ACT Connections

Tennessee Academic Standards and ACT Subtests

Tennessee Department of Education | July 2018

Table of Contents

*Note: In this document, information has been grouped by content area and not in the order of the ACT subtests.

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 (or SAT equivalent) by 2020. The desire to raise Tennessee's ACT average is rooted in our vision to improve postsecondary and career readiness for all Tennessee students. To reach our goal, it is essential that administrators, educators, parents, and students know that **all grade levels play an important part in ensuring college and career readiness**.

This document provides a snapshot of the academic skills students need in order to meet or exceed expectations for college and career readiness as assessed by the ACT. The document also highlights important connections between ACT College and Career Readiness Standards and Tennessee Academic Standards.

Notes

- TNReady measures student progress annually, while the ACT is a summative assessment used by postsecondary institutions and employers to measure college and career readiness.
- The ACT consists of four multiple-choice subtests (English, mathematics, reading, and science) and an optional writing test.
- The development of the academic skills necessary to be successful on the ACT extends across all grade levels.
- This document is not focused on test preparation; instead, it highlights 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 the Tennessee Academic Standards and the ACT assessment, but it is not an exhaustive document.

Suggestions for Use

The intent of this guide is to provide districts, schools, and teachers with a **starting point** for aligning instruction across content areas and grade levels to support student success on both TNReady and the ACT. While this document focuses on standards in English language arts (ELA), mathematics, and science, **teachers of all content areas play an essential role** in preparing students for college and career.

By providing this basic overview of the connections between our Tennessee Academic Standards and ACT College and Career Readiness Standards, we believe that Tennessee educators will be better equipped to align their curriculum planning, pacing, and daily instruction to ensure student success.

In addition to utilizing the overview, we recommend that districts and schools take the following next steps:

- **Make the connections real.** Instructional supervisors and content experts can utilize the following worksheets to chart when and where students are exposed to ACT standards within their current curriculum.
    - English Curriculum Review Worksheet
    - Mathematics Curriculum Review Worksheet
    - Reading Curriculum Review Worksheet
    - Science Curriculum Review Worksheet
    - Writing Curriculum Review Worksheet

- **Ensure all educators—from elementary to high school—understand when and where the standards they teach connect to ACT standards.**
    - Once teachers understand how their standards connect to ACT College and Career Readiness Standards, it is important to understand how students' knowledge and skills are developed over time.
    - If teachers throughout K–12 are making explicit connections between the standards they teach and the ACT, they can make students and parents aware of their progress toward college and career readiness well before they take the official ACT exam.

- **Provide targeted support to students based on their current progress.**
    - ***Ideas for Progress in College and Career Readiness***: On their website, ACT, Inc. provides lists of recommended instructional activities organized according to skills tested in each subject area and grouped by score ranges (e.g., 1–12, 13–15, 16–19, etc.).
    - By matching required skills to scores in specific ranges on the ACT, teachers can understand how their content and grade-level standards impact students' ability to progress toward college and career readiness.

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. The 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 education 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 postsecondary coursework (including remedial, non-credit bearing courses), and
- indicator of postsecondary readiness.

2. What is the purpose or goal of TNReady?

TNReady assesses and provides information on a student's mastery of the Tennessee Academic Standards in English language arts, mathematics, science, and social studies at each grade level. The test deeply evaluates a student's content knowledge and skills in each subject because it is specific to grade level. 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' critical thinking and problem-solving abilities, not just basic memorization skills.

3. Why does improving ACT scores matter?

The department's five-year strategic plan, *Tennessee Succeeds*, outlines 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 composite score of 21 or higher, students are predicted to be more successful in both college and career.

4. How are the TNReady and ACT designed differently?

TNReady is comprised of English language arts, math, science, and social studies tests. These tests are taken in three to four subparts over multiple days near the end of the course. Questions are designed in multiple formats (e.g., multiple choice, multiple select, evidence-based selected response, written response, technology-enhanced items, etc.), allowing students to demonstrate their *depth* of knowledge and conceptual understanding of grade-level or course-level standards.

The ACT is a *survey assessment* that consists of four multiple-choice tests and one optional open-ended writing test. The four subtests include English, reading, mathematics, and science. The ACT allows students to demonstrate their *breadth* of knowledge and provides a culminating view of a student's entire academic career. The skills and knowledge assessed on the ACT are introduced as early as kindergarten.

The table on the next pages provides a side-by-side comparison for each subject area.

Subject	ACT	TNReady
English	On the English subtest, students have 45 minutes to answer 75 questions about usage/mechanics (i.e., punctuation, grammar and usage, sentence structure) and rhetorical skills (i.e., strategy, organization, and style).	TNReady measures students' English language arts content knowledge and skills in an integrated manner. TNReady assesses students' mastery of usage/mechanics and rhetorical skills in two different formats: the editing task and the writing task. The editing task is designed to assess students' ability to *recognize* and *correct* errors in conventions and *revise* instances of ineffective style. The editing task consists of four to eight questions and is included in the same subpart as a reading passage. The writing task is placed only in subpart 1. In addition to measuring students' ability to organize and develop ideas, the writing task is designed to assess students' ability to *produce* writing that is both stylistically effective and free from conventions errors. Reading is embedded throughout all subparts of the TNReady assessment for English language arts. In subpart 1, students are asked to write to a prompt that is connected to the passage or passage set they have just read. The prompt expects students to cite evidence from the text(s). Over the course of the other subparts, students will encounter multiple passages or passage sets. These passages are a combination of grade-level complex literary and informational texts. The associated reading questions are aligned to the Tennessee Academic Standards for ELA and require a close reading of the texts. Writing is required on TNReady and is always located in subpart 1. Students are provided one to three texts and are asked to write to a prompt connected to the texts. No background knowledge is required. The prompt may be narrative, explanatory, or argumentative. Students are expected to use evidence and details from the text(s) they have read to develop their story, explanation, or position. For more information on time limits and
Reading	On the reading subtest, 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, etc.).	
Writing	The optional ACT writing test is designed to assess students' ability to take a position on an issue, develop the position with supporting ideas, and articulate the position and ideas through effective use of language. The prompt briefly describes an issue and provides three different perspectives on the issue. Students analyze and evaluate the perspectives to develop and communicate their own perspective. Students have 40 minutes to complete the essay.	

Subject	ACT	TNReady
Math	ACT measures how quickly and accurately a student can recall a wide variety of surface-level math skills and procedures 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 through grade 12. For example, students will be assessed on fourth grade skills, seventh grade skills, and high school skills all intertwined within the same assessment. Students may use a calculator on the entire math portion of the ACT.	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 learns 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. Additionally, students are expected to demonstrate that they have a firm grasp of the procedural and computational fluency expectations embedded within their grade-level Tennessee Academic Standards. There are calculator-permitted sections and calculator-prohibited sections on TNReady.
Science	The science subtest of the ACT does not assess specific understanding or comprehension of scientific topics (e.g., biology, chemistry, physics, etc.). 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, English language arts, science, and social studies.

6. Are the state standards aligned to ACT expectations?

The ACT standards are encompassed within the Tennessee Academic Standards, 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 and accurately answer a wide variety of surface-level math questions, many of which are grounded in the computational and procedural fluency expectations embedded in the Tennessee math standards. By stressing conceptual understanding at all levels, the Tennessee math standards are designed to prepare students not only to master this wide array of mathematical skills but also to retain conceptual knowledge from year to year.

English language arts:

The skills of the ACT English and reading subtests 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 the ELA 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 and across all content areas.

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

Yes, 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. Districts can find this information in their TVASS portal.

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

TNReady assesses a student's deep understanding of the 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. TNReady is necessary to measure mastery of more specific skills related to a specific grade level and measure progress within a subject, guide instruction, provide information for course/grade placement, and provide appropriate remediation/enrichment opportunities for students. In other words, TNReady measures *depth* of knowledge, while the ACT measures *breadth* of knowledge.

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. The best way teachers can prepare students for both TNReady and the ACT is 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 designed differently; TNReady tests depth, while 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 second 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 Test

Connections with Tennessee Academic Standards

Questions & Answers

1. ***What determines student success on the ACT English subtest?***
   The skills measured on the ACT English subtest extend across grade levels. Students begin studying the foundational rules of usage, punctuation, and sentence composition in the early grades. In the upper grades, students hone these skills as they compose sentences and paragraphs with more complex structures to convey more sophisticated ideas. Students' ability to manipulate language for different purposes, audiences, and styles is crucial for communicating their ideas effectively.

2. ***Did you know that the ACT has separate sections for English and reading?***
   The ACT assesses English and reading separately. The English section consists of five essays or passages, each of which is accompanied by a sequence of multiple-choice questions that ask students to revise or edit the passage as needed, measuring their mastery of usage, mechanics, and rhetorical skills. The reading subtest blends text from four major disciplines and measures students' ability to read closely, discern key ideas, analyze craft and structure, and integrate information.

3. ***How many major topics and skills does the ACT English subtest cover?***
   The English subtest is a 45-minute test with 75 questions divided into three major categories: Production of Writing (e.g., organization, cohesion, and topic focus), Knowledge of Language (e.g., rhetoric and style), and Conventions of Standard English Grammar (e.g., sentence structure, usage conventions, punctuation conventions)**.**

4. ***When should we begin preparing students for the ACT English subtest?***
   Early grades are incredibly important to a student's academic journey. In the elementary grades, students learn the foundational rules of usage and mechanics. In fact, many of the ACT benchmark standards for English are aligned to Tennessee Academic Standards found in the elementary grade levels. For example, the English benchmark standard *USG 302 Ensure straightforward subject-verb agreement* is aligned with a Tennessee standard found in grade 3 (*3.FL.SC.6f Ensure subject-verb and pronoun-antecedent agreement*).

Please note: This document is intended to highlight connections between the Tennessee Academic Standards and the ACT College and Career Readiness Standards, but it is **not** an exhaustive document that details every standard or every connection.

Many of the ACT standards are aligned to the Tennessee cornerstone standards, which spiral through each grade level. Instead of listing every applicable standard, this document may list the cornerstone standard, when appropriate, or a single grade-level standard as an example. For instance, the skill assessed in the ACT standard *SST 201 Determine the need for punctuation or conjunctions to join simple clauses* is encompassed within the Tennessee cornerstone standard *L.CSE.1 Demonstrate command of the conventions of standard English grammar and usage when speaking and conventions of standard English grammar and usage, including capitalization and punctuation, when writing.* However, the skill is also referenced specifically in a grade 4 standard (*4.Fl.SC.6 Use commas before coordinating conjunction in a compound sentence)*.

While the Tennessee Academic Standards for English Language Arts are organized by strand and grade level, the ACT College and Career Readiness Standards are organized by reporting category and score range.

ACT Score Range	ACT Standard Coding
13–15	200
16–19*	300
20–23	400
24–27	500
28–32	600
33–36	700

**The benchmark score for the ACT English subtest is 18. Many of the ACT English benchmark standards can be found in the Tennessee Foundational Literacy and Writing standards for grades K–5.*

Grades K–5, English

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades K–5?*
Production of Writing 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; judging the relevance of statements in context; organizing ideas; and choosing effective opening, transitional, and closing sentences.	**TOD 301** Delete material because it is obviously irrelevant in terms of the topic of the essay. **ORG 201** Determine the need for transition words or phrases to establish time relationships in simple narrative essays (e.g., *then, this time).* **ORG 405** Rearrange the sentences in a straightforward paragraph for the sake of logic.	**2.FL.SC.6f** Produce, expand, and rearrange simple and compound sentences. **3.W.TTP.2c, 4.W.TTP.2d, 5.W.TTP.5c*** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. **3.W.TTP.2e** Use linking words and phrases to connect ideas within and across categories of information. **4.W.TTP.2f** Link ideas within categories of information using words and phrases. **5.W.TTP.2e** Link ideas within and across categories of information using words, phrases, and clauses. **3.W.PDW.5, 4.W.PDW.5, 5.W.PDW.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. **The ACT standards are written from the perspective of a selected-response assessment (i.e., recognizing errors embedded in text and correcting them). The Tennessee Academic Standards are written with an instructional focus on producing an authentic product (e.g., writing an essay). Although students do not compose a written response on the ACT English subtest, the skills they have developed through the Tennessee writing standards will help them in selecting the appropriate corrections or revisions on the English subtest.*	• Have students regularly write informal and formal responses to literary and informational text to gain writing fluency. • Have students reread their drafts and check that their ideas are communicated clearly. • Take a model 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 model essay with missing words and phrases. Have students work in pairs to provide the most appropriate transitional words and phrases. • Give students a paragraph with one or more unrelated sentences. Have students work in pairs to determine which sentence(s) is irrelevant and should be omitted from the paragraph. • Give students a paragraph and/or paragraphs from an authentic student response. Have students work in pairs to determine which edits need to be made in to improve the writing for clarity. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

Knowledge of Language Questions in this category test how well students choose 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 pronoun references, wordiness, and redundancy.	**KLA 403** Determine the need for conjunctions to create straightforward logical links between clauses. **KLA 404** Use the word or phrase most appropriate in terms of the content of the sentence when the vocabulary is relatively common.	**3.FL.VA.7c** Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and time relationships. **4.FL.VA.7c** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being and that are basic to a particular topic. **5.FL.VA.7c** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships. **5.FL.SC.6e** Use correlative conjunctions.	□ Provide students with a paragraph containing only simple sentences. Have students work in pairs to combine the sentences into compound and complex sentences by adding appropriate conjunctions. □ Try out different words in a draft; discuss the words' connotations and effect on meaning. □ Begin building capacity for conjunctions as transitional terms. Use the anchors of "and," "but," and "so" to begin charting synonyms more commonly used as transitional terms. □ Build students' academic vocabulary by presenting them with content-rich complex texts.

Conventions of Standard English Grammar, Usage, and Punctuation Questions in the sentence structure and formation subcategory assess students' understanding of relationships between and among clauses, placement of modifiers, and shifts in construction. Questions in the usage conventions subcategory assess 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. Questions in the punctuation conventions subcategory assess 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).	**SST 201** Determine the need for punctuation or conjunctions to join simple clauses. **SST 202** Recognize and correct inappropriate shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences. **SST 301** Determine the need for punctuation or conjunctions to correct awkward-sounding fragments and fused sentences. **USG 201** Form the past tense and past participle of irregular but commonly used verbs. **USG 202** Form comparative and superlative adjectives. **USG 302** Ensure straightforward subject-verb agreement. **USG 303** Ensure straightforward pronoun-antecedent agreement. **PUN 302** Use appropriate punctuation in straightforward situations (e.g., simple items in a series). **PUN 404** Delete apostrophes used incorrectly to form plural nouns.	**1.FL.SC.6l** Use commas in dates and to separate single words in a series. **2.FL.SC.6d** Form and use the past tense of frequently occurring irregular verbs. **2.FL.SC.6g** Use common coordinating conjunctions. **3.FL.SC.6b** Form and use regular and irregular plural nouns. **3.FL.SC.6d** Form and use regular and irregular verbs. **3.FL.CS.6f** Ensure subject-verb agreement and pronoun-antecedent agreement.* **3.FL.SC.6g** Form and use comparative and superlative adjectives and adverbs correctly. **4.FL.SC.6e** Produce complete sentences; recognize and correct inappropriate fragments and run-ons.**** **4.FL.SC.6h** Use a comma before a coordinating conjunction in a compound sentence. **5.FL.SC.6** Recognize and correct inappropriate shifts in verb tense. **These standards are reinforced in the upper grade levels as sentence structure becomes increasingly complex.*	• When reading, have students highlight the author's correct use of agreement, verb tense, adjectives, conjunctions, and punctuation. • In a writers' workshop, have students rewrite a short piece in different tenses (i.e., rewrite a piece in present tense in past and in future tense) and discuss the difference in the message. • During an editing workshop, have students look for errors in agreement, verb tenses, run-ons, or fragments. • Differentiate student feedback by focusing on specific usage and punctuation errors at different points throughout the year. • Create an anchor chart with examples of common incorrect grammar, usage, and/or punctuation. Send students on a "scavenger hunt" to find incorrect uses in everyday experiences (e.g., signs, advertisements, etc.). Invite students to contribute to the list with their observations.

Grades 6–8, English

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 6-8?*
Production of Writing 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; judging the relevance of statements in context; organizing ideas; and choosing effective opening, transitional, and closing sentences.	**TOD 501** Determine the relevance of material in terms of the focus of the paragraph. **ORG 401** Determine the need for transition words or phrases to establish straightforward logical relationships. **ORG 403** Provide an introduction to a straightforward paragraph. **ORG 302** Provide a simple conclusion to a paragraph or essay **ORG 505** Rearrange the paragraphs in an essay for the sake of logic.	**6.W.TTP.2a, 7.W.TTP.2a, 8.W.TTP.2a*** Introduce a topic clearly, using the introduction to prepare the reader for what is to follow. **6.W.TTP.2b, 7.W.TTP.2b** Organize ideas, concepts, and information using effective strategies to create cohesion and aid in comprehension. **8.W.TTP.2b** Synthesize and organize ideas, concepts, and information into broader categories using effective strategies to create cohesion and aid in comprehension. **6.W.TTP.2c, 7.W.TTP.2c, 8.W.TTP.2c** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples. **6.W.TTP.2e, 7.W.TTP.2e, 8.W.TTP.2e** Craft an effective and relevant conclusion. **6.W.TTP.2g, 7.W.TTP.2g** Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts. **8.W.TTP.2g** Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. **6.W.PDW.5, 7.W.PDW.5, 8.W.PDW.5** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing, or trying a new approach.	□ Have students routinely write informal and formal responses to literary and informational text to strengthen writing fluency. □ Give students an authentic student essay. Have students work in teams to evaluate the relevance of the information presented. Where material is deemed irrelevant, have students provide suggestions for revisions. □ Recognize and experiment with sophisticated organizational structures (problem/solution, cause/effect, etc.). □ Take a model essay and cut it into paragraphs or sentences. Have students work in teams to organize the essay logically. □ Give students a model essay with missing words and phrases. Have students work in pairs to provide the most appropriate transitional words and phrases. □ During a writing workshop, have students focus on improving their introduction and conclusion in an essay through constructive feedback from teachers and peers.

Knowledge of Language Questions in this category test how well students choose 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 pronoun references, wordiness, and redundancy.	**KLA 402** Revise expressions that deviate from the style and tone of the essay. **KLA 501** Revise vague, clumsy, and confusing writing. **KLA 505** Use the word or phrase most appropriate in terms of the content of the sentence when the vocabulary is uncommon.	**6.L.KL.3** When writing and speaking, vary sentence patterns for meaning, reader/listener interest, and style; maintain consistency in style and tone. **7.L.KL.3** When writing and speaking, choose precise language to express ideas concisely. **8.L.KL.3** When writing and speaking, adjust style and tone to a variety of contexts; when reading or listening, analyze stylistic choices to determine context. **6.L.VAU.6, 7.L.VAU.6, 8.L.VAU.6** Acquire and accurately use grade-appropriate general academic and domain-specific words and phrases; develop vocabulary knowledge when considering a word or phrase important to comprehension or expression.	□ Have students discuss the author's purpose and audience when reading a mentor text. □ Have students identify their own audience and purpose when writing, and then write with a tone that fits that audience and purpose. □ Discuss what makes some writing "wordy" and the difference between repetition for emphasis and repetition that is redundant. □ Provide students with authentic student work. Challenge them to revise the essay for concision without oversimplifying or altering the writer's original ideas. □ Try out different words in a draft; discuss the words' connotations and effect on the draft's style and tone. □ Build students' academic vocabulary by presenting them with content-rich complex texts.

Conventions of Standard English Grammar, Usage, and Punctuation Questions in the sentence structure and formation subcategory assess students' understanding of relationships between and among clauses, placement of modifiers, and shifts in construction. Questions in the usage conventions subcategory assess 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. Questions in the punctuation conventions subcategory assess 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).	**SST 301** Recognize and correct inappropriate shifts in verb tense and voice when the meaning of the entire sentence must be considered. **SST 401** Recognize and correct marked disturbances in sentence structure. **SST 602** Maintain consistent and logical verb tense and voice and pronoun person on the basis of the paragraph or essay as a whole. **USG 503** Recognize and correct vague and ambiguous pronouns. **PUN 401** Delete commas when an incorrect understanding of the sentence suggests a pause that should be punctuated. **PUN 404** Use commas to set off parenthetical elements.	**6.L.CSE.1b** When writing or speaking, use pronouns (case, intensive pronouns, pronoun-antecedent agreement) effectively. **6.L.CSE.2** When reading or writing, explain the functions of commas, parentheses, and dashes to set off parenthetical elements and use them correctly to do so. **7.L.CSE.1b** When writing or speaking, produce simple, compound, and complex sentences with effectively-placed modifiers. **8.L.CSE.1d** When reading or listening, explain the function of the voice (active and passive) and the mood of a verb and its application in text. **8.L.CSE.2** When reading and writing, explain the functions of punctuation in creating sentence variety and style.	• When reading, discuss the author's correct use of agreement, verb tense, and commas. • Have students focus on revising misplaced modifiers and unclear pronoun references in an editing workshop. • Differentiate student feedback by focusing on specific usage and punctuation errors at different points throughout the year. • Have students record a peer's retelling of a story and then type up the story using correct punctuation. • Have students work with peers to create a punctuation handbook for younger students' use, utilizing examples from their own drafts. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

Grades 9–12, English

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 9-12?*
Production of Writing 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; judging the relevance of statements in context; organizing ideas; and choosing effective opening, transitional, and closing sentences.	**TOD 601** Determine relevance when considering material that is plausible but potentially irrelevant at a given point in the essay. **TOD 703** Use a word, phrase or sentence to accomplish a subtle purpose. **ORG 702** Provide a sophisticated introduction or conclusion to or transition within a paragraph or essay, basing decision on a thorough understanding of the paragraph and essay.	**9-10.W.TTP.2a, 11-12.W.TTP.2a** Provide an introduction that is relevant to the rest of the text and effectively engages the audience. **9-1.W.TTP.2c** Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. **11-12.W.TTP.2c** Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. **9-10.W.TTP.2e, 11-12.W.TTP.2e** Provide a concluding statement or section that follows from and supports the information or explanation presented. **9-10.W.PDW.5, 11-12.W.PDW.5** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	• Have students regularly write informal and formal, on-demand and extended research responses to literary and informational text to broaden and strengthen their writing fluency. • When reading mentor texts, have students evaluate the relevance of the author's use of evidence and validity of reasoning. • When reading mentor texts, have students analyze rhetorical strategies. • Have students rewrite essays to adjust for a new audience or purpose. • Discuss how the tone, meaning, or purpose of a sentence changes when a single word or phrase is altered. □ During a writing workshop, have students focus on improving their introduction and conclusion in an essay through constructive feedback from the teacher and peers. □ Have students engage in regular peer-editing workshops.

Knowledge of Language Questions in this category test how well students choose 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 pronoun references, wordiness, and redundancy.	**KLA 601** Revise vague, clumsy, and consuming writing involving sophisticated language. **KLA 702** Use the word or phrase most appropriate in terms of the content of the sentence when the vocabulary is sophisticated.	**9-10.L.KL.3, 11-12.L.KL.3** **Cornerstone:** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. **9-10.L.VAU.6, 11-12.L.VAU.6** **Cornerstone**: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the postsecondary and workforce level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	• During a writers' workshop, focus on revising for precision and concision. • Select mentor texts that are rich in interesting word choice. Have students write a response to a text, mirroring the tone or mood of the original mentor text. □ Build students' academic vocabulary by presenting them with content-rich complex texts.

Conventions of Standard English Grammar, Usage, and Punctuation Questions in the sentence structure and formation subcategory assess students' understanding of relationships between and among clauses, placement of modifiers, and shifts in construction. Questions in the usage conventions subcategory assess 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. Questions in the punctuation conventions subcategory assess 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).	**SST 601** Recognize and correct subtle disturbances in sentence structure (e.g., weak conjunctions between independent clauses, run-ons that would be acceptable in conversational English, lack of parallelism within a complex series of phrases or clauses). **PUN 501** Delete commas in long or involved sentences when an incorrect understanding of the sentence suggests a pause that should be punctuated. **PUN 601** Use commas to avoid ambiguity when the syntax or language is sophisticated. **PUN 604** Use a semicolon to link closely related independent clauses. **PUN 702** Use a colon to introduce an example or elaboration.	**9-10.L.CSE.1** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking; use effective parallel structure and various types of phrases and clauses to convey specific meaning and add variety and interest to writing or presentations. **9-10.L.CSE.2** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing; when reading and writing; explain the functions of semicolons and colons to separate related ideas and use them correctly to do so; write and edit work so that it conforms to a style guide appropriate for the discipline and writing type. **11-12.L.CSE.1** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking; consider complex and contested matters of usage and convention. **11-12.L.CSE.2** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing; when reading and writing, use knowledge of punctuation to enhance sentence style to support the content of the sentence; write and edit work so that it conforms to a style guide appropriate for the discipline and writing type.	• When reading, discuss the author's effective use of parallelism and stylistic punctuation. • During an editing workshop, have students look for examples of ineffective style and make suggestions for revisions. • Differentiate student feedback by focusing on specific usage and punctuation errors at different points throughout the year. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

ACT Reading Test

Connections with Tennessee Academic Standards

Questions & Answers

1. ***What determines student success on the ACT reading subtest?***
   The **biggest** differentiation of success on the ACT reading subtest 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 committed 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 are nonfiction/informational texts?***
   Passages are on topics in social studies, natural sciences, the humanities (fine arts, philosophy), and literary narrative (including prose fiction). This does not mean that 75 percent of instructional time should be 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 *across* content areas in *all* grade levels. Reading should be fostered in all core and elective courses.

3. ***Are students asked to bring prior knowledge to the ACT reading subtest?***
   No, students are not asked to bring any prior knowledge of any specific subject to the reading subtest of the ACT. Students are asked to read text independently and proficiently on grade level. In fact, much of the text on the ACT is complex and will require close, careful reading to determine the correct answer to questions.

4. ***When should we begin preparing students for the ACT reading subtest?***
   Beginning in kindergarten, the Tennessee Academic Standards expect students to interact with complex texts to discern meaning, ask questions, make inferences, synthesize information, and generate new ideas.

Please note: This document is intended to highlight connections between the Tennessee Academic Standards and the ACT College and Career Readiness Standards, but it is **not** an exhaustive document that details every standard or every connection. Many of the ACT standards are aligned to the Tennessee cornerstone standards, which spiral through each grade level. Instead of listing every connection, this document may list the cornerstone standard or a single grade-level standard as an example.

For example, the ACT standard *PPV 501 Infer a purpose in a passage and how that purpose shapes content and style* is aligned to the Tennessee cornerstone *R.CS.6 Assess how point of view or purpose shapes the content and style of a text*. This cornerstone applies to both literary and informational texts as well as multiple grade levels. In this case, only one example connection may be given (e.g., *8.RI.CS.6 Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints*), though others may apply.

While the Tennessee Academic Standards for English Language Arts are organized by strand and grade level, the ACT College and Career Readiness Standards are organized by reporting category and score range.

ACT Score Range	ACT Standard Coding
13–15	200
16–19	300
20–23*	400
24–27	500
28–32	600
33–36	700

**The benchmark score for the ACT Reading subtest is 22. Many of the skills found in the ACT Reading benchmark standards are first introduced in the Tennessee reading standards for grades K-5. In the middle grades, students strengthen this reading foundation and build stamina as they encounter increasingly complex texts. In high school, the standards focus on students' ability to recognize archetypal patterns, nuances of language, and inter-textual connections.*

Grades K–5, Reading

Reading Reporting Categories	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades K-5?*
Key Ideas and Details Questions in this category test students' ability to read texts closely to determine central ideas and themes; summarize information and ideas accurately; understand relationships; and draw logical inferences and conclusions.	**CLR 302** Draw simple logical conclusions in somewhat challenging passages. **IDT 402** Identify a clear central idea or theme in somewhat challenging passages or their paragraphs. **IDT 403** Summarize key supporting ideas and details in somewhat challenging passages. **REL 301** Identify clear comparative relationships between main characters in somewhat challenging literary narratives. **REL 403** Identify clear cause-effect relationships in somewhat challenging passages.	**3.R.KID.1, 4.R.KID.1, 5.R.KID.1 Cornerstone**: Read closely to determine what a text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. **3.R.KID.2, 4.R.KID.2, 5.R.KID.2 Cornerstone:** Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. **3.RI.KID.3** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect**.** **4.RI.KID.3** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in a text. **5.RL.KID.3** Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in a text.	● Read relevant and interesting literary texts (e.g., short stories, novels, memoirs, poems, and personal essays) that are quantitatively and qualitatively complex. ● Read relevant and interesting informational texts about social sciences, natural sciences, and humanities that are quantitatively and qualitatively complex. ● Ask text-dependent questions that require a close, careful reading of the text. □ Encourage active reading with text markers and annotations. ● Ask students to find evidence in a text by paying attention to specific details in text that help develop the main idea. ● Ask students to visualize characters, settings, or events and sketch relevant and challenging scenes with details from the text. ● Ask students to search for patterns or clues that indicate cause-effect relationships. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

Craft and Structure Questions in this category test students' ability to determine the meaning of words and phrases; analyze author's word choice; analyze text structure; and analyze the author's purpose and perspective.	**WME 301** Analyze how the choice of a specific word or phrase shapes meaning or tone in somewhat challenging passages when the effect is simple. **WME 302** Interpret basic figurative language as it is used in a passage. **TST 404** Analyze the overall structure of somewhat challenging passages **PPV 401** Identify a clear purpose of somewhat challenging passages and how that purpose shapes content and style. **PPV 402** Understand point of view in somewhat challenging passages.	**3.R.CS.4, 4.R.CS.4, 5.R.CS.4 Cornerstone**: Interpret words and phrases as they are used in a text, including technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. **3.RI.CS.6** Distinguish reader point of view from that of an author of a text. **4.RI.CS.5** Describe the overall structure of events, ideas, and concepts of information in a text or part of a text. **5.RL.CS.6** Describe how a narrator's or speaker's point of view influences how events are described.	• Work with students to build vocabulary and word knowledge, including Tier II vocabulary, through building an understanding of how to use context clues. • Help students build Tier III vocabulary through word study and reading several texts on the same topic or idea. • Help students to differentiate between denotative and connotative meanings of words in complex texts. • Have students explore how an author's or narrator's word choice can shape meaning and affect readers' understanding. • Have students examine the organization patterns used by the author of a text. • Provide examples of one event or topic from the perspective of two different narrators or authors.

Integration of Knowledge and Ideas Questions in this category test students' ability to evaluate authors' claims, differentiate between facts and opinions, and use evidence to make connections between different texts that are related by topic.	**ARG 201** Analyze how one or more sentences in somewhat challenging passages offer reasons for or support a claim. **SYN 301** Make straightforward comparisons between two passages. **SYN 501** Draw logical conclusions using information from two informational texts.	**3.RI.IKI.9** Compare and contrast the most important points and key details presented in two texts on the same topic. **4.RI.IKI.8** Explain how an author uses reasons and evidence to support particular points in a text. **4.RI.IKI.9** Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. **5.RI.IKI.8** Explain how an author uses reasons and evidence to support points in a text, identifying which reasons and evidence support which points. **5.RL.IKI.9** Compare and contrast stories in the same genre on their approaches to similar themes and topics.	• Have students read a traditional fairy tale or fable and compare it to one written by another author, particularly one that is derived from the original source. • Use selections from literary texts to supplement informational units; for instance, when studying U.S. history, read an excerpt of a literary text set in the same time period. • Use text in science and social studies instruction. • Build student knowledge through a deep exploration of one topic.

Grades 6–8, Reading

Reading Reporting Categories	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 6-8?*
Key Ideas and Details Questions in this category test students' ability to read texts closely to determine central ideas and themes; summarize information and ideas accurately; understand relationships; and draw logical inferences and conclusions.	**CLR 402** Draw logical conclusions in somewhat challenging passages. **IDT 501** Infer a central idea or theme in somewhat challenging passages or their paragraphs. **IDT 503** Summarize key supporting ideas and details in more challenging passages. **REL 502** Understand implied or subtly stated comparative relationships in somewhat challenging passages. **REL 504** Understand implied or subtly stated cause-effect relationships in somewhat challenging passages.	**6.R.KID.1, 7.R.KID.1, 8.R.KID.1 Cornerstone**: Read closely to determine what a text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. **6.R.KID.2, 7.R.KID.2, 8.R.KID.2 Cornerstone:** Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. **7.RI.KID.3** Analyze the relationships and interactions among individuals, events, and/or ideas in a text.	• Read relevant and interesting literary texts (e.g., short stories, novels, memoirs, poems, and personal essays) that are appropriately quantitatively and qualitatively complex. • Read relevant and interesting informational text about the social sciences, natural sciences, and humanities that are quantitatively and qualitatively complex. • 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. □ Encourage active reading with text markers and annotations. □ Ask students to trace character development through literature by looking for specific places in the text that highlight how the characters change. □ Ask students to examine events in text to determine the primary cause(s) and final outcome(s). **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

Craft and Structure Questions in this category test students' ability to determine the meaning of words and phrases; analyze the author's word choice; analyze text structure; and analyze the author's purpose and perspective.	**WME 401** Analyze how the choice of a specific word or phrase shapes meaning or tone in somewhat challenging passages. **WME 402** Interpret most words and phrases as they are used in somewhat challenging passages, including determining technical, connotative, and figurative meanings. **TST 401** Analyze how one or more sentences in somewhat challenging passages relate to the whole passage. **TST 505** Analyze the overall structure of more challenging passages. **PPV 501** Infer a purpose in somewhat challenging passages and how that purpose shapes content and style.	**6.R.CS.4, 7.R.CS.4, 8.R.CS.4** **Cornerstone:** Interpret words and phrases as they are used in a text, including technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. **6.RL.CS.5** Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot. **7.RI.CS.5** Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas. **8.RI.CS.6** Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.	• Work with students to build vocabulary and word knowledge, including Tier II vocabulary, through building an understanding of how to use context clues. • Help students build Tier III vocabulary through word study and reading several texts on the same topic or idea. • Have students predict how changes to the wording of a text might convey a different tone or attitude. • Provide examples of text where structure contributes to meaning: For example, have students read a graphic novel and contrast its structure and its impact on meaning to the structure of a traditional text about the same event or topic. • Have students analyze the relationship between an author's or narrator's intended message and the rhetorical devices used to convey that message. • Have students search for clues in a text that convey the author's or narrator's point of view.

Integration of Knowledge and Ideas Questions in this category test students' ability to evaluate authors' claims, differentiate between facts and opinions, and use evidence to make connections between different texts that are related by topic.	**ARG 501** Analyze how one or more sentences in more challenging passages offer reasons for or support a claim. **ARG 502** Infer a central claim in somewhat challenging passages. **SYN 401** Draw logical conclusions using information from two literary narratives. **SYN 501** Draw logical conclusions using information from two informational texts.	**6.RI.IKI.8** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. **6.RL.IKI.9** Compare and contrast texts in different forms or genres in terms of their approaches to similar themes and topics. **7.RI.IKI.8** Trace and evaluate the argument and specific claims in a text, assessing whether the evidence is relevant and sufficient to support the claims. **7.RI.IKI.9** Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing an alternate explanation of events. **8.RI.IKI.8** Delineate and evaluate the argument and specific claims in a text, assessing whether evidence is relevant and sufficient to support the claims and the reasoning is sound.	• Use text in science and social studies instruction. • Have students defend or challenge an author's assertions by locating several key pieces of evidence in a text. • Build student knowledge through reading multiple texts on the same topic and asking students to synthesize information across the texts. • Use selections from literary nonfiction to supplement informational units; for instance, when studying the Great Depression, read an excerpt of a memoir from the same time period.

Grades 9–12, Reading

Reading Reporting Categories	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 9-12?*
Key Ideas and Details Questions in this category test students' ability to read texts closely to determine central ideas and themes; summarize information and ideas accurately; understand relationships; and draw logical inferences and conclusions.	**CLR 603** Draw subtle logical conclusions in more challenging passages. **IDT 701** Identify or infer a central idea or theme in complex passages or their paragraphs. **IDT 602** Summarize key supporting ideas and details in complex passages. **REL 702** Understand implied or subtly stated comparative relationships in complex passages. **REL 704** Understand implied or subtly stated cause-effect relationships in complex passages.	**9-10.R.KID.1, 11-12.R.KID.1 Cornerstone:** Read closely to determine what a text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. **9-10.R.KID.2, 11-12.R.KID.2 Cornerstone:** Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. **11-12.RI.KID.3** Analyze how an author's choices regarding the ordering of ideas and events, the introduction and development of ideas, and connections among ideas impact meaning.	• Read relevant and interesting literary texts (e.g., short stories, novels, memoirs, poems, and personal essays) that are quantitatively and qualitatively complex. • Read relevant and interesting informational text about the social sciences, natural sciences, and humanities that is quantitatively and qualitatively complex. • Use text in science and social studies instruction. • 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. • Encourage active reading through the use of text markers and annotations. • Have students analyze subtle relationships between and among people, objects, events, and ideas in complex texts. • Have students identify implications and possible consequences of actions in complex texts.

Craft and Structure Questions in this category test students' ability to determine the meaning of words and phrases; analyze the author's word choice; analyze text structure; and analyze the author's purpose and perspective.	**WME 701** Analyze how the choice of a specific word or phrase shapes meaning or tone in passages when the effect is subtle or complex. **WME 702** Interpret words and phrases as they are used in complex passages, including determining technical, connotative, and figurative meanings. **TST 601** Analyze how one or more sentences in complex passages relate to the whole passage. **TST 602** Infer the function of paragraphs in more challenging passages. **TST 603** Analyze the overall structure of complex passages. **PPV 701** Identify or infer a purpose in complex passages and how that purpose shapes content and style.	**9-10.R.CS.4, 11-12.R.CS.4 Cornerstone:** Interpret words and phrases as they are used in a text, including technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. **9-10.RI.CS.5** Analyze how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text. **9-10.RL.CS.6** Analyze how point of view and/or author purpose shapes the content and style of diverse texts. **11-12.RL.CS.5** Analyze how an author's choices concerning the structure of specific parts of a text contribute to its overall structure, meaning, and aesthetic impact. **11-12.RI.CS.6** Determine an author's point of view and/or purpose in a text, analyzing how style and content contribute to its effectiveness.	• 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. • Have students predict how changes to the wording of a text might convey a different tone or attitude. • Have students explain how some sentence constructions (e.g., using parallel structures, many or no conjunctions, purposeful repetition) affect the meaning of the text. • Have students analyze the relationship between an author's or narrator's intended message and the rhetorical devices used to convey that message. • Have students search for subtle evidence in a text that conveys the author's or narrator's point of view.

Integration of Knowledge and Ideas Questions in this category test students' ability to evaluate authors' claims, differentiate between facts and opinions, and use evidence to make connections between different texts that are related by topic.	**ARG 701** Analyze how one or more sentences in passages offer reasons for or support a claim when the relationship is subtle or complex. **SYN 401** Draw logical conclusions using information from two literary narratives. **SYN 501** Draw logical conclusions using information from two informational texts.	**9-10.RI.IKI.8** Evaluate how reasoning and evidence affects the argument and specific claims in a text. **11-12.RI.IKI.8** Evaluate how an author incorporates evidence and reasoning to support the argument and specific claims in a text. **9-10.RL.IKI.9** Analyze a variety of related literary texts and evaluate how an author draws on, alludes to, or transforms source material to provide a deeper and more thorough interpretation of the text. **11-12.RI.IKI.9** Analyze and evaluate a variety of thematically-related texts of historical and literary significance for their topics, facts, purposes, and rhetorical features.	• Build student knowledge through reading multiple texts on the same topic and asking students to synthesize information across the texts. • Encourage students to conduct research on topics of personal interest that require reading of complex informational text. • Use selections from literature and literary nonfiction to supplement informational units; for instance, when studying the Holocaust, include an excerpt from a personal memoir from the same time period or a literary text set in the same time period. • Have students analyze details in a complex text in order to verify or contradict a specific point or claim made by an author. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

ACT Writing Test

Connections with Tennessee Academic Standards

Questions & Answers

1. ***What determines student success on the ACT writing test?***
   The ability to communicate effectively is one of the most important skills students must master for college and career readiness. The ACT writing test measures the writing skills taught in high school English classes and entry-level college composition courses. Students must take a clear position on an issue; support that position with focused ideas, meaningful examples, and sound reasoning; and explain the significance of their ideas in the broader context of the issue. Student writing is measured on a four-trait rubric: ideas and analysis, development and support, organization, and language and conventions.

2. ***How are TNReady and the ACT writing test similar? How are they different?***
   TNReady for grades 4–11 assesses three modes of writing: narrative, explanatory/informational, and argumentative. On TNReady, students are given 1–3 passages to read, 3–5 multiple-choice items to guide their thinking, and a text-based writing prompt. Depending on grade level, students have 75–85 minutes to complete the writing subpart of TNReady. The writing subpart is **required** for TNReady.

   ACT assesses only argumentative writing. No authentic stimulus text is provided; instead, students are presented with three different perspectives on a contemporary issue. Students are asked to analyze the perspectives and write an essay explaining their own position. Students are given 40 minutes to plan and write their essay. The writing test is **optional** for ACT.

3. ***Are students asked to bring prior knowledge to the ACT writing test?***
   Because the ACT does not provide a stimulus text, students must use general background knowledge of the issue and critical thinking skills to develop their position and ideas. On the writing subpart of TNReady, students are given 1–3 complex texts and are tasked with writing a response to a text-based prompt using evidence from the passage(s). No background knowledge is required.

4. ***When and how should we begin preparing students for the ACT writing test?***
   Teaching the depth and breadth of the Tennessee Academic Standards and building knowledge through content-rich texts at all grade levels will prepare students to be successful on the ACT writing test.

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

While the Tennessee Academic Standards for English Language Arts are organized by strand and grade level, the ACT College and Career Readiness Standards are organized by reporting category and score range. The ACT writing test is scored on a 12-point rubric. The TNReady writing subpart is scored on a 16-point rubric.

ACT Writing Score Range	ACT Writing Standard Coding
3–4	200
5–6	300
7–8	400
9–10	500
11–12	600

Grades K–5, Writing

Writing Reporting Categories	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades K–5? *
Ideas and Analysis Scores in this domain reflect the ability to generate productive ideas and engage critically with multiple perspectives on the given issue. Competent writers understand the issue they are invited to address, the purpose for writing, and the audience. They generate ideas that are relevant to the situation.	**EXJ 301** Show a basic understanding of the persuasive purpose of the task by taking a position on the issue in the prompt.	**2.W.TTP.1** Write opinion pieces on topics or texts. **3.W.TTP.1** Write opinion pieces on topics or texts, supporting a point of view with reasons. **4.W.TTP.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information. **5.W.TTP.1** Write opinion pieces on topics or texts, supporting a point of view with reasons and information.	• Have students discuss the goal of a persuasive essay with a partner. • Have students identify a local community or school issue; phrase the issue in the form of a question; and experiment with ways to clearly answer that question. • Have students generate a list of reasons that would support a position; decide which of those reasons are most relevant to the overall argument; explain how the reasons were chosen and why they are relevant. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*
Development and Support Scores in this domain reflect the ability to discuss ideas, offer rationale, and bolster an argument. Competent writers explain and explore their ideas, discuss implications, and illustrate through examples. They help the reader understand their thinking about the issue.	**DEV 401** Provide adequate development in support of ideas; clarify ideas by using some specific reasons, details, and examples.	**2.W.TTP.1c** Supply reasons to support the opinion. **3.W.TTP.1b**. Develop an opinion with reasons that support the opinion. **4.W.TTP.1b** Develop an opinion with reasons that are supported by facts and details. **5.W.TTP.1b** Develop an opinion through logically-ordered reasons that are supported by facts and details.	• Provide students with model paragraphs and have them work in teams to analyze the topic sentences and identify how the idea in each topic sentence is explained by the rest of the sentences in that paragraph. • Provide students with a model essay to discuss how the supporting details help to clarify the main idea. • Have students use prewriting strategies to explain or illustrate ideas.

Organization Scores in this domain reflect the ability to organize ideas with clarity and purpose. Organizational choices are integral to effective writing. Competent writers arrange their essay in a way that clearly shows the relationships between ideas, and they guide the reader through their discussion.	**ORI 401** Provide an adequate but simple organizational structure by logically grouping most ideas. **ORI 402** Use some appropriate transitional words and phrases **ORI 403** Present a somewhat developed introduction and conclusion.	**2.W.TTP.1a, 3.W.TTP.1a, 4.W.TTP.1a, 5.W.TTP.2a** Introduce topic or text. **2.W.TTP.1d** Use linking words to connect the reasons to the opinion. **2.W.TTP.1e, 3.W.TTP.1d** Provide a concluding statement or section. **3.W.TTP.1c** Create an organizational structure that lists supporting reasons. **3.W.TTP.1e**. Use linking words and phrases to connect opinion and reasons. **4.W.TTP.1c**. Create an organizational structure in which related ideas are grouped to support the writer's purpose. **4.W.TTP.1d**, **5.W.TTP.1d** Provide a concluding statement or section related to the opinion presented. **4.W.TTP.1e**. Link opinion and reasons using words and phrases. **5.W.TTP.1c** Create an organizational structure in which ideas are logically grouped to support the writer's purpose. **5.W.TTP.1e** Link opinion and reasons using words, phrases, and clauses.	• Have students use clustering, concept mapping, or another visual organizer to identify relationships among ideas. • Have students create a list of transitional words and discuss when and where to use them. • Have students analyze introductions and conclusions of model essays, paying careful attention to their structure and function.

Language and Conventions Scores in this domain reflect the ability to use written language to convey arguments with clarity. Competent writers make use of the conventions of grammar, syntax, word usage, and mechanics. They are also aware of their audience and adjust the style and tone of their writing to communicate effectively.	**USL 401** Show adequate use of language to communicate by: ● correctly employing many of the conventions of standard English grammar, usage, and mechanics ● choosing words that are appropriate	**3.W.TTP.1f, 4.W.TTP.1f, 5.W.TTP.1f** Apply language standards addressed in the Foundational Literacy standards. **3.FL.VA.7c** Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and time relationships. **4.FL.VA.7c** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being and that are basic to a particular topic. **5.FL.VA.7c** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships.	• Have students routinely write informal entries in a journal. • Have students read model essays, noting their use of language. • Have students practice peer editing to identify errors in conventions of standard English grammar, usage, and mechanics.

Grades 6–8, Writing

Writing Reporting Categories	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 6-8? *
Ideas and Analysis Scores in this domain reflect the ability to generate productive ideas and engage critically with multiple perspectives on the given issue. Competent writers understand the issue they are invited to address, the purpose for writing, and the audience. They generate ideas that are relevant to the situation.	**EXJ 401** Show clear understanding of the persuasive purpose of the task by taking a position on the issue in the prompt and offering some context for discussion.	**6.W.TTP.1, 7.W.TTP.1, 8.W.TTP.1** Write arguments to support claims with clear reasons and relevant evidence.	• Have students choose an issue and discuss possible contexts in which the issue might exist. • Have students take a position on the issue and generate a list of supporting reasons and identify which are best; generate a list of possible objections others might have to that position; and list possible outcomes if this position were adopted or enacted. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*
Development and Support Scores in this domain reflect the ability to discuss ideas, offer rationale, and bolster an argument. Competent writers explain and explore their ideas, discuss implications, and illustrate through examples. They help the reader understand their thinking about the issue.	**DEV 501** Provide thorough development in support of ideas; extend ideas by using specific, logical reasons and illustrative examples.	**6.W.TTP.1b, 7.W.TTP.1b** Support claim(s) with logical reasoning and relevant, sufficient evidence; acknowledge alternate or opposing claim(s). **8.W.TTP.1b** Support claim(s) with logical reasoning and relevant, sufficient evidence; acknowledge and refute alternate or opposing claim(s).	• Have students identify the thesis statements in a variety of model essays. • Have students generate an outline or visual representation of all major ideas in a model essay and the examples and details that support them. • In a writers' workshop, have students submit and critique writing to identify ideas that need further development in order to be persuasive or clear.

Organization Scores in this domain reflect the ability to organize ideas with clarity and purpose. Organizational choices are integral to effective writing. Competent writers arrange their essay in a way that clearly shows the relationships between ideas, and they guide the reader through their discussion.	**ORI 501** Provide a coherent organizational structure with some logical sequencing of ideas. **ORI 502** Use accurate and clear transitional words and phrases to convey logical relationships between ideas. **ORI 503** Present a generally well-developed introduction and conclusion.	**6.W.TTP.1a**, **7.W.TTP.1a**, **8.W.TTP.1a** Introduce claims. **6.W.TTP.1c, 7.W.TTP.1c, 8.W.TTP.1c** Organize the reasons and evidence clearly and clarify the relationships among claim(s) and reasons. **6.W.TTP.1d, 7.W.TTP.1d, 6.W.TTP.1d** Craft an effective and relevant conclusion that supports the argument presented. **6.W.TTP.1g, 7.W.TTP.1g, 8.W.TTP.1g** Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.	• Have students compare the outline of an original essay to the outline of a model essay and discuss ways to reorganize the original writing to make it more effective. • In an editing workshop, have students review others' writing to see if smooth transitions are provided from one paragraph to the next. • Have students practice writing an introduction that briefly but effectively introduces a context for the discussion as well as a thesis. • Encourage students to consider ways to conclude an essay that emphasize the thesis without restating the discussion or otherwise being repetitive.

Language and Conventions Scores in this domain reflect the ability to use written language to convey arguments with clarity. Competent writers make use of the conventions of grammar, syntax, word usage, and mechanics. They are also aware of their audience and adjust the style and tone of their writing to communicate effectively.	**USL 501** Show competent use of language to communicate ideas by: • correctly employing most conventions of standard English grammar, usage, and mechanics. • generally choosing words that are precise and varied. • using several kinds of sentence structures to vary pace and to support meaning.	**6.L.CSE.1, 7.L.CSE.1, 8.L.CSE.1 Cornerstone:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. **6.L.CSE.2, 7.L.CSE.2, 8.L.CSE.2 Cornerstone:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. **6.L.VAU.6, 7.L.VAU.6, 8.L.VAU.6** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; develop vocabulary knowledge when considering a word or phrase important to comprehension or expression. **6.W.TTP.1h, 7.W.TTP.1h, 8.W.TTP.1h** Use varied sentence structure to enhance meaning and reader interest.	• Have students read original writing aloud to hear and identify language errors. • In an editing workshop, have students revise writing to reduce unnecessary repetition of words or phrases and to replace vague language with more precise words. • In a writer's workshop, have students experiment with more sophisticated sentence structure.

Grades 9–12, Writing

Writing Reporting Categories	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 9-12? *
Ideas and Analysis Scores in this domain reflect the ability to generate productive ideas and engage critically with multiple perspectives on the given issue. Competent writers understand the issue they are invited to address, the purpose for writing, and the audience. They generate ideas that are relevant to the situation.	**EXJ 601** Show advanced 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.	**9-10.W.TTP.1, 11-12.W.TTP.1 Cornerstone:** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.	Select an argument from a published text and have students identify assumptions on which the arguments rest and determine if the assumptions are reasonable and open to challenge.
Development and Support Scores in this domain reflect the ability to discuss ideas, offer rationale, and bolster an argument. Competent writers explain and explore their ideas, discuss implications, and illustrate through examples. They help the reader understand their thinking about the issue.	**EV 601** Provide ample development in support of ideas; substantiate ideas with precise use of specific, logical reasons and illustrative examples.	**9-10.W.TTP.1b, 11-12.W.TTP.1b** Develop claim(s) and counterclaim(s) fairly, supplying evidence for each claim and counterclaim while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns.	During a writers' workshop, have students practice elaborating on ideas fully by describing their logical connection to the essay's main idea and checking to see if the essay's treatment of each idea is proportional to the idea's importance.

Organization Scores in this domain reflect the ability to organize ideas with clarity and purpose. Organizational choices are integral to effective writing. Competent writers arrange their essay in a way that clearly shows the relationships between ideas, and they guide the reader through their discussion.	**ORI 601** Provide a unified, coherent organizational structure that presents a logical progression of ideas. **ORI 602** Use precise transitional words, phrases, and sentences to convey logical relationships between ideas. **ORI 603** Present a well-developed introduction that effectively frames the prompt's issue and writer's argument; present a well-developed conclusion that extends the essay's ideas.	**9-10.W.TTP.1a**, **11-12.W.TTP.1a** Introduce precise claim(s). **9-10.W.TTP.1c, 11-12.W.TTP.1c** Create an organization that establishes cohesion and clear relationships among claim(s), counterclaim(s), reasons, and evidence. **9-10.W.TTP.1d, 11-12.W.TTP.1d** Provide a concluding statement or section that follows from and supports the argument presented. **9-10.W.TTP.1e, 11-12.W.TTP.1e** Use precise language and domain-specific vocabulary to manage the complexity of the topic.	• During a writers' workshop, have students practice composing thesis statements that clearly state a position on an issue and offer a rationale for taking that position. • During a writers' workshop, encourage students to experiment with how to conclude an essay while continuing to challenge the audience with critical questions or implications. • Have students consider how transitional phrases and sentences can help convey logical connections between ideas and between paragraphs.

Language and Conventions Scores in this domain reflect the ability to use written language to convey arguments with clarity. Competent writers make use of the conventions of grammar, syntax, word usage, and mechanics. They are also aware of their audience and adjust the style and tone of their writing to communicate effectively.	**USL 601** Show effective use of language to communicate ideas clearly by: • correctly employing most conventions of standard English grammar, usage, and mechanics. • consistently choosing words that are precise and varied. • using a variety of kinds of sentence structures to vary pace and to support meaning.	**9-10.L.CSE.1, 11-12.L.CSE.1** **Cornerstone:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. **9-10.L.CSE.2, 11-12.L.CSE.2** **Cornerstone:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. **9-10.L.VAU.6, 11-12.L.VAU.6** **Cornerstone:** Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the postsecondary and workforce readiness level; demonstrate independence in building vocabulary knowledge when considering a word or phrase important to comprehension or expression. **9-10.L.KL.3, 11-12.L.KL.3** **Cornerstone** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.	• Have students read a variety of texts to improve vocabulary and gain exposure to precise and effective language use. • Present students with model essays and have them discuss the effects of rhetorical devices. • In an editing workshop, have students edit sentences for meaningless words, wordiness, and redundancy. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

ACT Mathematics Test

Connections with Tennessee Academic Standards

Questions & Answers

1. ***What determines student success on the ACT mathematics subtest?***
   The mathematics skills assessed on the ACT extend across all grade levels. The ACT College and Career Readiness Standards for mathematics are a combination of skills taught beginning as early as second grade and extending throughout a student's fourth year high school mathematics course. The student needs instruction focused on developing a content-rich, conceptual understanding of mathematics at all grade levels in order to attain a score of 21 or higher. Additionally, students need to have developed a strong foundation in procedural and computational fluency. To be successful on the ACT mathematics subtest, 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 specific context for problem solving;
   - *why and how* certain key ideas aid in problem solving, which reminds us of the systematic progression of math (and the need to work on a high logical plane in problem-solving situations);
   - *how and why* an idea or procedure is mathematically defensible and *when* it is most efficient to use a procedure; and
   - *how* to flexibly adapt previous experience to new-problem-solving situations.

2. ***What is the structure of the ACT mathematics 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 and the efficiency in which they are able to access and apply those skills. The test presents multiple-choice questions that require a student to use reasoning skills grounded in both procedural and computational fluency to solve practical problems in mathematics. In preparation for the ACT mathematics test, it is essential to have survey-level knowledge of basic formulas and computational skills, but recall of complex formulas and extensive computation is not required.

3. ***When should we begin preparing students for the ACT mathematics subtest?***
   The ACT mathematics 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.

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.

While the Tennessee Academic Standards for Mathematics are organized by conceptual category, domains, and clusters, the ACT College and Career Readiness Standards are organized by reporting category and score range.

ACT Score Range	ACT Standard Coding
13-15	200
16-19	300
20-23*	400
24-27	500
28-32	600
33-36	700

**The benchmark score for the ACT math subtest is 22. Many of the skills a student needs to master this benchmark is embedded in the Tennessee math standards in grades 6-8. In the middle grades, students develop an understanding of quantities, operations with rational numbers, and basic algebraic thinking. These skills are anchored in concepts introduced in earlier grades (such as fractions). Reinforcing these foundational connections as students continue into specific conceptual courses in high school (such as algebra or geometry) is necessary for students to be successful on the foundational skills that define the readiness benchmark.*

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. In the chart below, you will see which math domains students are learning holistically throughout a given year and 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.

<table>
<tr><th>K</th><th>Grade 1</th><th>Grade 2</th><th>Grade 3</th><th>Grade 4</th><th>Grade 5</th><th>Grade 6</th><th>Grade 7</th><th>Grade 8</th><th>High School</th></tr>
<tr><td colspan="9">Geometry →</td><td>Geometry</td></tr>
<tr><td colspan="6">Measurement & Data →</td><td colspan="3">Statistics & Probability →</td><td>Statistics & Probability</td></tr>
<tr><td colspan="6">Number & Operations in Base Ten →</td><td colspan="3">The Number System →</td><td>Number & Quantity</td></tr>
<tr><td colspan="6">Operations in Algebraic Thinking →</td><td colspan="3">Expressions & Equations →</td><td>Algebra</td></tr>
<tr><td colspan="2">Counting & Cardinality →</td><td colspan="4">Numbers & Operations—Fractions →</td><td colspan="2">Ratios & Proportional Relationships →</td><td>Functions →</td><td>Functions</td></tr>
</table>

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 the ACT are assigned to each category and can be found here: http://www.act.org/content/dam/act/unsecured/documents/CCRS-MathStandards.pdf.

Side-by-Side Example: Number and Quantity Domain
Connectivity Between the ACT and Tennessee Academic Standards in Math

Multiple Tennessee Academic Standards are embedded within a single ACT College and Career Readiness Standard for mathematics. The following chart highlights a small, representative sample of connections between selected ACT 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 Tennessee Academic Standards to be successful on the ACT mathematics subtest.

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
N 201. Perform one-operation computation with whole numbers and decimals.	**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. **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 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers and related division facts. **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. **4.NBT.B.4**. Fluently add and subtract within 1,000,000 using appropriate strategies and algorithms. **4.OA.A.3**. Solve multi-step contextual 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. **5.NBT.B.5**. Fluently multiply multi-digit whole numbers (up to three-digit by four-digit factors) using appropriate strategies and algorithms. **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 operations; assess the reasonableness of answers using estimation strategies. (Limit division problems so that either the dividend or the divisor is a whole number.) **6.NS.B.2**. Fluently divide multi-digit numbers using the standard algorithm. **6.NS.B.3**. Fluently add, subtract, multiply, and divide multi-digit decimals using a standard algorithm for each operation.

N 202. Recognize equivalent fractions and fractions in lowest terms.	**3.NF.A.3a**. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. **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 using a visual fraction model. **3.NF.A.3c**. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *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.* ***continued on the next page*** **4.NF.A.1**. Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) or (a x n)/(b x n) 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.
N 302. Identify a digit's place value.	**2.NBT. A.1**. Know that the three digits of a three-digit number represent amounts of hundreds, tens, and ones (e.g., 706 can be represented in multiple ways as 7 hundreds , 0 tens, and 6 ones; 706 ones; or 70 tens and 6 ones). **4.NBT.A**. Generalize place value understanding for multi-digit whole numbers. **5.NBT.A.** Understand the place value system.
N 404. Understand absolute value in terms of distance.	**6.NS.C.7c.** Understand the absolute value of a rational number as its distance from 0 on the number line and distinguish comparisons of absolute value from statements about order in a real-world context. *For example, an account balance of -24 dollars represents a greater debt than an account balance -14 dollars because -24 is located to the left of -14 on the number line.* **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.

N 603. Apply number properties involving positive/negative numbers.	**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. **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. **7.NS.A.1a**. Describe situations in which opposite quantities combine to make 0. **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. **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. **7.NS.A.1d**. Apply properties of operations as strategies to add and subtract rational numbers. **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. **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. **7.NS.A.2c**. Apply properties of operations as strategies to multiply and divide rational numbers. **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.)
N 606. Multiply two complex numbers.	**A2.N.CN.A.2**. Know and use the relation $i^2 = –1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

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 College and Career 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 standards. **The navy blue areas indicate where Tennessee math standards overlap with ACT standards within each domain.**

<table>
<tr><th>K</th><th>Grade 1</th><th>Grade 2</th><th>Grade 3</th><th>Grade 4</th><th>Grade 5</th><th>Grade 6</th><th>Grade 7</th><th>Grade 8</th><th>High School</th></tr>
<tr><td colspan="9">Geometry →</td><td>Geometry</td></tr>
<tr><td colspan="3"></td><td colspan="7">ACT Readiness Domain: Geometry</td></tr>
<tr><td colspan="6">Measurement & Data →</td><td colspan="3">Statistics & Probability →</td><td>Statistics & Probability</td></tr>
<tr><td colspan="6"></td><td colspan="4">ACT Readiness Domain: Statistics & Probability</td></tr>
<tr><td colspan="6">Number & Operations in Base Ten →</td><td colspan="3">The Number System →</td><td>Number & Quantity</td></tr>
<tr><td colspan="2"></td><td colspan="8">ACT Readiness Domain: Number and Quantity</td></tr>
<tr><td colspan="6">Operations in Algebraic Thinking →</td><td colspan="3">Expressions & Equations →</td><td>Algebra</td></tr>
<tr><td colspan="4"></td><td colspan="6">ACT Readiness Domain: Algebra</td></tr>
<tr><td>Counting & Cardinality →</td><td colspan="2"></td><td colspan="3">Numbers & Operations—Fractions →</td><td colspan="2">Ratios & Proportional Relationships →</td><td>Functions →</td><td>Functions</td></tr>
<tr><td colspan="4"></td><td colspan="6">ACT Readiness Domain: Functions</td></tr>
</table>

ACT Science Test

Connections with Tennessee Academic Standards

Questions & Answers

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. ***How many distinct formats is scientific information presented in on the ACT science test?***
   The ACT science test consists of seven passages presented in one of the three following formats:
   - **Data Representation** (30-40 percent): 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 percent): 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 percent): 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–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 for Science 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 **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.

While the Tennessee Academic Standards for Science are organized by Disciplinary Core Ideas, the ACT College and Career Readiness Standards are organized by reporting category and score range.

ACT Score Range	ACT Standard Coding
13–15	200
16–19	300
20–23*	400
24–27	500
28–32	600
33–36	700

**The benchmark score for the ACT Science subtest is 23. It is important to note that the ACT benchmark standards are content-agnostic, meaning they represent critical science reasoning skills and knowledge that are found across disciplines and content areas. Many of these skills are introduced as early as elementary school and are used to describe, model, and communicate science content across all areas through high school. It is critical that elementary and middle school science teachers are aware of these skills and introduce them as they teach their content standards. It is critical that high school science teachers are also asking their students to use these skills to demonstrate their knowledge of specific scientific concepts. For example, determining if data is consistent with a claim can be introduced as early as K–5 and reinforced through formative assessment and activities in upper grades.*

Grades K–5, Science

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades K–5? *
Interpretation of Data (IOD) (45-55%) Questions in this category test a students' ability to manipulate and analyze scientific data presented in tables, graphs, and diagrams.	**IOD 201** Select one piece of data from a simple data presentation. **IOD. 203** Find basic information in text that describes a simple data presentation. **IOD 403** Translate information into a table, graph, or diagram.	**1.LS1.1** Recognize the structure of plants and describe the function of the parts. **2.ESS2.3** Compare simple maps of different areas to observe the shapes and kinds of land (rock, soil, sand) and water (river, stream, lake, pond). **5.PS1.2** Analyze and interpret data to show that the amount of matter is conserved even when it changes form, including transitions where matter seems to vanish.	• Have students locate data in simple tables, graphs, and diagrams. • Have students become familiar with different types of graphs (e.g., line graphs, pie charts, bar graphs). • Have students become familiar with units of measurement commonly used in science.
Scientific Investigation (SIN) (20-30%) Questions in this category assess a student's understanding of experimental tools, procedures, and design and the student's ability to compare, extend, and modify experiments.	**SIN 202** Understand the tools and functions of tools used in a simple experiment. **SIN 401** Understand a simple experimental design.	**K.PS1.1** Plan and conduct an investigation to describe and classify different kinds of materials including wood, plastic, metal, cloth, and paper by their observable properties (color, texture, hardness, and flexibility) and whether they are natural or human-made. **3.ESS2.3** Use tables, graphs, and tools to describe precipitation, temperature, and wind (direction and speed) to determine local weather and climate. **5.PS1.3** Design a process to measure how different variables (temperature, particle size, stirring) affect the rate of dissolving liquids into solids.	• Have students observe experiments being performed and discuss what was done and why. • Have students design a procedure to investigate a specific research question. • Have students use tools to make scientific measurements. • Have students begin to ask questions that can be answered through an experiment.

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades K–5? *
Evaluation of Models, Inferences, and Experimental Results (EMI) (25-35%) Judge the validity of scientific information and formulate conclusions and predictions based on that information (e.g., determine which explanation for a scientific phenomenon is supported by new findings).	**EMI 201.** Find basic information in a model (conceptual). **EMI 302** Determine which models present certain basic information. **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.	**K.LS3.1** Make observations to describe that young plants and animals resemble their young. **3.PS3.3** Evaluate how magnets cause changes in the motion and position of objects, even when the objects are not touching the magnet. **4.ESS1.1** Generate and support a claim with evidence that over long period of time, erosion, (weathering and transportation) and deposition have changed landscapes and created new landforms.	• Discuss what hypotheses and conclusions are and how they are different from each other. • Have students analyze data and conclusions from multiple investigations and text. • Discuss why scientists may have differing viewpoints or conclusions based on an incomplete data set. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*

Grades 6–8, Science

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 6–8? *
Interpretation of Data (IOD) (45-55%) Questions in this category test a student's ability to manipulate and analyze scientific data presented in tables, graphs, and diagrams.	**IOD 304** Determine how the values of variables change as the value of another variable changes in a simple data presentation. **IOD 402** Compare or combine data from a simple data presentation. **IOD 504** Determine and/or use a simple (e.g., linear) mathematical relationship that exists between data.	**6.PS3.3** Analyze and interpret data to show the relationship between kinetic energy and the mass of an object in motion and its speed. **7.LS1.9** Construct a scientific explanation based on compiled evidence for the processes of photosynthesis, cellular respiration, and anaerobic respiration in the cycling of matter and flow of energy into and out of organisms. **8.ESS2.1** Evaluate data collected from seismographs to create a model of Earth's structure.	• Have students examine line graphs to determine if they show a direct or inverse relationship between variables. • Have students become familiar with scatterplots. • Have students 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. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*
Scientific Investigation (SIN) (20-30%) Questions in this category assess a student's understanding of experimental tools, procedures, and design and the student's ability to compare, extend, and modify experiments.	**SIN 403** Identify a control in an experiment. **SIN 404** Identify similarities and differences between experiments.	**6.PS3.1** Conduct an investigation to demonstrate the way that heat (thermal energy) moves among objects through radiation, conduction, and convection. **7.LS1.2** Conduct and investigation to demonstrate how the cell membrane maintains homeostasis through the process of passive transport. **8.PS2.4** Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	• Have students perform several repetitions of an experiment to determine the reliability of results.
Evaluation of Models, Inferences, and Experimental Results (EMI) (25-35%) Judge the validity of scientific information and formulate conclusions and predictions based on that information (e.g., determine which explanation for a scientific phenomenon is supported by new findings).	**EMI 301** Identify implications in a model. **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. **EMI 404** Identify similarities and differences between models.	**6.LS2.3** Draw conclusions about the transfer of energy through a food web and energy pyramid in an ecosystem. **7.PS1.6** Create and interpret models of substances whose atoms represent the states of matter with respect to temperature and pressure. **8.PS2.2** Conduct an investigation to provide evidence that fields exist between objects exerting forces on each other even though the objects are not touching.	• Have students evaluate whether the data produced by an experiment adequately supports a given conclusion. • Have students compare and contrast two different models about a scientific phenomenon.

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

Category	ACT Readiness Standards: Snapshot of Expected Skills	Tennessee Academic Standards: Snapshot of Expected Skills	What could this look like in practices in grades 9–12?*
Interpretation of Data (IOD) (45-55%) Questions in this category test a student's ability to manipulate and analyze scientific data presented in tables, graphs, and diagrams.	**IOD 505** Analyze presented information when given new, simple information. **IOD 602** Determine and/or use a complex (e.g., non-linear) mathematical relationship that exists between data.	**BIO1.LS4.3** Identify ecosystem services and assess the role of biodiversity in support of these services. Analyze the role human activities have on disruption of these services. **CHEM1.PS1.5** Conduct investigations to explore and characterize the behavior of gases (pressure, volume, temperature [...] **PHYS.PS3.11** Investigate Ohm's Law (I = V/R) by conducting an experiment to determine the relationships between current and voltage, current and resistance, and voltage and resistance.	• Have students relate scientific information contained in written text to numerical data. • Have students manipulate algebraic equations that represent data. • Have students analyze data from an investigation with multiple independent variables affecting a single dependent variable.

Scientific Investigation (SIN) (20-30%) Questions in this category assess a student's understanding of experimental tools, procedures, and design and the student's ability to compare, extend, and modify experiments.	**SIN 502** Predict the results of an additional trail or measurement in an experiment. **SIN 601** Determine the hypothesis for an experiment. **SIN 701** Understand precision and accuracy issues.	**BIO1.LS1.5** Research examples that demonstrate the functional variety of proteins and construct an argument based on evidence for the importance of the molecular structure to its function. Plan and carry out a controlled investigation to test predictions about factors, which should cause an effect on the structure and function of a protein. **CHEM1.PS1.15** Investigate, describe, and mathematically determine the effect of solute concentration on vapor pressure using the solute's van 't Hoff factor on freezing point depression and boiling point elevation. **PHYS.PS2.12** Use experimental evidence to demonstrate that air resistance is a velocity dependent drag force that leads to terminal velocity.	• Have students determine the hypothesis of an experiment that requires more than one step. • Have students determine alternate methods of testing a hypothesis. • Have students argue and defend the presentation of data through scientific reasoning and fact. • Have students design and perform investigations of natural phenomena with multiple causative factors.

Evaluation of Models, Inferences, and Experimental Results (EMI) (25-35%) Judge the validity of scientific information and formulate conclusions and predictions based on that information (e.g., determine which explanation for a scientific phenomenon is supported by new findings).	**EMI 503** Identify strengths and weaknesses of models. **EMI 602** Determine whether presented information, or new information, supports or weakens a model, and why. **EMI 603** Use new information to make a prediction based on a model.	**BIO1.LS1.2** Evaluate comparative models of various cell types with a focus on organic molecules that make up cellular structures. **CHEM1.PS1.11** Develop and compare historical models of the atom (from Democritus to quantum model) and construct arguments to show how scientific knowledge evolves over time, based on experimental evidence, critique, and alternative explanations. **PHYS.PS4.1** Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model.	• Have students validate how new findings impact existing explanations for a phenomenon. • Have students communicate the findings of an experiment and compare conclusions with peers. • Have students formulate hypotheses, predictions, or conclusions by comparing and contrasting several different sets of data from different experiments. • Have students evaluate the merits of a conclusion based on the analysis of several sets of data. **Additional ideas for instructional practices can be found in the resource Ideas for Progress in College and Career Readiness on the ACT website.*