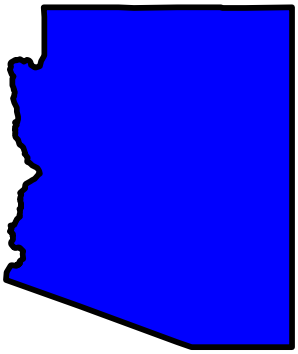

# STATE MATCH

## Arizona Academic Content Standards

Language Arts, Mathematics, and Science
Grades 8–12

and

ACT®

## EXPLORE, PLAN, the ACT, and WorkKeys

August 2006

# About This Report

## EXECUTIVE SUMMARY

(pp. 1–3)

This portion summarizes the findings of the alignment between Arizona's Academic Content Standards and ACT's WorkKeys assessments (Reading for Information, Applied Mathematics, and Locating Information) and ACT's Educational Planning and Assessment System (EPAS™) tests—EXPLORE® (8th, and 9th grades); PLAN® (10th grade); and the ACT® (11th and 12th grades). It also presents ACT's involvement in meeting NCLB requirements and describes additional critical information that ACT could provide to Arizona.

## SECTION A

(pp. 4–11)

This section provides tables by content area (Language Arts, Mathematics, and Science) listing the precise number of Arizona Academic Content Standards measured by ACT's EPAS tests and WorkKeys assessments by grade level.

## SECTION B

(pp. 13–56)

All Arizona Academic Content Standards are listed here; each one highlighted is measured by ACT's EPAS tests and WorkKeys assessments.

The Arizona standards listed here are from the following Arizona Academic Content Standards documents as presented on the Arizona Department of Education's website in August 2006.

| Subject | Standard | Approved by Arizona State Board of Education | Updated |
|---|---|---|---|
| Language Arts | 1: Reading<br>2: Writing<br>3: Listening/Speaking<br>4: Viewing/Presenting | March 31, 2003<br>June 28, 2004<br>July 8, 1996<br>July 8, 1996 | —<br>—<br>—<br>— |
| Mathematics | All | March 31, 2003 | — |
| Science | All | May 24, 2004 | March 10, 2005 |

Underlined science content indicates that the content topics are included in, but not directly measured by, ACT's EPAS Science Tests.

# About This Report

## SECTION C

(pp. 57–66)

ACT's College Readiness Standards appear here. Highlighting indicates that a statement reflects one or more statements in the Arizona Academic Content Standards. College Readiness Standards not highlighted are not addressed in the Arizona Academic Content Standards.

## SECTION D

(pp. 67–68)

WorkKeys Level Skills appear here. Highlighting indicates that a statement reflects one or more statements in the Arizona Academic Content Standards. Level Skills not highlighted are not addressed in the Arizona Academic Content Standards.

A supplement is available that identifies the specific ACT College Readiness Standard(s) and WorkKeys Skill(s) corresponding to each Arizona Academic Content Standard in a side-by-side format. To request this supplement, please e-mail ACT at **statematch@act.org**.

# Executive Summary

We at ACT believe our programs offer many advantages to Arizona students and educators, and this report offers strong evidence for this belief. This alignment analysis clearly answers three critical questions:

1. To what extent do ACT's WorkKeys assessments and ACT's Educational Planning and Assessment System (EPAS) tests—EXPLORE (8th and 9th grades); PLAN (10th grade); and the ACT (11th and 12th grades)—measure Arizona's Academic Content Standards?
2. Can ACT's EPAS and WorkKeys test results be used to meet Arizona's NCLB requirement?
3. Why should Arizona choose ACT?
4. Why choose to include WorkKeys assessments?

**ACT'S TESTS MEASURE MANY IMPORTANT ARIZONA ACADEMIC CONTENT STANDARDS IN LANGUAGE ARTS, MATHEMATICS, AND SCIENCE.**

**1. Match Results:** Comparisons conducted by our content specialists show that ACT's Reading, English, Writing, Mathematics and Science tests and WorkKeys Reading for Information, Applied Mathematics, and Locating Information assessments measure many of Arizona's Language Arts, Mathematics, and Science Academic Content Standards (with Performance Objective match totals appearing in Section A):

- Language Arts: 19 out of 31 Standards

  Many of Arizona's Language Arts Standards are covered by ACT's EPAS English, Reading, and Writing tests, and WorkKeys Reading for Information assessment.

- Mathematics: 17 out of 17 Standards

  All of Arizona's Mathematics Standards are covered by ACT's EPAS Mathematics tests and WorkKeys Applied Mathematics and Locating Information assessments.

- Science: *Process* Standards: 4 out of 6
  (*Content* Standards: 17 out of 17)

  Many of Arizona's Science standards are covered by ACT's EPAS Science tests and WorkKeys Locating Information assessment.

  (A note about science content: ACT's Science tests present content from biology, chemistry, physics, and Earth/space sciences. Although content knowledge in these content areas is needed to answer some of the test questions, the test questions emphasize scientific reasoning and are based in experimental science contexts. Factual content knowledge, although needed to answer some of the test questions, is not systematically sampled from the full content knowledge domain. Therefore, each ACT Science Test covers some, but not all, of the discrete science content knowledge specifically described in the Arizona Science Academic Content Standards.

  To emphasize the point that content is included, but not necessarily covered in its entirety on every test form, science content match results appear in parentheses in Section A of this document (which describes the number of Arizona standards measured by ACT's tests), and are underlined rather than highlighted in Section B. Our goal here is to clearly communicate that science content will be included, but each specific content topic will not be covered consistently enough for inferences to be made about student proficiency in all areas.)



ACT

**STATES CHOOSE ACT BECAUSE:**

- **STUDENT MOTIVATION IS HIGH.**
- **ACT'S IS THE ONLY CURRICULUM-BASED ASSESSMENT SYSTEM THAT MEASURES STUDENT READINESS ALONG A CONTINUUM OF EMPIRICALLY DERIVED COLLEGE READINESS BENCHMARKS.**
- **EPAS DATA PROVIDE HELPFUL FEEDBACK FOR TEACHERS, STUDENTS, AND POLICYMAKERS TO MAKE EDUCATIONAL DECISIONS AND IDENTIFY WAYS TO IMPROVE.**

**ACT BUILDS ITS DEFINITION OF COLLEGE READINESS ON A SOUND EMPIRICAL BASE:**

1. **THE ACT NATIONAL CURRICULUM SURVEY**
2. **ACT'S COLLEGE READINESS BENCHMARK SCORES**
3. **ACT'S COLLEGE READINESS STANDARDS**

Most exceptions to a match between ACT's tests and Arizona's Academic Content Standards arise from standards not being assessable in group settings, standards that are personal in nature, and standards requiring measurement over extended time. If additional testing is deemed necessary, ACT would be interested in working with Arizona on developing any necessary augmentation.

**2. NCLB requirement?** Yes; states like Illinois intend to use ACT components as part of testing that will be submitted to the U.S. Department of Education for NCLB approval.

**3. Why choose ACT?** States and school districts choose ACT's EPAS programs because student motivation is high, and EPAS is the *only curriculum-based assessment system that measures student readiness along a continuum of empirically derived college readiness benchmarks*. Various groups claim to describe what students truly need to know and be able to do for college and/or workplace readiness. Such groups typically ask individual experts in education to gather and discuss what they feel is important for students to understand. Not surprisingly, the answers vary. In contrast, ACT defines college readiness through a unique and rigorous empirical process:

- **The knowledge and skills necessary for students to be ready for college-level work are empirically identified via the ACT National Curriculum Survey®**

  ACT surveys thousands of secondary and postsecondary instructors across the nation to determine which skills and knowledge are most important at each course level and for college and work readiness. The responses drive the test specifications for EXPLORE, PLAN, and the ACT.

- **The empirically derived performance levels necessary for students to be ready to succeed in college-level work are defined in ACT's College Readiness Benchmark Scores.**

  ACT analyzed thousands of student records to identify the ACT scores associated with success in postsecondary coursework (i.e., a 50% chance of earning a B or better in credit-bearing first-year college courses): 18 for English, 22 for Math, 21 for Reading, and 24 for Science.

- **Skills and knowledge a student currently has and areas for improvement can be identified by the empirically derived ACT College Readiness Standards.**

  Using thousands of student records and responses, content and measurement experts worked backwards to develop data-driven, empirically derived statements of what students typically know and are able to do in various score ranges on ACT's English, Reading, Writing, Mathematics, and Science tests. These statements provide specific details about students' college readiness and can be used to identify next steps for improvement.



ACT

**4. Why choose to include WorkKeys assessments?** States and communities nationwide are using WorkKeys to create credentials for job applicants through cooperation between businesses and schools. These credentials are based on the same skills assessments no matter where they are used. Thus they are portable. Test takers in one state can show prospective employers in another state that they have the skills needed for jobs. And the employers, looking at job applicants, know that WorkKeys Level Scores will have the same meaning regardless of where the tests were administered. These employers know that prospective employees have attained a certain level of performance in the essential skills required for most jobs.

Test takers can most commonly be certified in the skills areas of Applied Mathematics, Locating Information and Reading for Information. Higher scores qualify test takers for more jobs than lower scores. Virginia, Louisiana, Kentucky, Indiana, North Carolina, and New Mexico already have initiated certificate programs. Many other states have similar programs in the development stages.

In sum, the ACT's EPAS and WorkKeys programs provide abundant data relevant to Arizona's Academic Content Standards and to Arizona students' readiness for college and work.



ACT

# Section A: Number of Arizona Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys

## Table A-1. Number of Arizona Language Arts Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys

| | Arizona Standards* | Number of Arizona POs Measured by ACT's EPAS and WorkKeys | Aspects of Not-Measured Arizona Performance Objectives |
|---|---|---|---|
| | **Reading** | | |
| Strand 1: Reading Process | [Concepts 1–3 apply only to grades K–3] | | |
| | Concept 4: Vocabulary | 8th: 3 out of 5<br>9th: 2 out of 5<br>10th: 2 out of 5<br>11th: 0 out of 2<br>12th: 0 out of 2 | Determine meaning of words using linguistic roots<br>Use dictionaries, thesauri, glossaries, CD-ROM, Internet<br>Identify meaning of metaphors based on common literary allusions |
| | Concept 5: Fluency | 8th: 1 out of 1<br>9th: 1 out of 1<br>10th: 1 out of 1<br>11th: 1 out of 1<br>12th: 1 out of 1 | |
| | Concept 6: Comprehension Strategies | 8th: 2 out of 7<br>9th: 1 out of 5<br>10th: 1 out of 5<br>11th: 2 out of 5<br>12th: 2 out of 5 | Use graphic organizers<br>Connect information and events to experience |
| Strand 2: Comprehending Literary Text | Concept 1: Elements of Literature | 8th: 5 out of 7<br>9th: 3 out of 4<br>10th: 3 out of 4<br>11th: 5 out of 6<br>12th: 3 out of 7 | Compare themes across works of prose, drama, poetry<br>Analyze a variety of poetic forms<br>Contrast works within a genre<br>Explain how meaning is enhanced through poetry |
| | Concept 2: Historical and Cultural Aspects of Literature | 8th: 0 out of 2<br>9th: 0 out of 3<br>10th: 0 out of 3<br>11th: 0 out of 3<br>12th: 0 out of 3 | Describe cultural aspects of works<br>Identify common structures and elements in literature and folklore across cultures<br>Analyze significant works of British and world literature |
| Strand 3: Comprehending Informational Text | Concept 1: Expository Text | 8th: 7 out of 12<br>9th: 5 out of 8<br>10th: 5 out of 8<br>11th: 1 out of 4<br>12th: 2 out of 5 | Locate specific information using organizational features (e.g., table of contents) of expository text<br>Locate and organize references<br>Differentiate between primary and secondary source material<br>Distinguish among different kinds of evidence |
| | Concept 2: Functional Text | 8th: 0 out of 3<br>9th: 0 out of 3<br>10th: 0 out of 3<br>11th: 1 out of 1<br>12th: 2 out of 2 | Explain the logic within functional text |

| Table A-1. Number of Arizona Language Arts Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys | | | |
|---|---|---|---|
| | Arizona Standards* | Number of Arizona POs Measured by ACT's EPAS and WorkKeys | Aspects of Not-Measured Arizona Performance Objectives |
| | Concept 3: Persuasive Text | 8th: 3 out of 4<br>9th: 2 out of 3<br>10th: 2 out of 3<br>11th: 1 out of 3<br>12th: 1 out of 4 | Evaluate effectiveness of facts author used<br>Describe how persuasive techniques contribute to the power of the text<br>Evaluate sources for adherence to ethics |
| | **Writing** | | |
| Strand 1: Writing Process | Concept 1: Prewriting | 8th: 0 out of 7<br>9th: 0 out of 7<br>10th: 0 out of 7<br>11th: 4 out of 7<br>12th: 4 out of 7 | Use prewriting strategies<br>Generate ideas through a wide variety of activities<br>Use outlines, charts, Venn diagrams<br>Maintain a record of writing ideas |
| | Concept 2: Drafting | 8th: 1 out of 2<br>9th: 1 out of 2<br>10th: 1 out of 2<br>11th: 2 out of 2<br>12th: 2 out of 2 | Use prewriting plan |
| | Concept 3: Revising | 8th: 5 out of 8<br>9th: 5 out of 8<br>10th: 5 out of 8<br>11th: 6 out of 8<br>12th: 6 out of 8 | Use peer review, rubrics, checklists to revise drafts<br>Use resources and reference materials |
| | Concept 4: Editing | 8th: 1 out of 4<br>9th: 1 out of 4<br>10th: 1 out of 4<br>11th: 1 out of 4<br>12th: 1 out of 4 | Use dictionary, word lists, spelling/grammar checkers<br>Apply proofreading marks<br>Apply peer review, checklists, rubrics to edit draft |
| | Concept 5: Publishing | 8th: 0 out of 4<br>9th: 0 out of 3<br>10th: 0 out of 3<br>11th: 1 out of 3<br>12th: 1 out of 3 | Use graphics<br>Prepare writing that follows a format appropriate for purpose<br>Include techniques as principles of design (e.g., margin, bias) |
| Strand 2: Writing Compo-nents | Concept 1: Ideas and Content | 8th: 2 out of 4<br>9th: 3 out of 5<br>10th: 3 out of 5<br>11th: 5 out of 5<br>12th: 5 out of 5 | |
| | Concept 2: Organization | 8th: 5 out of 6<br>9th: 5 out of 6<br>10th: 5 out of 6<br>11th: 6 out of 6<br>12th: 6 out of 6 | Use structure that fits the type of writing (letter, play, essay) |

## Table A-1. Number of Arizona Language Arts Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys

| | Arizona Standards* | Number of Arizona POs Measured by ACT's EPAS and WorkKeys | Aspects of Not-Measured Arizona Performance Objectives |
|---|---|---|---|
| | Concept 3: Voice | 8th: 2 out of 4<br>9th: 2 out of 5<br>10th: 2 out of 5<br>11th: 2 out of 5<br>12th: 2 out of 5 | Show awareness of audience<br>Convey sense of identity<br>Use engaging language that shows commitment to topic |
| | Concept 4: Word Choice | 8th: 2 out of 4<br>9th: 2 out of 5<br>10th: 2 out of 5<br>11th: 3 out of 5<br>12th: 3 out of 5 | Use vocabulary that is original, varied, natural<br>Use cliches when appropriate |
| | Concept 5: Sentence Fluency | 8th: 2 out of 4<br>9th: 0 out of 3<br>10th: 0 out of 3<br>11th: 2 out of 3<br>12th: 2 out of 3 | Demonstrate a flow that is natural when read aloud |
| | Concept 6:Conventions | 8th: 5 out of 13<br>9th: 7 out of 12<br>10th: 7 out of 12<br>11th: 10 out of 12<br>12th: 10 out of 12 | Use italics in typed copy<br>Use resources<br>Use appropriate format to cite sources |
| Strand 3: Writing Applica-tions | Concept 1: Expressive | 8th: 0 out of 2<br>9th: 0 out of 1<br>10th: 0 out of 1<br>11th: 0 out of 1<br>12th: 0 out of 1 | Write a narrative<br>Write in variety of expressive forms<br>Write a personal narrative |
| | Concept 2: Expository | 8th: 0 out of 3<br>9th: 0 out of 1<br>10th: 0 out of 1<br>11th: 0 out of 1<br>12th: 0 out of 1 | Record information related to topic<br>Write summary based on information gathered<br>Write explanatory essay |
| | Concept 3: Functional | 8th: 0 out of 4<br>9th: 0 out of 2<br>10th: 0 out of 2<br>11th: 0 out of 1<br>12th: 0 out of 1 | Write a variety of functional texts |
| | Concept 4: Persuasive | 8th: 0 out of 1<br>9th: 0 out of 1<br>10th: 0 out of 1<br>11th: 1 out of 1<br>12th: 1 out of 1 | |
| | Concept 5: Literary Response | 8th: 0 out of 1<br>9th: 0 out of 1<br>10th: 0 out of 1<br>11th: 0 out of 1<br>12th: 0 out of 1 | Write a response to literature |



ACT

| Table A-1. Number of Arizona Language Arts Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys | | |
|---|---|---|
| **Arizona Standards*** | **Number of Arizona POs Measured by ACT's EPAS and WorkKeys** | **Aspects of Not-Measured Arizona Performance Objectives** |
| Concept 6: Research | 8th: 0 out of 2<br>9th: 0 out of 1<br>10th: 0 out of 1<br>11th: 0 out of 1<br>12th: 0 out of 1 | Write a research product |
| **Listening and Speaking** | | |
| Essentials | 8th: 0 out of 4 | Effectively listen and speak |
| Proficiency | 9th: 0 out of 5<br>10th: 0 out of 5<br>11th: 0 out of 5<br>12th: 0 out of 5 | Deliver speech |
| Distinction (Honors) | 9th: 0 out of 4<br>10th: 0 out of 4<br>11th: 0 out of 4<br>12th: 0 out of 4 | Deliver creative and dramatic interpretations |
| **Viewing and Presenting** | | |
| Essentials | 8th: 0 out of 3 | Use variety of visual media |
| Proficiency | 9th: 0 out of 3<br>10th: 0 out of 3<br>11th: 0 out of 3<br>12th: 0 out of 3 | Analyze and evaluate visual media |
| Distinction (Honors) | 9th: 0 out of 3<br>10th: 0 out of 3<br>11th: 0 out of 3<br>12th: 0 out of 3 | Conduct research to evaluate impact |
| **TOTALS**<br>18 out of 31 Standards | 8th: 46 out of 121<br>9th: 40 out of 114<br>10th: 40 out of 114<br>11th: 54 out of 106<br>12th: 54 out of 110 | |

*Refer to Arizona's Language Arts Academic Content Standards on pages 13–42

## Table A-2. Number of Arizona Mathematics Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys

| | Arizona Standards* | Number of Arizona POs Measured by ACT's EPAS and WorkKeys | Aspects of Not-Measured Arizona Performance Objectives |
|---|---|---|---|
| Strand 1: Number Sense and Operations | Concept 1: Number Sense | 8th: 1 out of 3<br>9–12: 2 out of 3 | Classify rational and irrational<br>Identify properties of real number system |
| | Concept 2: Numerical Operations | 8th: 10 out of 11<br>9–12: 6 out of 7 | Use technology |
| | Concept 3: Estimation | 8th: 3 out of 4<br>9–12: 3 out of 3 | Verify reasonableness of estimates |
| Strand 2: Data Analysis, Probability, and Discrete Mathematics | Concept 1: Data Analysis (Statistics) | 8th: 9 out of 12<br>9–12: 10 out of 17 | Formulate questions to collect data<br>Construct box and whisker plots<br>Distinguish between correlation and causation<br>Construct equivalent displays of same data<br>Draw line of best fit<br>Identify differences between bias4d and unbiased samples |
| | Concept 2: Probability | 8th: 6 out of 7<br>9–12: 6 out of 7 | Record data |
| | Concept 3: Discrete Mathematics – Systematic Listing and Counting | 8th: 2 out of 2<br>9–12: 3 out of 3 | |
| | Concept 4: Vertex-Edge Graphs | 8th: 1 out of 1 | |
| Strand 3: Patterns, Algebra, & Functions | Concept 1: Patterns | 8th: 3 out of 3<br>9–12: 3 out of 3 | |
| | Concept 2: Functions and Relationships | 8th: 2 out of 4<br>9–12: 8 out of 9 | Identify independent and dependent variables<br>Sketch a graph |
| | Concept 3: Algebraic Representations | 8th: 11 out of 12<br>9–12: 18 out of 18 | |
| | Concept 4: Analysis of Change | 8th: 0 out of 1<br>9–12: 2 out of 2 | |
| Strand 4: Geometry and Measurement | Concept 1: Geometric Properties | 8th: 6 out of 10<br>9–12: 10 out of 14 | Draw model<br>Draw regular polygons<br>Draw 3-D figures<br>Construct a triangle |

**Table A-2. Number of Arizona Mathematics Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys**

| | Arizona Standards* | Number of Arizona POs Measured by ACT's EPAS and WorkKeys | Aspects of Not-Measured Arizona Performance Objectives |
|---|---|---|---|
| | Concept 2: Transformation of Shapes | 8th: 2 out of 2<br>9–12: 5 out of 6 | Sketch planar figure |
| | Concept 3: Coordinate Geometry | 8th: 3 out of 3<br>9–12: 4 out of 7 | Graph linear equations |
| | Concept 4: Measurement<br>—Units of Measure<br>—Geometric Objects | 8th: 7 out of 7<br>9–12: 10 out of 10 | |
| Strand 5: Structure and Logic | Concept 1: Algorithms and Algorithmic Thinking | 8th: 1 out of 2<br>9–12: 6 out of 6 | Describe how to use proportion |
| | Concept 2: Logic, Reasoning, Arguments, and Mathematical Proof | 8th: 2 out of 4<br>9–12: 9 out of 14 | Model using flow chart<br>Verify Pythagorean Theorem<br>Write conjecture given set of circumstances<br>Create arguments<br>Construct counterexample<br>State inverse<br>Construct a proof |
| | **TOTALS**<br>17 out of 17 Standards | 8th: 69 out of 88<br>9–12: 105 out of 129 | |

*Refer to Arizona's Mathematics Academic Content Standards on pages 43–48

## Table A-3. Number of Arizona Science Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys

| | Arizona Standards* | Number of Arizona POs Measured by ACT's EPAS and WorkKeys | Aspects of Not-Measured Arizona Performance Objectives |
|---|---|---|---|
| Strand 1: Inquiry Process | Concept 1 | 8th: 0 out of 3<br>9–12: 1 out of 4 | Locate appropriate resources |
| | Concept 2 | 8th: 1 out of 5<br>9–12: 2 out of 5 | Demonstrate safe behavior and procedures<br>Conduct a controlled investigation<br>Perform measurements<br>Keep record of observations |
| | Concept 3 | 8th: 5 out of 8<br>9–12: 5 out of 7 | Design models |
| | Concept 4 | 8th: 0 out of 5<br>9–12: 2 out of 4 | Communicate all results<br>Choose appropriate graphic<br>Present analyses in clear formats |
| Strand 2: History and Nature of Science | Concept 1 | 8th: 0 out of 4<br>9–12: 0 out of 4 | Identify individual, cultural, and technological contributions to scientific knowledge |
| | Concept 2 | 8th: 0 out of 4<br>9–12: 0 out of 4 | Explain the process by which accepted ideas are challenged |
| | **TOTALS**<br>4 out of 6 Standards | 8th: 6 out of 29<br>9–12: 10 out of 28 | **Science Process Standards** |
| Strand 3: Science in Personal and Social Perspec-tives | Concept 1 | 8th: (2) out of (2)<br>9–12: (5) out of (5) | |
| | Concept 2 | 8th: (0) out of (4)<br>9–12: (2) out of (5) | Develop viable solutions to a need or problem |
| | Concept 3 | 9–12: (2) out of (3) | Analyze social factors |
| Strand 4: Life Science | Concept 1 | 9–12: (5) out of (5) | |
| | Concept 2 | 8th: (3) out of (3)<br>9–12: (4) out of (4) | |
| | Concept 3 | 9–12: (3) out of (3) | |
| | Concept 4 | 8th: (6) out of (6)<br>9–12: (6) out of (6) | |
| | Concept 5 | 9–12: (5) out of (5) | |
| Strand 5: Physical Science | Concept 1 | 8th: (7) out of (7)<br>9–12: (8) out of (8) | |
| | Concept 2 | 8th: (5) out of (5)<br>9–12: (14) out of (14) | |
| | Concept 3 | 9–12: (7) out of (7) | |
| | Concept 4 | 9–12: (13) out of (13) | |
| | Concept 5 | 9–12: (9) out of (9) | |



ACT

Strand 6: Earth and Space Science

| Table A-3. Number of Arizona Science Academic Content Standards Measured by EXPLORE, PLAN, the ACT, and WorkKeys | | |
|---|---|---|
| **Arizona Standards*** | **Number of Arizona POs Measured by ACT's EPAS and WorkKeys** | **Aspects of Not-Measured Arizona Performance Objectives** |
| Concept 1 | 9–12: (7) out of (7) | |
| Concept 2 | 9–12: (17) out of (17) | |
| Concept 3 | 9–12: (9) out of (9) | |
| Concept 4 | 9–12: (6) out of (6) | |
| **TOTALS**<br>(17) out of (17) Standards | 8th: (23) out of (27)<br>9–12: (122) out of (126) | **Science Content Standards** |

*Refer to Arizona's Science Academic Content Standards on pages 49–56

Language Arts

## ARIZONA Grade 8 Language Arts
Academic Content Standards

### Academic Standard 1: READING

#### Strand 1: Reading Process

**Concept 1:** Print Concepts

Demonstrate understanding of print concepts. *(Grades K–3)*

**Concept 2:** Phonemic Awareness

Identify and manipulate the sounds of speech. *(Grades K–2)*

**Concept 3:** Phonics

Decode words, using knowledge of phonics, syllabication, and word parts. *(Grades K–3)*

**Concept 4:** Vocabulary

Acquire and use new vocabulary in relevant contexts.

***PO 1.*** *Determine the meaning of vocabulary using linguistic roots and affixes (e.g., Greek, Anglo-Saxon, Latin).*

***PO 2.*** *Use context to identify the intended meaning of unfamiliar words (e.g., definition, example, restatement, synonym, contrast).*

***PO 3.*** *Use context to identify the meaning of words with multiple meanings (e.g., definition, example, restatement, contrast).*

**PO 4.** Determine the meaning of figurative language, including similes, metaphors, personification, idioms, hyperbole, and technical language.

***PO 5.*** *Identify the meanings, pronunciations, syllabication, synonyms, antonyms, and parts of speech of words, by using a variety of reference aids, including dictionaries, thesauri, glossaries, and CD-ROM and the Internet when available.*

**Concept 5:** Fluency

Read fluently.

***PO 1.*** *Read from a variety of genres with accuracy, automaticity (immediate recognition), and prosody (expression).*

**Concept 6:** Comprehension Strategies

Employ strategies to comprehend text.

***PO 1.*** *Predict text content using prior knowledge and text features (e.g., illustrations, titles, topic sentences, key words).*

***PO 2.*** *Confirm predictions about text for accuracy.*

***PO 3.*** *Generate clarifying questions in order to comprehend text.*

***PO 4.*** *Use graphic organizers in order to clarify the meaning of the text.*

***PO 5.*** *Connect information and events in text to experience and to related text and sources.*

***PO 6.*** *Apply knowledge of the organizational structures (e.g., chronological order, compare and contrast, cause and effect relationships, logical order, by classification) of text to aid comprehension.*

***PO 7.*** *Use reading strategies (e.g., drawing conclusions, determining cause and effect, making inferences, sequencing) to interpret text.*

#### Strand 2: Comprehending Literary Text

**Concept 1:** Elements of Literature

Identify, analyze, and apply knowledge of the structures and elements of literature

***PO 1.*** *Analyze plot development (e.g., conflict, subplots, parallel episodes) to determine how conflicts are resolved.*

**PO 2.** Compare (and contrast) themes across works of prose, poetry, and drama.

***PO 3.*** *Describe a character, based upon the thoughts, words, and actions of the character, the narrator's description, and other characters.*

***PO 4.*** *Contrast points of view (e.g., first vs. third, limited vs. omniscient) in literary text.*

**PO 5.** Analyze the relevance of the setting (e.g., time, place, situation) to the mood and tone of the text.

***PO 6.*** *Draw conclusions about the style, mood, and meaning of literary text based on the author's word choice.*

**PO 7.** Analyze the characteristics and structural elements (essential attributes) of a variety of poetic forms (e.g., epic, lyric, sonnet, ballad, elegy, haiku, free verse).

**Concept 2:** Historical and Cultural Aspects of Literature

Recognize and apply knowledge of the historical and cultural aspects of American, British, and world literature.

***PO 1.*** *Describe the historical and cultural aspects found in cross-cultural works of literature.*

***PO 2.*** *Identify common structures and stylistic elements in literature, folklore, and myths from a variety of cultures.*

#### Strand 3: Comprehending Informational Text

**Concept 1:** Expository Text

Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.

***PO 1.*** *Restate the main idea (explicit or implicit) and supporting details in expository text.*

***PO 2.*** *Summarize the main idea (stated or implied) and critical details of expository text, maintaining chronological, sequential, or logical order.*

***PO 3.*** *Distinguish fact from opinion in expository text, providing supporting evidence from text.*

***PO 4.*** *Identify the author's stated or implied purpose(s) for writing expository text.*

***PO 5.*** *Locate specific information by using organizational features (e.g., table of contents, headings, captions, bold print, italics, glossaries, indices, key/guide words, topic sentences, concluding sentences, end notes, footnotes, bibliographic references) in expository text.*

***PO 6.*** *Locate appropriate print and electronic reference sources (e.g., encyclopedia, atlas, almanac, dictionary, thesaurus, periodical, CD-ROM, website) for a specific purpose.*

***PO 7.*** *Differentiate between primary and secondary source materials.*

***PO 8.*** *Interpret graphic features (e.g., charts, maps, diagrams, illustrations, tables, timelines, graphs) of expository text.*

**PO 9.** Apply knowledge of organizational structures (e.g., chronological order, comparison and contrast, cause and effect relationships, logical order, classification schemes) of expository text to aid comprehension.

***PO 10.*** *Make relevant inferences about expository text, supported by text evidence.*

***PO 11.*** *Compare (and contrast) the central ideas and concepts from selected readings on a specific topic.*

***PO 12.*** *Explain how authors use elements (e.g., language choice, organization) of expository text to achieve their purposes.*

**Concept 2:** Functional Text

Identify, analyze, and apply knowledge of the purpose, structures, clarity, and relevancy of functional text.

***PO 1.*** *Use information from text and text features to determine the sequence of activities needed to carry out a procedure.*

**PO 2.** Determine what information (e.g., steps in directions, legend, supplies needed, illustrations, diagram, sequence) is extraneous in functional text.

**PO 3.** Interpret details from a variety of functional text (e.g., warranties, product information, technical manuals, instructional manuals, consumer safety publications) for a specific purpose (e.g., to follow directions, to solve problems, to perform procedures, to answer questions.

**PO 4.** Evaluate the adequacy of details and facts from functional text to achieve a specific purpose.

**Concept 3:** Persuasive Text

Explain basic elements of argument in text and their relationship to the author's purpose and use of persuasive strategies.

***PO 1.*** *Determine the author's specific purpose for writing the persuasive text.*

**PO 2.** Evaluate the effectiveness of the facts used to support an author's argument regarding a particular idea, subject, concept, or object.

***PO 3.*** *Describe the intended effect of persuasive strategies and propaganda techniques (e.g., bandwagon, peer pressure, repetition, testimonial, transfer, loaded words) that an author uses.*

**PO 4.** Identify specific instances of bias in persuasive text.

## Academic Standard 2: WRITING

### Strand 1: Writing Process

**Concept 1:** Prewriting

Prewriting includes using strategies to generate, plan, and organize ideas for specific purposes.

***PO 1.*** *Generate ideas through a variety of activities (e.g., prior knowledge, discussion with others, printed material or other sources).*

***PO 2.*** *Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.*

***PO 3.*** *Determine the intended audience of a writing piece.*

***PO 4.*** *Establish a central idea appropriate to the type of writing.*

***PO 5.*** *Use organizational strategies (e.g., outlines, charts, tables, graphs, Venn Diagrams, webs, story map, plot pyramid) to plan writing.*

***PO 6.*** *Maintain a record (e.g., lists, journals, folders, notebooks) of writing ideas.*

***PO 7.*** *Use time management strategies, when appropriate, to produce a writing product within a set time period.*

**Concept 2:** Drafting

Drafting incorporates prewriting activities to create a first draft containing necessary elements for a specific purpose.

***PO 1.*** *Use a prewriting plan to develop a draft with main idea(s) and supporting details.*

***PO 2.*** *Organize writing into a logical sequence that is clear to the audience.*

**Concept 3:** Revising

Revising includes evaluating and refining the rough draft for clarity and effectiveness.

***PO 1.*** *Evaluate the draft for use of ideas and content, organization, voice, word choice, and sentence fluency.*

***PO 2.*** *Add details to the draft to more effectively accomplish the purpose.*

***PO 3.*** *Delete irrelevant and/or redundant information from the draft to more effectively accomplish the purpose.*

***PO 4.*** *Rearrange words, sentences, and paragraphs to clarify the meaning or to enhance the writing style.*

***PO 5.*** *Add transitional words, phrases and/or sentences to clarify meaning or enhance the writing style.*

***PO 6.*** *Use a variety of sentence structures (i.e., simple, compound, complex) to improve sentence fluency in the draft.*

***PO 7.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to refine the draft.*

***PO 8.*** *Use resources and reference materials to select more precise vocabulary.*

**Concept 4:** Editing

Editing includes proofreading and correcting the draft for conventions.

***PO 1.*** *Identify punctuation, spelling, and grammar and usage errors in the draft.*

***PO 2.*** *Use resources (e.g., dictionary, word lists, spelling/grammar checkers) to correct conventions.*

***PO 3.*** *Apply proofreading marks to indicate errors in conventions.*

***PO 4.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to edit the draft.*

**Concept 5:** Publishing

Publishing includes formatting and presenting a final product for the intended audience.

***PO 1.*** *Prepare writing in a format (e.g., oral presentation, manuscript, multimedia) appropriate to audience and purpose.*

***PO 2.*** *Use margins and spacing to enhance the final product.*

***PO 3.*** *Use graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product.*

***PO 4.*** *Write legibly.*

### Strand 2: Writing Components

**Concept 1:** Ideas and Content

Writing is clear and focused, holding the reader's attention throughout. Main ideas stand out and are developed by strong support and rich details. Purpose is accomplished.

***PO 1.*** *Use clear, focused ideas and details to support the topic.*

***PO 2.*** *Provide content and selected details that are well-suited to audience and purpose.*

***PO 3.*** *Develop a sufficient explanation or exploration of the topic.*

***PO 4.*** *Include ideas and details that show original perspective.*

**Concept 2:** Organization

Organization addresses the structure of the writing and integrates the central meaning and patterns that hold the piece together.

***PO 1.*** *Use a structure that fits the type or writing (e.g., letter format, narrative, play, essay).*

***PO 2.*** *Develop a strong beginning or introduction that draws in the reader.*

***PO 3.*** *Place details appropriately to support the main idea.*

***PO 4.*** *Include effective transitions among all elements (sentences, paragraphs, ideas).*

***PO 5.*** *Construct paragraphs by arranging sentences with an organizing principle (e.g., to develop a topic, to indicate a chronology).*

***PO 6.*** *Create an ending that provides a sense of resolution or closure.*

**Concept 3:** Voice

Voice will vary according to the type of writing, but should be appropriately formal or casual, distant or personal, depending on the audience and purpose.

***PO 1.*** *Show awareness of the audience through word choice, style, and an appropriate connection with, or distance from, the audience.*

***PO 2.*** *Convey a sense of identity through originality, sincerity, liveliness, or humor appropriate to the topic and application.*

***PO 3.*** *Use language appropriate for the topic and purpose.*

***PO 4.*** *Choose appropriate voice (e.g., formal, informal, academic discourse) for the application.*

**Concept 4:** Word Choice

Word choice reflects the writer's use of specific words and phrases to convey the intended message and employs a variety of words that are functional and appropriate to the audience and purpose.

***PO 1.*** *Use accurate, specific, powerful words that effectively convey the intended message.*

***PO 2.*** *Use words that consistently support style and type of writing.*

***PO 3.*** *Use vocabulary that is original, varied, and natural.*

***PO 4.*** *Use literal and figurative language where appropriate to purpose.*

**Concept 5:** Sentence Fluency

Fluency addresses the rhythm and flow of language. Sentences are strong and varied in structure and length.

***PO 1.*** *Write simple, compound, and complex sentences.*

***PO 2.*** *Create sentences that flow together and sound natural when read aloud.*

***PO 3.*** *Vary sentence beginnings, lengths, and patterns to enhance the flow of the writing.*

***PO 4.*** *Use effective and natural dialogue when appropriate.*

**Concept 6:**Conventions

Conventions addresses the mechanics of writing, including capitalization, punctuation, spelling, grammar and usage, and paragraph breaks.

***PO 1.*** *Use capital letters correctly for:*

a. *proper nouns*
   - *holidays*
   - *product names*
   - *languages*
   - *historical events*
   - *organizations*
   - *academic courses (e.g., algebra/Algebra I)*
   - *place*
   - *regional names (e.g., West Coast)*

b. *words used as names (e.g., Grandpa, Aunt Lyn)*
c. *literary titles (book, story, poem, play, song)*
d. *titles*
e. *abbreviations*
f. *proper adjectives*

***PO 2.*** *Use commas to correctly punctuate:*

a. *items in a series*
b. *greetings and closings of letters*
c. *introductory words and clauses*
d. *direct address*
e. *interrupters*
f. *compound sentences*
g. *appositives*
h. *dialogue*

***PO 3.*** *Use quotation marks to punctuate:*

a. *dialogue*
b. *titles of short works (e.g., chapter, story, article, song, poem)*
c. *exact words from sources*

***PO 4.*** *Use italics (in typed copy) and underlining (in handwriting) to indicate titles of longer works (e.g., books, plays, magazines, movies, TV series).*

***PO 5.*** *Use colons to punctuate business letter salutations.*

***PO 6.*** *Use apostrophes to punctuate:*

a. *contractions*
b. *singular possessives*
c. *plural possessives*

***PO 7.*** *Spell high frequency words correctly.*

***PO 8.*** *Use common spelling patterns/generalizations to spell words correctly.*

***PO 9.*** *Use homonyms correctly in context.*

***PO 10.*** *Use resources to spell correctly.*

***PO 11.*** *Use paragraph breaks to indicate an organizational structure.*

***PO 12.*** *Use the following parts of speech correctly in simple sentences:*

a. *nouns*
b. *action/linking verbs*
c. *personal pronouns*
d. *adjectives*
e. *adverbs*
f. *conjunctions*
g. *prepositions*
h. *interjections*

***PO 13.*** *Use subject/verb agreement in simple, compound, and complex sentences.*

## Strand 3: Writing Applications

**Concept 1:** Expressive

Expressive writing includes personal narratives, stories, poetry, songs, and dramatic pieces. Writing may be based on real or imagined events.

***PO 1.*** *Write a narrative that includes:*

a. *an engaging plot based on imagined or real ideas, observations, or memories of an event or experience*
b. *effectively developed characters*
c. *a clearly described setting*
d. *dialogue, as appropriate*
e. *figurative language, or descriptive words and phrases to enhance style and tone*

***PO 2.*** *Write in a variety of expressive forms (e.g., poetry, skit) that, according to mode, employ:*

a. *figurative language*
b. *rhythm*

*c. dialogue*
*d. characterization*
*e. plot*
*f. appropriate format*

**Concept 2:** Expository

Expository writing includes nonfiction writing that describes, explains, informs, or summarizes ideas and content. The writing supports a thesis based on research, observation, and/or experience.

***PO 1.*** *Record information (e.g., observations, notes, lists, charts, map labels and legends) related to the topic.*

***PO 2.*** *Write a summary based on the information gathered that include(s):*

*a. a topic sentence*
*b. supporting details*
*c. relevant information*

**PO 3.** Write an explanatory essay that includes:

a. a thesis statement
b. supporting details
c. introductory, body, and concluding paragraphs

**Concept 3:** Functional

Functional writing provides specific directions or information related to real-world tasks. This includes letters, memos, schedules, directories, signs, manuals, forms, recipes, and technical pieces for specific content areas.

***PO 1.*** *Write a variety of functional texts (e.g., directions, recipes, procedures, rubrics, labels, posters, graphs/tables).*

***PO 2.*** *[None in source document.]*

***PO 3.*** *Write a friendly letter that includes a:*

*a. heading*
*b. salutation*
*c. body*
*d. closing*
*e. signature*

***PO 4.*** *Write a formal letter that follows a conventional business letter format.*

***PO 5.*** *Address an envelope for correspondence that includes:*

*a. an appropriate return address*
*b. an appropriate recipient address*

**Concept 4:** Persuasive

Persuasive writing is used for the purpose of influencing the reader. The author presents an issue and expresses an opinion in order to convince an audience to agree with the opinion or to take a particular action.

***PO 1.*** *Write persuasive text (e.g., essay, paragraph, written communications) that:*

*a. establishes and develops a controlling idea*
*b. supports arguments with detailed evidence*
*c. includes persuasive techniques*
*d. excludes irrelevant information*
*e. attributes sources of information when appropriate*

**Concept 5:** Literary Response

Literary response is the writer's reaction to a literary selection. The response includes the writer's interpretation, analysis, opinion, and/or feelings about the piece of literature and selected elements within it.

**PO 1.** Write a response to literature that:

a. *presents several clear ideas*
*b. supports inferences and conclusions with examples from the text, personal experience, references to other works, or reference to non-print media*
*c. relates own ideas to supporting details in a clear and logical manner*
d. provides support adequate to the literary selection (e.g. short poem vs. novel)

**Concept 6:** Research

Research writing is a process in which the writer identifies a topic or question to be answered. The writer locates and evaluates information about the topic or question, and then organizes, summarizes, and synthesizes the information into a finished product.

***PO 1.*** *Write a summary of information from sources (e.g.encyclopedias, websites, experts) that includes:*

*a. paraphrasing to convey ideas and details from the source*
*b. main idea(s) and relevant details*

***PO 2.*** *Write an informational report that includes:*

*a. a focused topic*
*b. appropriate facts and relevant details*
*c. a logical sequence*
*d. a concluding statement*
*e. a list of sources used*

## Academic Standard 3: LISTENING & SPEAKING

Students effectively listen and speak in situations that serve different purposes and involve a variety of audiences.

**ESSENTIALS**

Students know and are able to do all "Readiness" and "Foundations" Listening and Speaking tasks, and the following:

**LS-E1.** Prepare and deliver an organized speech and effectively convey the message through verbal and nonverbal communications with a specific audience

**LS-E2.** Prepare and deliver an oral report in a content area and effectively convey the information through verbal and nonverbal communications with a specific audience

**LS-E3.** Interpret and respond to questions and evaluate responses both as interviewer and interviewee

**LS-E4.** Predict, clarify, analyze and critique a speaker's information and point of view

## Academic Standard 4: VIEWING & PRESENTING

Students use a variety of visual media and resources to gather, evaluate and synthesize information and to communicate with others.

**ESSENTIALS**

Students know and are able to do all "Readiness" and "Foundations" Viewing and Presenting tasks, and the following:

**VP-E1.** Analyze visual media for language, subject matter and visual techniques used to influence opinions, decision making and cultural perceptions

**VP-E2.** Plan, develop and produce a visual presentation, using a variety of media such as videos, films, newspapers, magazines and computer images

**VP-E3.** Compare, contrast and establish criteria to evaluate visual media for purpose and effectiveness

## Academic Standard 1: READING

### Strand 1: Reading Process

**Concept 1:** Print Concepts

Demonstrate understanding of print concepts. *(Grades K–3)*

**Concept 2:** Phonemic Awareness

Identify and manipulate the sounds of speech. *(Grades K–2)*

**Concept 3:** Phonics

Decode words, using knowledge of phonics, syllabication, and word parts. *(Grades K–3)*

**Concept 4:** Vocabulary

Acquire and use new vocabulary in relevant contexts.

***PO 1.*** *Determine the meaning of vocabulary, using linguistic roots and affixes (e.g., Latin, Greek, Anglo-Saxon).*

**PO 2.** Infer word meanings from context (e.g., definition, example, restatement, comparison/contrast, cause/effect).

**PO 3.** Distinguish between the denotative and connotative meanings of words.

**PO 4.** Identify the meaning of metaphors based on common literary allusions.

**PO 5.** Identify the meanings, pronunciations, syllabication, synonyms, antonyms, parts of speech, and correct spellings by using resources such as general and specialized dictionaries, thesauri, glossaries, and CD-ROM and the Internet when available.

**Concept 5:** Fluency

Read fluently.

***PO 1.*** *Read from a variety of genres with accuracy, automaticity (immediate recognition), and prosody (expression).*

**Concept 6:** Comprehension Strategies

Employ strategies to comprehend text

***PO 1.*** *Predict text content using prior knowledge and text features (e.g., illustrations, titles, topic sentences, key words).*

***PO 2.*** *Generate clarifying questions in order to comprehend text.*

***PO 3.*** *Use graphic organizers in order to clarify the meaning of the text.*

***PO 4.*** *Connect information and events in text to experience and to related text and sources.*

***PO 5.*** *Apply knowledge of organizational structures (e.g., chronological order, sequence-time order, cause and effect relationships, logical order, by classification, problem-solution) of text to aid comprehension.*

### Strand 2: Comprehending Literary Text

**Concept 1:** Elements of Literature

Identify, analyze, and apply knowledge of the structures and elements of literature

**PO 1.** Describe the author's use of literary elements:

- theme (moral, lesson, meaning, message, view or comment on life),
- point of view (e.g., first vs. third, limited vs. omniscient),
- characterization (qualities, motives, actions, thoughts, dialogue, development, interactions),
- setting (time of day or year, historical period, place, situation), and
- plot (exposition, conflict, rising action, climax, falling action, and resolution).

**PO 2.** Explain different elements of figurative language, including simile, metaphor, personification, hyperbole, symbolism, allusion, and imagery in a literary selection.

**PO 3.** Compare (and contrast) works within a literary genre that deal with similar themes (e.g., compare short stories, novels, short stories, poems).

**PO 4.** Compare interactions among major characters and minor characters in literary text with emphasis upon how the plot is revealed through action of the dialog.

**Concept 2:** Historical and Cultural Aspects of Literature

Recognize and apply knowledge of the historical and cultural aspects of American, British, and world literature.

***PO 1.*** *Describe the historical and cultural aspects found in cross-cultural works of literature.*

**PO 2.** Compare (and contrast) classic works of literature that deal with similar topics and problems (e.g., individual and society, meaning of friendship, freedom, responsibility).

**PO 3.** Recognize ways that forms of literature (including poetry, novel and/or short story) present similar themes differently across genres.

### Strand 3: Comprehending Informational Text

**Concept 1:** Expository Text

Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.

**PO 1.** Compare (and contrast) original text to a summary for accuracy of the main ideas, inclusion of critical details, and the extent to which it conveys the underlying meaning of the original text.

**PO 2.** Distinguish facts from opinions in expository selections such as editorials, newspaper articles, essays, reviews, and critiques, providing supporting evidence from the text.

***PO 3.*** *Locate specific information by using organizational features (e.g., table of contents, headings, captions, bold print, italics, glossaries, indices, key/guide words, topic sentences, concluding sentences, end notes, footnotes, bibliographic references) in expository text.*

**PO 4.** Organize information from both primary and secondary sources by taking notes, outlining ideas, paraphrasing information; and by making charts, conceptual maps, learning logs, and/or timelines.

**PO 5.** Interpret graphic sources of information (e.g., charts, maps, diagrams, illustrations, tables, timelines, graphs) to support ideas.

**PO 6.** Use knowledge of modes of expository writing (e.g., chronological order, comparison and contrast, cause and effect relationships, logical order, classification schemes, sequence-time order, problem-solution, analogy, definition, narrative) to interpret text.

**PO 7.** Explain how one excerpt relates and contributes to the reading selection (e.g., sentence to paragraph, paragraph to selection).

**PO 8.** Support conclusions drawn from ideas and concepts in expository text.

**Concept 2:** Functional Text

Identify, analyze, and apply knowledge of the purpose, structures, clarity, and relevancy of functional text.

**PO 1.** Synthesize information from multiple sources (e.g., texts, maps, illustrations, workplace documents, schematic diagrams) to solve a problem.

**PO 2.** Synthesize information from multiple sources (e.g., texts, maps, illustrations, workplace documents, schematic diagrams) to draw conclusions.

**PO 3.** Identify the objective(s) of functional text (e.g., warranties, product information, technical manuals, consumer publications, workplace documents).

**Concept 3:** Persuasive Text

Explain basic elements of argument in text and their relationship to the author's purpose and use of persuasive strategies.

**PO 1.** Identify the central argument and its elements (e.g., argument by cause and effect, analogy, authority, emotion, logic) in persuasive text.

**PO 2.** Evaluate the appropriateness of an author's word choice for an intended audience.

**PO 3.** Identify unsupported inferences or fallacious reasoning (e.g., circular reasoning, false causality, over-generalization, over-simplification, self-contradiction) in the arguments advanced in persuasive text.

## Academic Standard 2: WRITING

### Strand 1: Writing Process

**Concept 1:** Prewriting

Prewriting includes using strategies to generate, plan, and organize ideas for specific purposes.

***PO 1.*** *Generate ideas through a variety of activities (e.g., brainstorming, notes and logs, graphic organizers, record of writing ideas and discussion, printed material or other sources).*

***PO 2.*** *Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.*

***PO 3.*** *Determine the intended audience of a writing piece.*

***PO 4.*** *Establish a controlling idea appropriate to the type of writing.*

***PO 5.*** *Use organizational strategies (e.g., outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to plan writing.*

***PO 6.*** *Maintain a record (e.g., lists, journals, folders, notebooks) of writing ideas.*

***PO 7.*** *Use time management strategies, when appropriate, to produce a writing product within a set time period.*

**Concept 2:** Drafting

Drafting incorporates prewriting activities to create a first draft containing necessary elements for a specific purpose.

***PO 1.*** *Use a prewriting plan to develop the main idea(s) with supporting details.*

**PO 2.** Sequence ideas into a cohesive, meaningful order.

**Concept 3:** Revising

Revising includes evaluating and refining the rough draft for clarity and effectiveness.

***PO 1.*** *Evaluate the draft for use of ideas and content, organization, voice, word choice, and sentence fluency.*

***PO 2.*** *Add details to the draft to more effectively accomplish the purpose.*

***PO 3.*** *Delete irrelevant and/or redundant information from the draft to more effectively accomplish the purpose.*

***PO 4.*** *Rearrange words, sentences, and paragraphs in the draft in order to clarify the meaning or to enhance the writing style.*

***PO 5.*** *Add transitional words and phrases to the draft in order to clarify meaning or enhance the writing style.*

***PO 6.*** *Use a variety of sentence structures (i.e., simple, compound, complex) to improve sentence fluency in the draft.*

***PO 7.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to refine the draft.*

**PO 8.** Use resources and reference materials (e.g., thesaurus, dictionary) to select more effective and precise language.

**Concept 4:** Editing

Editing includes proofreading and correcting the draft for conventions.

***PO 1.*** *Identify punctuation, spelling, and grammar and usage errors in the draft.*

***PO 2.*** *Use resources (e.g., dictionary, word lists, spelling/grammar checkers) to correct conventions.*

***PO 3.*** *Apply proofreading marks to indicate errors in conventions.*

***PO 4.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to edit the draft.*

**Concept 5:** Publishing

Publishing includes formatting and presenting a final product for the intended audience.

**PO 1.** Prepare writing that follows a format appropriate for the purpose (e.g., for display, sharing with others, submitting to a publication).

**PO 2.** Include such techniques as principles of design (e.g., margins, tabs, spacing, columns) and graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product.

***PO 3.*** *Write legibly.*

### Strand 2: Writing Components

**Concept 1:** Ideas and Content

Writing is clear and focused, holding the reader's attention throughout. Main ideas stand out and are developed by strong support and rich details. Purpose is accomplished.

**PO 1.** Maintain a clear, narrow focus to support the topic.

**PO 2.** Write with an identifiable purpose and for a specific audience.

**PO 3.** Provide sufficient, relevant, and carefully selected details for support.

**PO 4.** Demonstrate a thorough, balanced explanation of the topic.

**PO 5.** Include ideas and details that show original perspective and insights.

**Concept 2:** Organization

Organization addresses the structure of the writing and integrates the central meaning and patterns that hold the piece together.

***PO 1.*** *Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay).*

***PO 2.*** *Include a strong beginning or introduction that draws in the reader.*

***PO 3.*** *Place details appropriately to support the main idea.*

***PO 4.*** *Use effective transitions among all elements (sentences, paragraphs, and ideas).*

**PO 5.** Employ a variety of paragraphing strategies (e.g., topical, chronological, spatial) appropriate to application and purpose.

***PO 6.*** *Create an ending that provides a sense of resolution or closure.*

**Concept 3:** Voice

Voice will vary according to the type of writing, but should be appropriately formal or casual, distant or personal, depending on the audience and purpose.

**PO 1.** Show awareness of the audience through word choice, style, and an appropriate connection with, or distance from, the audience.

***PO 2.*** *Convey a sense of identity through originality, sincerity, liveliness, or humor appropriate to topic and type of writing.*

***PO 3.*** *Choose appropriate voice (e.g., formal, informal, academic discourse) for the application.*

**PO 4.** Use engaging and expressive language that shows a commitment to the topic.

**PO 5.** Use language appropriate to purpose, topic, and audience.

**Concept 4:** Word Choice

Word choice reflects the writer's use of specific words and phrases to convey the intended message and employs a variety of words that are functional and appropriate to the audience and purpose.

***PO 1.*** *Use accurate, specific, powerful words and phrases that effectively convey the intended message.*

***PO 2.*** *Use vocabulary that is original, varied, and natural.*

**PO 3.** Use words that evoke clear images.

**PO 4.** Use literal and figurative language intentionally when appropriate.

**PO 5.** Use clichés only when appropriate to purpose.

**Concept 5:** Sentence Fluency

Fluency addresses the rhythm and flow of language. Sentences are strong and varied in structure and length.

**PO 1.** Use a variety of sentence structures (simple, compound, complex, and compound-complex) and lengths to reinforce relationships among ideas and to enhance the flow of the writing.

**PO 2.** Show extensive variation in sentence beginnings, lengths, and patterns to enhance the flow of the writing.

**PO 3.** Demonstrate a flow that is natural and powerful when read aloud.

**Concept 6:**Conventions

Conventions addresses the mechanics of writing, including capitalization, punctuation, spelling, grammar and usage, and paragraph breaks.

***PO 1.*** *Use capitals correctly for:*

*a. proper nouns:*
- *holidays*
- *place/regional names*
- *languages*
- *historical events*
- *organizations*
- *academic courses (e.g., algebra/Algebra I)*
- *product names*

*b. words used as names (e.g., Grandpa, Aunt Lyn)*
*c. literary titles (book, story, poem, play, song)*
*d. titles*
*e. abbreviations*
*f. proper adjectives (e.g., German shepherd, Chinese restaurant)*

***PO 2.*** *Use commas to correctly punctuate:*

*a. items in a series*
*b. greetings and closings of letters*
*c. introductory words, phrases and clauses*
*d. direct address*
*e. interruptors*
*f. compound sentences*
*g. appositives*
*h. dialogue*

***PO 3.*** *Use quotation marks to punctuate:*

*a. dialogue*
*b. titles*
*c. exact words from sources*

**PO 4.** Use underlining or italics to correctly identify titles and vessels (e.g., ships, spacecrafts, planes, trains).

**PO 5.** Use colons to punctuate business letter salutations and sentences introducing lists.

**PO 6.** Use semicolons to punctuate compound and compound-complex sentences when appropriate.

***PO 7.*** *Use apostrophes to punctuate:*

*a. contractions*
*b. singular possessives*
*c. plural possessives*

**PO 8.** Use hyphens, dashes, parentheses, ellipses, and brackets correctly.

***PO 9.*** *Spell words correctly.*

**PO 10.** Use paragraph breaks to reinforce the organizational structure, including dialogue.

**PO 11.** Demonstrate control of grammar and usage in writing:

a. parts of speech
b. verb forms and tenses
c. subject/verb agreement
d. pronoun/antecedent agreement
e. parallel structure
f. comparative and superlative degrees of adjectives
g. modifier placement
h. homonyms

**PO 12.** Use appropriate format, according to type of writing, to cite sources (e.g., Chicago, APA, MLA, UPI, any other recognized style manual).

## Strand 3: Writing Applications

**Concept 1:** Expressive

Expressive writing includes personal narratives, stories, poetry, songs, and dramatic pieces. Writing may be based on real or imagined events.

**PO 1.** Write a personal narrative that:

a. describes a sequence of events, focusing on one incident experienced by the author
b. sets scenes and incidents in specific times and places
c. describes with specific details the sights, sounds and smells of the scenes
d. uses figurative language (e.g., simile, metaphor, personification)

**Concept 2:** Expository

Expository writing includes nonfiction writing that describes, explains, informs, or summarizes ideas and content. The writing supports a thesis based on research, observation, and/or experience.

**PO 1.** Write an explanatory, multi-paragraph essay that:

a. includes background information to establish the thesis (hypothesis, essential question), as appropriate
b. states a thesis (hypothesis, essential question) with a narrow focus
c. includes evidence in support of a thesis (hypothesis, essential question) in the form of details, facts, examples, or reasons
d. communicates information and ideas from primary and/or secondary sources accurately and coherently, as appropriate
e. attributes sources of information as appropriate
f. includes a topic sentence for each body paragraph
g. includes relevant factors and variables that need to be considered
h. includes visual aids to organize and record information on charts, data tables, maps and graphs, as appropriate
i. includes an effective conclusion

**Concept 3:** Functional

Functional writing provides specific directions or information related to real-world tasks. This includes letters, memos, schedules, directories, signs, manuals, forms, recipes, and technical pieces for specific content areas.

**PO 1.** Write a business letter that:

a. presents information purposefully and succinctly to meet the needs of the intended audience
b. follows a conventional business letter format (block, modified block, email)

***PO 2.*** *Address an envelope for correspondence that includes:*

*a. an appropriate return address*
*b. an appropriate recipient address*

**Concept 4:** Persuasive

Persuasive writing is used for the purpose of influencing the reader. The author presents an issue and expresses an opinion in order to convince an audience to agree with the opinion or to take a particular action.

**PO 1.** Write a persuasive composition (e.g., business letter, essay) that:

a. states a position or claim
b. presents detailed evidence, examples, and reasoning to support effective arguments and emotional appeals
c. attributes sources of information when appropriate
d. structures ideas
e. addresses the reader's concerns

**Concept 5:** Literary Response

Literary response is the writer's reaction to a literary selection. The response includes the writer's interpretation, analysis, opinion, and/or feelings about the piece of literature and selected elements within it.

**PO 1.** Write a literary analysis that:

a. describes the author's use of literary elements (i.e., theme, point of view, characterization, setting, plot)
b. explains different elements of figurative language, (i.e., simile, metaphor, personification, hyperbole, symbolism, allusion, and imagery) in a literary selection
c. compares works within a literary genre that deal with similar themes (e.g., compare two short stories or two poems)

**Concept 6:** Research

Research writing is a process in which the writer identifies a topic or question to be answered. The writer locates and evaluates information about the topic or question, and then organizes, summarizes, and synthesizes the information into a finished product.

**PO 1.** Write an essay that:

a. incorporates evidence in support of a thesis/claim
b. integrates information from two or more pieces of research information
c. integrates direct quotes
d. cites sources

## Academic Standard 3: LISTENING & SPEAKING

Students effectively listen and speak in situations that serve different purposes and involve a variety of audiences.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Listening and Speaking tasks, and the following:

**LS-P1.** Deliver a polished speech that is organized and well suited to the audience and that uses resource materials to clarify and defend positions

**LS-P2.** Deliver an impromptu speech that is organized, addresses a particular subject and is tailored to the audience

**LS-P3.** Deliver oral interpretations of literary or original works

**LS-P4.** Conduct an interview, taking appropriate notes and summarizing the information learned

**LS-P5.** Evaluate the effectiveness of informal and formal presentations that use illustrations, statistics, comparisons and analogies

**DISTINCTION** (Honors)

Students know and are able to do all of the above Listening and Speaking tasks and the following:

**LS-D1.** Use clear and concise language when presenting analytical responses to literature, conveying technical information, and explaining complex concepts and procedures

**LS-D2.** Deliver creative and dramatic interpretations of literary or original works

**LS-D3.** Communicate information expressively, informatively and analytically through a variety of media to audiences inside or outside of school

**LS-D4.** Evaluate and improve personal communication skills

## Academic Standard 4: VIEWING & PRESENTING

Students use a variety of visual media and resources to gather, evaluate and synthesize information and to communicate with others.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Viewing and Presenting tasks, and the following:

**VP-P1.** Analyze and evaluate visual media for language, subject matter and visual techniques used to influence attitudes, decision making and cultural perceptions

**VP-P2.** Plan, organize, develop, produce and evaluate an effective multimedia presentation, using tools such as charts, photographs, maps, tables, posters, transparencies, slides and electronic media

**VP-P3.** Analyze and evaluate the impact of visual media on the intended audience

**DISTINCTION** (Honors)

Students know and are able to do all of the above Viewing and Presenting tasks and the following:

**VP-D1.** Conduct research to evaluate the impact of language, subject matter and visual techniques used by the media

**VP-D2.** Expand abilities in developing multimedia presentations

**VP-D3.** Research ethnical issues related to the laws, rules and regulations for the use of media

## Academic Standard 1: READING

### Strand 1: Reading Process

**Concept 1:** Print Concepts

Demonstrate understanding of print concepts. *(Grades K–3)*

**Concept 2:** Phonemic Awareness

Identify and manipulate the sounds of speech. *(Grades K–2)*

**Concept 3:** Phonics

Decode words, using knowledge of phonics, syllabication, and word parts. *(Grades K–3)*

**Concept 4:** Vocabulary

Acquire and use new vocabulary in relevant contexts.

***PO 1.*** *Determine the meaning of vocabulary, using linguistic roots and affixes (e.g., Latin, Greek, Anglo-Saxon).*

***PO 2.*** *Infer word meanings from context (e.g., definition, example, restatement, comparison/contrast, cause/effect).*

**PO 3.** Determine how the meaning of the text is affected by the writer's word choice (e.g., literal vs. figurative language, idioms, adages).

***PO 4.*** *Identify the meaning of metaphors based on common literary allusions.*

**PO 5.** Determine the meanings, pronunciations, contextually appropriate synonyms and antonyms, replacement words and phrases, etymologies, and correct spellings of words by using resources such as general and specialized dictionaries, thesauri, glossaries, and CD-ROM and the Internet when available.

**Concept 5:** Fluency

Read fluently.

***PO 1.*** *Read from a variety of genres with accuracy, automaticity (immediate recognition), and prosody (expression).*

**Concept 6:** Comprehension Strategies

Employ strategies to comprehend text.

***PO 1.*** *Predict text content using prior knowledge and text features (e.g., illustrations, titles, topic sentences, key words).*

***PO 2.*** *Generate clarifying questions in order to comprehend text.*

***PO 3.*** *Use graphic organizers in order to clarify the meaning of the text.*

***PO 4.*** *Connect information and events in text to experience and to related text and sources.*

***PO 5.*** *Apply knowledge of organizational structures (e.g., chronological order, sequence-time order, cause and effect relationships, logical order, by classification, problem-solution) of text to aid comprehension.*

### Strand 2: Comprehending Literary Text

**Concept 1:** Elements of Literature

Identify, analyze, and apply knowledge of the structures and elements of literature

**PO 1.** Analyze the author's use of literary elements:

- theme (moral, lesson, meaning, message, view or comment on life),
- point of view (e.g., first vs. third, limited vs. omniscient),
- characterization (qualities, motives, actions, thoughts, dialogue, development, interactions),
- setting (time of day or year, historical period, place, situation), and
- plot (exposition, major and minor conflicts, rising action, climax, falling action, and resolution).

**PO 2.** Analyze the author's use of figurative language, including simile, metaphor, personification, hyperbole, symbolism, allusion, and imagery in a literary selection.

**PO 3.** Compare (and contrast) the illustration of the same theme in two different literary genres, using their structural features as the basis for the comparison (e.g., novel and play, poem, short story).

**PO 4.** Identify how an author's choice of words and imagery sets the tone and advances the work's theme.

**Concept 2:** Historical and Cultural Aspects of Literature

Recognize and apply knowledge of the historical and cultural aspects of American, British, and world literature.

***PO 1.*** *Describe the historical and cultural aspects found in cross-cultural works of literature.*

***PO 2.*** *Compare (and contrast) classic works of literature that deal with similar topics and problems (e.g., individual and society, meaning of friendship, freedom, responsibility).*

***PO 3.*** *Recognize ways that forms of literature (including poetry, novel and/or short story) present similar themes differently across genres.*

### Strand 3: Comprehending Informational Text

**Concept 1:** Expository Text

Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.

***PO 1.*** *Compare (and contrast) original text to a summary for accuracy of the main ideas, inclusion of critical details, and the extent to which it conveys the underlying meaning of the original text.*

**PO 2.** Distinguish supported inferences from unsupported inferences in expository selections such as editorials, newspaper articles, essays, reviews, and critiques.

***PO 3.*** *Locate specific information by using organizational features (e.g., table of contents, headings, captions, bold print, italics, glossaries, indices, key/guide words, topic sentences, concluding sentences, end notes, footnotes, bibliographic references) in expository text.*

**PO 4.** Organize information from both primary and secondary sources by taking notes, outlining ideas,

paraphrasing information; and by making charts, conceptual maps, learning logs and/or timelines for a research document or other assigned tasks.

***PO 5.*** *Interpret graphic sources of information (e.g., charts, maps, diagrams, illustrations, tables, timelines, graphs) to support ideas.*

***PO 6.*** *Use knowledge of modes of expository writing (e.g., chronological order, comparison and contrast, cause and effect relationships, logical order, classification schemes, sequence-time order, problem-solution, analogy, definition, narrative) to interpret text.*

**PO 7.** Make relevant inferences by synthesizing concepts and ideas from a single reading selection.

***PO 8.*** *Support conclusions drawn from ideas and concepts in expository text.*

**Concept 2:** Functional Text

Identify, analyze, and apply knowledge of the purpose, structures, clarity, and relevancy of functional text.

***PO 1.*** *Synthesize information from multiple sources (e.g., texts, maps, illustrations, workplace documents, schematic diagrams) to solve a problem.*

***PO 2.*** *Synthesize information from multiple sources (e.g., texts, maps, illustrations, workplace documents, schematic diagrams) to draw conclusions.*

**PO 3.** Analyze the effectiveness of functional text (e.g., warranties, product information, technical manuals, consumer publications, workplace documents) to achieve its stated purpose(s).

**Concept 3:** Persuasive Text

Explain basic elements of argument in text and their relationship to the author's purpose and use of persuasive strategies.

**PO 1.** Describe the central argument and its elements (e.g., argument by cause and effect, analogy, authority, emotion, logic) in persuasive text.

**PO 2.** Describe how persuasive techniques (e.g., repetition, sentence variety, understatement, overstatement) contribute to the power of persuasive text.

***PO 3.*** *Identify unsupported inferences or fallacious reasoning (e.g., circular reasoning, false causality, over-generalization, over-simplification, self-contradiction) in the arguments advanced in persuasive text.*

## Academic Standard 2: WRITING

### Strand 1: Writing Process

**Concept 1:** Prewriting

Prewriting includes using strategies to generate, plan, and organize ideas for specific purposes.

***PO 1.*** *Generate ideas through a variety of activities (e.g., brainstorming, notes and logs, graphic organizers, record of writing ideas and discussion, printed material or other sources).*

***PO 2.*** *Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.*

***PO 3.*** *Determine the intended audience of a writing piece.*

***PO 4.*** *Establish a controlling idea appropriate to the type of writing.*

***PO 5.*** *Use organizational strategies (e.g., outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to plan writing.*

***PO 6.*** *Maintain a record (e.g., lists, journals, folders, notebooks) of writing ideas.*

***PO 7.*** *Use time management strategies, when appropriate, to produce a writing product within a set time period.*

**Concept 2:** Drafting

Drafting incorporates prewriting activities to create a first draft containing necessary elements for a specific purpose.

***PO 1.*** *Use a prewriting plan to develop the main idea(s) with supporting details.*

**PO 2.** Sequence ideas into a cohesive, meaningful order.

**Concept 3:** Revising

Revising includes evaluating and refining the rough draft for clarity and effectiveness.

***PO 1.*** *Evaluate the draft for use of ideas and content, organization, voice, word choice, and sentence fluency.*

***PO 2.*** *Add details to the draft to more effectively accomplish the purpose.*

***PO 3.*** *Delete irrelevant and/or redundant information from the draft to more effectively accomplish the purpose.*

***PO 4.*** *Rearrange words, sentences, and paragraphs in the draft in order to clarify the meaning or to enhance the writing style.*

***PO 5.*** *Add transitional words and phrases to the draft in order to clarify meaning or enhance the writing style.*

***PO 6.*** *Use a variety of sentence structures (i.e., simple, compound, complex) to improve sentence fluency in the draft.*

***PO 7.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to refine the draft.*

**PO 8.** Use resources and reference materials (e.g., thesaurus, dictionary) to select more effective and precise language.

**Concept 4:** Editing

Editing includes proofreading and correcting the draft for conventions.

***PO 1.*** *Identify punctuation, spelling, and grammar and usage errors in the draft.*

***PO 2.*** *Use resources (e.g., dictionary, word lists, spelling/grammar checkers) to correct conventions.*

***PO 3.*** *Apply proofreading marks to indicate errors in conventions.*

***PO 4.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to edit the draft.*

**Concept 5:** Publishing

Publishing includes formatting and presenting a final product for the intended audience.

**PO 1.** Prepare writing that follows a format appropriate for the purpose (e.g., for display, sharing with others, submitting to a publication).

**PO 2.** Include such techniques as principles of design (e.g., margins, tabs, spacing, columns) and graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product.

***PO 3.*** *Write legibly.*

### Strand 2: Writing Components

**Concept 1:** Ideas and Content

Writing is clear and focused, holding the reader's attention throughout. Main ideas stand out and are developed by strong support and rich details. Purpose is accomplished.

**PO 1.** Maintain a clear, narrow focus to support the topic.

**PO 2.** Write with an identifiable purpose and for a specific audience.

**PO 3.** Provide sufficient, relevant, and carefully selected details for support.

**PO 4.** Demonstrate a thorough, balanced explanation of the topic.

**PO 5.** Include ideas and details that show original perspective and insights.

**Concept 2:** Organization

Organization addresses the structure of the writing and integrates the central meaning and patterns that hold the piece together.

***PO 1.*** *Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay).*

***PO 2.*** *Include a strong beginning or introduction that draws in the reader.*

***PO 3.*** *Place details appropriately to support the main idea.*

***PO 4.*** *Use effective transitions among all elements (sentences, paragraphs, and ideas).*

**PO 5.** Employ a variety of paragraphing strategies (e.g., topical, chronological, spatial) appropriate to application and purpose.

***PO 6.*** *Create an ending that provides a sense of resolution or closure.*

**Concept 3:** Voice

Voice will vary according to the type of writing, but should be appropriately formal or casual, distant or personal, depending on the audience and purpose.

***PO 1.*** *Show awareness of the audience through word choice, style, and an appropriate connection with, or distance from, the audience.*

***PO 2.*** *Convey a sense of identity through originality, sincerity, liveliness, or humor appropriate to topic and type of writing.*

***PO 3.*** *Choose appropriate voice (e.g., formal, informal, academic discourse) for the application.*

**PO 4.** Use engaging and expressive language that shows a commitment to the topic.

**PO 5.** Use language appropriate to purpose, topic, and audience.

**Concept 4:** Word Choice

Word choice reflects the writer's use of specific words and phrases to convey the intended message and employs a variety of words that are functional and appropriate to the audience and purpose.

***PO 1.*** *Use accurate, specific, powerful words and phrases that effectively convey the intended message.*

***PO 2.*** *Use vocabulary that is original, varied, and natural.*

**PO 3.** Use words that evoke clear images.

**PO 4.** Use literal and figurative language intentionally when appropriate.

**PO 5.** Use clichés only when appropriate to purpose.

**Concept 5:** Sentence Fluency

Fluency addresses the rhythm and flow of language. Sentences are strong and varied in structure and length.

**PO 1.** Use a variety of sentence structures (simple, compound, complex, and compound-complex) and lengths to reinforce relationships among ideas and to enhance the flow of the writing.

**PO 2.** Show extensive variation in sentence beginnings, lengths, and patterns to enhance the flow of the writing.

**PO 3.** Demonstrate a flow that is natural and powerful when read aloud.

**Concept 6:**Conventions

Conventions addresses the mechanics of writing, including capitalization, punctuation, spelling, grammar and usage, and paragraph breaks.

***PO 1.*** *Use capitals correctly for:*

a. *proper nouns:*
   - *holidays*
   - *place/regional names*
   - *languages*
   - *historical events*
   - *organizations*
   - *academic courses (e.g., algebra/Algebra I)*
   - *product names*

b. *words used as names (e.g., Grandpa, Aunt Lyn)*
c. *literary titles (book, story, poem, play, song)*
d. *titles*
e. *abbreviations*
f. *proper adjectives (e.g., German shepherd, Chinese restaurant)*

***PO 2.*** *Use commas to correctly punctuate:*

a. *items in a series*
b. *greetings and closings of letters*
c. *introductory words, phrases and clauses*
d. *direct address*
e. *interruptors*
f. *compound sentences*
g. *appositives*
h. *dialogue*

***PO 3.*** *Use quotation marks to punctuate:*

a. *dialogue*
b. *titles*
c. *exact words from sources*

**PO 4.** Use underlining or italics to correctly identify titles and vessels (e.g., ships, spacecrafts, planes, trains).

**PO 5.** Use colons to punctuate business letter salutations and sentences introducing lists.

**PO 6.** Use semicolons to punctuate compound and compound-complex sentences when appropriate.

***PO 7.*** *Use apostrophes to punctuate:*

a. *contractions*
b. *singular possessives*
c. *plural possessives*

**PO 8.** Use hyphens, dashes, parentheses, ellipses, and brackets correctly.

***PO 9.*** *Spell words correctly.*

**PO 10.** Use paragraph breaks to reinforce the organizational structure, including dialogue.

**PO 11.** Demonstrate control of grammar and usage in writing:

a. parts of speech
b. verb forms and tenses
c. subject/verb agreement
d. pronoun/antecedent agreement
e. parallel structure
f. comparative and superlative degrees of adjectives
g. modifier placement
h. homonyms

**PO 12.** Use appropriate format, according to type of writing, to cite sources (e.g., Chicago, APA, MLA, UPI, any other recognized style manual).

## Strand 3: Writing Applications

**Concept 1:** Expressive

Expressive writing includes personal narratives, stories, poetry, songs, and dramatic pieces. Writing may be based on real or imagined events.

**PO 1.** Write a reflective personal narrative that:

a. describes a sequence of events, communicating the significance of the events to the audience
b. sets scenes and incidents in specific times and places
c. describes with specific details the sights, sounds, and smells of the scenes
d. describes with specific details the actions, movements, gestures, and feelings of the characters

e. uses interior monologue
f. uses figurative language (e.g., simile, metaphor, personification)

**Concept 2:** Expository

Expository writing includes nonfiction writing that describes, explains, informs, or summarizes ideas and content. The writing supports a thesis based on research, observation, and/or experience.

***PO 1.*** *Write an explanatory, multi-paragraph essay that:*

*a. includes background information to establish the thesis (hypothesis, essential question), as appropriate*
*b. states a thesis (hypothesis, essential question) with a narrow focus*
*c. includes evidence in support of a thesis (hypothesis, essential question) in the form of details, facts, examples, or reasons*
*d. communicates information and ideas from primary and/or secondary sources accurately and coherently, as appropriate*
*e. attributes sources of information, as appropriate*
*f. includes a topic sentence for each body paragraph*
*g. includes relevant factors and variables that need to be considered*
*h. includes visual aids to organize and record information on charts, data tables, maps and graphs, as appropriate*
*i. includes an effective conclusion*

**Concept 3:** Functional

Functional writing provides specific directions or information related to real-world tasks. This includes letters, memos, schedules, directories, signs, manuals, forms, recipes, and technical pieces for specific content areas.

**PO 1.** Write a business letter and/or memo that:

a. presents information purposefully and succinctly to meet the needs of the intended audience
b. follows a conventional format (block, modified block, memo, email)

***PO 2.*** *Address an envelope for correspondence that includes:*

*a. an appropriate return address*
*b. an appropriate recipient address*

**Concept 4:** Persuasive

Persuasive writing is used for the purpose of influencing the reader. The author presents an issue and expresses an opinion in order to convince an audience to agree with the opinion or to take a particular action.

***PO 1.*** *Write a persuasive composition (e.g., business letter, essay, letter to the editor) that:*

*a. states a position or claim*
*b. presents detailed evidence, examples, and reasoning to support effective arguments and emotional appeals*
*c. attributes sources of information when appropriate*
*d. structures ideas*
*e. addresses the reader's concerns*

**Concept 5:** Literary Response

Literary response is the writer's reaction to a literary selection. The response includes the writer's interpretation, analysis, opinion, and/or feelings about the piece of literature and selected elements within it.

**PO 1.** Write a literary analysis that:

a. analyzes the author's use of literary elements (i.e., theme, point of view, characterization, setting, plot)
b. analyzes different elements of figurative language (i.e., simile, metaphor, personification, hyperbole, symbolism, allusion, and imagery) in a literary selection
c. compares the illustration of the same theme in two different literary genres, using their structural features as the basis for the comparison (e.g., novel and play, poem and short story)
d. identifies how an author's choice of words and imagery sets the tone and advances the work's theme

**Concept 6:** Research

Research writing is a process in which the writer identifies a topic or question to be answered. The writer locates and evaluates information about the topic or question, and then organizes, summarizes, and synthesizes the information into a finished product.

**PO 1.** Write a research report that:

a. incorporates evidence in support of a thesis/claim
b. integrates information from two or more pieces of primary and/or secondary research information
c. makes distinctions between the relative value and significance of specific data, facts, and ideas
d. integrates direct quotes
e. uses internal citations
f. includes a works cited, bibliography, or reference page

## Academic Standard 3: LISTENING & SPEAKING

Students effectively listen and speak in situations that serve different purposes and involve a variety of audiences.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Listening and Speaking tasks, and the following:

**LS-P1.** Deliver a polished speech that is organized and well suited to the audience and that uses resource materials to clarify and defend positions

**LS-P2.** Deliver an impromptu speech that is organized, addresses a particular subject and is tailored to the audience

**LS-P3.** Deliver oral interpretations of literary or original works

**LS-P4.** Conduct an interview, taking appropriate notes and summarizing the information learned

**LS-P5.** Evaluate the effectiveness of informal and formal presentations that use illustrations, statistics, comparisons and analogies

**DISTINCTION** (Honors)

Students know and are able to do all of the above Listening and Speaking tasks and the following:

**LS-D1.** Use clear and concise language when presenting analytical responses to literature, conveying technical information, and explaining complex concepts and procedures

**LS-D2.** Deliver creative and dramatic interpretations of literary or original works

**LS-D3.** Communicate information expressively, informatively and analytically through a variety of media to audiences inside or outside of school

**LS-D4.** Evaluate and improve personal communication skills

## Academic Standard 4: VIEWING & PRESENTING

Students use a variety of visual media and resources to gather, evaluate and synthesize information and to communicate with others.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Viewing and Presenting tasks, and the following:

**VP-P1.** Analyze and evaluate visual media for language, subject matter and visual techniques used to influence attitudes, decision making and cultural perceptions

**VP-P2.** Plan, organize, develop, produce and evaluate an effective multimedia presentation, using tools such as charts, photographs, maps, tables, posters, transparencies, slides and electronic media

**VP-P3.** Analyze and evaluate the impact of visual media on the intended audience

**DISTINCTION** (Honors)

Students know and are able to do all of the above Viewing and Presenting tasks and the following:

**VP-D1.** Conduct research to evaluate the impact of language, subject matter and visual techniques used by the media

**VP-D2.** Expand abilities in developing multimedia presentations

**VP-D3.** Research ethnical issues related to the laws, rules and regulations for the use of media

## Academic Standard 1: READING

### Strand 1: Reading Process

**Concept 1:** Print Concepts

Demonstrate understanding of print concepts. *(Grades K–3)*

**Concept 2:** Phonemic Awareness

Identify and manipulate the sounds of speech. *(Grades K–2)*

**Concept 3:** Phonics

Decode words, using knowledge of phonics, syllabication, and word parts. *(Grades K–3)*

**Concept 4:** Vocabulary

Acquire and use new vocabulary in relevant contexts.

**PO 1.** Draw inferences about meaning of new vocabulary, based on knowledge of linguistic roots and affixes (e.g., Latin, Greek, Anglo-Saxon).

**PO 2.** Identify the meaning of metaphors based on literary allusions and conceits.

**Concept 5:** Fluency

Read fluently.

***PO 1.*** *Read from a variety of genres with accuracy, automaticity (immediate recognition), and prosody (expression).*

**Concept 6:** Comprehension Strategies

Employ strategies to comprehend text

***PO 1.*** *Predict text content using prior knowledge and text features (e.g., illustrations, titles, topic sentences, key words).*

***PO 2.*** *Generate clarifying questions in order to comprehend text.*

***PO 3.*** *Use graphic organizers in order to clarify the meaning of the text.*

***PO 4.*** *Connect information and events in text to experience and to related text and sources.*

***PO 5.*** *Apply knowledge of organizational structures (e.g., chronological order, sequence-time order, cause and effect relationships, logical order, classification schemes, problem-solution) of text to aid comprehension.*

### Strand 2: Comprehending Literary Text

**Concept 1:** Elements of Literature

Identify, analyze, and apply knowledge of the structures and elements of literature

**PO 1.** Evaluate the author's use of literary elements:

- theme (moral, lesson, meaning, message, view or comment on life),
- point of view (e.g., first vs. third, limited vs. omniscient),
- characterization (qualities, motives, actions, thoughts, dialogue, development, interactions),
- setting (time of day or year, historical period, place, situation), and
- plot (exposition, major and minor conflicts, rising action, climax, falling action, and resolution).

**PO 2.** Interpret figurative language, including, personification, hyperbole, symbolism, allusion, imagery, extended metaphor/conceit, and allegory with emphasis upon how the writer uses language to evoke readers' emotions.

**PO 3.** Analyze the way in which the theme or meaning of a selection represents a view or comment on life, providing textual evidence for the identified theme.

**PO 4.** Explain the writer's use of irony, contradictions, paradoxes, incongruities, and ambiguities in a literary selection.

**PO 5.** Analyze an author's development of time and sequence through the use of complex literary devices such as foreshadowing and flashbacks.

**PO 6.** Explain how meaning is enhanced through various features of poetry, including sound (e.g., rhythm, repetition, alliteration, consonance, assonance), structure (e.g., meter, rhyme scheme), and graphic elements (e.g., line length, punctuation, word position).

**Concept 2:** Historical and Cultural Aspects of Literature

Recognize and apply knowledge of the historical and cultural aspects of American, British, and world literature.

***PO 1.*** *Describe the historical and cultural aspects found in cross-cultural works of literature.*

**PO 2.** Relate literary works to the traditions, themes, and issues of their eras.

**PO 3.** Analyze culturally or historically significant literary works of American literature that reflect our major literary periods and traditions.

### Strand 3: Comprehending Informational Text

**Concept 1:** Expository Text

Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.

**PO 1.** Critique the consistency and clarity of the text's purposes.

**PO 2.** Distinguish among different kinds of evidence used to support conclusions (e.g., logical, empirical, anecdotal).

***PO 3.*** *Make relevant inferences by synthesizing concepts and ideas from a single reading selection.*

**PO 4.** Compare (and contrast) readings on the same topic, by explaining how authors reach the same or different conclusions based upon differences in evidence, reasoning, assumptions, purposes, beliefs, or biases.

**Concept 2:** Functional Text

Identify, analyze, and apply knowledge of the purpose, structures, clarity, and relevancy of functional text.

**PO 1.** Analyze the structures of functional text (e.g., their format, graphics and headers) to determine how authors use these features to achieve their purposes.

**Concept 3:** Persuasive Text

Explain basic elements of argument in text and their relationship to the author's purpose and use of persuasive strategies.

**PO 1.** Analyze the power, validity, and truthfulness of the arguments advanced in persuasive text.

**PO 2.** Evaluate the arguments an author uses in a document to refute opposing arguments and address reader concerns.

***PO 3.*** *Identify unsupported inferences or fallacious reasoning in arguments advanced in persuasive text.*

## Academic Standard 2: WRITING

### Strand 1: Writing Process

**Concept 1:** Prewriting

Prewriting includes using strategies to generate, plan, and organize ideas for specific purposes.

***PO 1.*** *Generate ideas through a variety of activities (e.g., brainstorming, notes and logs, graphic organizers, record of writing ideas and discussion, printed material or other sources).*

***PO 2.*** *Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.*

***PO 3.*** *Determine the intended audience of a writing piece.*

***PO 4.*** *Establish a controlling idea appropriate to the type of writing.*

***PO 5.*** *Use organizational strategies (e.g., outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to plan writing.*

***PO 6.*** *Maintain a record (e.g., lists, journals, folders, notebooks) of writing ideas.*

***PO 7.*** *Use time management strategies, when appropriate, to produce a writing product within a set time period.*

**Concept 2:** Drafting

Drafting incorporates prewriting activities to create a first draft containing necessary elements for a specific purpose.

***PO 1.*** *Use a prewriting plan to develop the main idea(s) with supporting details.*

**PO 2.** Sequence ideas into a cohesive, meaningful order.

**Concept 3:** Revising

Revising includes evaluating and refining the rough draft for clarity and effectiveness.

***PO 1.*** *Evaluate the draft for use of ideas and content, organization, voice, word choice, and sentence fluency.*

***PO 2.*** *Add details to the draft to more effectively accomplish the purpose.*

***PO 3.*** *Delete irrelevant and/or redundant information from the draft to more effectively accomplish the purpose.*

***PO 4.*** *Rearrange words, sentences, and paragraphs in the draft in order to clarify the meaning or to enhance the writing style.*

***PO 5.*** *Add transitional words and phrases to the draft in order to clarify meaning or enhance the writing style.*

***PO 6.*** *Use a variety of sentence structures (i.e., simple, compound, complex) to improve sentence fluency in the draft.*

***PO 7.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to refine the draft.*

**PO 8.** Use resources and reference materials (e.g., thesaurus, dictionary) to select more effective and precise language.

**Concept 4:** Editing

Editing includes proofreading and correcting the draft for conventions.

***PO 1.*** *Identify punctuation, spelling, and grammar and usage errors in the draft.*

***PO 2.*** *Use resources (e.g., dictionary, word lists, spelling/grammar checkers) to correct conventions.*

***PO 3.*** *Apply proofreading marks to indicate errors in conventions.*

***PO 4.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to edit the draft.*

**Concept 5:** Publishing

Publishing includes formatting and presenting a final product for the intended audience.

**PO 1.** Prepare writing that follows a format appropriate for the purpose (e.g., for display, sharing with others, submitting to a publication).

**PO 2.** Include such techniques as principles of design (e.g., margins, tabs, spacing, columns) and graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product.

***PO 3.*** *Write legibly.*

### Strand 2: Writing Components

**Concept 1:** Ideas and Content

Writing is clear and focused, holding the reader's attention throughout. Main ideas stand out and are developed by strong support and rich details. Purpose is accomplished.

**PO 1.** Maintain a clear, narrow focus to support the topic.

**PO 2.** Write with an identifiable purpose and for a specific audience.

**PO 3.** Provide sufficient, relevant, and carefully selected details for support.

**PO 4.** Demonstrate a thorough, balanced explanation of the topic.

**PO 5.** Include ideas and details that show original perspective and insights.

**Concept 2:** Organization

Organization addresses the structure of the writing and integrates the central meaning and patterns that hold the piece together.

***PO 1.*** *Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay).*

***PO 2.*** *Include a strong beginning or introduction that draws in the reader.*

***PO 3.*** *Place details appropriately to support the main idea.*

***PO 4.*** *Use effective transitions among all elements (sentences, paragraphs, and ideas).*

**PO 5.** Employ a variety of paragraphing strategies (e.g., topical, chronological, spatial) appropriate to application and purpose.

***PO 6.*** *Create an ending that provides a sense of resolution or closure.*

**Concept 3:** Voice

Voice will vary according to the type of writing, but should be appropriately formal or casual, distant or personal, depending on the audience and purpose.

***PO 1.*** *Show awareness of the audience through word choice, style, and an appropriate connection with, or distance from, the audience.*

***PO 2.*** *Convey a sense of identity through originality, sincerity, liveliness, or humor appropriate to topic and type of writing.*

***PO 3.*** *Choose appropriate voice (e.g., formal, informal, academic discourse) for the application.*

**PO 4.** Use engaging and expressive language that shows a commitment to the topic.

**PO 5.** Use language appropriate to purpose, topic, and audience.

**Concept 4:** Word Choice

Word choice reflects the writer's use of specific words and phrases to convey the intended message and employs a variety of words that are functional and appropriate to the audience and purpose.

***PO 1.*** *Use accurate, specific, powerful words and phrases that effectively convey the intended message.*

***PO 2.*** *Use vocabulary that is original, varied, and natural.*

**PO 3.** Use words that evoke clear images.

**PO 4.** Use literal and figurative language intentionally when appropriate.

**PO 5.** Use clichés only when appropriate to purpose.

**Concept 5:** Sentence Fluency

Fluency addresses the rhythm and flow of language. Sentences are strong and varied in structure and length.

**PO 1.** Use a variety of sentence structures (simple, compound, complex, and compound-complex) and lengths to reinforce relationships among ideas and to enhance the flow of the writing.

**PO 2.** Show extensive variation in sentence beginnings, lengths, and patterns to enhance the flow of the writing.

**PO 3.** Demonstrate a flow that is natural and powerful when read aloud.

**Concept 6:**Conventions

Conventions addresses the mechanics of writing, including capitalization, punctuation, spelling, grammar and usage, and paragraph breaks.

***PO 1.*** *Use capitals correctly for:*

*a. proper nouns:*
- *holidays*
- *place/regional names*
- *languages*
- *historical events*
- *organizations*
- *academic courses (e.g., algebra/Algebra I)*
- *product names*

*b. words used as names (e.g., Grandpa, Aunt Lyn)*
*c. literary titles (book, story, poem, play, song)*
*d. titles*
*e. abbreviations*
*f. proper adjectives (e.g., German shepherd, Chinese restaurant)*

***PO 2.*** *Use commas to correctly punctuate:*

*a. items in a series*
*b. greetings and closings of letters*
*c. introductory words, phrases and clauses*
*d. direct address*
*e. interruptors*
*f. compound sentences*
*g. appositives*
*h. dialogue*

***PO 3.*** *Use quotation marks to punctuate:*

*a. dialogue*
*b. titles*
*c. exact words from sources*

**PO 4.** Use underlining or italics to correctly identify titles and vessels (e.g., ships, spacecrafts, planes, trains).

**PO 5.** Use colons to punctuate business letter salutations and sentences introducing lists.

**PO 6.** Use semicolons to punctuate compound and compound-complex sentences when appropriate.

***PO 7.*** *Use apostrophes to punctuate:*

*a. contractions*
*b. singular possessives*
*c. plural possessives*

**PO 8.** Use hyphens, dashes, parentheses, ellipses, and brackets correctly.

***PO 9.*** *Spell words correctly.*

**PO 10.** Use paragraph breaks to reinforce the organizational structure, including dialogue.

**PO 11.** Demonstrate control of grammar and usage in writing:

a. parts of speech
b. verb forms and tenses
c. subject/verb agreement
d. pronoun/antecedent agreement
e. parallel structure
f. comparative and superlative degrees of adjectives
g. modifier placement
h. homonyms

**PO 12.** Use appropriate format, according to type of writing, to cite sources (e.g., Chicago, APA, MLA, UPI, any other recognized style manual).

## Strand 3: Writing Applications

**Concept 1:** Expressive

Expressive writing includes personal narratives, stories, poetry, songs, and dramatic pieces. Writing may be based on real or imagined events.

**PO 1.** Write in a variety of expressive forms (e.g. poetry, short story, and/or drama) that:

a. use voice and style appropriate to audience and purpose
b. organize ideas in writing to ensure coherence, logical progression, and support
c. employ literary devices (e.g., irony, conceit, foreshadowing, symbolism) to enhance style and voice

**Concept 2:** Expository

Expository writing includes nonfiction writing that describes, explains, informs, or summarizes ideas and content. The writing supports a thesis based on research, observation, and/or experience.

**PO 1.** Write a multi-paragraph essay (e.g., compare/contrast, cause/effect, process) that:

*a. includes background information to establish the thesis (hypothesis, essential question), as appropriate*
*b. states a thesis (hypothesis, essential question) with a narrow focus*
*c. includes evidence in support of a thesis (hypothesis, essential question) in the form of details, facts, examples, or reasons*
*d. communicates information and ideas from primary and/or secondary sources accurately and coherently, as appropriate*
*e. attributes sources of information, as appropriate*
*f. includes a topic sentence for each body paragraph*
*g. includes relevant factors and variables that need to be considered*
*h. includes visual aids to organize and record information on charts, data tables, maps and graphs, as appropriate*
*i. includes an effective conclusion*

**Concept 3:** Functional

Functional writing provides specific directions or information related to real-world tasks. This includes letters, memos, schedules, directories, signs, manuals, forms, recipes, and technical pieces for specific content areas.

**PO 1.** Write a work-related document (e.g., application, minutes, memo, cover letter, letter of application, speaker introduction, letter of recommendation, technical manual) that:

a. presents information purposefully and succinctly to meet the needs of the intended audience
b. follows a conventional format

**Concept 4:** Persuasive

Persuasive writing is used for the purpose of influencing the reader. The author presents an issue and expresses an opinion in order to convince an audience to agree with the opinion or to take a particular action.

**PO 1.** Write a persuasive composition (e.g. speech, editorial, letter to the editor, public service announcement) that:

a. states a position or claim
b. presents detailed evidence, examples, and reasoning to support effective arguments and emotional appeals
c. attributes sources of information when appropriate
d. structures ideas
e. acknowledges and refutes opposing arguments

**Concept 5:** Literary Response

Literary response is the writer's reaction to a literary selection. The response includes the writer's interpretation, analysis, opinion, and/or feelings about the piece of literature and selected elements within it.

**PO 1.** Write a literary analysis that:

a. evaluates the author's use of literary elements (i.e., theme, point of view, characterization, setting, plot)
b. interprets different elements of figurative language (i.e., simile, metaphor, personification, hyperbole, symbolism, allusion, and imagery, extended metaphor/conceit) with emphasis on how the author's use of language evokes readers' emotions
c. analyzes the way in which the theme, or meaning of a selection, represents a view or comment on life, providing textual evidence for the identified theme
d. explains the writer's use of irony, contradictions, paradoxes, incongruities, and ambiguities in a literary selection
e. analyzes an author's development of time and sequence through the use of complex literary devices such as foreshadowing and flashbacks
f. explains how meaning is enhanced through various features of poetry, including sound (e.g., rhythm, repetition, alliteration, consonance, assonance), structure (e.g., meter, rhyme scheme), and graphic elements (e.g., line length, punctuation, word position)

**Concept 6:** Research

Research writing is a process in which the writer identifies a topic or question to be answered. The writer locates and evaluates information about the topic or question, and then organizes, summarizes, and synthesizes the information into a finished product.

**PO 1.** Write a research product that:

a. incorporates evidence in support of a thesis or claim
b. integrates information and ideas from multiple primary and secondary sources
c. makes distinctions between the relative value and significance of specific data, facts, and ideas
d. includes visual aids to organize and record information on charts, data tables, maps and graphs, as appropriate
e. integrates direct quotes
f. uses internal citations
g. includes a works cited, bibliography, or reference page

## Academic Standard 3: LISTENING & SPEAKING

Students effectively listen and speak in situations that serve different purposes and involve a variety of audiences.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Listening and Speaking tasks, and the following:

**LS-P1.** Deliver a polished speech that is organized and well suited to the audience and that uses resource materials to clarify and defend positions

**LS-P2.** Deliver an impromptu speech that is organized, addresses a particular subject and is tailored to the audience

**LS-P3.** Deliver oral interpretations of literary or original works

**LS-P4.** Conduct an interview, taking appropriate notes and summarizing the information learned

**LS-P5.** Evaluate the effectiveness of informal and formal presentations that use illustrations, statistics, comparisons and analogies

**DISTINCTION** (Honors)

Students know and are able to do all of the above Listening and Speaking tasks and the following:

**LS-D1.** Use clear and concise language when presenting analytical responses to literature, conveying technical information, and explaining complex concepts and procedures

**LS-D2.** Deliver creative and dramatic interpretations of literary or original works

**LS-D3.** Communicate information expressively, informatively and analytically through a variety of media to audiences inside or outside of school

**LS-D4.** Evaluate and improve personal communication skills

## Academic Standard 4: VIEWING & PRESENTING

Students use a variety of visual media and resources to gather, evaluate and synthesize information and to communicate with others.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Viewing and Presenting tasks, and the following:

**VP-P1.** Analyze and evaluate visual media for language, subject matter and visual techniques used to influence attitudes, decision making and cultural perceptions

**VP-P2.** Plan, organize, develop, produce and evaluate an effective multimedia presentation, using tools such as charts, photographs, maps, tables, posters, transparencies, slides and electronic media

**VP-P3.** Analyze and evaluate the impact of visual media on the intended audience

**DISTINCTION** (Honors)

Students know and are able to do all of the above Viewing and Presenting tasks and the following:

**VP-D1.** Conduct research to evaluate the impact of language, subject matter and visual techniques used by the media

**VP-D2.** Expand abilities in developing multimedia presentations

**VP-D3.** Research ethnical issues related to the laws, rules and regulations for the use of media

## Academic Standard 1: READING

### Strand 1: Reading Process

**Concept 1:** Print Concepts

Demonstrate understanding of print concepts. *(Grades K–3)*

**Concept 2:** Phonemic Awareness

Identify and manipulate the sounds of speech. *(Grades K–2)*

**Concept 3:** Phonics

Decode words, using knowledge of phonics, syllabication, and word parts. *(Grades K–3)*

**Concept 4:** Vocabulary

Acquire and use new vocabulary in relevant contexts.

***PO 1.*** *Draw inferences about meaning of new vocabulary, based on knowledge of linguistic roots and affixes (e.g., Latin, Greek, Anglo-Saxon).*

***PO 2.*** *Identify the meaning of metaphors based on literary allusions and conceits.*

**Concept 5:** Fluency

Read fluently.

***PO 1.*** *Read from a variety of genres with accuracy, automaticity (immediate recognition), and prosody (expression).*

**Concept 6:** Comprehension Strategies

Employ strategies to comprehend text

***PO 1.*** *Predict text content using prior knowledge and text features (e.g., illustrations, titles, topic sentences, key words).*

***PO 2.*** *Generate clarifying questions in order to comprehend text.*

***PO 3.*** *Use graphic organizers in order to clarify the meaning of the text.*

***PO 4.*** *Connect information and events in text to experience and to related text and sources.*

***PO 5.*** *Apply knowledge of organizational structures (e.g., chronological order, sequence-time order, cause and effect relationships, logical order, classification schemes, problem-solution) of text to aid comprehension.*

### Strand 2: Comprehending Literary Text

**Concept 1:** Elements of Literature

Identify, analyze, and apply knowledge of the structures and elements of literature

***PO 1.*** *Evaluate the author's use of literary elements:*

- *theme (moral, lesson, meaning, message, view or comment on life),*
- *point of view (e.g., first vs. third, limited vs. omniscient),*
- *characterization (qualities, motives, actions, thoughts, dialogue, development, interactions),*
- *setting (time of day or year, historical period, place, situation), and*
- *plot (exposition, major and minor conflicts, rising action, climax, falling action, and resolution).*

***PO 2.*** *Interpret figurative language, including, personification, hyperbole, symbolism, allusion, imagery, extended metaphor/conceit, and allegory with emphasis upon how the writer uses language to evoke readers' emotions.*

**PO 3.** Analyze a writer's word choice and imagery as a means to appeal to the reader's senses and to set the tone, providing evidence from the text to support the analysis.

**PO 4.** Compare (and contrast) literary texts that express a universal theme, providing textual evidence (e.g., examples, details, quotations) as support for the identified theme.

**PO 5.** Analyze characteristics of sub genres (e.g., satire, parody, allegory) that overlap or cut across the lines of genre classifications such as poetry, novel, drama, short story, essay or editorial.

**PO 6.** Describe the function of dialogue, scene design, soliloquies, asides, and/or character foils in dramatic literature.

***PO 7.*** *Explain how meaning is enhanced through various features of poetry, including sound (e.g., rhythm, repetition, alliteration, consonance, assonance), structure (e.g., meter, rhyme scheme), graphic elements (e.g., line length, punctuation, word position).*

**Concept 2:** Historical and Cultural Aspects of Literature

Recognize and apply knowledge of the historical and cultural aspects of American, British, and world literature.

***PO 1.*** *Describe the historical and cultural aspects found in cross-cultural works of literature.*

**PO 2.** Relate literary works and their authors to the seminal ideas of their eras.

**PO 3.** Analyze culturally or historically significant literary works of British and world literature that reflect the major literary periods and traditions.

### Strand 3: Comprehending Informational Text

**Concept 1:** Expository Text

Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.

**PO 1.** Critique the effectiveness of the organizational pattern (e.g., logic, focus, consistency, coherence, visual appeal) of expository text.

**PO 2.** Determine the accuracy and truthfulness of one source of information by examining evidence offered in the material itself and by referencing and comparing the evidence with information available from multiple sources.

**PO 3.** Evaluate the evidence used to support the author's perspective contained within both primary and secondary sources.

**PO 4.** Compare (and contrast) readings on the same topic, by explaining how authors reach the same or different conclusions based upon differences in evidence, reasoning, assumptions, purposes, beliefs, biases, and argument.

**PO 5.** Identify an author's implicit and stated assumptions about a subject, based upon evidence in the selection.

**Concept 2:** Functional Text

Identify, analyze, and apply knowledge of the purpose, structures, clarity, and relevancy of functional text.

**PO 1.** Analyze how the patterns of organization, hierarchic structures, repetition of key ideas, syntax, and word choice influence the clarity and understandability of functional text.

**PO 2.** Evaluate the logic within functional text.

**Concept 3:** Persuasive Text

Explain basic elements of argument in text and their relationship to the author's purpose and use of persuasive strategies.

**PO 1.** Evaluate the merit of an argument, action, or policy by citing evidence offered in the material itself and by comparing the evidence with information available in other sources.

**PO 2.** Evaluate the effectiveness of an author's use of rhetorical devices in a persuasive argument.

***PO 3.*** *Identify unsupported inferences or fallacious reasoning in arguments advanced in persuasive text.*

**PO 4.** Evaluate persuasive sources for adherence to ethics.

## Academic Standard 2: WRITING

### Strand 1: Writing Process

**Concept 1:** Prewriting

Prewriting includes using strategies to generate, plan, and organize ideas for specific purposes.

***PO 1.*** *Generate ideas through a variety of activities (e.g., brainstorming, notes and logs, graphic organizers, record of writing ideas and discussion, printed material or other sources).*

***PO 2.*** *Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.*

***PO 3.*** *Determine the intended audience of a writing piece.*

***PO 4.*** *Establish a controlling idea appropriate to the type of writing.*

***PO 5.*** *Use organizational strategies (e.g., outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to plan writing.*

***PO 6.*** *Maintain a record (e.g., lists, journals, folders, notebooks) of writing ideas.*

***PO 7.*** *Use time management strategies, when appropriate, to produce a writing product within a set time period.*

**Concept 2:** Drafting

Drafting incorporates prewriting activities to create a first draft containing necessary elements for a specific purpose.

***PO 1.*** *Use a prewriting plan to develop the main idea(s) with supporting details.*

**PO 2.** Sequence ideas into a cohesive, meaningful order.

**Concept 3:** Revising

Revising includes evaluating and refining the rough draft for clarity and effectiveness.

***PO 1.*** *Evaluate the draft for use of ideas and content, organization, voice, word choice, and sentence fluency.*

***PO 2.*** *Add details to the draft to more effectively accomplish the purpose.*

***PO 3.*** *Delete irrelevant and/or redundant information from the draft to more effectively accomplish the purpose.*

***PO 4.*** *Rearrange words, sentences, and paragraphs in the draft in order to clarify the meaning or to enhance the writing style.*

***PO 5.*** *Add transitional words and phrases to the draft in order to clarify meaning or enhance the writing style.*

***PO 6.*** *Use a variety of sentence structures (i.e., simple, compound, complex) to improve sentence fluency in the draft.*

***PO 7.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to refine the draft.*

**PO 8.** Use resources and reference materials (e.g., thesaurus, dictionary) to select more effective and precise language.

**Concept 4:** Editing

Editing includes proofreading and correcting the draft for conventions.

***PO 1.*** *Identify punctuation, spelling, and grammar and usage errors in the draft.*

***PO 2.*** *Use resources (e.g., dictionary, word lists, spelling/grammar checkers) to correct conventions.*

***PO 3.*** *Apply proofreading marks to indicate errors in conventions.*

***PO 4.*** *Apply appropriate tools or strategies (e.g., peer review, checklists, rubrics) to edit the draft.*

**Concept 5:** Publishing

Publishing includes formatting and presenting a final product for the intended audience.

**PO 1.** Prepare writing that follows a format appropriate for the purpose (e.g., for display, sharing with others, submitting to a publication).

**PO 2.** Include such techniques as principles of design (e.g., margins, tabs, spacing, columns) and graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product.

***PO 3.*** *Write legibly.*

### Strand 2: Writing Components

**Concept 1:** Ideas and Content

Writing is clear and focused, holding the reader's attention throughout. Main ideas stand out and are developed by strong support and rich details. Purpose is accomplished.

**PO 1.** Maintain a clear, narrow focus to support the topic.

**PO 2.** Write with an identifiable purpose and for a specific audience.

**PO 3.** Provide sufficient, relevant, and carefully selected details for support.

**PO 4.** Demonstrate a thorough, balanced explanation of the topic.

**PO 5.** Include ideas and details that show original perspective and insights.

**Concept 2:** Organization

Organization addresses the structure of the writing and integrates the central meaning and patterns that hold the piece together.

***PO 1.*** *Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay).*

***PO 2.*** *Include a strong beginning or introduction that draws in the reader.*

***PO 3.*** *Place details appropriately to support the main idea.*

***PO 4.*** *Use effective transitions among all elements (sentences, paragraphs, and ideas).*

**PO 5.** Employ a variety of paragraphing strategies (e.g., topical, chronological, spatial) appropriate to application and purpose.

***PO 6.*** *Create an ending that provides a sense of resolution or closure.*

**Concept 3:** Voice

Voice will vary according to the type of writing, but should be appropriately formal or casual, distant or personal, depending on the audience and purpose.

***PO 1.*** *Show awareness of the audience through word choice, style, and an appropriate connection with, or distance from, the audience.*

***PO 2.*** *Convey a sense of identity through originality, sincerity, liveliness, or humor appropriate to topic and type of writing.*

***PO 3.*** *Choose appropriate voice (e.g., formal, informal, academic discourse) for the application.*

**PO 4.** Use engaging and expressive language that shows a commitment to the topic.

**PO 5.** Use language appropriate to purpose, topic, and audience.

**Concept 4:** Word Choice

Word choice reflects the writer's use of specific words and phrases to convey the intended message and employs a variety of words that are functional and appropriate to the audience and purpose.

***PO 1.*** *Use accurate, specific, powerful words and phrases that effectively convey the intended message.*

***PO 2.*** *Use vocabulary that is original, varied, and natural.*

**PO 3.** Use words that evoke clear images.

**PO 4.** Use literal and figurative language intentionally when appropriate.

**PO 5.** Use clichés only when appropriate to purpose.

**Concept 5:** Sentence Fluency

Fluency addresses the rhythm and flow of language. Sentences are strong and varied in structure and length.

**PO 1.** Use a variety of sentence structures (simple, compound, complex, and compound-complex) and lengths to reinforce relationships among ideas and to enhance the flow of the writing.

**PO 2.** Show extensive variation in sentence beginnings, lengths, and patterns to enhance the flow of the writing.

**PO 3.** Demonstrate a flow that is natural and powerful when read aloud.

**Concept 6:**Conventions

Conventions addresses the mechanics of writing, including capitalization, punctuation, spelling, grammar and usage, and paragraph breaks.

***PO 1.*** *Use capitals correctly for:*

a. *proper nouns:*
   - *holidays*
   - *place/regional names*
   - *languages*
   - *historical events*
   - *organizations*
   - *academic courses (e.g., algebra/Algebra I)*
   - *product names*

b. *words used as names (e.g., Grandpa, Aunt Lyn)*
c. *literary titles (book, story, poem, play, song)*
d. *titles*
e. *abbreviations*
f. *proper adjectives (e.g., German shepherd, Chinese restaurant)*

***PO 2.*** *Use commas to correctly punctuate:*

a. *items in a series*
b. *greetings and closings of letters*
c. *introductory words, phrases and clauses*
d. *direct address*
e. *interruptors*
f. *compound sentences*
g. *appositives*
h. *dialogue*

***PO 3.*** *Use quotation marks to punctuate:*

a. *dialogue*
b. *titles*
c. *exact words from sources*

**PO 4.** Use underlining or italics to correctly identify titles and vessels (e.g., ships, spacecrafts, planes, trains).

**PO 5.** Use colons to punctuate business letter salutations and sentences introducing lists.

**PO 6.** Use semicolons to punctuate compound and compound-complex sentences when appropriate.

***PO 7.*** *Use apostrophes to punctuate:*

a. *contractions*
b. *singular possessives*
c. *plural possessives*

**PO 8.** Use hyphens, dashes, parentheses, ellipses, and brackets correctly.

***PO 9.*** *Spell words correctly.*

**PO 10.** Use paragraph breaks to reinforce the organizational structure, including dialogue.

**PO 11.** Demonstrate control of grammar and usage in writing:

a. parts of speech
b. verb forms and tenses
c. subject/verb agreement
d. pronoun/antecedent agreement
e. parallel structure
f. comparative and superlative degrees of adjectives
g. modifier placement
h. homonyms

**PO 12.** Use appropriate format, according to type of writing, to cite sources (e.g., Chicago, APA, MLA, UPI, any other recognized style manual).

## Strand 3: Writing Applications

**Concept 1:** Expressive

Expressive writing includes personal narratives, stories, poetry, songs, and dramatic pieces. Writing may be based on real or imagined events.

***PO 1.*** *Write in a variety of expressive forms (e.g., poetry, fiction, autobiography, narrative, and/or drama) that:*

a. *use voice and style appropriate to audience and purpose*
b. *organize ideas in writing to ensure coherence, logical progression, and support*
c. *employ literary devices (e.g., irony, conceit, flashback, foreshadowing, symbolism, allusion) to enhance style and voice*

**Concept 2:** Expository

Expository writing includes nonfiction writing that describes, explains, informs, or summarizes ideas and content. The writing supports a thesis based on research, observation, and/or experience.

***PO 1.*** *Write a multi-paragraph essay (e.g., analysis, deduction/induction, problem/solution, extended definition) that:*

*a. includes background information to set up the thesis (hypothesis, essential question), as appropriate*
*b. states a thesis (hypothesis, essential question) with a narrow focus*
*c. includes evidence in support of a thesis (hypothesis, essential question) in the form of details, facts, examples, or reasons*
*d. communicates information and ideas from primary and/or secondary sources accurately and coherently, as appropriate*
*e. attributes sources of information as appropriate*
*f. includes a topic sentence for each body paragraph*
*g. includes relevant factors and variables that need to be considered*
*h. includes visual aids to organize and record information on charts, data tables, maps and graphs, as appropriate*
*i. includes an effective conclusion*

**Concept 3:** Functional

Functional writing provides specific directions or information related to real-world tasks. This includes letters, memos, schedules, directories, signs, manuals, forms, recipes, and technical pieces for specific content areas.

***PO 1.*** *Write a work-related document (e.g., resume, application essay) that:*

*a. presents information purposefully and succinctly to meet the needs of the intended audience*
*b. follows a conventional format*

**Concept 4:** Persuasive

Persuasive writing is used for the purpose of influencing the reader. The author presents an issue and expresses an opinion in order to convince an audience to agree with the opinion or to take a particular action.

***PO 1.*** *Write a persuasive composition (e.g. speech, editorial, letter to the editor, public service announcement) that:*

*a. states a position or claim*
*b. presents detailed evidence, examples, and reasoning to support effective arguments and emotional appeals*
*c. attributes sources of information when appropriate*
*d. structures ideas*
e. acknowledges and refutes opposing arguments

**Concept 5:** Literary Response

Literary response is the writer's reaction to a literary selection. The response includes the writer's interpretation, analysis, opinion, and/or feelings about the piece of literature and selected elements within it.

**PO 1.** Write a literary analysis that:

*a. evaluates the author's use of literary elements (i.e., theme, point of view, characterization, setting, plot)*
*b. interprets figurative language (i.e., personification, hyperbole, symbolism, allusion, imagery, extended metaphor/conceit, and allegory) with emphasis upon how the writer uses language to evoke readers' emotions*
*c. explains how meaning is enhanced through various features of poetry, including sound (e.g., rhythm, repetition, alliteration, consonance, assonance), structure (e.g., meter, rhyme scheme), graphic elements (e.g., line length, punctuation, word position)*
d. analyzes a writer's word choice and imagery as a means to appeal to the reader's senses and to set the tone, providing evidence from the text to support the analysis,
e. describes the function of dialogue, scene design, soliloquies, asides, and/or character foils in dramatic literature
f. compares literary texts that express a universal theme, providing textual evidence (e.g., examples, details, quotations) as support for the identified theme
g. analyzes characteristics of subgenres (e.g., satire, parody, allegory) that overlap or cut across the lines of genre classifications such as poetry, novel, drama, short story, essay or editorial

**Concept 6:** Research

Research writing is a process in which the writer identifies a topic or question to be answered. The writer locates and evaluates information about the topic or question, and then organizes, summarizes, and synthesizes the information into a finished product.

***PO 1.*** *Write a research product that:*

*a. incorporates evidence in support of a thesis or claim*
*b. integrates information and ideas from multiple primary and secondary sources*
*c. makes distinctions between the relative value and significance of specific data, facts, and ideas*
*d. includes visual aids to organize and record information on charts, data tables, maps and graphs, as appropriate*
*e. integrates direct quotes*
*f. uses internal citations*
*g. includes a works cited, bibliography, or reference page*

## Academic Standard 3: LISTENING & SPEAKING

Students effectively listen and speak in situations that serve different purposes and involve a variety of audiences.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Listening and Speaking tasks, and the following:

**LS-P1.** Deliver a polished speech that is organized and well suited to the audience and that uses resource materials to clarify and defend positions

**LS-P2.** Deliver an impromptu speech that is organized, addresses a particular subject and is tailored to the audience

**LS-P3.** Deliver oral interpretations of literary or original works

**LS-P4.** Conduct an interview, taking appropriate notes and summarizing the information learned

**LS-P5.** Evaluate the effectiveness of informal and formal presentations that use illustrations, statistics, comparisons and analogies

**DISTINCTION** (Honors)

Students know and are able to do all of the above Listening and Speaking tasks and the following:

**LS-D1.** Use clear and concise language when presenting analytical responses to literature, conveying technical information, and explaining complex concepts and procedures

**LS-D2.** Deliver creative and dramatic interpretations of literary or original works

**LS-D3.** Communicate information expressively, informatively and analytically through a variety of media to audiences inside or outside of school

**LS-D4.** Evaluate and improve personal communication skills

## Academic Standard 4: VIEWING & PRESENTING

Students use a variety of visual media and resources to gather, evaluate and synthesize information and to communicate with others.

**PROFICIENCY**

Students know and are able to do all "Readiness," "Foundations," and "Essentials" Viewing and Presenting tasks, and the following:

**VP-P1.** Analyze and evaluate visual media for language, subject matter and visual techniques used to influence attitudes, decision making and cultural perceptions

**VP-P2.** Plan, organize, develop, produce and evaluate an effective multimedia presentation, using tools such as charts, photographs, maps, tables, posters, transparencies, slides and electronic media

**VP-P3.** Analyze and evaluate the impact of visual media on the intended audience

**DISTINCTION** (Honors)

Students know and are able to do all of the above Viewing and Presenting tasks and the following:

**VP-D1.** Conduct research to evaluate the impact of language, subject matter and visual techniques used by the media

**VP-D2.** Expand abilities in developing multimedia presentations

**VP-D3.** Research ethnical issues related to the laws, rules and regulations for the use of media

# ARIZONA Grade 8 Mathematics
Academic Content Standards

## Strand 1: Number Sense and Operations

**Concept 1:** Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

**PO 1.** Locate rational numbers on a number line.

**PO 2.** Identify irrational numbers.

**PO 3.** Classify real numbers as rational or irrational.

**Concept 2:** Numerical Operations

Understand and apply numerical operations and their relationship to one another.

**PO 1.** Select the grade-level appropriate operation to solve word problems.

**PO 2.** Solve word problems using grade-level appropriate operations and numbers.

**PO 3.** Determine the square of an integer.

**PO 4.** Determine the square root of an integer.

**PO 5.** Identify squaring and finding square roots as inverse operations.

**PO 6.** Apply grade-level appropriate properties to assist in computation.

**PO 7.** Apply the symbols "√" to represent square root, "±" to represent roots, and "{ }" as grouping symbols.

**PO 8.** Use grade-level appropriate mathematical terminology.

**PO 9.** Calculate the missing value in a percentage problem.

**PO 10.** Convert standard notation to scientific notation, and vice versa.

**PO 11.** Simplify numerical expressions using the order of operations with grade-appropriate operations on number sets.

**Concept 3:** Estimation

Use estimation strategies reasonably and fluently.

**PO 1.** Solve grade-level appropriate problems using estimation.

**PO 2.** Use estimation to verify the reasonableness of a calculation (e.g., Is 32 the square root of 64?).

**PO 3.** Express answers to the appropriate place or degree of precision (e.g., time, money).

**PO 4.** Verify the reasonableness of estimates made from calculator results within a contextual situation.

## Strand 2: Data Analysis, Probability, and Discrete Mathematics

**Concept 1:** Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

**PO 1.** Formulate questions to collect data in contextual situations.

**PO 2.** Construct box-and-whisker plots.

**PO 3.** Determine the appropriate type of graphical display for a given data set.

**PO 4.** Interpret box-and-whisker plots, circle graphs, and scatter plots.

**PO 5.** Answer questions based on box-and-whisker plots, circle graphs, and scatter plots.

**PO 6.** Solve problems in contextual situations using the mean, median, mode, and range of a given data set.

**PO 7.** Formulate reasonable predictions based on a given set of data.

**PO 8.** Compare trends in data related to the same investigation.

**PO 9.** Solve contextual problems using scatter plots, box-and-whiskers plots, and double line graphs of continuous data.

**PO 10.** Evaluate the effects of missing or incorrect data on the results of an investigation (e.g., Susie's teacher recorded a 39 instead of a 93 for her last quiz, what will happen to Susie's average?).

**PO 11.** Identify a line of best fit for a scatter plot.

**PO 12.** Distinguish between causation and correlation.

**Concept 2:** Probability

Understand and apply the basic concepts of probability.

**PO 1.** Determine the probability that a specific event will occur in a 2-stage probability experiment.

**PO 2.** Solve contextual situations using probability (e.g., If the probability of Michelle making a free throw is 0.25, what is the probability that she will make three free throws in a row?).

**PO 3.** Predict the outcome of a grade-level appropriate probability experiment.

**PO 4.** Record the data from performing a grade-level appropriate probability experiment.

**PO 5.** Compare the outcome of an experiment to predictions made prior to performing the experiment.

**PO 6.** Distinguish between independent and dependent events.

**PO 7.** Compare the results of two repetitions of the same grade-level appropriate probability experiment.

**Concept 3:** Discrete Mathematics – Systematic Listing and Counting

Understand and demonstrate the systematic listing and counting of possible outcomes.

**PO 1.** Determine all possible outcomes involving the combination of two or more sets of objects (e.g., If you roll a six-sided number cube 4 times, how many possible outcomes are possible?).

**PO 2.** Determine all possible arrangements given a set (e.g., How many ways can you arrange a set of 7 books on a shelf?).

**Concept 4:** Vertex-Edge Graphs

Understand and apply vertex-edge graphs.

**PO 1.** Solve contextual problems represented by vertex-edge graphs.

## Strand 3: Patterns, Algebra, and Functions

**Concept 1:** Patterns

Identify patterns and apply pattern recognition to reason mathematically.

**PO 1.** Communicate a grade-level appropriate iterative or recursive pattern, using symbols or numbers.

**PO 2.** Extend a grade-level appropriate iterative or recursive pattern.

**PO 3.** Solve grade-level appropriate iterative or recursive pattern problems.

**Concept 2:** Functions and Relationships

Describe and model functions and their relationships.

**PO 1.** Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).

**PO 2.** Distinguish between linear and nonlinear functions, given graphic examples.

**PO 3.** Determine whether a graph or table is related to a given equation of the form $y = ax^2$ where '$a$' is a natural number.

**PO 4.** Identify independent and dependent variables for a contextual situation.

**Concept 3:** Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

**PO 1.** Evaluate algebraic expressions by substituting rational values for variables [e.g., $2(ab + ac + bc)$, when $a = 2$, $b = 3/5$, and $c = 4$].

**PO 2.** Use variables in contextual situations.

**PO 3.** Translate a written sentence or phrase into an algebraic equation or expression, and vice versa (e.g., Three less than twice a number is $2n - 3$.).

**PO 4.** Translate a sentence written in context into an algebraic equation involving two operations.

**PO 5.** Translate a contextual situation into an algebraic inequality (e.g., Joe earns more than $5.00 an hour; therefore, $x > 5$).

**PO 6.** Identify an equation or inequality that represents a contextual situation.

**PO 7.** Solve one-step equations with rational numbers as coefficients or as solutions.

**PO 8.** Solve one-step equations that model contextual situations.

**PO 9.** Solve two-step equations with rational coefficients and integer solutions (e.g., $3x + 5 = 11$, $4x - 20 = 8$).

**PO 10.** Graph an inequality on a number line.

**PO 11.** Solve a simple algebraic proportion.

**PO 12.** Solve applied problems using the Pythagorean theorem.

**Concept 4:** Analysis of Change

Analyze change in a variable over time and in various contexts.

**PO 1.** Identify the slope of a line as the rate of change (the ratio of rise over run).

## Strand 4: Geometry and Measurement

**Concept 1:** Geometric Properties

Analyze the attributes and properties of 2- and 3-dimensional shapes and develop mathematical arguments about their relationships.

**PO 1.** Draw a model that demonstrates basic geometric relationships such as parallelism, perpendicularity, similarity/proportionality, and congruence.

**PO 2.** Draw 3-dimensional figures by applying properties of each (e.g., parallelism, perpendicularity, congruency).

**PO 3.** Recognize the 3-dimensional figure represented by a net.

**PO 4.** Represent the surface area of rectangular prisms and cylinders as the area of their net.

**PO 5.** Draw regular polygons with appropriate labels.

**PO 6.** Identify the properties of angles created by a transversal intersecting two parallel lines (e.g., corresponding angles are congruent).

**PO 7.** Recognize the relationship between inscribed angles and intercepted arcs.

**PO 8.** Identify tangents and secants of a circle.

**PO 9.** Determine whether three given lengths can form a triangle.

**PO 10.** Identify corresponding angles of similar polygons as congruent and sides as proportional.

**Concept 2:** Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

**PO 1.** Identify the planar geometric figure that is the result of a given rigid transformation.

**PO 2.** Model a simple transformation on a coordinate grid (e.g., Translate right four units and down two units.).

**Concept 3:** Coordinate Geometry

Specify and describe spatial relationships using coordinate geometry and other representational systems.

**PO 1.** Use a table of values to graph a linear equation.

**PO 2.** Determine the midpoint given two points on a number line.

**PO 3.** Determine the distance between two points on a number line.

**Concept 4:** Measurement—Units of Measure
—Geometric Objects

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

**PO 1.** Solve problems for the area of a trapezoid.

**PO 2.** Solve problems involving the volume of rectangular prisms and cylinders.

**PO 3.** Calculate the surface area of rectangular prisms or cylinders.

**PO 4.** Identify rectangular prisms and cylinders having the same volume.

**PO 5.** Find the measure of a missing interior angle in a triangle or quadrilateral.

**PO 6.** Solve problems using ratios and proportions, given the scale factor.

**PO 7.** Calculate the length of a side, given two similar triangles.

## Strand 5: Structure and Logic

**Concept 1:** Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems in contextual situations.

**PO 1.** Describe how to use a proportion to solve a problem in context.

**PO 2.** Analyze algorithms.

**Concept 2:** Logic, Reasoning, Arguments, and Mathematical Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions and recognize their applications.

**PO 1.** Solve a logic problem given the necessary information.

**PO 2.** Identify simple valid arguments using *if…then* statements (e.g., All squares are rectangles. If quadrilateral *ABCD* is a rectangle, is it a square?).

**PO 3.** Model a contextual situation using a flow chart.

**PO 4.** Verify the Pythagorean theorem using an area dissection argument.

## Strand 1: Number Sense and Operations

**Concept 1:** Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

**PO 1.** Classify real numbers as members of one or more subsets: natural, whole, integers, rational, or irrational numbers.

**PO 2.** Identify properties of the real number system: commutative, associative, distributive, identity, inverse, and closure.

**PO 3.** Distinguish between finite and infinite sets of numbers.

**Concept 2:** Numerical Operations

Understand and apply numerical operations and their relationship to one another.

**PO 1.** Select the grade-level appropriate operation to solve word problems.

**PO 2.** Solve word problems using grade-level appropriate operations and numbers.

**PO 3.** Simplify numerical expressions including signed numbers and absolute values.

**PO 4.** Apply subscripts to represent ordinal position.

**PO 5.** Use grade level-appropriate mathematical terminology.

**PO 6.** Compute using scientific notation.

**PO 7.** Simplify numerical expressions using the order of operations.

**Concept 3:** Estimation

Use estimation strategies reasonably and fluently.

**PO 1.** Solve grade-level appropriate problems using estimation.

**PO 2.** Determine if a solution to a problem is reasonable.

**PO 3.** Determine rational approximations of irrational numbers.

## Strand 2: Data Analysis, Probability, and Discrete Mathematics

**Concept 1:** Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

**PO 1.** Formulate questions to collect data in contextual situations.

**PO 2.** Organize collected data into an appropriate graphical representation.

**PO 3.** Display data as lists, tables, matrices, and plots.

**PO 4.** Construct equivalent displays of the same data.

**PO 5.** Identify graphic misrepresentations and distortions of sets of data.

**PO 6.** Identify which of the measures of central tendency is most appropriate in a given situation.

**PO 7.** Make reasonable predictions based upon linear patterns in data sets or scatter plots.

**PO 8.** Make reasonable predictions for a set of data, based on patterns.

**PO 9.** Draw inferences from charts, tables, graphs, plots, or data sets.

**PO 10.** Apply the concepts of mean, median, mode, range, and quartiles to summarize data sets.

**PO 11.** Evaluate the reasonableness of conclusions drawn from data analysis.

**PO 12.** Recognize and explain the impact of interpreting data (making inferences or drawing conclusions) from a biased sample.

**PO 13.** Draw a line of best fit for a scatter plot.

**PO 14.** Determine whether displayed data has positive, negative, or no correlation.

**PO 15.** Identify a normal distribution.

**PO 16.** Identify differences between sampling and census.

**PO 17.** Identify differences between biased and unbiased samples.

**Concept 2:** Probability

Understand and apply the basic concepts of probability.

**PO 1.** Find the probability that a specific event will occur, with or without replacement.

**PO 2.** Determine simple probabilities related to geometric figures.

**PO 3.** Predict the outcome of a grade-level appropriate probability experiment.

**PO 4.** Record the data from performing a grade-level appropriate probability experiment.

**PO 5.** Compare the outcome of an experiment to predictions made prior to performing the experiment.

**PO 6.** Distinguish between independent and dependent events.

**PO 7.** Compare the results of two repetitions of the same grade-level appropriate probability experiment.

**Concept 3:** Discrete Mathematics – Systematic Listing and Counting

Understand and demonstrate the systematic listing and counting of possible outcomes.

**PO 1.** Determine the number of possible outcomes for a contextual event using a chart, a tree diagram, or the counting principle.

**PO 2.** Determine when to use combinations versus permutations in counting objects.

**PO 3.** Use combinations or permutations to solve contextual problems.

**Concept 4:** Vertex-Edge Graphs

Understand and apply vertex-edge graphs.
*(Grades K–8)*

## Strand 3: Patterns, Algebra, and Functions

**Concept 1:** Patterns

Identify patterns and apply pattern recognition to reason mathematically.

**PO 1.** Communicate a grade-level appropriate iterative or recursive pattern, using symbols or numbers.

**PO 2.** Find the *n*th term of an iterative or recursive pattern.

**PO 3.** Evaluate problems using basic recursion formulas.

**Concept 2:** Functions and Relationships

Describe and model functions and their relationships.

**PO 1.** Determine if a relationship is a function, given a graph, table, or set of ordered pairs.

**PO 2.** Describe a contextual situation that is depicted by a given graph.

**PO 3.** Identify a graph that models a given real-world situation.

**PO 4.** Sketch a graph that models a given contextual situation.

**PO 5.** Determine domain and range for a function.

**PO 6.** Determine the solution to a contextual maximum/minimum problem, given the graphical representation.

**PO 7.** Express the relationship between two variables using tables/matrices, equations, or graphs.

**PO 8.** Interpret the relationship between data suggested by tables/matrices, equations, or graphs.

**PO 9.** Determine from two linear equations whether the lines are parallel, perpendicular, coincident, or intersecting but not perpendicular.

**Concept 3:** Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

**PO 1.** Evaluate algebraic expressions, including absolute value and square roots.

**PO 2.** Simplify algebraic expressions.

**PO 3.** Multiply and divide monomial expressions with integral exponents.

**PO 4.** Translate a written expression or sentence into a mathematical expression or sentence.

**PO 5.** Translate a sentence written in context into an algebraic equation involving multiple operations.

**PO 6.** Write a linear equation for a table of values.

**PO 7.** Write a linear algebraic sentence that represents a data set that models a contextual situation.

**PO 8.** Solve linear (first degree) equations in one variable (may include absolute value).

**PO 9.** Solve linear inequalities in one variable.

**PO 10.** Write an equation of the line given: two points on the line, the slope and a point on the line, or the graph of the line.

**PO 11.** Solve an algebraic proportion.

**PO 12.** Solve systems of linear equations in two variables (integral coefficients and rational solutions).

**PO 13.** Add, subtract, and perform scalar multiplication with matrices.

**PO 14.** Calculate powers and roots of real numbers, both rational and irrational, using technology when appropriate.

**PO 15.** Simplify square roots and cube roots with monomial radicands (including those with variables) that are perfect squares or perfect cubes.

**PO 16.** Solve square root radical equations involving only one radical.

**PO 17.** Solve quadratic equations.

**PO 18.** Identify the sine, cosine, and tangent ratios of the acute angles of a right triangle.

**Concept 4:** Analysis of Change

Analyze change in a variable over time and in various contexts.

**PO 1.** Determine slope, *x*-, and *y*-intercepts of a linear equation.

**PO 2.** Solve formulas for specified variables.

## Strand 4: Geometry and Measurement

**Concept 1:** Geometric Properties

Analyze the attributes and properties of 2- and 3-dimensional shapes and develop mathematical arguments about their relationships.

**PO 1.** Identify the attributes of special triangles (isosceles, equilateral, right).

**PO 2.** Identify the hierarchy of quadrilaterals.

**PO 3.** Make a net to represent a 3-dimensional object.

**PO 4.** Make a 3-dimensional model from a net.

**PO 5.** Draw 2-dimensional and 3-dimensional figures with appropriate labels.

**PO 6.** Solve problems related to complementary, supplementary, or congruent angle concepts.

**PO 7.** Solve problems by applying the relationship between circles, angles, and intercepted arcs.

**PO 8.** Solve problems by applying the relationship between radii, diameters, chords, tangents, or secants.

**PO 9.** Solve problems using the triangle inequality property.

**PO 10.** Solve problems using special case right triangles.

**PO 11.** Determine when triangles are congruent by applying SSS, ASA, AAS, or SAS.

**PO 12.** Determine when triangles are similar by applying SAS, SSS, or AA similarity postulates.

**PO 13.** Construct a triangle congruent to a given triangle.

**PO 14.** Solve contextual situations using angle and side length relationships.

**Concept 2:** Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

**PO 1.** Sketch the planar figure that is the result of two or more transformations.

**PO 2.** Identify the properties of the planar figure that is the result of two or more transformations.

**PO 3.** Determine the new coordinates of a point when a single transformation is performed on a planar geometric figure.

**PO 4.** Determine whether a given pair of figures on a coordinate plane represents a translation, reflection, rotation, or dilation.

**PO 5.** Classify transformations based on whether they produce congruent or similar figures.

**PO 6.** Determine the effects of a single transformation on linear or area measurements of a planar geometric figure.

**Concept 3:** Coordinate Geometry

Specify and describe spatial relationships using coordinate geometry and other representational systems.

**PO 1.** Graph a quadratic equation with lead coefficient equal to one.

**PO 2.** Graph a linear equation in two variables.

**PO 3.** Graph a linear inequality in two variables.

**PO 4.** Determine the solution to a system of equations in two variables from a given graph.

**PO 5.** Determine the midpoint between two points in a coordinate system.

**PO 6.** Determine changes in the graph of a linear function when constants and coefficients in its equation are varied.

**PO 7.** Determine the distance between two points in the coordinate system.

**Concept 4:** Measurement—Units of Measure
—Geometric Objects

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

**PO 1.** Calculate the area of geometric shapes composed of two or more geometric figures.

**PO 2.** Calculate the volumes of 3-dimensional geometric figures.

**PO 3.** Calculate the surface areas of 3-dimensional geometric figures.

**PO 4.** Compare perimeter, area, or volume of figures when dimensions are changed.

**PO 5.** Find the length of a circular arc.

**PO 6.** Find the area of a sector of a circle.

**PO 7.** Solve for missing measures in a pyramid (i.e., slant height, height).

**PO 8.** Find the sum of the interior and exterior angles of a polygon.

**PO 9.** Solve scale factor problems using ratios and proportions.

**PO 10.** Solve applied problems using similar triangles.

## Strand 5: Structure and Logic

**Concept 1:** Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems in contextual situations.

**PO 1.** Determine whether a given procedure for simplifying an expression is valid.

**PO 2.** Determine whether a given procedure for solving an equation is valid.

**PO 3.** Determine whether a given procedure for solving a linear inequality is valid.

**PO 4.** Select an algorithm that explains a particular mathematical process.

**PO 5.** Determine the purpose of a simple mathematical algorithm.

**PO 6.** Determine whether given simple mathematical algorithms are equivalent.

**Concept 2:** Logic, Reasoning, Arguments, and Mathematical Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions and recognize their applications.

**PO 1.** Draw a simple valid conclusion from a given *if…then* statement and a minor premise.

**PO 2.** List related *if…then* statements in logical order.

**PO 3.** Write an appropriate conjecture given a certain set of circumstances.

**PO 4.** Analyze assertions related to a contextual situation by using principles of logic.

**PO 5.** Identify a valid conjecture using inductive reasoning.

**PO 6.** Distinguish valid arguments from invalid arguments.

**PO 7.** Create inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.

**PO 8.** Critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.

**PO 9.** Identify a counterexample for a given conjecture.

**PO 10.** Construct a counterexample to show that a given conjecture is false.

**PO 11.** State the inverse, converse, or contrapositive of a given statement.

**PO 12.** Determine if the inverse, converse, or contrapositive of a given statement is true or false.

**PO 13.** Construct a simple formal or informal deductive proof.

**PO 14.** Verify characteristics of a given geometric figure using coordinate formulas such as distance, mid-point, and slope to confirm parallelism, perpendicularity, and congruency.

# ARIZONA Grade 8 Science
Academic Content Standards

## Strand 1: Inquiry Process

**Concept 1:** Observations, Questions, and Hypotheses

Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

***PO 1.*** *Formulate questions based on observations that lead to the development of a hypothesis.*

**PO 2.** Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis.

**PO 3.** Generate a hypothesis that can be tested.

**Concept 2:** Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

***PO 1.*** *Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.*

**PO 2.** Design a controlled investigation to support or reject a hypothesis.

**PO 3.** Conduct a controlled investigation to support or reject a hypothesis.

***PO 4.*** *Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).*

***PO 5.*** *Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.*

**Concept 3:** Analysis and Conclusions

Analyze and interpret data to explain correlations and results; formulate new questions.

***PO 1.*** *Analyze data obtained in a scientific investigation to identify trends.*

***PO 2.*** *Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).*

**PO 3.** Interpret data that show a variety of possible relationships between two variables, including:

- positive relationship
- negative relationship
- no relationship

**PO 4.** Formulate a future investigation based on the data collected.

**PO 5.** Explain how evidence supports the validity and reliability of a conclusion.

**PO 6.** Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).

**PO 7.** Critique scientific reports from periodicals, television, or other media.

***PO 8.*** *Formulate new questions based on the results of a previous investigation.*

**Concept 4:** Communication

Communicate results of investigations.

**PO 1.** Communicate the results of an investigation.

***PO 2.*** *Choose an appropriate graphic representation for collected data:*

- *line graph*
- *double bar graph*
- *stem and leaf plot*
- *histogram*

**PO 3.** Present analyses and conclusions in clear, concise formats.

**PO 4.** Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns).

***PO 5.*** *Communicate the results and conclusion of the investigation.*

## Strand 2: History and Nature of Science

**Concept 1:** History of Science as a Human Endeavor

Identify individual, cultural, and technological contributions to scientific knowledge.

***PO 1.*** *Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson and Crick; Rosalind Franklin; Charles Darwin; George Washington Carver; Joseph Priestley; Sir Frances Bacon; Isaac Newton).*

**PO 2.** Evaluate the effects of the following major scientific milestones on society:

- Mendelian Genetics
- Newton's Laws

**PO 3.** Evaluate the impact of a major scientific development occurring within the past decade.

**PO 4.** Evaluate career opportunities related to life and physical sciences.

**Concept 2:** Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

***PO 1.*** *Apply the following scientific processes to other problem solving or decision making situations:*

- *observing*
- *questioning*
- *communicating*



= Measured by ACT's EPAS Science tests and/or WorkKeys Locating Information

_____ = Content sampled by ACT's EPAS Science tests

- *comparing*
- *measuring*
- *classifying*
- *predicting*
- *organizing data*
- *inferring*
- *generating hypotheses*
- *identifying variables*

***PO 2.*** *Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.*

**PO 3.** Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.

**PO 4.** Explain why scientific claims may be questionable if based on very small samples of data, biased samples, or samples for which there was no control.

## Strand 3: Science in Personal and Social Perspectives

**Concept 1:** Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

**PO 1.** Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:

- waste disposal of industrial chemicals
- greenhouse gases

**PO 2.** Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.

**Concept 2:** Science and Technology in Society

Develop viable solutions to a need or problem.

***PO 1.*** *Propose viable methods of responding to an identified need or problem.*

***PO 2.*** *Compare solutions to best address an identified need or problem.*

***PO 3.*** *Design and construct a solution to an identified need or problem using simple classroom materials.*

**PO 4.** Compare risks and benefits of the following technological advances:

- radiation treatments
- genetic engineering
- airbags

## Strand 4: Life Science

**Concept 1:** Structure and Function in Living Systems

Understand the relationships between structures and functions of organisms.

No performance objectives at this grade level

**Concept 2:** Reproduction and Heredity

Understand the basic principles of heredity.

**PO 1.** Explain the purposes of cell division:

- growth and repair
- reproduction

**PO 2.** Explain the basic principles of heredity using the human examples of:

- eye color
- widow's peak
- blood type

**PO 3.** Distinguish between the nature of dominant and recessive traits in humans.

**Concept 3:** Populations of Organisms in an Ecosystem

Analyze the relationships among various organisms and their environment.

No performance objectives at this grade level

**Concept 4:** Diversity, Adaptation, and Behavior

Identify structural and behavioral adaptations.

**PO 1.** Explain how an organism's behavior allows it to survive in an environment.

**PO 2.** Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.

**PO 3.** Determine characteristics of organisms that could change over several generations.

**PO 4.** Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).

**PO 5.** Analyze the following behavioral cycles of organisms:

- hibernation
- migration
- dormancy (plants)

**PO 6.** Describe the following factors that allow for the survival of living organisms:

- protective coloration
- beak design
- seed dispersal
- pollination

## Strand 5: Physical Science

**Concept 1:** Properties and Changes of Properties in Matter

Understand physical and chemical properties of matter.

**PO 1.** Identify different kinds of matter based on the following physical properties:

- states
- density
- boiling point
- melting point
- solubility

**PO 2.** Identify different kinds of matter based on the following chemical properties:

- reactivity
- pH
- oxidation (corrosion)



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**PO 3.** Identify the following types of evidence that a chemical reaction has occurred:

- formation of a precipitate
- generation of gas
- color change
- absorption or release of heat

**PO 4.** Classify matter in terms of elements, compounds, or mixtures.

**PO 5.** Classify mixtures as being homogeneous or heterogeneous.

**PO 6.** Explain the systematic organization of the periodic table.

**PO 7.** Investigate how the transfer of energy can affect the physical and chemical properties of matter.

**Concept 2:** Motion and Forces

Understand the relationship between force and motion.

**PO 1.** Demonstrate velocity as the rate of change of position over time.

**PO 2.** Identify the conditions under which an object will continue in its state of motion (Newton's 1st Law of Motion).

**PO 3.** Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton's 2nd Law of Motion).

**PO 4.** Describe forces as interactions between bodies (Newton's 3rd Law of Motion).

**PO 5.** Create a graph devised from measurements of moving objects and their interactions, including:

- position-time graphs
- velocity-time graphs

**Concept 3:** Transfer of Energy

Understand that energy can be stored and transferred.

No performance objectives at this grade level

## Strand 6: Earth and Space Science

**Concept 1:** Structure of the Earth

Describe the composition and interactions between the structure of the Earth and its atmosphere.

No performance objectives at this grade level

**Concept 2:** Earth's Processes and Systems

Understand the processes acting on the Earth and their interaction with the Earth systems.

No performance objectives at this grade level

**Concept 3:** Earth in the Solar System

Understand the relationships of the Earth and other objects in the solar system.

No performance objectives at this grade level



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## Strand 1: Inquiry Process

**Concept 1:** Observations, Questions, and Hypotheses

Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

**PO 1.** Evaluate scientific information for relevance to a given problem.

**PO 2.** Develop questions from observations that transition into testable hypotheses.

**PO 3.** Formulate a testable hypothesis.

**PO 4.** Predict the outcome of an investigation based on prior evidence, probability, and/or modeling (not guessing or inferring).

**Concept 2:** Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

**PO 1.** Demonstrate safe and ethical procedures (e.g., use and care of technology, materials, organisms) and behavior in all science inquiry.

**PO 2.** Identify the resources needed to conduct an investigation.

**PO 3.** Design an appropriate protocol (written plan of action) for testing a hypothesis:

- Identify dependent and independent variables in a controlled investigation.
- Determine an appropriate method for data collection (e.g., using balances, thermometers, microscopes, spectrophotometer, using qualitative changes).
- Determine an appropriate method for recording data (e.g., notes, sketches, photographs, videos, journals (logs), charts, computers/calculators).

**PO 4.** Conduct a scientific investigation that is based on a research design.

**PO 5.** Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers.

**Concept 3:** Analysis, Conclusions, and Refinements

Evaluate experimental design, analyze data to explain results and propose further investigations. Design models.

***PO 1.*** *Interpret data that show a variety of possible relationships between variables, including:*

- *positive relationship*
- *negative relationship*
- *no relationship*

**PO 2.** Evaluate whether investigational data support or do not support the proposed hypothesis.

**PO 3.** Critique reports of scientific studies (e.g., published papers, student reports).

**PO 4.** Evaluate the design of an investigation to identify possible sources of procedural error, including:

- sample size
- trials
- controls
- analyses

**PO 5.** Design models (conceptual or physical) of the following to represent "real world" scenarios:

- carbon cycle
- water cycle
- phase change
- collisions

**PO 6.** Use descriptive statistics to analyze data, including:

- mean
- frequency
- range

**PO 7.** Propose further investigations based on the findings of a conducted investigation.

**Concept 4:** Communication

Communicate results of investigations.

**PO 1.** For a specific investigation, choose an appropriate method for communicating the results.

**PO 2.** Produce graphs that communicate data.

**PO 3.** Communicate results clearly and logically.

**PO 4.** Support conclusions with logical scientific arguments.

## Strand 2: History and Nature of Science

**Concept 1:** History of Science as a Human Endeavor

Identify individual, cultural, and technological contributions to scientific knowledge.

**PO 1.** Describe how human curiosity and needs have influenced science, impacting the quality of life worldwide.

***PO 2.*** *Describe how diverse people and/or cultures, past and present, have made important contributions to scientific innovations.*

**PO 3.** Analyze how specific changes in science have affected society.

**PO 4.** Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.

**Concept 2:** Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

**PO 1.** Specify the requirements of a valid, scientific explanation (theory), including that it be:

- logical
- subject to peer review
- public
- respectful of rules of evidence

**PO 2.** Explain the process by which accepted ideas are challenged or extended by scientific innovation.

**PO 3.** Distinguish between pure and applied science.

**PO 4.** Describe how scientists continue to investigate and critically analyze aspects of theories.



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## Strand 3: Science in Personal and Social Perspectives

**Concept 1:** Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

**PO 1.** Evaluate how the processes of natural ecosystems affect, and are affected by, humans.

**PO 2.** Describe the environmental effects of the following natural and/or human-caused hazards:

- flooding
- drought
- earthquakes
- fires
- pollution
- extreme weather

**PO 3.** Assess how human activities (e.g., clear cutting, water management, tree thinning) can affect the potential for hazards.

**PO 4.** Evaluate the following factors that affect the quality of the environment:

- urban development
- smoke
- volcanic dust

**PO 5.** Evaluate the effectiveness of conservation practices and preservation techniques on environmental quality and biodiversity.

**Concept 2:** Science and Technology in Society

Develop viable solutions to a need or problem.

**PO 1.** Analyze the costs, benefits, and risks of various ways of dealing with the following needs or problems:

- various forms of alternative energy
- storage of nuclear waste
- abandoned mines
- greenhouse gases
- hazardous wastes

**PO 2.** Recognize the importance of basing arguments on a thorough understanding of the core concepts and principles of science and technology.

**PO 3.** Support a position on a science or technology issue.

**PO 4.** Analyze the use of renewable and nonrenewable resources in Arizona:

- water
- land
- soil
- minerals
- air

**PO 5.** Evaluate methods used to manage natural resources (e.g., reintroduction of wildlife, fire ecology).

**Concept 3:** Human Population Characteristics

Analyze factors that affect human populations.

**PO 1.** Analyze social factors that limit the growth of a human population, including:

- affluence
- education
- access to health care
- cultural influences

**PO 2.** Describe biotic (living) and abiotic (nonliving) factors that affect human populations.

**PO 3.** Predict the effect of a change in a specific factor on a human population.

## Strand 4: Life Science

**Concept 1:** The Cell

Understand the role of the cell and cellular processes.

**PO 1.** Describe the role of energy in cellular growth, development, and repair.

**PO 2.** Compare the form and function of prokaryotic and eukaryotic cells and their cellular components.

**PO 3.** Explain the importance of water to cells.

**PO 4.** Analyze mechanisms of transport of materials (e.g., water, ions, macromolecules) into and out of cells:

- passive transport
- active transport

**PO 5.** Describe the purposes and processes of cellular reproduction.

**Concept 2:** Molecular Basis of Heredity

Understand the molecular basis of heredity and resulting genetic diversity.

**PO 1.** Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes.

**PO 2.** Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.

**PO 3.** Explain how genotypic variation occurs and results in phenotypic diversity.

**PO 4.** Describe how meiosis and fertilization maintain genetic variation.

**Concept 3:** Interdependence of Organisms

Analyze the relationships among various organisms and their environment.

**PO 1.** Identify the relationships among organisms within populations, communities, ecosystems, and biomes.

**PO 2.** Describe how organisms are influenced by a particular combination of biotic (living) and abiotic (nonliving) factors in an environment.

**PO 3.** Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.

**Concept 4:** Biological Evolution

Understand the scientific principles and processes involved in biological evolution.

**PO 1.** Identify the following components of natural selection, which can lead to speciation:

- potential for a species to increase its numbers
- genetic variability and inheritance of offspring due to mutation and recombination of genes


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- finite supply of resources required for life
- selection by the environment of those offspring better able to survive and produce offspring

**PO 2.** Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.

**PO 3.** Describe how the continuing operation of natural selection underlies a population's ability to adapt to changes in the environment and leads to biodiversity and the origin of new species.

**PO 4.** Predict how a change in an environmental factor (e.g., rainfall, habitat loss, non-native species) can affect the number and diversity of species in an ecosystem.

**PO 5.** Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology, and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.

**PO 6.** Analyze, using a biological classification system (i.e., cladistics, phylogeny, morphology, DNA analysis), the degree of relatedness among various species.

**Concept 5:** Matter, Energy, and Organization in Living Systems (Including Human Systems)

Understand the organization of living systems, and the role of energy within those systems.

**PO 1.** Compare the processes of photosynthesis and cellular respiration in terms of energy flow, reactants, and products.

**PO 2.** Describe the role of organic and inorganic chemicals (e.g., carbohydrates, proteins, lipids, nucleic acids, water, ATP) important to living things.

**PO 3.** Diagram the following biogeochemical cycles in an ecosystem:
- water
- carbon
- nitrogen

**PO 4.** Diagram the energy flow in an ecosystem through a food chain.

**PO 5.** Describe the levels of organization of living things from cells, through tissues, organs, organ systems, organisms, populations, and communities to ecosystems.

## Strand 5: Physical Science

**Concept 1:** Structure and Properties of Matter

Understand physical, chemical, and atomic properties of matter.

**PO 1.** Describe substances based on their physical properties.

**PO 2.** Describe substances based on their chemical properties.

**PO 3.** Predict properties of elements and compounds using trends of the periodic table (e.g., metals, non-metals, bonding—ionic/covalent).

**PO 4.** Separate mixtures of substances based on their physical properties.

**PO 5.** Describe the properties of electric charge and the conservation of electric charge.

**PO 6.** Describe the following features and components of the atom:
- protons
- neutrons
- electrons
- mass
- number and type of particles
- structure
- organization

**PO 7.** Describe the historical development of models of the atom.

**PO 8.** Explain the details of atomic structure (e.g., electron configuration, energy levels, isotopes).

**Concept 2:** Motion and Forces

Analyze relationships between forces and motion.

**PO 1.** Determine the rate of change of a quantity (e.g., rate of erosion, rate of reaction, rate of growth, velocity).

**PO 2.** Analyze the relationships among position, velocity, acceleration, and time:
- graphically
- mathematically

**PO 3.** Explain how Newton's 1st Law applies to objects at rest or moving at constant velocity.

**PO 4.** Using Newton's 2nd Law of Motion, analyze the relationships among the net force acting on a body, the mass of the body, and the resulting acceleration:
- graphically
- mathematically

**PO 5.** Use Newton's 3rd Law to explain forces as interactions between bodies (e.g., a table pushing up on a vase that is pushing down on it; an athlete pushing on a basketball as the ball pushes back on her).

**PO 6.** Analyze the two-dimensional motion of objects by using vectors and their components.

**PO 7.** Give an example that shows the independence of the horizontal and vertical components of projectile motion.

**PO 8.** Analyze the general relationships among force, acceleration, and motion for an object undergoing uniform circular motion.

**PO 9.** Represent the force conditions required to maintain static equilibrium.

**PO 10.** Describe the nature and magnitude of frictional forces.

**PO 11.** Using the Law of Universal Gravitation, predict how the gravitational force will change when the distance between two masses changes or the mass of one of them changes.

**PO 12.** Using Coulomb's Law, predict how the electrical force will change when the distance between two point charges changes or the charge of one of them changes.

**PO 13.** Analyze the impulse required to produce a change in momentum.

**PO 14.** Quantify interactions between objects to show that the total momentum is conserved in both collision and recoil situations.

**Concept 3:** Conservation of Energy and Increase in Disorder

Understand ways that energy is conserved, stored, and transferred.

**PO 1.** Describe the following ways in which energy is stored in a system:

- mechanical
- electrical
- chemical
- nuclear

**PO 2.** Describe various ways in which energy is transferred from one system to another (e.g., mechanical contact, thermal conduction, electromagnetic radiation.)

**PO 3.** Recognize that energy is conserved in a closed system.

**PO 4.** Calculate quantitative relationships associated with the conservation of energy.

**PO 5.** Analyze the relationship between energy transfer and disorder in the universe (2nd Law of Thermodynamics).

**PO 6.** Distinguish between heat and temperature.

**PO 7.** Explain how molecular motion is related to temperature and phase changes.

**Concept 4:** Chemical Reactions

Investigate relationships between reactants and products in chemical reactions.

**PO 1.** Apply the law of conservation of matter to changes in a system.

**PO 2.** Identify the indicators of chemical change, including formation of a precipitate, evolution of a gas, color change, absorption or release of heat energy.

**PO 3.** Represent a chemical reaction by using a balanced equation.

**PO 4.** Distinguish among the types of bonds (i.e., ionic, covalent, metallic, hydrogen bonding).

**PO 5.** Describe the mole concept and its relationship to Avogadro's number.

**PO 6.** Solve problems involving such quantities as moles, mass, molecules, volume of a gas, and molarity using the mole concept and Avogadro's number.

**PO 7.** Predict the properties (e.g., melting point, boiling point, conductivity) of substances based upon bond type.

**PO 8.** Quantify the relationships between reactants and products in chemical reactions (e.g., stoichiometry, equilibrium, energy transfers).

**PO 9.** Predict the products of a chemical reaction using types of reactions (e.g., synthesis, decomposition, replacement, combustion).

**PO 10.** Explain the energy transfers within chemical reactions using the law of conservation of energy.

**PO 11.** Predict the effect of various factors (e.g., temperature, concentration, pressure, catalyst) on the equilibrium state and on the rates of chemical reaction.

**PO 12.** Compare the nature, behavior, concentration, and strengths of acids and bases.

**PO 13.** Determine the transfer of electrons in oxidation/reduction reactions.

**Concept 5:** Interactions of Energy and Matter

Understand the interactions of energy and matter.

**PO 1.** Describe various ways in which matter and energy interact (e.g., photosynthesis, phase change).

**PO 2.** Describe the following characteristics of waves:

- wavelength
- frequency
- period
- amplitude

**PO 3.** Quantify the relationships among the frequency, wavelength, and the speed of light.

**PO 4.** Describe the basic assumptions of kinetic molecular theory.

**PO 5.** Apply kinetic molecular theory to the behavior of matter (e.g., gas laws).

**PO 6.** Analyze calorimetric measurements in simple systems and the energy involved in changes of state.

**PO 7.** Explain the relationship between the wavelength of light absorbed or released by an atom or molecule and the transfer of a discrete amount of energy.

**PO 8.** Describe the relationship among electric potential, current, and resistance in an ohmic system.

**PO 9.** Quantify the relationships among electric potential, current, and resistance in an ohmic system.

## Strand 6: Earth and Space Science

**Concept 1:** Geochemical Cycles

Analyze the interactions between the Earth's structures, atmosphere, and geochemical cycles.

**PO 1.** Identify ways materials are cycled within the Earth system (i.e., carbon cycle, water cycle, rock cycle).

**PO 2.** Demonstrate how dynamic processes such as weathering, erosion, sedimentation, metamorphism, and orogenesis relate to redistribution of materials within the Earth system.

**PO 3.** Explain how the rock cycle is related to plate tectonics.

**PO 4.** Demonstrate how the hydrosphere links the biosphere, lithosphere, cryosphere, and atmosphere.

**PO 5.** Describe factors that impact current and future water quantity and quality including surface, ground, and local water issues.

**PO 6.** Analyze methods of reclamation and conservation of water.

**PO 7.** Explain how the geochemical processes are responsible for the concentration of economically valuable minerals and ores in Arizona and worldwide.



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**Concept 2:** Energy in the Earth System (Both Internal and External)

Understand the relationships between the Earth's land masses, oceans, and atmosphere.

**PO 1.** Describe the flow of energy to and from the Earth.

**PO 2.** Explain the mechanisms of heat transfer (convection, conduction, radiation) among the atmosphere, land masses, and oceans.

**PO 3.** Distinguish between weather and climate.

**Internal Energy:**

**PO 4.** Demonstrate the relationship between the Earth's internal convective heat flow and plate tectonics.

**PO 5.** Demonstrate the relationships among earthquakes, volcanoes, mountain ranges, mid-oceanic ridges, deep sea trenches, and tectonic plates.

**PO 6.** Distinguish among seismic S, P, and surface waves.

**PO 7.** Analyze the seismic evidence (S and P waves) used to determine the structure of the Earth.

**PO 8.** Describe how radioactive decay maintains the Earth's internal temperature.

**External Energy:**

**PO 9.** Explain the effect of heat transfer on climate and weather.

**PO 10.** Demonstrate the effect of the Earth's rotation (i.e., Coriolis effect) on the movement of water and air.

**PO 11.** Describe the origin, life cycle, and behavior of weather systems (i.e., air mass, front, high and low systems, pressure gradients).

**PO 12.** Describe the conditions that cause severe weather (e.g., hurricanes, tornadoes, thunderstorms).

**PO 13.** Propose appropriate safety measures that can be taken in preparation for severe weather.

**PO 14.** Analyze how weather is influenced by both natural and artificial Earth features (e.g., mountain ranges, bodies of water, cities, air pollution).

**PO 15.** List the factors that determine climate (e.g., altitude, latitude, water bodies, precipitation, prevailing winds, topography).

**PO 16.** Explain the causes and/or effects of climate changes over long periods of time (e.g., glaciation, desertification, solar activity, greenhouse effect).

**PO 17.** Investigate the effects of acid rain, smoke, volcanic dust, urban development, and greenhouse gases, on climate change over various periods of time.

**Concept 3:** Origin and Evolution of the Earth System

Analyze the factors used to explain the history and evolution of the Earth.

**Earth Origin/System:**

**PO 1.** Describe the scientific theory of the origin of the solar system (solar nebular hypothesis).

**PO 2.** Describe the characteristics, location, and motions of the various kinds of objects in our solar system, including the Sun, planets, satellites, comets, meteors, and asteroids.

**PO 3.** Explain the phases of the Moon, eclipses (lunar and solar), and the interaction of the Sun, Moon, and Earth (tidal effect).

**Earth History/Evolution:**

**PO 4.** Interpret a geologic time scale.

**PO 5.** Distinguish between relative and absolute geologic dating techniques.

**PO 6.** Investigate scientific theories of how life originated on Earth (high temperature, low oxygen, clay catalyst model).

**PO 7.** Describe how life on Earth has influenced the evolution of the Earth's systems.

**PO 8.** Sequence major events in the Earth's evolution (e.g., mass extinctions, glacial episodes) using relative and absolute dating data.

**PO 9.** Analyze patterns in the fossil record related to the theory of organic evolution.

**Concept 4:** Origin and Evolution of the Universe

Analyze the factors used to explain the origin and evolution of the universe.

**PO 1.** Describe the Big Bang Theory as an explanation for the origin of the universe.

**PO 2.** Describe the fusion process that takes place in stars.

**PO 3.** Analyze the evolution of various types of stars using the Hertzsprung-Russell (HR) diagram.

**PO 4.** Compare the evolution (life cycles) of stars of different masses (low and high mass).

**PO 5.** Explain the formation of the light elements in stars and the heavier elements (what astronomers call "metals") in supernova explosions.

**PO 6.** Explain the evolution and life cycles of galaxies.



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# Section C: ACT's College Readiness Standards Included in Arizona's Grades 8–12 Academic Content Standards

Using thousands of student records and responses, content and measurement experts worked backwards to develop data-driven, empirically derived statements of what students know and are typically able to do in various score ranges on the English, Reading, Writing, Mathematics, and Science tests on the EXPLORE, PLAN, and ACT tests. These empirically derived score descriptors are called **ACT's College Readiness Standards**. Because of this unique way the ACT Standards were derived, ACT's Standards contain specific descriptions of proficiency and content, including descriptions of the complexity of the test material. The ACT standards prove to be an effective way to communicate the skills and knowledge measured by our EXPLORE, PLAN, and ACT tests.

> In this section (Section C), the ACT Standards that are highlighted are those that are included in Arizona's Standards. ACT Standards not highlighted are those statements that include specific content, complexity and/or proficiency level descriptions that were not described in Arizona's standards.

Because Arizona educators are the experts on the Arizona Academic Content Standards, we would strongly encourage them to examine this document and offer their interpretations.

## Table C-1. ACT's College Readiness Standards — English

| | Topic Development in Terms of Purpose and Focus | Organization, Unity, and Coherence | Word Choice in Terms of Style, Tone, Clarity, and Economy |
|---|---|---|---|
| **13–15** | | Use conjunctive adverbs or phrases to show time relationships in simple narrative essays (e.g., *then*, *this time*) | Revise sentences to correct awkward and confusing arrangements of sentence elements<br><br>Revise vague nouns and pronouns that create obvious logic problems |
| **16–19** | Identify the basic purpose or role of a specified phrase or sentence<br><br>Delete a clause or sentence because it is obviously irrelevant to the essay | Select the most logical place to add a sentence in a paragraph | Delete obviously synonymous and wordy material in a sentence<br><br>Revise expressions that deviate from the style of an essay |
| **20–23** | Identify the central idea or main topic of a straightforward piece of writing<br><br>Determine relevancy when presented with a variety of sentence-level details | Use conjunctive adverbs or phrases to express straightforward logical relationships (e.g., *first*, *afterward*, *in response*)<br><br>Decide the most logical place to add a sentence in an essay<br><br>Add a sentence that introduces a simple paragraph | Delete redundant material when information is repeated in different parts of speech (e.g., "alarmingly startled")<br><br>Use the word or phrase most consistent with the style and tone of a fairly straightforward essay<br><br>Determine the clearest and most logical conjunction to link clauses |
| **24–27** | Identify the focus of a simple essay, applying that knowledge to add a sentence that sharpens that focus or to determine if an essay has met a specified goal<br><br>Delete material primarily because it disturbs the flow and development of the paragraph<br><br>Add a sentence to accomplish a fairly straightforward purpose such as illustrating a given statement | Determine the need for conjunctive adverbs or phrases to create subtle logical connections between sentences (e.g., *therefore*, *however*, *in addition*)<br><br>Rearrange the sentences in a fairly uncomplicated paragraph for the sake of logic<br><br>Add a sentence to introduce or conclude the essay or to provide a transition between paragraphs when the essay is fairly straightforward | Revise a phrase that is redundant in terms of the meaning and logic of the entire sentence<br><br>Identify and correct ambiguous pronoun references<br><br>Use the word or phrase most appropriate in terms of the content of the sentence and tone of the essay |
| **28–32** | Apply an awareness of the focus and purpose of a fairly involved essay to determine the rhetorical effect and suitability of an existing phrase or sentence, or to determine the need to delete plausible but irrelevant material<br><br>Add a sentence to accomplish a subtle rhetorical purpose such as to emphasize, to add supporting detail, or to express meaning through connotation | Make sophisticated distinctions concerning the logical use of conjunctive adverbs or phrases, particularly when signaling a shift between paragraphs<br><br>Rearrange sentences to improve the logic and coherence of a complex paragraph<br><br>Add a sentence to introduce or conclude a fairly complex paragraph | Correct redundant material that involves sophisticated vocabulary and sounds acceptable as conversational English (e.g., "an aesthetic viewpoint" versus "the outlook of an aesthetic viewpoint")<br><br>Correct vague and wordy or clumsy and confusing writing containing sophisticated language |
| **33–36** | Determine whether a complex essay has accomplished a specific purpose<br><br>Add a phrase or sentence to accomplish a complex purpose, often expressed in terms of the main focus of the essay | Consider the need for introductory sentences or transitions, basing decisions on a thorough understanding of both the logic and rhetorical effect of the paragraph and essay | Delete redundant material that involves subtle concepts or that is redundant in terms of the paragraph as a whole |

## Table C-1. ACT's College Readiness Standards — English (continued)

| | Sentence Structure and Formation | Conventions of Usage | Conventions of Punctuation |
|---|---|---|---|
| **13–15** | Use conjunctions or punctuation to join simple clauses<br><br>Revise shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences | Solve such basic grammatical problems as how to form the past and past participle of irregular but commonly used verbs and how to form comparative and superlative adjectives | Delete commas that create basic sense problems (e.g., between verb and direct object) |
| **16–19** | Determine the need for punctuation and conjunctions to avoid awkward-sounding sentence fragments and fused sentences<br><br>Decide the appropriate verb tense and voice by considering the meaning of the entire sentence | Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts<br><br>Recognize and use the appropriate word in frequently confused pairs such as *there* and *their*, *past* and *passed*, and *led* and *lead* | Provide appropriate punctuation in straightforward situations (e.g., items in a series)<br><br>Delete commas that disturb the sentence flow (e.g., between modifier and modified element) |
| **20–23** | Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers) | Use idiomatically appropriate prepositions, especially in combination with verbs (e.g., *long for*, *appeal to*)<br><br>Ensure that a verb agrees with its subject when there is some text between the two | Use commas to set off simple parenthetical phrases<br><br>Delete unnecessary commas when an incorrect reading of the sentence suggests a pause that should be punctuated (e.g., between verb and direct object clause) |
| **24–27** | Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems<br><br>Maintain consistent verb tense and pronoun person on the basis of the preceding clause or sentence | Ensure that a pronoun agrees with its antecedent when the two occur in separate clauses or sentences<br><br>Identify the correct past and past participle forms of irregular and infrequently used verbs and form present-perfect verbs by using *have* rather than *of* | Use punctuation to set off complex parenthetical phrases<br><br>Recognize and delete unnecessary commas based on a careful reading of a complicated sentence (e.g., between the elements of a compound subject or compound verb joined by *and*)<br><br>Use apostrophes to indicate simple possessive nouns<br><br>Recognize inappropriate uses of colons and semicolons |
| **28–32** | Use sentence-combining techniques, effectively avoiding problematic comma splices, run-on sentences, and sentence fragments, especially in sentences containing compound subjects or verbs<br><br>Maintain a consistent and logical use of verb tense and pronoun person on the basis of information in the paragraph or essay as a whole | Correctly use reflexive pronouns, the possessive pronouns *its* and *your*, and the relative pronouns *who* and *whom*<br><br>Ensure that a verb agrees with its subject in unusual situations (e.g., when the subject-verb order is inverted or when the subject is an indefinite pronoun) | Use commas to set off a nonessential/nonrestrictive appositive or clause<br><br>Deal with multiple punctuation problems (e.g., compound sentences containing unnecessary commas and phrases that may or may not be parenthetical)<br><br>Use an apostrophe to show possession, especially with irregular plural nouns<br><br>Use a semicolon to indicate a relationship between closely related independent clauses |
| **33–36** | Work comfortably with long sentences and complex clausal relationships within sentences, avoiding weak conjunctions between independent clauses and maintaining parallel structure between clauses | Provide idiomatically and contextually appropriate prepositions following verbs in situations involving sophisticated language or ideas<br><br>Ensure that a verb agrees with its subject when a phrase or clause between the two suggests a different number for the verb | Use a colon to introduce an example or an elaboration |

| Table C-2. ACT's College Readiness Standards — Reading | | |
|---|---|---|
| | **Main Ideas and Author's Approach** | **Supporting Details** |
| **13–15** | Recognize a clear intent of an author or narrator in uncomplicated literary narratives | Locate basic facts (e.g., names, dates, events) clearly stated in a passage |
| **16–19** | Identify a clear main idea or purpose of straightforward paragraphs in uncomplicated literary narratives | Locate simple details at the sentence and paragraph level in uncomplicated passages<br>Recognize a clear function of a part of an uncomplicated passage |
| **20–23** | Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives<br>Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages | Locate important details in uncomplicated passages<br>Make simple inferences about how details are used in passages |
| **24–27** | Identify a clear main idea or purpose of any paragraph or paragraphs in uncomplicated passages<br>Infer the main idea or purpose of straightforward paragraphs in more challenging passages<br>Summarize basic events and ideas in more challenging passages<br>Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in more challenging passages | Locate important details in more challenging passages<br>Locate and interpret minor or subtly stated details in uncomplicated passages<br>Discern which details, though they may appear in different sections throughout a passage, support important points in more challenging passages |
| **28–32** | Infer the main idea or purpose of more challenging passages or their paragraphs<br>Summarize events and ideas in virtually any passage<br>Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in virtually any passage | Locate and interpret minor or subtly stated details in more challenging passages<br>Use details from different sections of some complex informational passages to support a specific point or argument |
| **33–36** | Identify clear main ideas or purposes of complex passages or their paragraphs | Locate and interpret details in complex passages<br>Understand the function of a part of a passage when the function is subtle or complex |

**Descriptions of the ACT Reading Passages**

***Uncomplicated Literary Narratives*** refers to excerpts from essays, short stories, and novels that tend to use simple language and structure, have a clear purpose and a familiar style, present straightforward interactions between characters, and employ only a limited number of literary devices such as metaphor, simile, or hyperbole.

***More Challenging Literary Narratives*** refers to excerpts from essays, short stories, and novels that tend to make moderate use of figurative language, have a more intricate structure and messages conveyed with some subtlety, and may feature somewhat complex interactions between characters.

***Complex Literary Narratives*** refers to excerpts from essays, short stories, and novels that tend to make generous use of ambiguous language and literary devices, feature complex and subtle interactions between characters, often contain challenging context-dependent vocabulary, and typically contain messages and/or meanings that are not explicit but are embedded in the passage.

## Table C-2. ACT's College Readiness Standards — Reading (continued)

| | Sequential, Comparative, and Cause-Effect Relationships | Meanings of Words | Generalizations and Conclusions |
|---|---|---|---|
| **13–15** | Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages<br>Recognize clear cause-effect relationships described within a single sentence in a passage | Understand the implication of a familiar word or phrase and of simple descriptive language | Draw simple generalizations and conclusions about the main characters in uncomplicated literary narratives |
| **16–19** | Identify relationships between main characters in uncomplicated literary narratives<br>Recognize clear cause-effect relationships within a single paragraph in uncomplicated literary narratives | Use context to understand basic figurative language | Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages |
| **20–23** | Order simple sequences of events in uncomplicated literary narratives<br>Identify clear relationships between people, ideas, and so on in uncomplicated passages<br>Identify clear cause-effect relationships in uncomplicated passages | Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages | Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages<br>Draw simple generalizations and conclusions using details that support the main points of more challenging passages |
| **24–27** | Order sequences of events in uncomplicated passages<br>Understand relationships between people, ideas, and so on in uncomplicated passages<br>Identify clear relationships between characters, ideas, and so on in more challenging literary narratives<br>Understand implied or subtly stated cause-effect relationships in uncomplicated passages<br>Identify clear cause-effect relationships in more challenging passages | Use context to determine the appropriate meaning of virtually any word, phrase, or statement in uncomplicated passages<br>Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in more challenging passages | Draw subtle generalizations and conclusions about characters, ideas, and so on in uncomplicated literary narratives<br>Draw generalizations and conclusions about people, ideas, and so on in more challenging passages |
| **28–32** | Order sequences of events in more challenging passages<br>Understand the dynamics between people, ideas, and so on in more challenging passages<br>Understand implied or subtly stated cause-effect relationships in more challenging passages | Determine the appropriate meaning of words, phrases, or statements from figurative or somewhat technical contexts | Use information from one or more sections of a more challenging passage to draw generalizations and conclusions about people, ideas, and so on |
| **33–36** | Order sequences of events in complex passages<br>Understand the subtleties in relationships between people, ideas, and so on in virtually any passage<br>Understand implied, subtle, or complex cause-effect relationships in virtually any passage | Determine, even when the language is richly figurative and the vocabulary is difficult, the appropriate meaning of context-dependent words, phrases, or statements in virtually any passage | Draw complex or subtle generalizations and conclusions about people, ideas, and so on, often by synthesizing information from different portions of the passage<br>Understand and generalize about portions of a complex literary narrative |

***Uncomplicated Informational Passages*** refers to materials that tend to contain a limited amount of data, address basic concepts using familiar language and conventional organizational patterns, have a clear purpose, and are written to be accessible.

***More Challenging Informational Passages*** refers to materials that tend to present concepts that are not always stated explicitly and that are accompanied or illustrated by more—and more detailed—supporting data, include some difficult context-dependent words, and are written in a somewhat more demanding and less accessible style.

***Complex Informational Passages*** refers to materials that tend to include a sizable amount of data, present difficult concepts that are embedded (not explicit) in the text, use demanding words and phrases whose meaning must be determined from context, and are likely to include intricate explanations of processes or events.

## Table C-3. ACT's College Readiness Standards — Writing

| | Expressing Judgments | Focusing on the Topic | Developing a Position |
|---|---|---|---|
| **3–4** | Show a little understanding of the persuasive purpose of the task but neglect to take or to maintain a position on the issue in the prompt<br><br>Show limited recognition of the complexity of the issue in the prompt | Maintain a focus on the general topic in the prompt through most of the essay | Offer a little development, with one or two ideas; if examples are given, they are general and may not be clearly relevant; resort often to merely repeating ideas<br><br>Show little or no movement between general and specific ideas and examples |
| **5–6** | Show a basic understanding of the persuasive purpose of the task by taking a position on the issue in the prompt but may not maintain that position<br><br>Show a little recognition of the complexity of the issue in the prompt by acknowledging, but only briefly describing, a counterargument to the writer's position | Maintain a focus on the general topic in the prompt throughout the essay | Offer limited development of ideas using a few general examples; resort sometimes to merely repeating ideas<br><br>Show little movement between general and specific ideas and examples |
| **7–8** | Show understanding of the persuasive purpose of the task by taking a position on the issue in the prompt<br><br>Show some recognition of the complexity of the issue in the prompt by<br>• acknowledging counterarguments to the writer's position<br>• providing some response to counter-arguments to the writer's position | Maintain a focus on the general topic in the prompt throughout the essay and attempt a focus on the specific issue in the prompt<br><br>Present a thesis that establishes focus on the topic | Develop ideas by using some specific reasons, details, and examples<br><br>Show some movement between general and specific ideas and examples |
| **9–10** | Show clear understanding of the persuasive purpose of the task by taking a position on the specific issue in the prompt and offering a broad context for discussion<br><br>Show recognition of the complexity of the issue in the prompt by<br>• partially evaluating implications and/or complications of the issue, and/or<br>• posing and partially responding to counter-arguments to the writer's position | Maintain a focus on discussion of the specific topic and issue in the prompt throughout the essay<br><br>Present a thesis that establishes a focus on the writer's position on the issue | Develop most ideas fully, using some specific and relevant reasons, details, and examples<br><br>Show clear movement between general and specific ideas and examples |
| **11–12** | Show clear understanding of the persuasive purpose of the task by taking a position on the specific issue in the prompt and offering a critical context for discussion<br><br>Show understanding of the complexity of the issue in the prompt by<br>• examining different perspectives, and/or<br>• evaluating implications or complications of the issue, and/or<br>• posing and fully discussing counter-arguments to the writer's position | Maintain a clear focus on discussion of the specific topic and issue in the prompt throughout the essay<br><br>Present a critical thesis that clearly establishes the focus on the writer's position on the issue | Develop several ideas fully, using specific and relevant reasons, details, and examples<br><br>Show effective movement between general and specific ideas and examples |

## Table C-3. ACT's College Readiness Standards — Writing (continued)

| | Organizing Ideas | Using Language |
|---|---|---|
| **3–4** | Provide a discernible organization with some logical grouping of ideas in parts of the essay<br><br>Use a few simple and obvious transitions<br><br>Present a discernible, though minimally developed, introduction and conclusion | Show limited control of language by<br>• correctly employing some of the conventions of standard English grammar, usage, and mechanics, but with distracting errors that sometimes significantly impede understanding<br>• using simple vocabulary<br>• using simple sentence structure |
| **5–6** | Provide a simple organization with logical grouping of ideas in parts of the essay<br><br>Use some simple and obvious transitional words, though they may at times be inappropriate or misleading<br><br>Present a discernible, though underdeveloped, introduction and conclusion | Show a basic control of language by<br>• correctly employing some of the conventions of standard English grammar, usage, and mechanics, but with distracting errors that sometimes impede understanding<br>• using simple but appropriate vocabulary<br>• using a little sentence variety, though most sentences are simple in structure |
| **7–8** | Provide an adequate but simple organization with logical grouping of ideas in parts of the essay but with little evidence of logical progression of ideas<br><br>Use some simple and obvious, but appropriate, transitional words and phrases<br><br>Present a discernible introduction and conclusion with a little development | Show adequate use of language to communicate by<br>• correctly employing many of the conventions of standard English grammar, usage, and mechanics, but with some distracting errors that may occasionally impede understanding<br>• using appropriate vocabulary<br>• using some varied kinds of sentence structures to vary pace |
| **9–10** | Provide unity and coherence throughout the essay, sometimes with a logical progression of ideas<br><br>Use relevant, though at times simple and obvious, transitional words and phrases to convey logical relationships between ideas<br><br>Present a somewhat developed introduction and conclusion | Show competent use of language to communicate ideas by<br>• correctly employing most conventions of standard English grammar, usage, and mechanics, with a few distracting errors but none that impede understanding<br>• using some precise and varied vocabulary<br>• using several kinds of sentence structures to vary pace and to support meaning |
| **11–12** | Provide unity and coherence throughout the essay, often with a logical progression of ideas<br><br>Use relevant transitional words, phrases, and sentences to convey logical relationships between ideas<br><br>Present a well-developed introduction and conclusion | Show effective use of language to clearly communicate ideas by<br>• correctly employing most conventions of standard English grammar, usage, and mechanics, with just a few, if any, errors<br>• using precise and varied vocabulary<br>• using a variety of kinds of sentence structures to vary pace and to support meaning |

## Table C-4. ACT's College Readiness Standards — Mathematics

| | Basic Operations & Applications | Probability, Statistics, & Data Analysis | Numbers: Concepts & Properties | Expressions, Equations, & Inequalities |
|---|---|---|---|---|
| **13–15** | Perform one-operation computation with whole numbers and decimals<br>Solve problems in one or two steps using whole numbers<br>Perform common conversions (e.g., inches to feet or hours to minutes) | Calculate the average of a list of positive whole numbers<br>Perform a single computation using information from a table or chart | Recognize equivalent fractions and fractions in lowest terms | Exhibit knowledge of basic expressions (e.g., identify an expression for a total as $b + g$)<br>Solve equations in the form $x + a = b$, where $a$ and $b$ are whole numbers or decimals |
| **16–19** | Solve routine one-step arithmetic problems (using whole numbers, fractions, and decimals) such as single-step percent<br>Solve some routine two-step arithmetic problems | Calculate the average of a list of numbers<br>Calculate the average, given the number of data values and the sum of the data values<br>Read tables and graphs<br>Perform computations on data from tables and graphs<br>Use the relationship between the probability of an event and the probability of its complement | Recognize one-digit factors of a number<br>Identify a digit's place value | Substitute whole numbers for unknown quantities to evaluate expressions<br>Solve one-step equations having integer or decimal answers<br>Combine like terms (e.g., $2x + 5x$) |
| **20–23** | Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average | Calculate the missing data value, given the average and all data values but one<br>Translate from one representation of data to another (e.g., a bar graph to a circle graph)<br>Determine the probability of a simple event<br>Exhibit knowledge of simple counting techniques | Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor | Evaluate algebraic expressions by substituting integers for unknown quantities<br>Add and subtract simple algebraic expressions<br>Solve routine first-degree equations<br>Perform straightforward word-to-symbol translations<br>Multiply two binomials |
| **24–27** | Solve multistep arithmetic problems that involve planning or converting units of measure (e.g., feet per second to miles per hour) | Calculate the average, given the frequency counts of all the data values<br>Manipulate data from tables and graphs<br>Compute straightforward probabilities for common situations<br>Use Venn diagrams in counting | Find and use the least common multiple<br>Order fractions<br>Work with numerical factors<br>Work with scientific notation<br>Work with squares and square roots of numbers<br>Work problems involving positive integer exponents<br>Work with cubes and cube roots of numbers<br>Determine when an expression is undefined<br>Exhibit some knowledge of the complex numbers | Solve real-world problems using first-degree equations<br>Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions)<br>Identify solutions to simple quadratic equations<br>Add, subtract, and multiply polynomials<br>Factor simple quadratics (e.g., the difference of squares and perfect square trinomials)<br>Solve first-degree inequalities that do not require reversing the inequality sign |
| **28–32** | Solve word problems containing several rates, proportions, or percentages | Calculate or use a weighted average<br>Interpret and use information from figures, tables, and graphs<br>Apply counting techniques<br>Compute a probability when the event and/or sample space are not given or obvious | Apply number properties involving prime factorization<br>Apply number properties involving even/odd numbers and factors/multiples<br>Apply number properties involving positive/negative numbers<br>Apply rules of exponents<br>Multiply two complex numbers | Manipulate expressions and equations<br>Write expressions, equations, and inequalities for common algebra settings<br>Solve linear inequalities that require reversing the inequality sign<br>Solve absolute value equations<br>Solve quadratic equations<br>Find solutions to systems of linear equations |
| **33–36** | Solve complex arithmetic problems involving percent of increase or decrease and problems requiring integration of several concepts from pre-algebra and/or pre-geometry (e.g., comparing percentages or averages, using several ratios, and finding ratios in geometry settings) | Distinguish between mean, median, and mode for a list of numbers<br>Analyze and draw conclusions based on information from figures, tables, and graphs<br>Exhibit knowledge of conditional and joint probability | Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers<br>Exhibit knowledge of logarithms and geometric sequences<br>Apply properties of complex numbers | Write expressions that require planning and/or manipulating to accurately model a situation<br>Write equations and inequalities that require planning, manipulating, and/or solving<br>Solve simple absolute value inequalities |

## Table C-4. ACT's College Readiness Standards — Mathematics (continued)

| | Graphical Representations | Properties of Plane Figures | Measurement | Functions |
|---|---|---|---|---|
| **13–15** | Identify the location of a point with a positive coordinate on the number line | | Estimate or calculate the length of a line segment based on other lengths given on a geometric figure | |
| **16–19** | Locate points on the number line and in the first quadrant | Exhibit some knowledge of the angles associated with parallel lines | Compute the perimeter of polygons when all side lengths are given<br>Compute the area of rectangles when whole number dimensions are given | |
| **20–23** | Locate points in the coordinate plane<br>Comprehend the concept of length on the number line<br>Exhibit knowledge of slope | Find the measure of an angle using properties of parallel lines<br>Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°) | Compute the area and perimeter of triangles and rectangles in simple problems<br>Use geometric formulas when all necessary information is given | Evaluate quadratic functions, expressed in function notation, at integer values |
| **24–27** | Identify the graph of a linear inequality on the number line<br>Determine the slope of a line from points or equations<br>Match linear graphs with their equations<br>Find the midpoint of a line segment | Use several angle properties to find an unknown angle measure<br>Recognize Pythagorean triples<br>Use properties of isosceles triangles | Compute the area of triangles and rectangles when one or more additional simple steps are required<br>Compute the area and circumference of circles after identifying necessary information<br>Compute the perimeter of simple composite geometric figures with unknown side lengths | Evaluate polynomial functions, expressed in function notation, at integer values<br>Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths |
| **28–32** | Interpret and use information from graphs in the coordinate plane<br>Match number line graphs with solution sets of linear inequalities<br>Use the distance formula<br>Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point<br>Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle) | Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles<br>Use the Pythagorean theorem | Use relationships involving area, perimeter, and volume of geometric figures to compute another measure | Evaluate composite functions at integer values<br>Apply basic trigonometric ratios to solve right-triangle problems |
| **33–36** | Match number line graphs with solution sets of simple quadratic inequalities<br>Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$<br>Solve problems integrating multiple algebraic and/or geometric concepts<br>Analyze and draw conclusions based on information from graphs in the coordinate plane | Draw conclusions based on a set of conditions<br>Solve multistep geometry problems that involve integrating concepts, planning, visualization, and/or making connections with other content areas<br>Use relationships among angles, arcs, and distances in a circle | Use scale factors to determine the magnitude of a size change<br>Compute the area of composite geometric figures when planning or visualization is required | Write an expression for the composite of two simple functions<br>Use trigonometric concepts and basic identities to solve problems<br>Exhibit knowledge of unit circle trigonometry<br>Match graphs of basic trigonometric functions with their equations |

## Table C-5. ACT's College Readiness Standards — Science

| | Interpretation of Data | Scientific Investigation | Evaluation of Models, Inferences, and Experimental Results |
|---|---|---|---|
| **13–15** | Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram)<br>Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels) | | |
| **16–19** | Select two or more pieces of data from a simple data presentation<br>Understand basic scientific terminology<br>Find basic information in a brief body of text<br>Determine how the value of one variable changes as the value of another variable changes in a simple data presentation | Understand the methods and tools used in a simple experiment | |
| **20–23** | Select data from a complex data presentation (e.g., a table or graph with more than three variables; a phase diagram)<br>Compare or combine data from a simple data presentation (e.g., order or sum data from a table)<br>Translate information into a table, graph, or diagram | Understand the methods and tools used in a moderately complex experiment<br>Understand a simple experimental design<br>Identify a control in an experiment<br>Identify similarities and differences between experiments | Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model<br>Identify key issues or assumptions in a model |
| **24–27** | Compare or combine data from two or more simple data presentations (e.g., categorize data from a table using a scale from another table)<br>Compare or combine data from a complex data presentation<br>Interpolate between data points in a table or graph<br>Determine how the value of one variable changes as the value of another variable changes in a complex data presentation<br>Identify and/or use a simple (e.g., linear) mathematical relationship between data<br>Analyze given information when presented with new, simple information | Understand the methods and tools used in a complex experiment<br>Understand a complex experimental design<br>Predict the results of an additional trial or measurement in an experiment<br>Determine the experimental conditions that would produce specified results | Select a simple hypothesis, prediction, or conclusion that is supported by two or more data presentations or models<br>Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why<br>Identify strengths and weaknesses in one or more models<br>Identify similarities and differences between models<br>Determine which model(s) is(are) supported or weakened by new information<br>Select a data presentation or a model that supports or contradicts a hypothesis, prediction, or conclusion |
| **28–32** | Compare or combine data from a simple data presentation with data from a complex data presentation<br>Identify and/or use a complex (e.g., nonlinear) mathematical relationship between data<br>Extrapolate from data points in a table or graph | Determine the hypothesis for an experiment<br>Identify an alternate method for testing a hypothesis | Select a complex hypothesis, prediction, or conclusion that is supported by a data presentation or model<br>Determine whether new information supports or weakens a model, and why<br>Use new information to make a prediction based on a model |
| **33–36** | Compare or combine data from two or more complex data presentations<br>Analyze given information when presented with new, complex information | Understand precision and accuracy issues<br>Predict how modifying the design or methods of an experiment will affect results<br>Identify an additional trial or experiment that could be performed to enhance or evaluate experimental results | Select a complex hypothesis, prediction, or conclusion that is supported by two or more data presentations or models<br>Determine whether given information supports or contradicts a complex hypothesis or conclusion, and why |

**Science College Readiness Standards are measured in the context of science topics students encounter in science courses. These topics may include:**

| Life Science/Biology | Physical Science/Chemistry, Physics | Earth & Space Science |
|---|---|---|
| • Animal behavior<br>• Animal development and growth<br>• Body systems<br>• Cell structure and processes<br>• Ecology<br>• Evolution<br>• Genetics<br>• Homeostasis<br>• Life cycles<br>• Molecular basis of heredity<br>• Origin of life<br>• Photosynthesis<br>• Plant development, growth, structure<br>• Populations<br>• Taxonomy | • Atomic structure<br>• Chemical bonding, equations, nomenclature, reactions<br>• Electrical circuits<br>• Elements, compounds, mixtures<br>• Force and motions<br>• Gravitation<br>• Heat and work<br>• Kinetic and potential energy<br>• Magnetism<br>• Momentum<br>• The Periodic Table<br>• Properties of solutions<br>• Sound and light<br>• States, classes, and properties of matter<br>• Waves | • Earthquakes and volcanoes<br>• Earth's atmosphere<br>• Earth's resources<br>• Fossils and geological time<br>• Geochemical cycles<br>• Groundwater<br>• Lakes, rivers, oceans<br>• Mass movements<br>• Plate tectonics<br>• Rocks, minerals<br>• Solar system<br>• Stars, galaxies, and the universe<br>• Water cycle<br>• Weather and climate<br>• Weathering and erosion |

# Section D: ACT's WorkKeys Skills Included in Arizona's Grades 8–12 Academic Content Standards

Working with Charter States, national education organizations, educators, employers, and experts in employment and training requirements, ACT identified workplace skills that help individuals successfully perform a wide range of jobs. These skills form the basis of the WorkKeys assessments.

In this section (Section D), the WorkKeys Skills that are highlighted are those that are included in Arizona's Academic Content Standards. WorkKeys Skills not highlighted are those statements that include specific content, complexity and/or proficiency level descriptions that were not described in Arizona's standards.

Because Arizona educators are the experts on the Arizona Academic Content Standards, we would strongly encourage them to examine this document and offer their interpretations.

# WorkKeys Skills

| Level | Reading for Information | Applied Mathematics | Locating Information |
|---|---|---|---|
| 3 | Identify main ideas and clearly stated details<br>Choose the correct meaning of a word that is clearly defined in the reading<br>Choose the correct meaning of common, everyday and workplace words<br>Choose when to perform each step in a short series of steps<br>Apply instructions to a situation that is the same as the one in the reading materials | Solve problems that require a single type of mathematics operation (addition, subtraction, multiplication, and division) using whole numbers<br>Add or subtract negative numbers<br>Change numbers from one form to another using whole numbers, fractions, decimals, or percentages<br>Convert simple money and time units (e.g., hours to minutes) | Find one or two pieces of information in a graphic<br>Fill in one or two pieces of information that are missing from a graphic |
| 4 | Identify important details that may not be clearly stated<br>Use the reading material to figure out the meaning of words that are not defined<br>Apply instructions with several steps to a situation that is the same as the situation in the reading materials<br>Choose what to do when changing conditions call for a different action (follow directions that include "if-then" statements) | Solve problems that require one or two operations<br>Multiply negative numbers<br>Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals<br>Add commonly known fractions, decimals, or percentages (e.g., ½, .75, 25%)<br>Add three fractions that share a common denominator<br>Multiply a mixed number by a whole number or decimal<br>Put the information in the right order before performing calculations | Find several pieces of information in one or two graphics<br>Understand how graphics are related to each other<br>Summarize information from one or two straightforward graphics<br>Identify trends shown in one or two straightforward graphics<br>Compare information and trends shown in one or two straightforward graphics |
| 5 | Figure out the correct meaning of a word based on how the word is used<br>Identify the correct meaning of an acronym that is defined in the document<br>Identify the paraphrased definition of a technical term or jargon that is defined in the document<br>Apply technical terms and jargon and relate them to stated situations<br>Apply straightforward instructions to a new situation that is similar to the one described in the material<br>Apply complex instructions that include conditionals to situations described in the materials | Decide what information, calculations, or unit conversions to use to solve the problem<br>Look up a formula and perform single-step conversions within or between systems of measurement<br>Calculate using mixed units (e.g., 3.5 hours and 4 hours 30 minutes)<br>Divide negative numbers<br>Find the best deal using one- and two-step calculations and then comparing results<br>Calculate perimeters and areas of basic shapes (rectangles and circles)<br>Calculate percentage discounts or markups | Sort through distracting information<br>Summarize information from one or more detailed graphics<br>Identify trends shown in one or more detailed or complicated graphics<br>Compare information and trends from one or more complicated graphics |
| 6 | Identify implied details<br>Use technical terms and jargon in new situations<br>Figure out the less common meaning of a word based on the context<br>Apply complicated instructions to new situations<br>Figure out the principles behind policies, rules, and procedures<br>Apply general principles from the materials to similar and new situations<br>Explain the rationale behind a procedure, policy, or communication | Use fractions, negative numbers, ratios, percentages, or mixed numbers<br>Rearrange a formula before solving a problem<br>Use two formulas to change from one unit to another within the same system of measurement<br>Use two formulas to change from one unit in one system of measurement to a unit in another system of measurement<br>Find mistakes in items that belong at Levels 3, 4, and 5<br>Find the best deal and use the result for another calculation<br>Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations<br>Find the volume of rectangular solids<br>Calculate multiple rates | Draw conclusions based on one complicated graphic or several related graphics<br>Apply information from one or more complicated graphics to specific situations<br>Use the information to make decisions |
| 7 | Figure out the definitions of difficult, uncommon words based on how they are used<br>Figure out the meaning of jargon or technical terms based on how they are used<br>Figure out the general principles behind the policies and apply them to situations that are quite different from any described in the materials | Solve problems that include nonlinear functions and/or that involve more than one unknown<br>Find mistakes in Level 6 items<br>Convert between systems of measurement that involve fractions, mixed numbers, decimals, and/or percentages<br>Calculate multiple areas and volumes of spheres, cylinders, or cones<br>Set up and manipulate complex ratios or proportions<br>Find the best deal when there are several choices<br>Apply basic statistical concepts | |



= Included in Arizona Academic Content Standards