



ACT Connections

Tennessee Academic Standards
and ACT Subtests

Content & Assessment Design | February 2016



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Introduction

The department's five-year strategic plan, [Tennessee Succeeds](#), lays out the state's goal to have an average ACT composite score of 21 by 2020. The desire to raise Tennessee's ACT average is rooted in improving postsecondary and career readiness for all Tennessee students. In order to reach that target, preparation begins much earlier than high school—in fact, **all grade levels play an important part in ensuring college readiness.**

This document is a snapshot of the skills students must have in order to reach the goal of 21 on the ACT by 2020. The document also highlights some of the many connections between ACT expectations and Tennessee Academic Standards.

After the general FAQs (pp. 4–7), the majority of this document is organized in the sequence of the ACT subtests.

Notes

- TNReady measures student progress annually while ACT results are a critical benchmark to measure college and career readiness.
- The ACT consists of four multiple-choice subtests: English, mathematics, reading, and science.
- The development of skills necessary to be successful on the ACT extends across grade levels.
- This document is not about “test prep;” it is about the progression of learning across grade levels and the connections between Tennessee expectations for what students should know in each subject each year and ACT expectations for what students should know by the end of high school.
- This document highlights some of the connections between Tennessee's academic standards and the ACT assessment, but it is not an exhaustive document.

Frequently Asked Questions

TNReady & ACT Alignment

1. What is the purpose or goal of the ACT?

The ACT is a nationally recognized benchmark assessment for college and career readiness that provides a snapshot of a student's K-12 academic career. ACT assesses students' cumulative knowledge from grades K-12 while end of year tests, like TNReady, assess content in specific grades and subjects more deeply. By taking the ACT, students gain valuable information on their readiness for postsecondary and the workforce. A student's ACT results can be used for the following:

- Admission to postsecondary education
- Opportunities for scholarships (e.g., HOPE scholarship, ASPIRE award, etc.)
- Placement into college courses
- Prediction of postsecondary success

2. What is the purpose or goal of TNReady?

TNReady will assess and provide information on a student's mastery of the Tennessee academic standards in English language arts and mathematics at each grade level. Because TNReady is specific to a grade and subject, the test will deeply assess a student's content knowledge in each subject. This assessment is designed to provide educators, parents, and students with a clear picture of our students' progress toward college and career readiness by measuring students' understanding of problem-solving abilities, not just basic memorization skills.

3. Why does improving ACT scores matter?

The department's five-year strategic plan, [Tennessee Succeeds](#), lays out the state's goal to have an average ACT composite score of 21 by 2020. The desire to raise Tennessee's ACT average is rooted in improving postsecondary and career readiness for *all* Tennessee students. This goal reflects the reality that Tennessee students will enter a workforce that requires some type of postsecondary training. With a score of 21, students are predicted to be more successful in both college and career. Allowing our students an opportunity to take the ACT within the school day removes a college entrance barrier for many of our students.

4. How are the ACT and TNReady designed differently?

TNReady is comprised of math and English language arts tests. These tests are taken in two parts on separate days throughout the course. Questions are designed in multiple formats (i.e., technology-enhanced items, multiple-select items, writing, and evidence-enhanced selected-response items), allowing students to demonstrate their depth of knowledge and conceptual understanding of grade-level or course-level concepts.

The ACT is a *survey assessment* that consists of four, multiple-choice tests. The four, multiple-choice tests include English, reading, mathematics and science reasoning. The ACT provides a culminating view of a student's entire academic career and predicts college readiness.

The table on the next page provides a side-by-side comparison for each subject areas.

Subject	ACT	TNReady
Math	<p>ACT measures how quickly and accurately a student can recall a wide variety of surface-level math skills that have been taught over a student's entire academic career. Questions are multiple choice and designed to assess specific mathematical skills. This is a 60-question, 60-minute test designed to assess math skills students have typically acquired in courses taken up to the beginning of grade 12. In Tennessee, a few standards from the fourth-grade math courses are on the ACT. Students may use a calculator on the entire math portion of the ACT.</p>	<p>TNReady is designed to measure how deeply students have mastered the math content taught in a single academic school year. It is a measure of mastery of a small portion of the math continuum a student needs during his/her scholastic career. Questions are designed in multiple formats to allow demonstration of conceptual understanding and to provide an opportunity for students to show their deep understanding of grade-level mathematical concepts. There are <i>calculator-permitted</i> sections and <i>calculator-prohibited</i> sections on TNReady.</p>
English	<p>For the English section, students have 45 minutes to answer 75 questions, including usage/mechanics (punctuation, grammar and usage, sentence structure) and rhetorical skills (strategy, organization, and style).</p>	<p>Part I is a writing subtest. Part II includes not only traditional multiple-choice questions, but also technology-enhanced items, multiple-select items, and evidence-based selected-response items, allowing for great depth of thought. On TNReady, students have 75 minutes to read several complex passages and answer 45-55 operational items.</p>
Reading	<p>For the reading section, students have 35 minutes to read four complex passages and answer 40 questions. The reading test is made up of four sections, each containing one long or two shorter prose passages that are representative of the level and kinds of text commonly encountered in first-year college curricula. Passages are on topics in social studies, natural sciences, literary narrative (including prose fiction), and the humanities (fine arts, philosophy).</p>	

Subject	ACT	TNReady
Science	The science subtest of the ACT does not assess specific understanding or comprehension of scientific topics (i.e., biology, chemistry, physics). Instead, the ACT aims to measure a student’s ability to solve problems and interpret information under strict time constraints as a proxy for scientific reasoning. The test presents several sets of scientific information, each followed by a number of multiple-choice test questions, including data representation, research summaries, and conflicting viewpoints. This subtest has 40 questions in 35 minutes.	Students take a timed, multiple-choice, paper assessment that measures grade- and course-specific Tennessee academic standards in science.

5. How are the ACT and TNReady aligned?

Each test assesses a unique set of standards. While these standards overlap in places, the ACT assesses skills and knowledge from a student’s full educational career while TNReady assesses a singular grade or course in math and English language arts.

6. Are the state standards aligned to ACT expectations?

Tennessee’s academic standards are aligned to the ACT, ensuring that students who show strong growth and achievement on TNReady will also be well prepared to meet the college- and career-readiness benchmarks on the ACT.

Math:

Mastery of the Tennessee academic standards in math prepares a student to be successful on the ACT assessment. Of the approximate 180 ACT math standards, all are addressed in Tennessee’s K-12 mathematics standards. The expectation for the ACT math assessment is that students should be able to quickly answer a wide variety of surface-level math questions very accurately. By stressing conceptual understanding at all levels, the Tennessee math standards prepare students to not only master this wide array of math, but also the standards are designed so that students must retain knowledge year to year.

English language arts:

The skills of the ACT English and reading extend across grade levels; however, the biggest differentiator of success is the ability to read complex text proficiently. The Tennessee academic standards call for students to have regular practice with complex text. Three of the four passages students read on the ACT reading subtest are nonfiction/informational text. This does not mean that 75 percent of teachers’ instructional time is spent on nonfiction/informational text. It *does* mean that students should read a range of nonfiction/informational text from the natural sciences, social sciences, and humanities throughout the school year.

7. Can we use TNReady to compute ACT score projections?

Currently, our TVAAS system uses a student's historical TCAP performance to project his or her ACT composite scale score. These projections are used in calculating a growth score for ACT performance at the school level. Similarly, the TVAAS model will incorporate student performance on TNReady to calculate ACT projections and ACT growth scores.

In 2015-16, we will have students completing TNReady, as well as EXPLORE, PLAN, and ACT. We will use student ACT/EXPLORE/PLAN scores to complete a study to determine how TNReady performance relates to the probability of reaching the ACT benchmark score in grades 8,10, and 11.

8. Why do we need both the ACT and TNReady?

TNReady assesses a student's deep understanding of Tennessee academic standards, whereas the ACT holistically measures a student's college and career readiness based on a host of interrelated and/or comprehensive standards. Because of this, TNReady is necessary to measure mastery of more specific skills related to a specific grade level and subject as a means to measure progress, guide instruction, provide information for course/grade placement, and provide appropriate remediation/enrichment opportunities for students.

9. How should I be preparing my students for both the ACT and TNReady in the limited time I have?

While the types of questions on the ACT differ from the types of questions on TNReady, the content is very similar. Teachers can prepare students for both TNReady and the ACT by implementing high-quality instruction every day. Strong, student-centered instruction that is aligned to the Tennessee academic standards is strong preparation for both TNReady and the ACT. While students will benefit from regular practice and familiarity with the format of the ACT exam, the skills that they need to do well (strong reading fluency, comprehension, and stamina; strong critical thinking and analytical skills in math, including algebra and geometry) are encompassed in both assessments. Though the content is not fundamentally different, the tests are structured differently; TNReady tests depth, the ACT tests breadth.

English and math ACT questions are based on skills and standards taught from elementary school through high school. This means that students who have a strong foundation in math and reading and who consistently perform well on TNReady will use the same skills to perform well on the ACT. Additionally, all academic areas have a crucial part to play in preparing students for ACT success. Science and social studies teachers at all grade levels should be preparing students to read text in their content areas.

Math and English language arts teachers at all levels should be aware of ACT benchmarks that are addressed within their grade level, some as early as the third grade. The key to preparing students for both assessments is an initial understanding of the differences in both format and purpose of these two exams and strategically integrating the differences, while teaching the Tennessee academic standards.

ACT English Subtest

Connections with Tennessee Academic Standards

Frequently Asked Questions

1. What determines student success on the ACT English test?

The skills of the ACT extend across grade levels; **however, the biggest differentiator of success is the ability to read complex text proficiently.** Therefore, when we say students will attain a score of 21 or higher, we are really saying that we are committing to presenting students appropriately-complex informational and literary texts at each grade level. The work that happens in early grades impacts the work in upper grades.

2. Did you know that the ACT has separate sections for English and Reading?

The ACT assesses English and reading separately. While the reading portion of the ACT blends text from four major subjects, the English section also consists of five essays or passages, each of which is accompanied by a sequence of multiple choice questions. Spelling, vocabulary, and rote recall rules of grammar are not tested.

3. Did you know the ACT English test covers two major topics and six separate skills?

The English test is a 45-minute test with 75 questions that cover *Usage/Mechanics* (i.e., punctuation, grammar and usage, and sentence structure) and *Rhetorical Skills* (i.e., strategy, organization, and style).

4. Is it too early to begin preparing kids for the ACT English test in elementary school?

Early grades are incredibly important to a student’s academic journey. In the early grades, students practice stamina, persistence, fortitude—all key qualities for success on the ACT and beyond. Students learn how language works and begin building critical thinking skills. This document is not about “test prep;” it is about building upon a foundation to achieve success by grades 11–12.

Please note: This document is intended to highlight connections between Tennessee’s Academic Standards and the ACT English test, but it is not an exhaustive document that details every connection.

Grades 3–5, English

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 3–5?
<p>Punctuation</p> <p>Questions in this category test students' knowledge of the conventions of internal and end-of-sentence punctuation, with emphasis on the relationship of punctuation to meaning (e.g., avoiding ambiguity, indicating appositives)</p>	<ul style="list-style-type: none"> • Determine the need for punctuation or conjunctions to join simple clauses. • Determine the need for punctuation or conjunctions to correct awkward-sounding fragments and fused sentences as well as obviously faulty subordination and coordination of clauses. • Form the past tense and past participle of irregular but commonly used verbs. • Determine whether an adjective form or an adverb form is called for in a given situation. • Ensure straightforward subject-verb agreement. • Ensure straightforward pronoun-antecedent agreement. • Use the appropriate word in frequently confused pairs (e.g., <i>there</i> and <i>their</i>, <i>past</i> and <i>passed</i>, <i>led</i> and <i>lead</i>). • Delete commas that create basic sense problems (e.g., between verb and direct object). 	<p>L.3.1f Ensure subject-verb agreement and pronoun-antecedent agreement.</p> <p>L.3.1e Form and use the simple (i.e., <i>I walked</i>; <i>I walk</i>; <i>I will walk</i>) verb tenses.</p> <p>L.3.1g Form and use comparative and superlative adjectives and adverbs, and choose between them depending on what is being modified.</p> <p>L.4.1g Correctly use frequently confused words (e.g., <i>to</i>, <i>too</i>; <i>there</i>, <i>their</i>).</p> <p>L.4.1f Produce correct sentences, recognizing and correcting inappropriate fragments and run-ons.</p>	<ul style="list-style-type: none"> • When reading, highlight the author's correct use of agreement, verb tense, adverbs and adjectives. • When writing, focus on revising for consistent verb tense in writers' workshop. • Rewrite a short piece in different tenses—for example, rewrite a piece in present tense in past or future tense and discuss the difference in the message. • Play grammar games that practice homonyms. • Focus student feedback on agreement errors at points in the year. • During an editing workshop, have students look for errors in agreement, verb tense, run-ons or fragments.
<p>Grammar and Usage</p> <p>Questions in this category test students' understanding of agreement between subject and verb, between pronoun and antecedent, and between modifiers and the word modified; verb formation; pronoun case; formation of comparative and superlative adjectives and adverbs; and idiomatic usage.</p>			
<p>Sentence Structure</p> <p>Questions in this category test students' understanding of relationships between and among clauses, placement of modifiers, and shifts in construction.</p>			

Grades 3–5, English (continued)

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 3–5?
<p>Strategy Questions in this category test how well students develop a given topic by choosing expressions appropriate to an essay’s audience and purpose; judging the effect of adding, revising, or deleting supporting material; and judging the relevance of statements in context.</p>	<ul style="list-style-type: none"> • Delete material because it is obviously irrelevant in terms of the topic of the essay. • Determine whether a simple essay has met a straightforward goal. • Use a word, phrase, or sentence to accomplish a straightforward purpose (e.g., conveying a feeling or attitude). • Determine relevance of material in terms of the focus of the paragraph. • Determine the need for transition words or phrases to establish time relationships in simple narrative essays (e.g., <i>then, this time</i>). 	<p>L.3.3a Choose words and phrases for effect. L.4.3a Choose words and phrases to convey ideas precisely. L.4.3b Choose punctuation for effect. L.5.3a Expand, combine and reduce sentences for meaning, reader/listener interest, and style. W.3-5.5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising and editing.</p>	<ul style="list-style-type: none"> • Take a master essay or paragraph and cut it into paragraphs or sentences. Have students work in teams to organize the essay or paragraph logically. • Give students a paragraph with one sentence omitted. Provide the omitted sentence separately. Have students work in pairs to determine where to best place the omitted sentence.
<p>Organization Questions in this category test how well students organize ideas and choose effective opening, transitional, and closing sentences.</p>	<ul style="list-style-type: none"> • Determine the most logical place for a sentence in a paragraph. • Determine the need for transition words or phrases to establish straightforward logical relationships (e.g., <i>first, afterward, in response</i>). 		<ul style="list-style-type: none"> • Discuss how the tone of a sentence changes when end punctuation changes.
<p>Style Questions in this category test how well students chose precise and appropriate words and images, maintain the level of style and tone in an essay, manage sentence elements for rhetorical effectiveness, and avoid ambiguous pronouns references, wordiness, and redundancy.</p>	<ul style="list-style-type: none"> • Determine the most logical place for a sentence in a straightforward essay. • Rearrange the sentences in a straightforward paragraph for the sake of logic. • Revise vague, clumsy and confusing writing that creates obvious logic problems. 		<ul style="list-style-type: none"> • Practice revision techniques like sentence expanding, depth charging, or <i>explode a moment</i>. • When students are planning to write, teach them to think very early on about purpose and audience.

Grades 6–8, English

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 6–8?
<p>Punctuation</p> <p>Questions in this category test students' knowledge of the conventions of internal and end-of-sentence punctuation, with emphasis on the relationship of punctuation to meaning (e.g., avoiding ambiguity, indicating appositives).</p>	<ul style="list-style-type: none"> • Determine the need for punctuation or conjunctions to join simple clauses. • Recognize and correct inappropriate shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences. • Determine the need for punctuation or conjunctions to correct awkward-sounding fragments and fused sentences as well as obviously faulty subordination and coordination of clauses. 	<p>L.3.1f ensure subject-verb agreement and pronoun-antecedent agreement.*</p> <p>L.4.1g correctly use frequently confused words (e.g., to, too; there, their).*</p> <p>L.4.1f Produce correct sentences, recognizing and correcting inappropriate fragments and run-ons.*</p> <p>L.6.2a Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.*</p> <p>L.7.1a Explain the function of phrases and clauses in general and their function in specific sentences.</p> <p>L.7.1b Choose among simple, compound, complex and compound-complex sentences to signal differing relationships between ideas.</p> <p>L.7.1c Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.</p> <p>L.8.1b Form and use verbs in the active and passive voice.</p> <p>L.8.1c Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.</p> <p>L.8.1d Recognize and correct inappropriate shifts in verb voice and mood.</p>	<ul style="list-style-type: none"> • When reading, discuss the author's correct use of agreement, verb tense, adverbs and adjectives. • When writing, focus on revising for consistent verb tense in writers' workshop. • Rewrite a short piece in different tenses—for example, rewrite a piece in present tense in past or future tense and discuss the difference in the message. • Focus student feedback on agreement errors at points in the year. • During an editing workshop, have students look for errors in agreement, verb tense, run-ons or fragments. • Read pieces with inappropriate shifts in verbs and discuss the impact on the reader. Revise back to appropriate verb tense.
<p>Grammar and Usage</p> <p>Questions in this category test students' understanding of agreement between subject and verb, between pronoun and antecedent, and between modifiers and the word modified; verb formation; pronoun case; formation of comparative and superlative adjectives and adverbs; and idiomatic usage.</p>	<ul style="list-style-type: none"> • Recognize and correct inappropriate shifts in verb tense and voice when the meaning of the entire sentence must be considered. • Recognize and correct marked disturbances in sentence structure (e.g., faulty placement of adjectives, participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers, lack of parallelism with a simple series of verbs). • Form the past tense and past participle of irregular but commonly used verbs. • Determine whether an adjective or an adverb form is called for in a given situation. 	<p>L.7.1b Choose among simple, compound, complex and compound-complex sentences to signal differing relationships between ideas.</p> <p>L.7.1c Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.</p> <p>L.8.1b Form and use verbs in the active and passive voice.</p> <p>L.8.1c Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.</p> <p>L.8.1d Recognize and correct inappropriate shifts in verb voice and mood.</p>	
<p>Sentence Structure</p> <p>Questions in this category test students' understanding of relationships between and among clauses, placement of modifiers, and shifts in construction.</p>	<ul style="list-style-type: none"> • Ensure straightforward subject-verb agreement. • Ensure straightforward pronoun-antecedent agreement. • Use the appropriate word in frequently confused pairs (e.g., <i>there</i> and <i>their</i>, <i>past</i> and <i>passed</i>, <i>led</i> and <i>lead</i>). • Delete commas that create basic sense problems (e.g., between verb and direct object). • Use commas to set off simple parenthetical element. 		

Skills marked with an asterisk () are particularly likely to require continued attention in the higher grades as they are applied to increasingly sophisticated and complex writing and speaking. These skills, while introduced in earlier grades, should continue to be taught and practiced.

Grades 6–8, English (continued)

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 6–8?			
<p>Strategy Questions in this category test how well students develop a given topic by choosing expressions appropriate to an essay’s audience and purpose; judging the effect of adding, revising, or deleting supporting material; and judging the relevance of statements in context.</p>	<ul style="list-style-type: none"> • Delete material because it is obviously irrelevant in terms of the topic of the essay. • Determine whether a simple essay has met a straightforward goal. • Use a word, phrase, or sentence to accomplish a straightforward purpose (e.g., conveying a feeling or attitude). • Determine relevance of material in terms of the focus of the paragraph. • Determine the need for transition words or phrases to establish time relationships in simple narrative essays (e.g., <i>then, this time</i>). • Determine the most logical place for a sentence in a paragraph. • Determine the need for transition words or phrases to establish straightforward logical relationships (e.g., <i>first, afterward, in response</i>). • Determine the most logical place for a sentence in a straightforward essay. • Rearrange the sentences in a straightforward paragraph for the sake of logic. • Revise vague, clumsy and confusing writing that creates obvious logic problems. 	<p>L.3.3a Choose words and phrases for effect.*</p> <p>L.4.3a Choose words and phrases to convey ideas precisely.*</p> <p>L.4.3b Choose punctuation for effect.*</p> <p>L.5.3a Expand, combine and reduce sentences for meaning, reader/listener interest, and style.</p> <p>L.6.3a Vary sentence patterns for meaning, reader/listener interest, and style.*</p> <p>L.6.3b Maintain consistency in style and tone.*</p> <p>L.7.3a Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.*</p> <p>L.8.3a Use verbs in the active and passive mood and in the conditional and subjunctive mood to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact).</p> <p>W.3-5.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising and editing.</p>	<ul style="list-style-type: none"> • Take a master essay or paragraph and cut it into paragraphs or sentences. Have students work in teams to organize the essay or paragraph logically. • Give students a paragraph with one sentence omitted. Provide the omitted sentence separately. Have students work in pairs to determine where to best place the omitted sentence. • Discuss how the tone of a sentence changes when end punctuation changes. • Practice revision techniques like sentence expanding, depth charging, or <i>explode a moment</i>. • When students are planning to write, teach them to think very early on about purpose and audience. • Have students discuss the author’s purpose and audience when reading text. • Have students identify their own audience and purpose when reading, and write with a tone that fits the audience and purpose. 			
<p>Organization Questions in this category test how well students organize ideas and choose effective opening, transitional, and closing sentences.</p>						
<p>Style Questions in this category test how well students chose precise and appropriate words and images, maintain the level of style and tone in an essay, manage sentence elements for rhetorical effectiveness, and avoid ambiguous pronouns references, wordiness, and redundancy.</p>						

Skills marked with an asterisk () are particularly likely to require continued attention in the higher grades as they are applied to increasingly sophisticated and complex writing and speaking. These skills, while introduced in earlier grades, should continue to be taught and practiced.

Grades 9–12, English

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 9–12?
<p>Punctuation Questions in this category test students' knowledge of the conventions of internal and end-of-sentence punctuation, with emphasis on the relationship of punctuation to meaning (e.g., avoiding ambiguity, indicating appositives).</p>	<ul style="list-style-type: none"> Determine the need for punctuation or conjunctions to join simple clauses. Recognize and correct inappropriate shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences. Determine the need for punctuation or conjunctions to correct awkward-sounding fragments and fused sentences as well as obviously faulty subordination and coordination of clauses. 	<p>L.3.1f ensure subject-verb agreement and pronoun-antecedent agreement.* L.4.1g correctly use frequently confused words (e.g., to, too; there, their).* L.4.1f Produce correct sentences, recognizing and correcting inappropriate fragments and run-ons.* L.6.2a Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.* L.7.1a Explain the function of phrases and clauses in general and their function in specific sentences. L.7.1b Choose among simple, compound, complex and compound-complex sentences to signal differing relationships between ideas. L.7.1c Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers. L.8.1b Form and use verbs in the active and passive voice. L.8.1c Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood. L.8.1d Recognize and correct inappropriate shifts in verb voice and mood. L.9-10.1a Use parallel structure.* L.9-10.1b Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations.</p>	<ul style="list-style-type: none"> When reading, discuss the author's correct use of agreement, verb tense, adverbs and adjectives. When writing, focus on revising for consistent verb tense in writers' workshop. Rewrite a short piece in different tenses—for example, rewrite a piece in present tense in past or future tense and discuss the difference in the message. Focus student feedback on editing subject/verb or pronoun/antecedent agreement errors. During an editing workshop, have students look for errors in agreement, verb tense, run-ons or fragments in each other's writing. Read pieces with inappropriate shifts in verbs and discuss the impact on the reader. Revise back to appropriate verb tense.
<p>Grammar and Usage Questions in this category test students' understanding of agreement between subject and verb, between pronoun and antecedent, and between modifiers and the word modified; verb formation; pronoun case; formation of comparative and superlative adjectives and adverbs; and idiomatic usage.</p>	<ul style="list-style-type: none"> Recognize and correct inappropriate shifts in verb tense and voice when the meaning of the entire sentence must be considered. Recognize and correct marked disturbances in sentence structure (e.g., faulty placement of adjectives, participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers, lack of parallelism with a simple series of verbs). Form the past tense and past participle of irregular but commonly used verbs. Determine whether an adjective form or an adverb form is called for in a given situation. Ensure straightforward subject-verb agreement. Ensure straightforward pronoun-antecedent agreement. Use the appropriate word in frequently confused pairs (e.g., <i>there</i> and <i>their</i>, <i>past</i> and <i>passed</i>, <i>led</i> and <i>lead</i>). Delete commas that create basic problems (e.g., between verb and direct object). Use commas to set off simple parenthetical elements. 	<p>(continued on next page)</p>	<p>(continued on next page)</p>
<p>Sentence Structure Questions in this category test students' understanding of relationships between and among clauses, placement of modifiers, and shifts in construction.</p>	<p>(continued on next page)</p>	<p>(continued on next page)</p>	<p>(continued on next page)</p>

Skills marked with an asterisk () are particularly likely to require continued attention in the higher grades as they are applied to increasingly sophisticated and complex writing and speaking. These skills, while introduced in earlier grades, should continue to be taught and practiced.

Grades 9–12, English (continued)

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 9–12?
<i>*Continued from previous page</i>	<ul style="list-style-type: none"> Recognize and correct subtle disturbances in sentence structure (e.g., weak conjunctions between independent clauses). Use the appropriate word in less-common confused pairs (e.g., <i>allude</i> and <i>elude</i>). Use a semicolon to link closely related independent clauses. 	L.9-10.2a Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses.	
Strategy Questions in this category test how well students develop a given topic by choosing expressions appropriate to an essay's audience and purpose; judging the effect of adding, revising, or deleting supporting material; and judging the relevance of statements in context.	<ul style="list-style-type: none"> Delete material because it is obviously irrelevant in terms of the topic of the essay. Determine whether a simple essay has met a straightforward goal. Use a word, phrase, or sentence to accomplish a straightforward purpose (e.g., conveying a feeling or attitude). Determine relevance of material in terms of the focus of the paragraph. Determine the need for transition words or phrases to establish time relationships in simple narrative essays (e.g., <i>then, this time</i>). Determine the most logical place for a sentence in a paragraph. Determine the need for transition words or phrases to establish straightforward logical relationships (e.g., <i>first, afterward, in response</i>). Determine the most logical place for a sentence in a straightforward essay. Rearrange the sentences in a straightforward paragraph for the sake of logic. Revise vague, clumsy and confusing writing that creates obvious logic problems. 	L.3.3a Choose words and phrases for effect.* L.4.3a Choose words and phrases to convey ideas precisely.* L.4.3b Choose punctuation for effect.* L.5.3a Expand, combine and reduce sentences for meaning, reader/listener interest, and style. (continued on next page) L.6.3a Vary sentence patterns for meaning, reader/listener interest, and style.* L.6.3b Maintain consistency in style and tone.* L.7.3a Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.* L.8.3a Use verbs in the active and passive mood and in the conditional and subjunctive mood to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact). W.9-10.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on what is most significant for a specific purpose and audience.	<ul style="list-style-type: none"> Take a master essay or paragraph and cut it into paragraphs or sentences. Have students work in teams to organize the essay or paragraph logically. Give students a paragraph with one sentence omitted. Provide the omitted sentence separately. Have students work in pairs to determine where to best place the omitted sentence. Discuss how the tone of a sentence changes when end punctuation changes. Practice revision techniques like sentence expanding, depth charging, or <i>explode a moment</i>. When students are planning to write, teach them to think very early on about purpose and audience. Have students discuss the author's purpose and audience when reading text. Have students identify their own audience and purpose when reading, and write with a tone that fits the audience and purpose.
Organization Questions in this category test how well students organize ideas and choose effective opening, transitional, and closing sentences.			
Style Questions in this category test how well students chose precise and appropriate words and images, maintain the level of style and tone in an essay, manage sentence elements for rhetorical effectiveness, and avoid ambiguous pronouns references, wordiness, and redundancy.			

Skills marked with an asterisk () are particularly likely to require continued attention in the higher grades as they are applied to increasingly sophisticated and complex writing and speaking. These skills, while introduced in earlier grades, should continue to be taught and practiced.

ACT Mathematics Subtest

Connections with Tennessee Academic Standards

Frequently Asked Questions

1. What determines student success on the ACT mathematics subtest?

The mathematics assessed on the ACT extends across all grade levels. The ACT College and Career Readiness Standards for mathematics are a combination of skills taught beginning as early as grade 2 and extending through a student's fourth year high school mathematics course. In order for a student to attain a 21 or higher, the student needs instruction focused on developing a content-rich, conceptual understanding of mathematics at all grade levels. Students need to develop an understanding of the following:

- *which* math ideas are most important, and *why* they are important
- *which* ideas are useful in a particular context for problem solving
- *why and how* certain key ideas aid in problem solving, which reminds us of the systematic progression of math
- *how and why* an idea or procedure is mathematically defensible
- *how* to flexibly adapt previous experience to new transfer problems.

2. When should we begin preparing students for the Math ACT?

The mathematics ACT questions are based on skills and standards taught from elementary school through high school. This means that students who have a strong foundation in mathematics and who consistently perform well in each grade level will use the same skills to perform well on the ACT. Therefore, all academic grades have a crucial part to play in preparing students for ACT mathematics success.

3. Did you know that the math ACT is a timed test?

The ACT mathematics test is a 60-minute test with 60 questions that are designed to assess the mathematical skills students have acquired across the entirety of their mathematical academic career. The test presents multiple-choice questions that require a student to use reasoning skills to solve practical problems in mathematics. In preparation for the ACT mathematics test, it is essential to have general knowledge of the foundational math formulas and be able to demonstrate computational skills. The ACT mathematics test does not require recall of complex formulas or extensive computation.

Please note: This document is intended to highlight connections between Tennessee's Academic Standards and the ACT mathematics test, but it is not an exhaustive document that details every connection.

Big Picture of Tennessee Math Concepts, K–12

Mathematics is broken into domains, which are the buckets of main concepts that students learn over the course of time. As previously mentioned, success on the ACT is dependent upon the **entirety of a student’s mathematics career from elementary school through high school**. The following chart shows how the domains within the current Tennessee academic standards in mathematics build on one another. When you read the chart vertically, you will see which math domains students are learning each year. When you read the chart horizontally, you will see how the math domains build on one another across a student’s academic career.

The domains of Tennessee math standards build on each other over time. This chart shows the progression of learning from kindergarten through high school.

	K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	High School
	Geometry →									Geometry
	Measurement & Data →					Statistics & Probability →				Statistics & Probability
	Number & Operations in Base Ten →					The Number System →				Number & Quantity
	Operations in Algebraic Thinking →					Expressions & Equations →				Algebra
	Counting & Cardinality →			Numbers & Operations— Fractions →			Ratios & Proportional Relationships →	Functions →		Functions

The domains of the ACT College and Career Readiness Standards for math are similar to the domains of the Tennessee math standards: geometry, statistics and probability, number and quantity, algebra, and functions. Standards unique to ACT are assigned to each domain and can be found here: <http://www.act.org/standard/planact/pdf/MathStandards.pdf>.

Side-by-Side Example: Number and Quantity Domain

Connectivity Between ACT Standards and TN Standards in Math

Multiple Tennessee academic standards are embedded within a single ACT Readiness Standard for mathematics. The following chart highlights a small, representative sample of connections between selected ACT Readiness Standards and the Tennessee Academic Standards in the **Number and Quantity domain**. This is for illustrative purposes only, as students should be consistently exposed to all of the Tennessee Academic Standards to be successful on the ACT mathematics test.

This example illustrates how the ACT mathematics subtest assesses the entirety of a student’s academic career in mathematics. Even though students take the ACT in high school, if building blocks are left out—even in the early grades—students are less prepared to be successful on this important measure of college and career readiness.

ACT Readiness Standards	Tennessee Academic Standards
<p>N 201. Perform one-operation computation with whole numbers and decimals</p>	<p>2.NBT.B.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p>4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p> <p>4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding</p> <p>5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm</p> <p>5.NBT.B.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</p> <p>6.NS.B.2. Fluently divide multi-digit numbers using the standard algorithm.</p> <p>6.NS.B.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p>
<p>N 202. Recognize equivalent fractions and fractions in lowest terms</p>	<p>3.NF.A.3a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</p> <p>3.NF.A.3b. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$). Explain why the fractions are equivalent, e.g., by using a visual fraction model.</p> <p>3.NF.A.3c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.</i></p> <p>continued on the next page</p>

	<p>4.NF.A.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</p>
<p>N 302. Identify a digit's place value</p>	<p>2.NBT.A.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.</p> <p>4.NBT.A. Generalize place value understanding for multi-digit whole numbers.</p> <p>5.NBT.A. Understand the place value system.</p>
<p>N 404. Understand absolute value in terms of distance</p>	<p>6.NS.C.7c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</p> <p>6.NS.C.7d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.</p> <p>7.NS.A.1b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p>
<p>N 603. Apply number properties involving positive/negative numbers</p>	<p>6.NS.C.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p>6.NS.C.6a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.</p> <p>7.NS.A.1a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</p> <p>7.NS.A.1b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>7.NS.A.1c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>7.NS.A.1d. Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.A.2a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>7.NS.A.2b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts.</p> <p>7.NS.A.2c. Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>7.NS.A.3. Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)</p>
<p>N 606. Multiply two complex numbers</p>	<p>N-CN.A.2. Algebra II: Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</p>

Side-by-Side Example: Domain Comparison Chart

Connectivity Between Tennessee Math Domains and ACT Math Domains

Multiple Tennessee academic standards are embedded within a single ACT Readiness Standard for mathematics. The following chart shows the connection and overlap between the domains of the current Tennessee math standards and the domains of ACT Readiness Standards.

The navy blue areas indicate where Tennessee math standards overlap with ACT Readiness Standards within each domain.

K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	High School
Geometry →									Geometry
			ACT Readiness Domain: Geometry						
Measurement & Data →						Statistics & Probability →			Statistics & Probability
						ACT Readiness Domain: Statistics & Probability			
Number & Operations in Base Ten →						The Number System →			Number & Quantity
		ACT Readiness Domain: Number and Quantity							
Operations in Algebraic Thinking →						Expressions & Equations →			Algebra
				ACT Readiness Domain: Algebra					
Counting & Cardinality			Numbers & Operations—Fractions →			Ratios & Proportional Relationships →	Functions →	Functions	
				ACT Readiness Domain: Functions					

ACT Reading Subtest

Connections with Tennessee Academic Standards

Frequently Asked Questions

1. *What determines student success on the ACT reading test?*

The **biggest differentiator of success is the ability to read complex text proficiently.** Therefore, when we say students will attain a score of 21 or higher, we are really saying that we are committing to presenting students with appropriately-complex informational and literary texts at each grade level. The work that happens in early grades impacts the work in upper grades.

2. *Did you know that three of the four passages students read on the ACT is on nonfiction/informational text?*

This does not mean that 75 percent of your instructional time is spent on nonfiction/informational text. It does mean that students should read a range of nonfiction/informational text from the natural sciences, social sciences, and humanities throughout the school year in all grades.

3. *Are students asked to bring prior knowledge to the ACT reading test?*

No, students are not asked to bring any prior knowledge of any specific subject to the reading portion of the ACT. Students are asked to read text independently and proficiently at grade level. In fact, much of the text on the ACT is complex and will require a close, careful reading in order to determine the correct answer.

4. *Is it necessary to prepare students for the ACT reading test?*

Students learn how to interact with complex texts in order to discern meaning, ask questions, make inferences, synthesize information, and create new ideas. This document is not about “test prep;” it is about building upon a strong foundation to achieve success by grades 11-12.

Please note: This document is intended to highlight connections between Tennessee’s Academic Standards and the ACT reading test, but it is not an exhaustive document that details every connection.

Grades 3–5, Reading

ACT Reading Passage	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 3–5?
<p>Social Sciences Questions are based on passages in anthropology, archaeology, biography, business, economics, education, geography, history, political science, psychology and sociology.</p>	<ul style="list-style-type: none"> Identify a clear main idea or purpose of any paragraph or paragraphs in challenging passages. Identify clear main ideas or purposes of complex passages or their paragraphs. Summarize events and ideas in virtually any passage. Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages. 	<p>RI.3-5.1 Refer to details and examples from the text when drawing inferences from the text.</p> <p>RI.3-5.2 Determine the main idea of a text, explain how the main idea is supported by key details, and to summarize the text.</p> <p>RI.3-5.3 Explain events, procedures, or concepts in historical, scientific or technical texts by drawing on specific information in the text.</p> <p>RI.3-5.4 Determine the meaning of general academic and domain-specific words or phrases in the text.</p> <p>RI.3-5.5 Describe the overall structure of the events, ideas, and information in the text.</p> <p>RI.3-5.7 Interpret information presented visually or orally from various sources and explain how the information contributes to an understanding of the text in which it appears.</p> <p>RI.3-5.10 Read and comprehend informational texts.</p>	<ul style="list-style-type: none"> Read relevant and interesting text that is quantitatively and qualitatively complex about the social sciences, natural science, and humanities. Use text in science and social studies instruction. Build student knowledge through a deep exploration of one topic. Ask text-dependent questions that require a close, careful reading of the text. Ask students to find evidence in a text by paying attention to specific details in text that help develop the main idea. Help students build academic and Tier II vocabulary through an understanding of how to use context to discern meaning. Help students build Tier III vocabulary through word study and reading several texts on the same topic or idea. Use strategies and graphic organizers to provide a structure for students to generate a text-based summary.
<p>Natural Sciences Questions are based on passages in anatomy, astronomy, biology, botany, chemistry, ecology, geology, medicine, meteorology, microbiology, natural history, physiology, physics, technology and zoology.</p>	<ul style="list-style-type: none"> Use details from different sections of some complex informational passages to support a specific point or argument. Identify clear relationships between people, ideas in challenging passages. Use context to determine that appropriate meaning of virtually any word, phrase or statement in unchallenging and more complicated passages. Understand the subtleties in relationships between people, ideas, and concepts in more challenging passages. 		
<p>Humanities Questions are based on passages on architecture, art, dance, ethics, film, language, literary criticism, music, memoirs and personal essays.</p>			

Grades 3–5, Reading (continued)

ACT Reading Passage	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 3–5?
<p>Literary Narrative (includes prose fiction) Questions are based on passages from short stories, novels, memoirs, & personal essays.</p>	<ul style="list-style-type: none"> • Infer the main idea or purpose of straightforward paragraphs in literary narratives of varying complexity. • Summarize events and ideas in virtually any passage. • Understand the function of a part of a passage when the function is subtle or complex. • Determine the appropriate meaning of words, phrases, or statements from figurative contexts. • Make inferences about how details are used in a passage. • Discern which details, though they may appear in different sections throughout a passage, support important points 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. 	<p>RL.3-5.2 Determine the theme of a story, drama, or poem with details from a text and to summarize the story.</p> <p>RL.3-5.3 Describe in depth a character, setting or event, by drawing on specific details in the text.</p> <p>RL.3-5.4 Determine the words and phrases as they are used in a text, including figurative language.</p> <p>RL.3-5.5 Explain how the series of chapters, scenes or stanzas fit together to provide the structure of a particular story, drama or poem.</p> <p>RL.3-5.6 Compare and contrast the point of view from which different stories are narrated.</p>	<ul style="list-style-type: none"> • Read relevant and interesting literary text (e.g., short stories, novels, memoirs, poems, and personal essays) that is quantitatively and qualitatively complex. • Use selections from literary nonfiction to supplement informational units: For instance, when studying U.S. History, read a chapter or selection from <i>Little House on the Prairie</i> by Laura Ingalls Wilder. • Ask students to visualize characters, settings or events and sketch relevant and challenging scenes with details from the text. • Provide examples of one event from two narrators with different points of view: For example, have students read the tradition Little Red Riding Hood story and compare it to <i>The True Story of the Three Little Pigs</i> by John Scieszka. • Work with students to build vocabulary and word knowledge through building an understanding of how to use context clues.

Grades 6-8, Reading

ACT Reading Passage	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 6–8?
<p>Social Sciences Questions are based on passages in anthropology, archaeology, biography, business, economics, education, geography, history, political science, psychology and sociology.</p>	<ul style="list-style-type: none"> Identify a clear main idea or purpose of any paragraph or paragraphs in challenging passages. Identify clear main ideas or purposes of complex passages or their paragraphs. Summarize events and ideas in virtually any passage. Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages. 	<p>RI.6-8.1 Support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI.6-8.2 Determine one or more central ideas in a text and analyze their development over the course of the text and provide an objective summary of the text.</p> <p>RI.6-8.3 Analyze the interactions between individuals, events, and ideas in a text.</p> <p>RI.6-8.4 Determine the meaning of words and phrases as they are used in a text.</p> <p>RI.6-8.5 Analyze the structure an author uses to organize a text, including how the major sections contribute to the development of the ideas of the text.</p>	<ul style="list-style-type: none"> Read relevant and interesting text that is quantitatively and qualitatively complex about the social sciences, natural science, and humanities. Use text in science and social studies instruction. Build student knowledge through reading multiple texts on the same topic, and asking students to synthesize information across text.
<p>Natural Sciences Questions are based on passages in anatomy, astronomy, biology, botany, chemistry, ecology, geology, medicine, meteorology, microbiology, natural history, physiology, physics, technology and zoology.</p>	<ul style="list-style-type: none"> Use details from different sections of some complex informational passages to support a specific point or argument. Identify clear relationships between people, ideas in challenging passages. Use context to determine that appropriate meaning of virtually any word, phrase or statement in unchallenging and more complicated passages. Understand the subtleties in relationships between people, ideas, and concepts in more challenging passages. 	<p>RI.6-8.8 Trace and evaluate the argument and specific claims in a text.</p> <p>RI.6-8.10 Read and comprehend informational texts, including history/social studies, science and technical texts within the grade text complexity band proficiently, sometimes with scaffolding.</p>	<ul style="list-style-type: none"> Ask text-dependent questions that require a close, careful reading of the text. Ask students to find evidence in text by paying attention to specific details in text that help create the claim or central idea. Help students build academic and Tier II vocabulary through an understanding of how to use context to discern meaning. Help students build Tier II vocabulary through word study and reading several texts on the same topic or idea. Encourage active reading with text markers and annotations.
<p>Humanities Questions are based on passages on architecture, art, dance, ethics, film, language, literary criticism, music, memoirs and personal essays.</p>			

Grades 6-8, Reading (continued)

ACT Reading Passage	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 6–8?
<p>Literary Narrative (includes prose fiction) Questions are based on passages from short stories, novels, memoirs, & personal essays.</p>	<ul style="list-style-type: none"> • Infer the main idea or purpose of straightforward paragraphs in literary narratives of varying complexity. • Summarize events and ideas in virtually any passage. • Understand the function of a part of a passage when the function is subtle or complex. • Determine the appropriate meaning of words, phrases, or statements from figurative contexts. • Make inferences about how details are used in a passage. • Discern which details, though they may appear in different sections throughout a passage, support important points 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. 	<p>RL.6-8.2 Determine a theme or central idea of a text and analyze its development over the course of a text and to provide an objective summary of the text.</p> <p>RL.6-8.3 Analyze how particular elements of a story interact.</p> <p>RL.6-8.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone.</p> <p>RL.6-8.5 Analyze how structure contribute to meaning.</p> <p>RL.6-8.6 Analyze how an author develops the point of view of the narrator in a text.</p>	<ul style="list-style-type: none"> • Read relevant and interesting literary text like short stories, novels, memoirs, poems, and personal essays text that are appropriately quantitatively and qualitatively complex. • Use selections from literary nonfiction to supplement informational units: For instance, when studying the Great Depression, include a chapter or excerpt from <i>Roll of Thunder, Hear My Cry</i> by Mildred D. Taylor. • Ask students to trace character development through literature by looking for specific places in the text that highlight how they change. • Provide examples of text where structure contributes to meaning: For example, have students read the graphic novel <i>Maus</i> by Art Spiegelman and contrast the structure and its impact on meaning to the diary entries in <i>The Diary of a Young Girl</i> by Anne Frank. • Work with students to build vocabulary and word knowledge by practicing using context clues to grow Tier II vocabulary.

Grades 9–12, Reading

ACT Reading Passage	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 9–12?
<p>Social Sciences Questions are based on passages in anthropology, archaeology, biography, business, economics, education, geography, history, political science, psychology and sociology.</p>	<ul style="list-style-type: none"> Identify a clear main idea or purpose of any paragraph or paragraphs in challenging passages. Identify clear main ideas or purposes of complex passages or their paragraphs. Summarize events and ideas in virtually any passage. Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages. 	<p>RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</p> <p>RI.9-10.2 Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.</p> <p>RI.9-10.3 Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.</p>	<ul style="list-style-type: none"> Read relevant and interesting text that is quantitatively and qualitatively complex about the social sciences, natural science, and humanities. Use text in science and social studies instruction. Build student knowledge through reading multiple texts on the same topic, and asking students to synthesize information across text.
<p>Natural Sciences Questions are based on passages in anatomy, astronomy, biology, botany, chemistry, ecology, geology, medicine, meteorology, microbiology, natural history, physiology, physics, technology and zoology.</p>	<ul style="list-style-type: none"> Use details from different sections of some complex informational passages to support a specific point or argument. Identify clear relationships between people, ideas in challenging passages. Use context to determine that appropriate meaning of virtually any word, phrase or statement in unchallenging and more complicated passages. Understand the subtleties in relationships between people, ideas, and concepts in more challenging passages. 	<p>RI.9-10.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone.</p> <p>RI.9-10.5 Analyze in detail how an author’s ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text.</p>	<ul style="list-style-type: none"> Ask text-dependent questions that require a close, careful reading of the text. Ask students to find evidence in a text by examining specific details in text that help create the claim or central idea. Help students build academic and Tier II vocabulary through an understanding of how to use context to discern meaning.
<p>Humanities Questions are based on passages on architecture, art, dance, ethics, film, language, literary criticism, music, memoirs and personal essays.</p>	<ul style="list-style-type: none"> Compare or combine data from a simple data presentation with data from a complex data presentation. 	<p>RI.9-10.8 Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.</p> <p>RI.9-10.10 Read and comprehend informational texts, including history/social studies, science and technical texts within the grade text complexity band proficiently, sometimes with scaffolding as needed at the high end of the band.</p>	<ul style="list-style-type: none"> Help students build Tier II vocabulary. Use strategies and graphic organizers to provide a structure for students. Encourage active reading through the use of text markers and annotations. Encourage students to conduct research on topics of personal interest and that require reading of complex informational text.

Grades 9–12, Reading (continued)

ACT Reading Passage	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee State Standards Snapshot of Expected Skills	What could this look like in practices in grades 9–12?
<p>Literary Narrative (includes prose fiction): Questions are based on passages from short stories, novels, memoirs, & personal essays.</p>	<ul style="list-style-type: none"> • Infer the main idea or purpose of straightforward paragraphs in literary narratives of varying complexity. • Summarize events and ideas in virtually any passage. • Understand the function of a part of a passage when the function is subtle or complex. • Determine the appropriate meaning of words, phrases, or statements from figurative contexts. • Make inferences about how details are used in a passage. • Discern which details, though they may appear in different sections throughout a passage, support important points 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. 	<p>RL.9-10.2 Determine a theme or central idea of a text and analyze in detail its development over the course of a text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.</p> <p>RL.9-10.3 Analyze how complex characters develop over the course of a text, interact with other characters, and advance the plot or develop the theme.</p> <p>RL.9-10.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone.</p> <p>RL.9-10.5 Analyze how an author's choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension or surprise.</p> <p>RL.9-10.6 Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature.</p>	<ul style="list-style-type: none"> • Read relevant and interesting literary text like short stories, novels, memoirs, poems, and personal essays text that is appropriately quantitatively and qualitatively complex. • Use selections from literary nonfiction to supplement informational units: For instance, when studying the Holocaust, include a chapter or excerpt from <i>The Book Thief</i> by Marcus Zusak. • Ask students to trace character development through literature by looking for specific places in the text that highlight who the characters are and how they change. • Provide examples of text that highlights cultural experiences outside the United States: For example, have students read the graphic novel <i>Things Fall Apart</i> by Chinua Achibe.

ACT Science Subtest

Connections with Tennessee Academic Standards

Frequently Asked Questions

1. What determines student success on the ACT science test?

Although basic content knowledge in biology, chemistry, physics, and earth science is recommended, advanced knowledge of the subject-specific content is not expected. Instead, the ACT science test measures a student's scientific reasoning abilities, such as analysis, interpretation, evaluation, and problem-solving under strict time conditions: 40 questions in 35 minutes.

2. Did you know that scientific information is presented in three distinct formats on the ACT science test?

The ACT science test consists of seven passages presented in one of the following formats:

- **Data Representation** (30-40%). This format includes graphics and tables for student analysis and interpretation. These questions measure a student's ability to read graphs, interpret scatterplots, and interpret information presented in tables.
- **Research Summaries** (45-55%). This format includes descriptions of one or more related experiments. These questions measure the student's ability to interpret experimental design and associated results.
- **Conflicting Viewpoints** (15-20%). This format presents alternative hypotheses expressed in response to incomplete data or differing views. These questions measure the student's ability to understand, analyze, and compare inconsistent viewpoints or hypotheses.

3. How can we support the development of scientific reasoning skills from grades K through 12?

Preparation begins with developing in our students critical thinking skills that enable them to interpret data, understand methodology used in complex experimental design, and evaluate both models and experimental results. The development of these skills is best fostered through consistent exposure to the process of science, both through inquiry and text, beginning in kindergarten. The instructional crosswalk beginning on the next page connects our current Tennessee Academic Standards with the science skills tested on the ACT and shares some suggestions for practice within each grade band. Preparing our students to meet or exceed the ACT College Readiness Benchmark is possible through **intentional, thoughtful and rigorous** teaching of our current K-12 science standards with particular **emphasis on science literacy and the embedded inquiry and technology and engineering standards.**

Please note: This document is intended to highlight connections between Tennessee's Academic Standards and the ACT science test, but it is not an exhaustive document that details every connection.

Grades K-5, Science

Category	ACT Readiness Standards in Science	Example(s) of Related Tennessee Science Standards	Suggestions for Practice in K-5
Interpretation of Data (IOD)	<p>IOD 201. Select one piece of data from a simple data presentation (e.g., a simple food web diagram).</p> <p>IOD 202. Identify basic features of a table, graph, or diagram (e.g. units of measurement).</p> <p>IOD 203. Find basic information in text that describes a simple data presentation.</p>	<p>GLE.Inq.3. Explain the data from an investigation.</p> <p>GLE.Inq.4 Identify and interpret simple patterns of evidence to communicate the findings of multiple investigations.</p>	<ul style="list-style-type: none"> Locate data in simple tables and graphs. Become familiar with different types of graphs (e.g., line graphs, pie charts, bar graphs). Become familiar with units of measurement commonly used in science.
Scientific Investigation (SIN)	<p>SIN 202. Understand the tools and functions of tools used in a simple experiment.*</p> <p>SIN 401. Understand a simple experimental design.</p>	<p>GLE.Inq.1 Observe the world of familiar objects using the senses and tools.</p> <p>GLE.Inq.1 Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data.</p>	<ul style="list-style-type: none"> Observe experiments being performed and discuss what was done and why. Design a procedure to investigate a specific research question.
Evaluation of Models, Inferences, and Experimental Results (EMI)	<p>EMI 201. Find basic information in a model (conceptual).*</p> <p>EMI 401. Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with a data presentation, model, or piece of information in text.*</p>	<p>GLE.Inq.2 Ask questions, make logical predictions, plan investigations, and represent data.</p> <p>GLE.T/E.2 Apply engineering design and creative thinking to solve practical problems.</p> <p>GLE.Inq.5 Recognize that people may interpret the same results in different ways.</p>	<ul style="list-style-type: none"> Discuss what hypotheses and conclusion are and how they are different from each other. Analyze data and conclusions from multiple investigations and text. Discuss why scientists may have differing viewpoints or conclusions based on an incomplete data set.

Skills marked with an asterisk () are particularly likely to require continued attention in the higher grades as they are applied to increasingly sophisticated and complex writing and speaking. These skills, while introduced in earlier grades, should continue to be taught and practiced.

Grades 6–8, Science

Category	ACT Readiness Standards in Science	Example(s) of Related Tennessee Science Standards	Suggestions for Practice in 6–8
Interpretation of Data (IOD)	<p>IOD 301. Select two or more pieces of data from a simple data presentation.</p> <p>IOD 304. Determine how the values of variables change as the value of another variable changes in a simple data presentation.</p>	<p>SPI.Inq.3 Interpret and translate data in a table, graph, or diagram.</p> <p>SPI.Inq.4 Draw a conclusion that establishes a cause and effect relationship supported by evidence.</p>	<ul style="list-style-type: none"> Examine line graphs to determine if they show a direct or inverse relationship between variables. Become familiar with scatterplots. Determine a simple mathematical relationship between two variables. Integrate scientific information from popular sources (e.g., newspapers, magazines, the internet) with that found in textbooks.
Scientific Investigation (SIN)	<p>SIN 201. Find the basic information in text that describes a simple experiment.</p> <p>SIN 301. Understand the methods used in a simple experiment.</p>	<p>GLE.Inq.1 Design and conduct open-ended scientific investigations.</p>	<ul style="list-style-type: none"> Perform several repetitions of an experiment to determine the reliability of results.
Evaluation of Models, Inferences, and Experimental Results (EMI)	<p>EMI 301. Identify implications in a model.</p> <p>EMI 302. Determine which models present certain basic information.</p> <p>EMI 401. Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with a data presentation, model, or piece of information in text.*</p>	<p>SPI.Inq.5 Identify a faulty interpretation of data that is due to bias or experimental error.</p> <p>GLE.Inq.5 Communicate scientific understanding using descriptions, explanations, and models.</p>	<ul style="list-style-type: none"> Evaluate whether the data produced by an experiment adequately supports a given conclusion. Compare and contrast two different models about a scientific phenomenon.

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Grades 9-12 (Biology I, Chemistry I, Physics)

Category	ACT Readiness Standards in Science	Example(s) of Related Tennessee Science Standards	Suggestions for Practice in 9-12
Interpretation of Data (IOD)	<p>IOD 401. Select data from a complex data presentation (e.g. phase diagram).</p> <p>IOD 402. Compare or combine data from a simple data presentation (e.g., order or sum data from a table).</p> <p>IOD 404. Perform a simple interpolation or simple extrapolation using data in a table or graph.</p>	<p>CLE.Inq.4 Apply qualitative and quantitative measures to analyze data and draw conclusions that are free of bias.</p> <p>SPI.Inq.4 Evaluate the accuracy and precision of data.</p>	<ul style="list-style-type: none"> Relate scientific information contained in written text to numerical data. Manipulate algebraic equations that represent data.
Scientific Investigation (SIN)	<p>SIN 402. Understand the methods used in a complex experiment.</p> <p>SIN 403. Identify a control in an experiment.</p> <p>SIN 404. Identify similarities and differences between experiments.</p>	<p>CLE.Inq.2 Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts, and compare opposing theories.</p> <p>SPI.Inq.5 Defend a conclusion based on scientific evidence.</p>	<ul style="list-style-type: none"> Determine the hypothesis of an experiment that requires more than one step. Determine alternate methods of testing a hypothesis. Argue and defend the presentation of data through scientific reasoning and fact.
Evaluation of Models, Inferences, and Experimental Results (EMI)	<p>EMI 402. Identify key assumptions in a model.</p> <p>EMI 404. Identify similarities and differences between models.</p> <p>EMI 501. Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with two or more data presentations, models, and/or pieces of information in text.</p> <p>EMI 502. Determine whether presented information, or new information, supports or contradicts a simple hypothesis or conclusion, and why.</p>	<p>SPI.Inq.6 Determine why a conclusion is free of bias.</p> <p>SPI.Inq.7 Compare conclusions that offer different, but acceptable explanations for the same set of experimental data.</p> <p>CLE.T/E.2 Differentiate among elements of the engineering design cycle: design constraints, model building, testing, evaluating, modifying, and retesting.</p>	<ul style="list-style-type: none"> Communicate the findings of an experiment and compare conclusions with peers. Formulate hypotheses, predictions, or conclusions by comparing and contrasting several different sets of data from different experiments. Evaluate the merits of a conclusion based on the analysis of several sets of data.
		<p>Example(s) of Related Tennessee Science Standards—Physics ONLY</p> <p>SPI 3231.Inq.7 Determine if data supports or contradicts a hypothesis or a conclusion</p> <p>SPI 3231.Inq.14 Suggest alternative explanations for the same set of observations.</p> <p>SPI 3231.Inq. 15 Formulate and revise scientific explanations and models using logic and evidence.</p> <p>SPI 3231.T/E.2 Evaluate a protocol to determine the degree to which an engineering design process was successfully applied.</p>	