrence relations, first terms, common differences or ratios, nth terms, limits, or statements of convergence or divergence. • Solving problems modeled by finite geometric series, including home mortgage problems • Expanding binomials raised to a whole number power using the binomial theorem	**Numbers: Concepts & Properties:** Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor Apply rules of exponents Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers Exhibit knowledge of logarithms and geometric sequences **Expressions, Equations, & Inequalities:** Multiply two binomials Add, subtract, and multiply polynomials Manipulate expressions and equations
5. Create graphs of conic sections, including parabolas, hyperbolas, ellipses, circles, and degenerate conics, from second-degree equations. • Formulating equations of conic sections from their determining characteristics	**Expressions, Equations, & Inequalities:** Write expressions, equations, and inequalities for common algebra settings **Graphical Representations:** Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
6. Determine the inverse of a function and a relation.	

TABLE 2T

ALABAMA Precalculus Content Standards	ACT Mathematics College Readiness Standards
Algebra	
7. Analyze rational, logarithmic, exponential, trigonometric, and piecewise-defined functions graphically and algebraically to determine the domain and range; to identify symmetries; to identify vertical, horizontal, or oblique asymptotes; to classify functions as increasing or decreasing, continuous or discontinuous; and to identify the type of discontinuity if one exists. • Using the difference quotient to approximate rates of change	**Graphical Representations:** Analyze and draw conclusions based on information from graphs in the coordinate plane **Functions:** Match graphs of basic trigonometric functions with their equations
8. Compare effects of parameter changes on graphs of transcendental functions.	
9. Determine the amplitude, period, phase shift, domain, and range of trigonometric functions and their inverses.	**Graphical Representations:** Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$ **Functions:** Match graphs of basic trigonometric functions with their equations
10. Solve trigonometric equations using sum, difference, and half- and double-angle identities. • Verifying trigonometric identities	**Functions:** Use trigonometric concepts and basic identities to solve problems
11. Apply the law of sines and the law of cosines to determine missing measures of triangles, including application-based problems. • Deriving formulas for the law of sines and the law of cosines • Determining the area of oblique triangles	**Measurement:** Use geometric formulas when all necessary information is given
12. Determine the value of the six trigonometric functions for special angles. • Using the sum, difference, and half-angle identities to find the exact value of a trigonometric function	**Functions:** Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths Apply basic trigonometric ratios to solve right-triangle problems Use trigonometric concepts and basic identities to solve problems
13. Utilize parametric equations by graphing and by converting to rectangular form. • Solving application-based problems involving parametric equations • Solving applied problems that include sequences with recurrence relations	
14. Apply laws of logarithms to simplify expressions and to solve equations using common logarithms, natural logarithms, and logarithms with other bases.	**Numbers: Concepts & Properties:** Exhibit knowledge of logarithms and geometric sequences

TABLE 2T

ALABAMA Precalculus Content Standards	ACT Mathematics College Readiness Standards
Geometry	
15. Determine the location of polar coordinates and complex numbers on the complex plane and convert coordinates, equations, and complex numbers from Cartesian form to polar form and from polar form to Cartesian form. • Constructing graphs of simple polar equations on the polar coordinate plane	**Graphical Representations:** Solve problems integrating multiple algebraic and/or geometric concepts
Measurement	
[No standards in this strand for this course]	
Data Analysis and Probability	
16. Determine the equation of a curve of best fit from a set of data using exponential, quadratic, or logarithmic functions.	**Probability, Statistics, & Data Analysis:** Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write equations and inequalities that require planning, manipulating, and/or solving

TABLE 2U

ALABAMA Probability and Statistics Content Standards	ACT Mathematics College Readiness Standards
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Use the binomial theorem to expand powers of binomials. • Using Pascal's triangle to expand powers of binomials	
Geometry	
[No standards in this strand for this course]	
Measurement	
[No standards in this strand for this course]	
Data Analysis and Probability	
2. Compare summary statistics for sets of data represented in a graph, a stem-and-leaf chart, a box-and-whisker graph, a histogram, a linear or quadratic equation of best fit of a scatterplot, and a frequency distribution.	**Probability, Statistics, & Data Analysis:** Read tables and graphs Interpret and use information from figures, tables, and graphs
3. Calculate descriptive statistics of univariate data, including measures of central tendency, measures of dispersion, and measures of position. • Defining vocabulary associated with probability and statistics, including descriptive and inferential statistics • Comparing descriptive statistics for samples of various sizes generated by simulation	**Probability, Statistics, & Data Analysis:** Calculate the average of a list of positive whole numbers Calculate the average of a list of numbers Interpret and use information from figures, tables, and graphs
4. Calculate probabilities of mutually exclusive, independent, and dependent events using permutations, combinations, and laws of probability. • Predicting outcomes of events involving conditional probabilities	**Probability, Statistics, & Data Analysis:** Determine the probability of a simple event Exhibit knowledge of simple counting techniques Compute straightforward probabilities for common situations Apply counting techniques Compute a probability when the event and/or sample space are not given or obvious Exhibit knowledge of conditional and joint probability
5. Determine the probability of an event using a frequency distribution curve. • Comparing terms of a binominal expansion to terms of a binomial probability distribution • Analyzing data from a student-designed study to create a distribution curve, including determining the resulting confidence interval • Using data from a study in quality control applications to compute distributions and confidence intervals	

TABLE 2U

ALABAMA Probability and Statistics Content Standards	ACT Mathematics College Readiness Standards
Data Analysis and Probability	
6. Analyze experimental, simulation, and theoretical probability techniques for differences, including advantages and disadvantages of each. • Evaluating data-based reports by examining the design of the study, appropriateness of data analysis, and validity of conclusion	**Probability, Statistics, & Data Analysis:** Read tables and graphs Interpret and use information from figures, tables, and graphs Analyze and draw conclusions based on information from figures, tables, and graphs
7. Determine the validity of a hypothesis for a study involving one or two populations, including generating appropriate descriptive statistics. • Designing a study to answer questions about characteristics of a population • Critiquing the instrument used in a study of populations • Using z-scores in a study of populations • Using a t-test, when appropriate, to test a hypothesis for a study	
8. Interpret linear relationships of bivariate data using power and exponential regression and linear correlation. • Determining the validity of a hypothesis by displaying a scatterplot of experimental data and examining its correlation • Calculating the regression coefficient, regression equation, and the correlation coefficient	**Probability, Statistics, & Data Analysis:** Read tables and graphs Translate from one representation of data to another (e.g., a bar graph to a circle graph) Manipulate data from tables and graphs Interpret and use information from figures, tables, and graphs **Expressions, Equations, & Inequalities:** Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Write expressions, equations, and inequalities for common algebra settings Write equations and inequalities that require planning, manipulating, and/or solving **Graphical Representations:** Locate points on the number line and in the first quadrant Locate points in the coordinate plane Determine the slope of a line from points or equations Interpret and use information from graphs in the coordinate plane Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$
9. Describe methods of data collection in a census, sample survey, experiment, and observational study.	
10. Develop a method of solution for an application-based problem.	
11. Apply the binomial probability distribution for discrete random variables, including computing the mean and standard deviation for the binomial variable.	

TABLE 2V

ALABAMA Probability and Statistics Content Standards	WorkKeys Applied Mathematics Level Skills
Number and Operations	
[No standards in this strand for this course]	
Algebra	
1. Use the binomial theorem to expand powers of binomials. • Using Pascal's triangle to expand powers of binomials	
Geometry	
[No standards in this strand for this course]	
Measurement	
[No standards in this strand for this course]	
Data Analysis and Probability	
2. Compare summary statistics for sets of data represented in a graph, a stem-and-leaf chart, a box-and-whisker graph, a histogram, a linear or quadratic equation of best fit of a scatterplot, and a frequency distribution.	
3. Calculate descriptive statistics of univariate data, including measures of central tendency, measures of dispersion, and measures of position. • Defining vocabulary associated with probability and statistics, including descriptive and inferential statistics • Comparing descriptive statistics for samples of various sizes generated by simulation	Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals Apply basic statistical concepts
4. Calculate probabilities of mutually exclusive, independent, and dependent events using permutations, combinations, and laws of probability. • Predicting outcomes of events involving conditional probabilities	
5. Determine the probability of an event using a frequency distribution curve. • Comparing terms of a binominal expansion to terms of a binomial probability distribution • Analyzing data from a student-designed study to create a distribution curve, including determining the resulting confidence interval • Using data from a study in quality control applications to compute distributions and confidence intervals	
6. Analyze experimental, simulation, and theoretical probability techniques for differences, including advantages and disadvantages of each. • Evaluating data-based reports by examining the design of the study, appropriateness of data analysis, and validity of conclusion	

TABLE 2V

ALABAMA Probability and Statistics Content Standards	WorkKeys Applied Mathematics Level Skills
Data Analysis and Probability	
7. Determine the validity of a hypothesis for a study involving one or two populations, including generating appropriate descriptive statistics. • Designing a study to answer questions about characteristics of a population • Critiquing the instrument used in a study of populations • Using z-scores in a study of populations • Using a t-test, when appropriate, to test a hypothesis for a study	
8. Interpret linear relationships of bivariate data using power and exponential regression and linear correlation. • Determining the validity of a hypothesis by displaying a scatterplot of experimental data and examining its correlation • Calculating the regression coefficient, regression equation, and the correlation coefficient	
9. Describe methods of data collection in a census, sample survey, experiment, and observational study.	
10. Develop a method of solution for an application-based problem.	
11. Apply the binomial probability distribution for discrete random variables, including computing the mean and standard deviation for the binomial variable.	

SUPPLEMENT
TABLES 3A–3U:

SCIENCE

TABLE 3A

ALABAMA Scientific Process and Application Skills Content Standards	EXPLORE Science College Readiness Standards
Observing	
Using one or more of the senses to gather information about one's environment	
Communicating	
Conveying oral or written information verbally as well as visually through models, tables, charts, and graphs	
Classifying	
Utilizing simple groupings of objects or events based on common properties	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Understand basic scientific terminology Find basic information in a brief body of text Compare or combine data from a simple data presentation (e.g., order or sum data from a table)
Measuring	
Using appropriate metric units for measuring length, volume, and mass	**Interpretation of Data:** Understand basic scientific terminology **Scientific Investigation:** Understand the methods and tools used in a simple experiment
Predicting	
Proposing possible results or outcomes of future events based on observations and inferences drawn from previous events	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Inferring	
Constructing an interpretation or explanation based on information gathered	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Controlling Variables	
Recognizing the many factors that affect the outcome of events and understanding their relationships to each other whereby one factor (variable) can be manipulated while others are controlled	**Scientific Investigation:** Understand a simple experimental design Identify a control in an experiment
Defining Operationally	
Stating definitions of objects or events based on observable characteristics	
Formulating Hypotheses	
Making predictions of future events based on manipulation of variables	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3A

ALABAMA Scientific Process and Application Skills Content Standards	EXPLORE Science College Readiness Standards
Experimenting (Controlled)	
Conducting scientific investigations systematically, including identifying and framing the question carefully, forming a hypothesis, managing variables effectively, developing a logical experimental procedure, recording and analyzing data, and presenting conclusions based on investigation and previous research	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels) Understand basic scientific terminology Find basic information in a brief body of text Determine how the value of one variable changes as the value of another variable changes in a simple data presentation Compare or combine data from a simple data presentation (e.g., order or sum data from a table) Translate information into a table, graph, or diagram **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment **Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Analyzing Data	
Using collected data to accept or reject hypothese	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why Select a data presentation or a model that supports or contradicts a hypothesis, prediction, or conclusion

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3B

ALABAMA Scientific Process and Application Skills Content Standards	PLAN Science College Readiness Standards
Observing	
Using one or more of the senses to gather information about one's environment	
Communicating	
Conveying oral or written information verbally as well as visually through models, tables, charts, and graphs	
Classifying	
Utilizing simple groupings of objects or events based on common properties	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Understand basic scientific terminology Find basic information in a brief body of text Compare or combine data from a simple data presentation (e.g., order or sum data from a table)
Measuring	
Using appropriate metric units for measuring length, volume, and mass	**Interpretation of Data:** Understand basic scientific terminology **Scientific Investigation:** Understand the methods and tools used in a simple experiment
Predicting	
Proposing possible results or outcomes of future events based on observations and inferences drawn from previous events	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Inferring	
Constructing an interpretation or explanation based on information gathered	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Controlling Variables	
Recognizing the many factors that affect the outcome of events and understanding their relationships to each other whereby one factor (variable) can be manipulated while others are controlled	**Scientific Investigation:** Understand a simple experimental design Identify a control in an experiment
Defining Operationally	
Stating definitions of objects or events based on observable characteristics	
Formulating Hypotheses	
Making predictions of future events based on manipulation of variables	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model

= Measured by PLAN Science Test
_____ = Content sampled by PLAN Science Test

TABLE 3B

ALABAMA Scientific Process and Application Skills Content Standards	PLAN Science College Readiness Standards
Experimenting (Controlled)	
Conducting scientific investigations systematically, including identifying and framing the question carefully, forming a hypothesis, managing variables effectively, developing a logical experimental procedure, recording and analyzing data, and presenting conclusions based on investigation and previous research	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels) Understand basic scientific terminology Find basic information in a brief body of text Determine how the value of one variable changes as the value of another variable changes in a simple data presentation Compare or combine data from a simple data presentation (e.g., order or sum data from a table) Translate information into a table, graph, or diagram **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment Determine the hypothesis for an experiment **Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Analyzing Data	
Using collected data to accept or reject hypothese	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why Select a data presentation or a model that supports or contradicts a hypothesis, prediction, or conclusion

= Measured by PLAN Science Test
_____ = Content sampled by PLAN Science Test

TABLE 3C

ALABAMA Scientific Process and Application Skills Content Standards	ACT Science College Readiness Standards
Observing	
Using one or more of the senses to gather information about one's environment	
Communicating	
Conveying oral or written information verbally as well as visually through models, tables, charts, and graphs	
Classifying	
Utilizing simple groupings of objects or events based on common properties	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Understand basic scientific terminology Find basic information in a brief body of text Compare or combine data from a simple data presentation (e.g., order or sum data from a table)
Measuring	
Using appropriate metric units for measuring length, volume, and mass	**Interpretation of Data:** Understand basic scientific terminology **Scientific Investigation:** Understand the methods and tools used in a simple experiment
Predicting	
Proposing possible results or outcomes of future events based on observations and inferences drawn from previous events	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Inferring	
Constructing an interpretation or explanation based on information gathered	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Controlling Variables	
Recognizing the many factors that affect the outcome of events and understanding their relationships to each other whereby one factor (variable) can be manipulated while others are controlled	**Scientific Investigation:** Understand a simple experimental design Identify a control in an experiment
Defining Operationally	
Stating definitions of objects or events based on observable characteristics	
Formulating Hypotheses	
Making predictions of future events based on manipulation of variables	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model

= Measured by ACT Science Test
_____ = Content sampled by ACT Science Test

TABLE 3C

ALABAMA Scientific Process and Application Skills Content Standards	ACT Science College Readiness Standards
Experimenting (Controlled)	
Conducting scientific investigations systematically, including identifying and framing the question carefully, forming a hypothesis, managing variables effectively, developing a logical experimental procedure, recording and analyzing data, and presenting conclusions based on investigation and previous research	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels) Understand basic scientific terminology Find basic information in a brief body of text Determine how the value of one variable changes as the value of another variable changes in a simple data presentation Compare or combine data from a simple data presentation (e.g., order or sum data from a table) Translate information into a table, graph, or diagram **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment Determine the hypothesis for an experiment **Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model
Analyzing Data	
Using collected data to accept or reject hypothese	**Evaluation of Models, Inferences, and Experimental Results:** Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why Select a data presentation or a model that supports or contradicts a hypothesis, prediction, or conclusion

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3D

ALABAMA Scientific Process and Application Skills Content Standards	WorkKeys Locating Information Level Skills
Observing	
Using one or more of the senses to gather information about one's environment	Find one or two pieces of information in a graphic
Communicating	
Conveying oral or written information verbally as well as visually through models, tables, charts, and graphs	Fill in one or two pieces of information that are missing from a graphic
Classifying	
Utilizing simple groupings of objects or events based on common properties	Understand how graphics are related to each other Summarize information from one or two straightforward graphics
Measuring	
Using appropriate metric units for measuring length, volume, and mass	
Predicting	
Proposing possible results or outcomes of future events based on observations and inferences drawn from previous events	Draw conclusions based on one complicated graphic or several related graphics
Inferring	
Constructing an interpretation or explanation based on information gathered	Summarize information from one or more detailed graphics Identify trends shown in one or more detailed or complicated graphics
Controlling Variables	
Recognizing the many factors that affect the outcome of events and understanding their relationships to each other whereby one factor (variable) can be manipulated while others are controlled	Sort through distracting information
Defining Operationally	
Stating definitions of objects or events based on observable characteristics	Identify trends shown in one or two straightforward graphics
Formulating Hypotheses	
Making predictions of future events based on manipulation of variables	Use the information to make decisions
Experimenting (Controlled)	
Conducting scientific investigations systematically, including identifying and framing the question carefully, forming a hypothesis, managing variables effectively, developing a logical experimental procedure, recording and analyzing data, and presenting conclusions based on investigation and previous research	Compare information and trends from one or more complicated graphics
Analyzing Data	
Using collected data to accept or reject hypotheses	Use the information to make decisions

TABLE 3E

ALABAMA Grade 8 Science (Physical Science) Content Standards	EXPLORE Science College Readiness Standards
1. Identify steps within the scientific process. • Applying process skills to interpret data from graphs, tables, and charts • Identifying controls and variables in a scientific investigation • Measuring dimension, volume, and mass using Système International d'Unités (SI units) • Identifying examples of hypotheses • Identifying appropriate laboratory glassware, balances, time measuring equipment, and optical instruments used to conduct an investigation	**Interpretation of Data:** Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels) Understand basic scientific terminology Find basic information in a brief body of text Determine how the value of one variable changes as the value of another variable changes in a simple data presentation Compare or combine data from a simple data presentation (e.g., order or sum data from a table) Translate information into a table, graph, or diagram **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment
2. Describe the structure of atoms, including the location of protons, neutrons, and electrons. • Identifying the charge of each subatomic particle • Identifying Democritus and Dalton as contributors to the atomic theory	
3. Determine the number of protons, neutrons, and electrons, and the mass of an element using the periodic table. • Locating metals, nonmetals, metalloids, and noble gases on the periodic table • Using data about the number of electrons in the outer shell of an atom to determine its reactivity	
4. State the law of conservation of matter. • Balancing chemical equations by adjusting coefficients	
5. Differentiate between ionic and covalent bonds. • Illustrating the transfer or sharing of electrons using electron dot diagrams	
6. Define solution in terms of solute and solvent. • Defining diffusion and osmosis • Defining isotonic, hypertonic, and hypotonic solutions • Describing acids and bases based on their hydrogen ion concentration	
7. Describe states of matter based on kinetic energy of particles in matter. • Explaining effects of temperature, concentration, surface area, and catalysts on the rate of chemical reactions	

= Measured by EXPLORE Science Test
____ = Content sampled by EXPLORE Science Test

TABLE 3E

ALABAMA Grade 8 Science (Physical Science) Content Standards	EXPLORE Science College Readiness Standards
8. Identify Newton's three laws of motion. • Defining terminology such as action and reaction forces, inertia, acceleration, momentum, and friction • Interpreting distance–time graphs	
9. Describe how mechanical advantages of simple machines reduce the amount of force needed for work. • Describing the effect of force on pressure in fluids	
10. Differentiate between potential and kinetic energy.	
11. Explain the law of conservation of energy and its relationship to energy transformation, including chemical to electrical, chemical to heat, electrical to light, electrical to mechanical, and electrical to sound.	
12. Classify waves as mechanical or electromagnetic. • Describing how earthquake waves, sound waves, water waves, and electromagnetic waves can be destructive or beneficial due to the transfer of energy • Describing longitudinal and transverse waves • Describing how waves travel through different media • Relating wavelength, frequency, and amplitude to energy • Describing the electromagnetic spectrum in terms of frequencies	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3F

ALABAMA Physical Science Core Content Standards	EXPLORE Science College Readiness Standards
1. Recognize periodic trends of elements, including the number of valence electrons, atomic size, and reactivity. • Categorizing elements as metals, nonmetals, metalloids, and noble gases • Differentiating between families and periods • Using atomic number and mass number to identify isotopes	
2. Identify solutions in terms of components, solubility, concentration, and conductivity. • Comparing saturated, unsaturated, and supersaturated solutions • Comparing characteristics of electrolytes and nonelectrolytes • Describing factors that affect solubility and rate of solution, including nature of solute and solvent, temperature, agitation, surface area, and pressure on gases	
3. Contrast the formation of ionic and covalent bonds based on the transfer or sharing of valence electrons. • Demonstrating the formation of positive and negative monatomic ions by using electron dot diagrams	
4. Use nomenclature and chemical formulas to write balanced chemical equations. • Explaining the law of conservation of matter • Identifying chemical reactions as composition, decomposition, single replacement, or double replacement • Defining the role of electrons in chemical reactions	
5. Describe physical and chemical changes in terms of endothermic and exothermic processes.	
6. Identify characteristics of gravitational, electromagnetic, and nuclear forces.	
7. Relate velocity, acceleration, and kinetic energy to mass, distance, force, and time. • Interpreting graphic representations of velocity versus time and distance versus time • Solving problems for velocity, acceleration, force, work, and power • Describing action and reaction forces, inertia, acceleration, momentum, and friction in terms of Newton's three laws of motion • Determining the resultant of collinear forces acting on a body • Solving problems for efficiency and mechanical advantage of simple machines	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3F

ALABAMA Physical Science Core Content Standards	EXPLORE Science College Readiness Standards
8. Relate the law of conservation of energy to transformations of potential energy, kinetic energy, and thermal energy. • Identifying the relationship between thermal energy and the temperature of a sample of matter • Describing the flow of thermal energy between two samples of matter • Explaining how thermal energy is transferred by radiation, conduction, and convection • Relating simple formulas to the calculation of potential energy, kinetic energy, and work	
9. Compare methods of energy transfer by mechanical and electromagnetic waves. • Distinguishing between transverse and longitudinal mechanical waves • Relating physical properties of sound and light to wave characteristics	
10. Explain the relationship between electricity and magnetism. • Differentiating between induction and conduction • Identifying mechanical, magnetic, and chemical methods used to create an electrical charge • Describing electrical circuits in terms of Ohm's law	
11. Describe the nuclear composition of unstable isotopes and the resulting changes to their nuclear composition. • Identifying types of nuclear emissions, including alpha particles, beta particles, and gamma radiation • Differentiating between fission and fusion • Identifying uses and possible negative side effects of nuclear technology	
12. Identify metric units for mass, distance, time, temperature, velocity, acceleration, density, force, energy, and power.	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3G

ALABAMA Physical Science Core Content Standards	PLAN Science College Readiness Standards
1. Recognize periodic trends of elements, including the number of valence electrons, atomic size, and reactivity. • Categorizing elements as metals, nonmetals, metalloids, and noble gases • Differentiating between families and periods • Using atomic number and mass number to identify isotopes	
2. Identify solutions in terms of components, solubility, concentration, and conductivity. • Comparing saturated, unsaturated, and supersaturated solutions • Comparing characteristics of electrolytes and nonelectrolytes • Describing factors that affect solubility and rate of solution, including nature of solute and solvent, temperature, agitation, surface area, and pressure on gases	
3. Contrast the formation of ionic and covalent bonds based on the transfer or sharing of valence electrons. • Demonstrating the formation of positive and negative monatomic ions by using electron dot diagrams	
4. Use nomenclature and chemical formulas to write balanced chemical equations. • Explaining the law of conservation of matter • Identifying chemical reactions as composition, decomposition, single replacement, or double replacement • Defining the role of electrons in chemical reactions	
5. Describe physical and chemical changes in terms of endothermic and exothermic processes.	
6. Identify characteristics of gravitational, electromagnetic, and nuclear forces.	
7. Relate velocity, acceleration, and kinetic energy to mass, distance, force, and time. • Interpreting graphic representations of velocity versus time and distance versus time • Solving problems for velocity, acceleration, force, work, and power • Describing action and reaction forces, inertia, acceleration, momentum, and friction in terms of Newton's three laws of motion • Determining the resultant of collinear forces acting on a body • Solving problems for efficiency and mechanical advantage of simple machines	

= Measured by PLAN Science Test
_____ = Content sampled byPLAN Science Test

TABLE 3G

ALABAMA Physical Science Core Content Standards	PLAN Science College Readiness Standards
8. Relate the law of conservation of energy to transformations of potential energy, kinetic energy, and thermal energy. • Identifying the relationship between thermal energy and the temperature of a sample of matter • Describing the flow of thermal energy between two samples of matter • Explaining how thermal energy is transferred by radiation, conduction, and convection • Relating simple formulas to the calculation of potential energy, kinetic energy, and work	
9. Compare methods of energy transfer by mechanical and electromagnetic waves. • Distinguishing between transverse and longitudinal mechanical waves • Relating physical properties of sound and light to wave characteristics	
10. Explain the relationship between electricity and magnetism. • Differentiating between induction and conduction • Identifying mechanical, magnetic, and chemical methods used to create an electrical charge • Describing electrical circuits in terms of Ohm's law	
11. Describe the nuclear composition of unstable isotopes and the resulting changes to their nuclear composition. • Identifying types of nuclear emissions, including alpha particles, beta particles, and gamma radiation • Differentiating between fission and fusion • Identifying uses and possible negative side effects of nuclear technology	
12. Identify metric units for mass, distance, time, temperature, velocity, acceleration, density, force, energy, and power.	

= Measured by PLAN Science Test
_____ = Content sampled byPLAN Science Test

TABLE 3H

ALABAMA Physical Science Core Content Standards	ACT Science College Readiness Standards
1. Recognize periodic trends of elements, including the number of valence electrons, atomic size, and reactivity. • Categorizing elements as metals, nonmetals, metalloids, and noble gases • Differentiating between families and periods • Using atomic number and mass number to identify isotopes	
2. Identify solutions in terms of components, solubility, concentration, and conductivity. • Comparing saturated, unsaturated, and supersaturated solutions • Comparing characteristics of electrolytes and nonelectrolytes • Describing factors that affect solubility and rate of solution, including nature of solute and solvent, temperature, agitation, surface area, and pressure on gases	
3. Contrast the formation of ionic and covalent bonds based on the transfer or sharing of valence electrons. • Demonstrating the formation of positive and negative monatomic ions by using electron dot diagrams	
4. Use nomenclature and chemical formulas to write balanced chemical equations. • Explaining the law of conservation of matter • Identifying chemical reactions as composition, decomposition, single replacement, or double replacement • Defining the role of electrons in chemical reactions	
5. Describe physical and chemical changes in terms of endothermic and exothermic processes.	
6. Identify characteristics of gravitational, electromagnetic, and nuclear forces.	
7. Relate velocity, acceleration, and kinetic energy to mass, distance, force, and time. • Interpreting graphic representations of velocity versus time and distance versus time • Solving problems for velocity, acceleration, force, work, and power • Describing action and reaction forces, inertia, acceleration, momentum, and friction in terms of Newton's three laws of motion • Determining the resultant of collinear forces acting on a body • Solving problems for efficiency and mechanical advantage of simple machines	

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3H

ALABAMA Physical Science Core Content Standards	ACT Science College Readiness Standards
8. Relate the law of conservation of energy to transformations of potential energy, kinetic energy, and thermal energy. • Identifying the relationship between thermal energy and the temperature of a sample of matter • Describing the flow of thermal energy between two samples of matter • Explaining how thermal energy is transferred by radiation, conduction, and convection • Relating simple formulas to the calculation of potential energy, kinetic energy, and work	
9. Compare methods of energy transfer by mechanical and electromagnetic waves. • Distinguishing between transverse and longitudinal mechanical waves • Relating physical properties of sound and light to wave characteristics	
10. Explain the relationship between electricity and magnetism. • Differentiating between induction and conduction • Identifying mechanical, magnetic, and chemical methods used to create an electrical charge • Describing electrical circuits in terms of Ohm's law	
11. Describe the nuclear composition of unstable isotopes and the resulting changes to their nuclear composition. • Identifying types of nuclear emissions, including alpha particles, beta particles, and gamma radiation • Differentiating between fission and fusion • Identifying uses and possible negative side effects of nuclear technology	
12. Identify metric units for mass, distance, time, temperature, velocity, acceleration, density, force, energy, and power.	

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3I

ALABAMA Physical Science Core Content Standards	WorkKeys Locating Information Level Skills
1. Recognize periodic trends of elements, including the number of valence electrons, atomic size, and reactivity. • Categorizing elements as metals, nonmetals, metalloids, and noble gases • Differentiating between families and periods • Using atomic number and mass number to identify isotopes	
2. Identify solutions in terms of components, solubility, concentration, and conductivity. • Comparing saturated, unsaturated, and supersaturated solutions • Comparing characteristics of electrolytes and nonelectrolytes • Describing factors that affect solubility and rate of solution, including nature of solute and solvent, temperature, agitation, surface area, and pressure on gases	
3. Contrast the formation of ionic and covalent bonds based on the transfer or sharing of valence electrons. • Demonstrating the formation of positive and negative monatomic ions by using electron dot diagrams	Compare information and trends from one or more complicated graphics Apply information from one or more complicated graphics to specific situations Fill in one or two pieces of information that are missing from a graphic
4. Use nomenclature and chemical formulas to write balanced chemical equations. • Explaining the law of conservation of matter • Identifying chemical reactions as composition, decomposition, single replacement, or double replacement • Defining the role of electrons in chemical reactions	
5. Describe physical and chemical changes in terms of endothermic and exothermic processes.	
6. Identify characteristics of gravitational, electromagnetic, and nuclear forces.	
7. Relate velocity, acceleration, and kinetic energy to mass, distance, force, and time. • Interpreting graphic representations of velocity versus time and distance versus time • Solving problems for velocity, acceleration, force, work, and power • Describing action and reaction forces, inertia, acceleration, momentum, and friction in terms of Newton's three laws of motion • Determining the resultant of collinear forces acting on a body • Solving problems for efficiency and mechanical advantage of simple machines	Understand how graphics are related to each other Sort through distracting information Draw conclusions based on one complicated graphic or several related graphics Find several pieces of information in one or two graphics

= Measured by WorkKeys Locating Information Test

____ = Context in which Locating Information skills might be measured

TABLE 3I

ALABAMA Physical Science Core Content Standards	WorkKeys Locating Information Level Skills
8. Relate the law of conservation of energy to transformations of potential energy, kinetic energy, and thermal energy. • Identifying the relationship between thermal energy and the temperature of a sample of matter • Describing the flow of thermal energy between two samples of matter • Explaining how thermal energy is transferred by radiation, conduction, and convection • Relating simple formulas to the calculation of potential energy, kinetic energy, and work	
9. Compare methods of energy transfer by mechanical and electromagnetic waves. • Distinguishing between transverse and longitudinal mechanical waves • Relating physical properties of sound and light to wave characteristics	
10. Explain the relationship between electricity and magnetism. • Differentiating between induction and conduction • Identifying mechanical, magnetic, and chemical methods used to create an electrical charge • Describing electrical circuits in terms of Ohm's law	
11. Describe the nuclear composition of unstable isotopes and the resulting changes to their nuclear composition. • Identifying types of nuclear emissions, including alpha particles, beta particles, and gamma radiation • Differentiating between fission and fusion • Identifying uses and possible negative side effects of nuclear technology	
12. Identify metric units for mass, distance, time, temperature, velocity, acceleration, density, force, energy, and power.	

= Measured by WorkKeys Locating Information Test

_____ = Context in which Locating Information skills might be measured

TABLE 3J

ALABAMA Biology Core Content Standards	EXPLORE Science College Readiness Standards
1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. • Describing the steps of the scientific method • Comparing controls, dependent variables, and independent variables • Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware • Using appropriate SI units for measuring length, volume, and mass	**Interpretation of Data:** Understand basic scientific terminology **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment
2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis. • Identifying functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities • Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hypertonic solutions • Explaining how surface area, cell size, temperature, light, and pH affect cellular activities • Applying the concept of fluid pressure to biological systems	
3. Identify reactants and products associated with photosynthesis and cellular respiration and the purposes of these two processes.	
4. Describe similarities and differences of cell organelles, using diagrams and tables. • Identifying scientists who contributed to the cell theory • Distinguishing between prokaryotic and eukaryotic cells • Identifying various technologies used to observe cells	
5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere. • Recognizing that cells differentiate to perform specific functions	
6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells. • Comparing sperm and egg formation in terms of ploidy • Comparing sexual and asexual reproduction	

= Measured by EXPLORE Science Test
____ = Content sampled by EXPLORE Science Test

TABLE 3J

ALABAMA Biology Core Content Standards	EXPLORE Science College Readiness Standards
7. Apply Mendel's law to determine phenotypic and genotypic probabilities of offspring. • Defining important genetic terms, including dihybrid cross, monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele • Interpreting inheritance patterns shown in graphs and charts • Calculating genotypic and phenotypic percentages and ratios using a Punnett square	
8. Identify the structure and function of DNA, RNA, and protein. • Explaining relationships among DNA, genes, and chromosomes • Listing significant contributions of biotechnology to society, including agricultural and medical practices • Relating normal patterns of genetic inheritance to genetic variation • Relating ways chance, mutagens, and genetic engineering increase diversity • Relating genetic disorders and disease to patterns of genetic inheritance	
9. Differentiate between the previous five-kingdom and current six-kingdom classification systems. • Sequencing taxa from most inclusive to least inclusive in the classification of living things • Identifying organisms using a dichotomous key • Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful • Justifying the grouping of viruses in a category separate from living things • Writing scientific names accurately by using binomial nomenclature	
10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants. • Describing the histology of roots, stems, leaves, and flowers • Recognizing chemical and physical adaptations of plants	
11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion.	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3J

ALABAMA Biology Core Content Standards	EXPLORE Science College Readiness Standards
12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation. • Identifying ways in which the theory of evolution explains the nature and diversity of organisms • Describing natural selection, survival of the fittest, geographic isolation, and fossil record	
13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids. • Describing the interdependence of biotic and abiotic factors in an ecosystem • Contrasting autotrophs and heterotrophs • Describing the niche of decomposers • Using the ten percent law to explain the decreasing availability of energy through the trophic levels	
14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen. • Relating natural disasters, climate changes, nonnative species, and human activity to the dynamic equilibrium of ecosystems • Describing the process of ecological succession	
15. Identify biomes based on environmental factors and native organisms.	
16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem. • Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3K

ALABAMA Biology Core Content Standards	PLAN Science College Readiness Standards
1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. • Describing the steps of the scientific method • Comparing controls, dependent variables, and independent variables • Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware • Using appropriate SI units for measuring length, volume, and mass	**Interpretation of Data:** Understand basic scientific terminology **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment
2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis. • Identifying functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities • Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hypertonic solutions • Explaining how surface area, cell size, temperature, light, and pH affect cellular activities • Applying the concept of fluid pressure to biological systems	
3. Identify reactants and products associated with photosynthesis and cellular respiration and the purposes of these two processes.	
4. Describe similarities and differences of cell organelles, using diagrams and tables. • Identifying scientists who contributed to the cell theory • Distinguishing between prokaryotic and eukaryotic cells • Identifying various technologies used to observe cells	
5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere. • Recognizing that cells differentiate to perform specific functions	
6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells. • Comparing sperm and egg formation in terms of ploidy • Comparing sexual and asexual reproduction	

= Measured by PLAN Science Test
____ = Content sampled by PLAN Science Test

TABLE 3K

ALABAMA Biology Core Content Standards	PLAN Science College Readiness Standards
7. Apply Mendel's law to determine phenotypic and genotypic probabilities of offspring. • Defining important genetic terms, including dihybrid cross, monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele • Interpreting inheritance patterns shown in graphs and charts • Calculating genotypic and phenotypic percentages and ratios using a Punnett square	
8. Identify the structure and function of DNA, RNA, and protein. • Explaining relationships among DNA, genes, and chromosomes • Listing significant contributions of biotechnology to society, including agricultural and medical practices • Relating normal patterns of genetic inheritance to genetic variation • Relating ways chance, mutagens, and genetic engineering increase diversity • Relating genetic disorders and disease to patterns of genetic inheritance	
9. Differentiate between the previous five-kingdom and current six-kingdom classification systems. • Sequencing taxa from most inclusive to least inclusive in the classification of living things • Identifying organisms using a dichotomous key • Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful • Justifying the grouping of viruses in a category separate from living things • Writing scientific names accurately by using binomial nomenclature	
10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants. • Describing the histology of roots, stems, leaves, and flowers • Recognizing chemical and physical adaptations of plants	
11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion.	

= Measured by PLAN Science Test
____ = Content sampled by PLAN Science Test

TABLE 3K

ALABAMA Biology Core Content Standards	PLAN Science College Readiness Standards
12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation. • Identifying ways in which the theory of evolution explains the nature and diversity of organisms • Describing natural selection, survival of the fittest, geographic isolation, and fossil record	
13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids. • Describing the interdependence of biotic and abiotic factors in an ecosystem • Contrasting autotrophs and heterotrophs • Describing the niche of decomposers • Using the ten percent law to explain the decreasing availability of energy through the trophic levels	
14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen. • Relating natural disasters, climate changes, nonnative species, and human activity to the dynamic equilibrium of ecosystems • Describing the process of ecological succession	
15. Identify biomes based on environmental factors and native organisms.	
16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem. • Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism	

= Measured by PLAN Science Test
____ = Content sampled by PLAN Science Test

TABLE 3L

ALABAMA Biology Core Content Standards	ACT Science College Readiness Standards
1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. • Describing the steps of the scientific method • Comparing controls, dependent variables, and independent variables • Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware • Using appropriate SI units for measuring length, volume, and mass	**Interpretation of Data:** Understand basic scientific terminology **Scientific Investigation:** Understand the methods and tools used in a simple experiment Understand a simple experimental design Identify a control in an experiment
2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis. • Identifying functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities • Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hypertonic solutions • Explaining how surface area, cell size, temperature, light, and pH affect cellular activities • Applying the concept of fluid pressure to biological systems	
3. Identify reactants and products associated with photosynthesis and cellular respiration and the purposes of these two processes.	
4. Describe similarities and differences of cell organelles, using diagrams and tables. • Identifying scientists who contributed to the cell theory • Distinguishing between prokaryotic and eukaryotic cells • Identifying various technologies used to observe cells	
5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere. • Recognizing that cells differentiate to perform specific functions	
6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells. • Comparing sperm and egg formation in terms of ploidy • Comparing sexual and asexual reproduction	

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3L

ALABAMA Biology Core Content Standards	ACT Science College Readiness Standards
7. Apply Mendel's law to determine phenotypic and genotypic probabilities of offspring. • Defining important genetic terms, including dihybrid cross, monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele • Interpreting inheritance patterns shown in graphs and charts • Calculating genotypic and phenotypic percentages and ratios using a Punnett square	
8. Identify the structure and function of DNA, RNA, and protein. • Explaining relationships among DNA, genes, and chromosomes • Listing significant contributions of biotechnology to society, including agricultural and medical practices • Relating normal patterns of genetic inheritance to genetic variation • Relating ways chance, mutagens, and genetic engineering increase diversity • Relating genetic disorders and disease to patterns of genetic inheritance	
9. Differentiate between the previous five-kingdom and current six-kingdom classification systems. • Sequencing taxa from most inclusive to least inclusive in the classification of living things • Identifying organisms using a dichotomous key • Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful • Justifying the grouping of viruses in a category separate from living things • Writing scientific names accurately by using binomial nomenclature	
10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants. • Describing the histology of roots, stems, leaves, and flowers • Recognizing chemical and physical adaptations of plants	
11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion.	

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3L

ALABAMA Biology Core Content Standards	ACT Science College Readiness Standards
12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation. • Identifying ways in which the theory of evolution explains the nature and diversity of organisms • Describing natural selection, survival of the fittest, geographic isolation, and fossil record	
13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids. • Describing the interdependence of biotic and abiotic factors in an ecosystem • Contrasting autotrophs and heterotrophs • Describing the niche of decomposers • Using the ten percent law to explain the decreasing availability of energy through the trophic levels	
14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen. • Relating natural disasters, climate changes, nonnative species, and human activity to the dynamic equilibrium of ecosystems • Describing the process of ecological succession	
15. Identify biomes based on environmental factors and native organisms.	
16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem. • Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism	

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3M

ALABAMA Biology Core Content Standards	WorkKeys Locating Information Level Skills
1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. • Describing the steps of the scientific method • Comparing controls, dependent variables, and independent variables • Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware • Using appropriate SI units for measuring length, volume, and mass	
2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis. • Identifying functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities • Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hypertonic solutions • Explaining how surface area, cell size, temperature, light, and pH affect cellular activities • Applying the concept of fluid pressure to biological systems	
3. Identify reactants and products associated with photosynthesis and cellular respiration and the purposes of these two processes.	
4. Describe similarities and differences of cell organelles, using diagrams and tables. • Identifying scientists who contributed to the cell theory • Distinguishing between prokaryotic and eukaryotic cells • Identifying various technologies used to observe cells	Compare information and trends shown in one or two straightforward graphics Find several pieces of information in one or two graphics
5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere. • Recognizing that cells differentiate to perform specific functions	
6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells. • Comparing sperm and egg formation in terms of ploidy • Comparing sexual and asexual reproduction	

= Measured by WorkKeys Locating Information Test

____ = Context in which Locating Information skills might be measured

TABLE 3M

ALABAMA Biology Core Content Standards	WorkKeys Locating Information Level Skills
7. Apply Mendel's law to determine phenotypic and genotypic probabilities of offspring. • Defining important genetic terms, including dihybrid cross, monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele • Interpreting inheritance patterns shown in graphs and charts • Calculating genotypic and phenotypic percentages and ratios using a Punnett square	Apply information from one or more complicated graphics to specific situations Draw conclusions based on one complicated graphic or several related graphics Fill in one or two pieces of information that are missing from a graphic
8. Identify the structure and function of DNA, RNA, and protein. • Explaining relationships among DNA, genes, and chromosomes • Listing significant contributions of biotechnology to society, including agricultural and medical practices • Relating normal patterns of genetic inheritance to genetic variation • Relating ways chance, mutagens, and genetic engineering increase diversity • Relating genetic disorders and disease to patterns of genetic inheritance	
9. Differentiate between the previous five-kingdom and current six-kingdom classification systems. • Sequencing taxa from most inclusive to least inclusive in the classification of living things • Identifying organisms using a dichotomous key • Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful • Justifying the grouping of viruses in a category separate from living things • Writing scientific names accurately by using binomial nomenclature	Compare information and trends shown in one or two straightforward graphics Fill in one or two pieces of information that are missing from a graphic Draw conclusions based on one complicated graphic or several related graphics
10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants. • Describing the histology of roots, stems, leaves, and flowers • Recognizing chemical and physical adaptations of plants	
11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion.	

= Measured by WorkKeys Locating Information Test

____ = Context in which Locating Information skills might be measured

TABLE 3M

ALABAMA Biology Core Content Standards	WorkKeys Locating Information Level Skills
12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation. • Identifying ways in which the theory of evolution explains the nature and diversity of organisms • Describing natural selection, survival of the fittest, geographic isolation, and fossil record	
13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids. • Describing the interdependence of biotic and abiotic factors in an ecosystem • Contrasting autotrophs and heterotrophs • Describing the niche of decomposers • Using the ten percent law to explain the decreasing availability of energy through the trophic levels	
14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen. • Relating natural disasters, climate changes, nonnative species, and human activity to the dynamic equilibrium of ecosystems • Describing the process of ecological succession	
15. Identify biomes based on environmental factors and native organisms.	
16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem. • Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism	

= Measured by WorkKeys Locating Information Test

_____ = Context in which Locating Information skills might be measured

TABLE 3N

ALABAMA Chemistry Core Content Standards	EXPLORE Science College Readiness Standards
1. Differentiate among pure substances, mixtures, elements, and compounds. • Distinguishing between intensive and extensive properties of matter • Contrasting properties of metals, nonmetals, and metalloids • Distinguishing between homogeneous and heterogeneous forms of matter	
2. Describe the structure of carbon chains, branched chains, and rings.	
3. Use the periodic table to identify periodic trends, including atomic radii, ionization energy, electronegativity, and energy levels. • Utilizing electron configurations, Lewis dot structures, and orbital notations to write chemical formulas • Calculating the number of protons, neutrons, and electrons in an isotope • Utilizing benchmark discoveries to describe the historical development of atomic structure, including photoelectric effect, absorption, and emission spectra of elements	
4. Describe solubility in terms of energy changes associated with the solution process. • Using solubility curves to interpret saturation levels • Explaining the conductivity of electrolytic solutions • Describing acids and bases in terms of strength, concentration, pH, and neutralization reactions • Describing factors that affect the rate of solution • Solving problems involving molarity, including solution preparation and dilution	
5. Use the kinetic theory to explain states of matter, phase changes, solubility, and chemical reactions.	
6. Solve stoichiometric problems involving relationships among the number of particles, moles, and masses of reactants and products in a chemical reaction. • Predicting ionic and covalent bond types and products given known reactants • Assigning oxidation numbers for individual atoms of monatomic and polyatomic ions • Identifying the nomenclature of ionic compounds, binary compounds, and acids • Classifying chemical reactions as composition, decomposition, single replacement, or double replacement • Determining the empirical or molecular formula for a compound using percent composition data	
7. Explain the behavior of ideal gases in terms of pressure, volume, temperature, and number of particles using Charles's law, Boyle's law, Gay-Lussac's law, the combined gas law, and the ideal gas law.	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3N

ALABAMA Chemistry Core Content Standards	EXPLORE Science College Readiness Standards
8. Distinguish among endothermic and exothermic physical and chemical changes. • Calculating temperature change by using specific heat • Using Le Châtelier's principle to explain changes in physical and chemical equilibrium	
9. Distinguish between chemical and nuclear reactions. • Identifying atomic and subatomic particles, including mesons, quarks, tachyons, and baryons • Calculating the half-life of selective radioactive isotopes • Identifying types of radiation and their properties • Contrasting fission and fusion • Describing carbon-14 decay as a dating method	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3O

ALABAMA Chemistry Core Content Standards	PLAN Science College Readiness Standards
1. Differentiate among pure substances, mixtures, elements, and compounds. • Distinguishing between intensive and extensive properties of matter • Contrasting properties of metals, nonmetals, and metalloids • Distinguishing between homogeneous and heterogeneous forms of matter	
2. Describe the structure of carbon chains, branched chains, and rings.	
3. Use the periodic table to identify periodic trends, including atomic radii, ionization energy, electronegativity, and energy levels. • Utilizing electron configurations, Lewis dot structures, and orbital notations to write chemical formulas • Calculating the number of protons, neutrons, and electrons in an isotope • Utilizing benchmark discoveries to describe the historical development of atomic structure, including photoelectric effect, absorption, and emission spectra of elements	
4. Describe solubility in terms of energy changes associated with the solution process. • Using solubility curves to interpret saturation levels • Explaining the conductivity of electrolytic solutions • Describing acids and bases in terms of strength, concentration, pH, and neutralization reactions • Describing factors that affect the rate of solution • Solving problems involving molarity, including solution preparation and dilution	
5. Use the kinetic theory to explain states of matter, phase changes, solubility, and chemical reactions.	
6. Solve stoichiometric problems involving relationships among the number of particles, moles, and masses of reactants and products in a chemical reaction. • Predicting ionic and covalent bond types and products given known reactants • Assigning oxidation numbers for individual atoms of monatomic and polyatomic ions • Identifying the nomenclature of ionic compounds, binary compounds, and acids • Classifying chemical reactions as composition, decomposition, single replacement, or double replacement • Determining the empirical or molecular formula for a compound using percent composition data	
7. Explain the behavior of ideal gases in terms of pressure, volume, temperature, and number of particles using Charles's law, Boyle's law, Gay-Lussac's law, the combined gas law, and the ideal gas law.	

= Measured by PLAN Science Test
____ = Content sampled by PLAN Science Test

TABLE 3O

ALABAMA Chemistry Core Content Standards	PLAN Science College Readiness Standards
8. Distinguish among endothermic and exothermic physical and chemical changes. • Calculating temperature change by using specific heat • Using Le Châtelier's principle to explain changes in physical and chemical equilibrium	
9. Distinguish between chemical and nuclear reactions. • Identifying atomic and subatomic particles, including mesons, quarks, tachyons, and baryons • Calculating the half-life of selective radioactive isotopes • Identifying types of radiation and their properties • Contrasting fission and fusion • Describing carbon-14 decay as a dating method	

= Measured by PLAN Science Test
_____ = Content sampled by PLAN Science Test

TABLE 3P

ALABAMA Chemistry Core Content Standards	ACT Science College Readiness Standards
1. Differentiate among pure substances, mixtures, elements, and compounds. • Distinguishing between intensive and extensive properties of matter • Contrasting properties of metals, nonmetals, and metalloids • Distinguishing between homogeneous and heterogeneous forms of matter	
2. Describe the structure of carbon chains, branched chains, and rings.	
3. Use the periodic table to identify periodic trends, including atomic radii, ionization energy, electronegativity, and energy levels. • Utilizing electron configurations, Lewis dot structures, and orbital notations to write chemical formulas • Calculating the number of protons, neutrons, and electrons in an isotope • Utilizing benchmark discoveries to describe the historical development of atomic structure, including photoelectric effect, absorption, and emission spectra of elements	
4. Describe solubility in terms of energy changes associated with the solution process. • Using solubility curves to interpret saturation levels • Explaining the conductivity of electrolytic solutions • Describing acids and bases in terms of strength, concentration, pH, and neutralization reactions • Describing factors that affect the rate of solution • Solving problems involving molarity, including solution preparation and dilution	
5. Use the kinetic theory to explain states of matter, phase changes, solubility, and chemical reactions.	
6. Solve stoichiometric problems involving relationships among the number of particles, moles, and masses of reactants and products in a chemical reaction. • Predicting ionic and covalent bond types and products given known reactants • Assigning oxidation numbers for individual atoms of monatomic and polyatomic ions • Identifying the nomenclature of ionic compounds, binary compounds, and acids • Classifying chemical reactions as composition, decomposition, single replacement, or double replacement • Determining the empirical or molecular formula for a compound using percent composition data	
7. Explain the behavior of ideal gases in terms of pressure, volume, temperature, and number of particles using Charles's law, Boyle's law, Gay-Lussac's law, the combined gas law, and the ideal gas law.	

= Measured by ACT Science Test
_____ = Content sampled by ACT Science Test

TABLE 3P

ALABAMA Chemistry Core Content Standards	ACT Science College Readiness Standards
8. Distinguish among endothermic and exothermic physical and chemical changes. • Calculating temperature change by using specific heat • Using Le Châtelier's principle to explain changes in physical and chemical equilibrium	
9. Distinguish between chemical and nuclear reactions. • Identifying atomic and subatomic particles, including mesons, quarks, tachyons, and baryons • Calculating the half-life of selective radioactive isotopes • Identifying types of radiation and their properties • Contrasting fission and fusion • Describing carbon-14 decay as a dating method	

= Measured by ACT Science Test
_____ = Content sampled by ACT Science Test

TABLE 3Q

ALABAMA Chemistry Core Content Standards	WorkKeys Locating Information Level Skills
1. Differentiate among pure substances, mixtures, elements, and compounds. • Distinguishing between intensive and extensive properties of matter • Contrasting properties of metals, nonmetals, and metalloids • Distinguishing between homogeneous and heterogeneous forms of matter	
2. Describe the structure of carbon chains, branched chains, and rings.	
3. Use the periodic table to identify periodic trends, including atomic radii, ionization energy, electronegativity, and energy levels. • Utilizing electron configurations, Lewis dot structures, and orbital notations to write chemical formulas • Calculating the number of protons, neutrons, and electrons in an isotope • Utilizing benchmark discoveries to describe the historical development of atomic structure, including photoelectric effect, absorption, and emission spectra of elements	Identify trends shown in one or two straightforward graphics Apply information from one or more complicated graphics to specific situations Find one or two pieces of information in a graphic Fill in one or two pieces of information that are missing from
4. Describe solubility in terms of energy changes associated with the solution process. • Using solubility curves to interpret saturation levels • Explaining the conductivity of electrolytic solutions • Describing acids and bases in terms of strength, concentration, pH, and neutralization reactions • Describing factors that affect the rate of solution • Solving problems involving molarity, including solution preparation and dilution	Identify trends shown in one or more detailed or complicated graphics Apply information from one or more complicated graphics to specific situations Identify trends shown in one or two straightforward graphics
5. Use the kinetic theory to explain states of matter, phase changes, solubility, and chemical reactions.	
6. Solve stoichiometric problems involving relationships among the number of particles, moles, and masses of reactants and products in a chemical reaction. • Predicting ionic and covalent bond types and products given known reactants • Assigning oxidation numbers for individual atoms of monatomic and polyatomic ions • Identifying the nomenclature of ionic compounds, binary compounds, and acids • Classifying chemical reactions as composition, decomposition, single replacement, or double replacement • Determining the empirical or molecular formula for a compound using percent composition data	
7. Explain the behavior of ideal gases in terms of pressure, volume, temperature, and number of particles using Charles's law, Boyle's law, Gay-Lussac's law, the combined gas law, and the ideal gas law.	

= Measured by WorkKeys Locating Information Test

 _____ = Context in which Locating Information skills might be measured

TABLE 3Q

ALABAMA Chemistry Core Content Standards	WorkKeys Locating Information Level Skills
8. Distinguish among endothermic and exothermic physical and chemical changes. • Calculating temperature change by using specific heat • Using Le Châtelier's principle to explain changes in physical and chemical equilibrium	
9. Distinguish between chemical and nuclear reactions. • Identifying atomic and subatomic particles, including mesons, quarks, tachyons, and baryons • Calculating the half-life of selective radioactive isotopes • Identifying types of radiation and their properties • Contrasting fission and fusion • Describing carbon-14 decay as a dating method	

= Measured by WorkKeys Locating Information Test

_____ = Context in which Locating Information skills might be measured

TABLE 3R

ALABAMA Physics Core Content Standards	EXPLORE Science College Readiness Standards
1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object	
2. Define the law of conservation of momentum. • Calculating the momentum of a single object • Calculating momenta of two objects before and after collision in one-dimensional motion	
3. Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws.	
4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	
5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	
6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media	
7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	
8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law	
9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	

= Measured by EXPLORE Science Test
_____ = Content sampled by EXPLORE Science Test

TABLE 3S

ALABAMA Physics Core Content Standards	PLAN Science College Readiness Standards
1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object	
2. Define the law of conservation of momentum. • Calculating the momentum of a single object • Calculating momenta of two objects before and after collision in one-dimensional motion	
3. Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws.	
4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	
5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	
6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media	
7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	
8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law	
9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	

= Measured by PLAN Science Test
____ = Content sampled by PLAN Science Test

TABLE 3T

ALABAMA Physics Core Content Standards	ACT Science College Readiness Standards
1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object	
2. Define the law of conservation of momentum. • Calculating the momentum of a single object • Calculating momenta of two objects before and after collision in one-dimensional motion	
3. Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws.	
4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	
5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	
6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media	
7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	
8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law	
9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	

= Measured by ACT Science Test
____ = Content sampled by ACT Science Test

TABLE 3U

ALABAMA Physics Core Content Standards	WorkKeys Locating Information Level Skills
1. Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. • Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data • Describing forces that act on an object	Apply information from one or more complicated graphics to specific situations Identify trends shown in one or two straightforward graphics
2. Define the law of conservation of momentum. • Calculating the momentum of a single object • Calculating momenta of two objects before and after collision in one-dimensional motion	
3. Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws.	
4. Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	
5. Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. • Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	
6. Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect. • Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials • Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation • Demonstrating particle and wave duality • Describing the change of wave speed in different media	
7. Describe properties of reflection, refraction, and diffraction. • Demonstrating the path of light through mirrors, lenses, and prisms • Describing the effect of filters and polarization on the transmission of light	
8. Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects. • Determining the force on charged particles using Coulomb's law	
9. Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	

= Measured by WorkKeys Locating Information Test

____ = Context in which Locating Information skills might be measured