ARIZONA ACADEMIC STANDARDS

GRADE 4

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GRADE 4

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Additional information about the Arizona Academic Standards including glossaries of terms may be found at http://www.ade.az.gov/standards/contentstandards.asp.

The Arts Standard 2006

Grade 4

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATED FOR FOURTH GRADE

Philosophy and Rationale for the Arts
The arts are essential in education for they provide students with the means to think, feel, and understand the world around them in ways unique and distinct from other academic disciplines. These skills have been recognized as essential to lifelong success both in and out of school by a variety of education and civic leaders, including the National Association of State Boards of Education, the Education Commission of the States, the Arts Education Partnership, and *BusinessWeek*.

Arts Education in Arizona
Arizona has recognized the importance of arts education for its students in a variety of ways, including:
- Requiring music and visual arts be taught in grades K-8
- Creating high quality certifications (endorsements) for teachers in the areas of dance, music, theatre and visual arts
- Requiring a fine arts high school credit for admission to our state's universities
- Adopting Academic Standards in the Arts, with rigorous, sequential guidelines for creating quality arts education for Arizona's students.

Arts Standards Articulation for Fourth Grade
- The Arts Standards are divided into four discipline areas: dance, music, theatre and visual arts.
- The Music Standard is articulated for <u>general music</u> by grade level for Kindergarten – 8th grade.
- The remaining Standards (Dance, Theatre, Visual Arts) are articulated by **skill level**, reflecting the variety of ways in which the arts are taught in Arizona schools. Included in this **Fourth Grade** packet are the **Intermediate Skill Level Performance Objectives** for Dance, Theatre and Visual Arts. If your students are more or less advanced, or if you would like to see how these skill articulated standards build on one other, the Department encourages you to view the arts standards in their entirety at http://www.ade.az.gov/standards/contentstandards.asp.

Additional Resources for Arts Education
Additional resources on arts education can be accessed at http://www.ade.az.gov/asd/arts/ or by calling the Department's Arts Education Specialist at 602-364-1534.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATED FOR FOURTH GRADE

INTERMEDIATE DANCE
Strand 1 - Create

Concept 1: Body Intermediate Objectives	
Healthy Practices	PO 201 Identify and apply individual patterns and habits that influence a safe and healthy body in dance (e.g. **injury prevention**)**.**
Anatomy	PO 202 Identify skeletal components and major muscle groups.
Dynamic Alignment	PO 203 Demonstrate **dynamic alignment** through extended, more complex movement combinations and varying dance styles.
Fundamental Movement Patterns	PO 204 Apply **fundamental movement patterns** to warm-ups and improvisation.
Body Skills	PO 205 Apply **basic body skills** in all movement applications including warm-ups, improvisation, choreography etc.

Concept 2: Movement Skills Intermediate Objectives	
Axial/Non-locomotor	PO 201 Utilize dynamic alignment while performing sequenced combinations of basic **axial movements**.
Locomotor	PO 202 Utilize dynamic alignment while performing sequenced combinations of basic **locomotor movements**.
Axial and locomotor combinations	PO 203 Perform more complex combinations, which require increased motor memory and coordination.
Articulation of movement skills	PO 204 Apply **breath support, initiation of movement, connectivity,** and **transition** from one movement to another in performing short movement phrases.

Strand 1 – Create (continued)

Concept 3: Elements of Dance	
Intermediate Objectives	
Time: Tempo *See also "Relating Dance and Music"*	PO 201 Demonstrate moving while maintaining a steady beat in a variety of tempos.
Time: Meter	PO 202 Demonstrate the ability to perform a phrase in both duple and triple time.
Time: Rhythm	PO 203 Demonstrate moving in relation to and coordination with changes in rhythm and meter in even and **syncopated** rhythms.
Space: Direction, Facing, Pathway	PO 204 Demonstrate clarity of facings in space while moving in different directions.
Space: Level	PO 205 Demonstrate the ability to move through space at low, middle and high levels.
Space: Shapes	PO 206 Demonstrate the ability to work with a partner and/or group to create a variety of shapes.
Space: Size and Range	PO 207 Use size and range to vary an existing movement phrase and analyze the effect of such changes.
Space: Focus and Intent	PO 208 Demonstrate use of various **points of focus** to convey meaning.
Energy: Movement Qualities	PO 209 Apply the **movement qualities** to develop and revise movement phrases.
Energy: Effort	PO 210 Apply the **effort principles** to develop and revise movement phrases.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
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Strand 1 – Create (continued)

Concept 4: Improvisation/Choreography Intermediate Objectives	
Improvisational Strategies	PO 201 Identify and apply more **advanced improvisational strategies** (e.g. props, responding to movement of others, literal/abstract, contact).
Using the Elements of Dance to Communicate	PO 202 Using the elements of dance, create dance phrases that communicate meaning.
Ideas and Themes	PO 203 Create dance **phrases** that use ideas and themes as motivation.
Choreographic Processes	PO 204 Identify and demonstrate the use of **choreographic devices** to create dance phrases.
Choreographic Forms	PO 205 Create dance **phrases** that incorporate a single **choreographic form**.
Choreographic Principles	PO 206 Using the **choreographic principles**, analyze and revise existing dance phrases.
Technology	PO 207 Use technology or software to record a dance or phrase.
	PO 208 Use technology or the internet to share choreography and discussion between two different schools/groups.

Concept 5: Performance Values Intermediate Objectives	
Focus and Concentration	PO 201 Maintain consistent concentration and focus while moving or holding a fixed position.
Kinesthetic and Spatial Awareness	PO 202 Demonstrate appropriate **kinesthetic awareness** while performing alone or with a group.
Performance Qualities	PO 203 Identify and perform dance with projection and overall expression.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
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Strand 1 – Create (continued)

Concept 6: Production Design	
Intermediate Objectives	
Production terms, crew, elements	PO 201 Identify the roles of the production **crew members**.
Marketing and budget	PO 202 Identify and analyze components, sources and steps in budgeting for a dance concert.
Technology	PO 203 Observe and discuss the ways to use technology in design and production of a theatrical performance.

Strand 2 - Relate

Concept 1: Dance Forms/History	
Intermediate Objectives	
Production terms, crew, elements	PO 201 Demonstrate knowledge of the historical development and continued evolution of the various dance forms.
Marketing and budget	PO 202 Discuss and demonstrate how historical influences affect the theoretical and technical differences of various dance forms.
Technology	PO 203 Describe the historical evolution of the use of technology in dance.

Concept 2: Social and Cultural Influences	
Intermediate Objectives	
Cultural Dances	PO 201 Perform dances from a variety of cultures. Compare the styles and movements of the different dances in relation to the elements of dance.
Meaning of Cultural Dances	PO 202 Compare and contrast the meaning, purpose and roles people play in various **social/cultural** and **folk** dances.
Contemporary Cultural Dances	PO 203 Identify and analyze the influence of pop culture on social dance (e.g. various decades).

Strand 2 – Relate (continued)

Concept 3: Dance and Literacy Intermediate Objectives	
Using text to create movement	PO 201 Create a thematic movement phrase to express images, ideas, situations, and feelings found in text.
Using text to describe and understand movement	PO 202 Apply descriptive language (similes and metaphors) and dance terminology to express images, ideas and feelings that are danced.

Concept 4: Dance and other disciplines Intermediate Objectives	
Using movement with other disciplines	PO 201 Create a thematic movement phrase to express ideas, concepts and images (e.g. numbers, patterns, sounds, textures, animals) found in other disciplines.
Integrating dance and other art forms	PO 202 Relate the elements used in dance to the elements of other art forms.
Careers	PO 203 List the skills learned through dance and how they relate to other career fields (e.g. problem solving, discipline, collaboration, anatomy).

Concept 5: Dance and Music Intermediate Objectives	
Elements of music	PO 201 Identify and explore (e.g. discussion, body percussion, locomotors, other body movements). rhythmic structure of various music examples.
Rhythmic Patterns/Variations	PO 202 Demonstrate the ability to alter the tempo, rhythm and/or meter of a movement phrase.
Technology	PO 203 Using current technology create a sound-score for dance.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATED FOR FOURTH GRADE

<u>Strand 3 – Evaluate</u>

Concept 1: Understanding Dance Intermediate Objectives	
Dance Terminology	PO 201 After observing a dance, using dance terminology, discuss how the **elements of dance** have been manipulated within the choreography.
Production Elements	PO 202 After observing a dance, analyze how the production elements have enhanced the intent of the choreographer.
Communicating Meaning	PO 203 Interpret how the **elements of dance** and **choreographic strategies** can be used to communicate meaning in dance.
Evaluation Criteria	PO 204 Using selected criteria, evaluate its effectiveness in dance choreography or performance.
Personal Interpretation	PO 205 Explain your reaction to a dance and identify how your personal experiences lead you to your response.
Technology	PO 206 Use technology over time to understand and analyze individual progress of technique, choreography and performance values.

Concept 2: Professionalism Intermediate Objectives	
Classroom, rehearsal and performance behaviors	PO 201 Contribute to and support a nurturing and safe classroom, rehearsal and performance environment. by modeling appropriate practices.
Audience Etiquette	PO 202 Demonstrate appropriate **audience behavior** in all performance situations and respond with relevant and supportive comments.
Portfolio collection and maintenance	PO 203 At regular intervals, record and discuss movement skills acquired, choreography and performances. Self-assess progress. Maintain records for future use.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
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GRADE 4 MUSIC

Strand 1 – Create

Concept 1:
Singing, alone and with others, music from various genres and diverse cultures.
PO 1. Singing **partner songs** on **pitch** with an appropriate tone quality.
PO 2. Singing unaccompanied with correct timing and intonation.
PO 3.   Reading and singing using pitch names.
PO 4. Responding properly to formal conducting **cues**. (e.g.

Concept 2:
Playing instruments, alone and with others, music from various genres and diverse cultures.
PO 2.   Playing a short **melody** using appropriate **dynamics**.
PO 3.   Playing with correct rhythmic duration dotted half notes and dotted quarters.
PO 4.   Responding properly to formal conducting cues. (e.g., 3/4, 4/4).

Concept 3:
Improvising rhythms, melodies, variations, and accompaniments
PO 1. Singing and/or playing short improvised melodies for a specified time frame.

Concept 4:
Composing and arranging music.
PO 1. Creating short songs and/or instrumental pieces within specified guidelines choosing from a variety of sound sources (e.g., body percussion, found objects, non-pitched instruments, pitched instruments, computer generated sound sources).

Concept 5:
Reading and notating music.
PO 2. Reading/decoding dotted half notes and dotted quarter notes.
*PO 3   Identifying the letter names for the lines and spaces of the treble **clef**.*
PO 4. Reading and notating music using standard musical notation.
PO 5. Iidentifying parts/symbols in a musical score: • *accidentals*   • *phrasing marks*   • *key signatures*

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATED FOR FOURTH GRADE

Strand 2: Relate

Concept 1: Understanding the relationships among music, the arts, and other disciplines outside the arts.
PO 1. Identifying the use/function of music from various cultures correlating to grade level social studies curriculum.
PO 3. Explaining and applying the relationship between note values and mathematics
PO 4. Exploring and analyzing the relationship of music to language arts, visual arts, literature

Concept 2: Understanding music in relation to history and culture.
PO 1. Explaining the musical characteristics that make a piece appropriate for a specific event or function.
PO 2. Applying appropriate movements to music from various cultures.
PO 3. Identifying the origins and development of instruments
PO 4. Describing different musical careers.

Concept 3: Understanding music in relation to self and universal themes.
PO 1. Describing the roles and impact music plays in their lives and the lives of others.
PO 2. Distinguishing music preferences (I like it because…) from music judgments (It is good because…) from cultural judgments (It is important because…).

Strand 3: Evaluate

Concept 1: Listening to, analyzing, and describing music.
PO 1   Describing the **melodic** movement within a given piece.
PO 4   Identifying musical examples by culture.
PO 3. Describing **canon** and **rondo forms**.

Concept 2: Evaluating music and music performances.
PO 1. Distinguishing music preferences (I like it because…) from music judgments (It is good because) from cultural judgments (It is important because…)
PO 2. *Listening attentively while others perform and showing appropriate audience behavior for the context and style of the music performed.*

ARIZONA ACADEMIC STANDARDS IN THE ARTS
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INTERMEDIATE THEATRE

Strand 1 - Create

Concept 1: Collaboration
Intermediate Objectives
PO 201. Collaborate to create a scenario/**script** as a team.
PO 202. Collaborate to **design** and choose the **environmental** elements for a scenario/**script**.
PO 203. Collaborate and communicate in the **rehearsal** process.
PO 204. Collaborate in informal **performances**.

Concept 2: Acting
Intermediate Objectives
PO 201. Work individually to create **characters** for theatre and/or other media productions (e.g., for **classical**, contemporary, realistic, and non-realistic **improvisations** and **scripted plays**).
PO 202. As a **character**, play out her/his wants by interacting with others, maintaining concentration, and contributing to the **action** of classroom **improvisations** (e.g., **scenes** based on personal experience and heritage, imagination, literature, and history).
PO 203. Demonstrate mental and physical attributes required to communicate **characters** different from themselves (e.g., concentration, sense recall, ability to remember lines and cues, breath and vocal control, body alignment, flexibility, and coordination).
PO 204. Communicate sensory images through movement, vocal, visual, or written expression.
PO 205. Implement theatre etiquette in rehearsal and production settings.

Concept 3: Theatre Technology and Design
Intermediate Objectives
PO 201. Develop designs that use visual and aural elements to convey **environments** that clearly support the **text**.
PO 202. Implement technical theatre etiquette in **rehearsal** and production settings.
PO 203. Use available art materials, tools, and/or stock scenery (e.g., **rehearsal** blocks, puppets, curtains, backdrops) to create and convey **props** and/or **setting**.
PO 204. Create floor plans and **props**.
PO 205. Construct or locate appropriate **props** to enhance a **scene** or production.
PO 206. Use available lighting sources to enhance formal and informal theatre, film/video, and electronic media productions to create design elements.
PO 207. Create sound effects and select music to enhance a scene or production.
PO 208. Create costume drawings and/or make-up charts.
PO 209. Use standard procedures to efficiently and safely operate tools and equipment for technical aspects of formal and informal theatre, film/video, and electronic media productions.
PO 210. Develop technical designs based on design concepts (musical and visual art principles) that meet the requirements of the dramatic work, film/video, and electronic media production.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
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Strand 1 – Create (continued)

Concept 4:Playwriting
Intermediate Objectives
PO 201. Adapt a short, non-dramatic literary selection (e.g., folktale, poem, life story) into a scripted dramatic format.
PO 202. Dramatize and document scenes using a variety of characters to develop monologues and/or dialogue.
PO 203. Dramatize and document scenes based on life experiences using a variety of conflicts to create resolution to the story.
PO 204. Dramatize and document, both individually and in groups, scenarios that develop **theme**, **plot**, **conflict**, and **dialogue**.

Concept 5: Directing
Intermediate Objectives
PO 201. Analyze dramatic **text** (e.g., folktale, myth, poetry, narrative, **monologue**, **scene**, **play**, etc.) to develop an informal **performance** describing **character motivations**, structure of the story, and the **role** of the **environment** in the story.
PO 202. Develop an understanding of how actors' qualities and skills are considered when casting various **characters** or **roles**.
PO 203. Make directorial decisions about group work and informal dramatic presentations (including **movement**, **voice**, etc.).
PO 206. Provide actor warm-ups that help them develop sensory recall, as needed, or as a means of accessing their characters.
PO 207. Implement theatre etiquette as a director in rehearsal and production settings.

Strand 2 – Relate

Concept 1:Collaboration
Intermediate Objectives
PO 201. Identify social issues and individual attitudes that promote or impede the collaborative process.
PO 202. Discuss and implement the skills that address social issues in the collaborative process (e.g., accept leader/follower roles, how to negotiate differences of ideas) in an **informal production** and other school-related projects.
PO 203. Discuss how participation in theatre benefits other life skills and other content areas.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATED FOR FOURTH GRADE

Strand 2 – Relate (continued)

Concept 2: Acting
Intermediate Objectives

PO 201. Using self-evaluation and reflection, determine the influences of creative work on the individual and his/her community.

PO 202. Analyze the emotional and social impact (e.g., historical and contemporary) of **performances** in their lives and the lives of others.

PO 203. Analyze the historical, cultural effects on the **characters** and story of a dramatic concept, class **improvisation**, and theatre or other media production.

PO 204. Demonstrate how interrelated conditions (time, place, other **characters**, and the situation) influence the **characters** and stories in **formal productions** of theatre, film/video, and **electronic media**.

PO 205. Analyze the effects of their own cultural experiences on their dramatic work.

PO 206. Explain how one's own behavior might change in response to a performance (e.g., drug or alcohol abuse, criminal behavior, friendship, or family relationships).

Concept 3: Theatre Technology and Design
Intermediate Objectives

PO 201. Research historical and cultural influences from a variety of resources (e.g., **text**, library, artifact, internet) to implement with credible **design** choices.

PO 202. Compare and contrast how nature, social life, and visual art practices and products influence and affect **design** choices for theatre, film/television, and **electronic media** productions in the past and the present.

PO 203. Analyze a variety of dramatic works for artistic (e.g., color, **style**, line, texture) and technical requirements influenced by history and culture.

Concept 4: Playwriting
Intermediate Objectives

PO 201. Demonstrate and identify a **character**'s wants and needs, and physical, emotional, and social qualities based on historical and cultural influences.

PO 203. Research and identify contemporary social issues that can be explored through classroom **improvisation**.

PO 204. Discuss a class **improvisation** or **performance**'s storylines, **characters**, **dialogue**, and **actions**, and how they relate to real life situations.

PO 205. Compare how similar themes are treated in dramas of different genres and styles from various cultural and historical periods.

PO 206. Analyze the historical and cultural effects on the characters and story of a dramatic concept, class improvisation, and theatre or other media production.

Concept 5: Directing
Intermediate Objectives

PO 201. Research and use cultural, historical, and **symbolic** clues to develop an interpretation for visual and aural production choices.

PO 202. Present selected information from research to the **ensemble** to support the production process.

PO 203. Analyze the effects of personal and cultural experiences on the dramatic work.

PO 204. Analyze the historical and cultural effects on the **characters** and story of a dramatic concept, class **improvisation**, and theatre or other media production.

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ARIZONA ACADEMIC STANDARDS IN THE ARTS
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Strand 3: Evaluate

Concept 1: Collaboration
Intermediate Objectives
PO 201. Model and use appropriate ways to give, take, and use praise and constructive **criticism**.

Concept 2: Acting
Intermediate Objectives
PO 201. Describe physical and vocal attributes appropriate to the **characters** in the **play** in class and professional **performances**.
PO 202. Describe physical concentration and **character** interaction that advance the **plot** in class and professional **performances**.
PO 203. Evaluate a **role** by responding and deconstructing deeper meanings of the **text** and **character**.
PO 204. Develop and articulate criteria to analyze, interpret, and evaluate classroom, informal and formal theatre, or media productions.
PO 205. Use developed criteria to interpret dramatic text and performances in an organized oral or written presentation.

Concept 3: Theatre Technology and Design
Intermediate Objectives
PO 201. Evaluate how the historical and cultural influences of technical elements affect a variety of performed dramatic works.
PO 202. Develop criteria to evaluate technical elements for formal and informal theatre, film/video, and **electronic media** productions.
PO 204. Evaluate and interpret technical elements in a variety of performed dramatic works including theatre, film/video, and **electronic media** productions.
PO 205. Evaluate their own and their peers' execution of duties and responsibilities on a technical crew.

Concept 4: Playwriting
Intermediate Objectives
PO 201. Develop criteria to analyze, interpret, and evaluate a **play script** (e.g., structure, language, **characters**).
PO 202. Describe how the **setting**, storyline, and **characters** are interrelated in scenarios and **scripts**.
PO 203. Use developed criteria to analyze a variety of dramatic works (e.g., formal and informal theatre, film/video, and **electronic media** productions) according to **style**, **genre**, dramatic elements, and **characters**.
PO 204. Develop and articulate criteria to analyze, interpret, and evaluate classroom, informal and formal theatre, or media productions.
PO 205. Use developed criteria to interpret dramatic text and performances in an organized oral or written presentation.
PO 206. Justify the perception of a performance and critique its production elements.
PO 207. Evaluate and justify, with examples, the meanings constructed from a dramatic text or performance relating to daily life.

Strand 3: Evaluate (continued)

Concept 5: Directing Intermediate Objectives
PO 201. Explain and justify personal criteria for evaluating the basic elements of **text**, **acting**, and production values in their work and the work of others.
PO 202. Develop and articulate criteria to analyze, interpret, and evaluate classroom, informal and formal theatre, or media productions.
PO 203. Use criteria to interpret dramatic **text** and **performances** in an organized oral or written presentation.
PO 204. Evaluate and justify, with examples, the meanings constructed from a dramatic **text** or **performance** relating to daily life.
PO 205. Justify the director's concept of a performance and critique its production elements.

INTERMEDIATE VISUAL ARTS

Strand 1: Create

Concept 1: Creative Process - The student will develop, revise, and reflect on ideas for expression in his or her own artwork Intermediate Objectives
PO 201. *Contribute to a discussion about ideas for his or her own artwork .*
PO 202. *Make and explain revisions in his or her own artwork .*
PO 203. Develop plans for his or her own artwork , (e.g., sketches, models, and notes).

Concept 2: Materials, Tools, and Techniques • The student will use materials, tools, and techniques in his or her own artwork . Intermediate Objectives
PO 201*. Identify and experiment with materials, tools, and techniques* <u>appropriately and expressively</u> *in his or her own artwork .*
PO 202. Demonstrate purposeful use of materials, tools, and techniques in his or her own artwork .

Concept 3:   Elements and Principles - The student will judge the effectiveness of the artist's use of elements of art and principles of design in communicating meanings and/or purposes, in artworks. Intermediate Objectives
PO 201. *Identify,* select*, and use* **elements** *and* **principles** to organize the **composition** *in his or her own artwork .*

Concept 4: Meanings or Purposes - The student will judge an artist's success in communicating meaning or purpose in their artwork. Intermediate Objectives
PO 201. Explain purposeful use <u>of </u>subject matter, **symbols,** and/or **themes** in his or her own artwork .
PO 202. Create an artwork that serves a function.

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATED FOR FOURTH GRADE

Strand 1: Create (continued)

Concept 5: Quality - The student will apply criteria for judging the quality of specific artwork. Intermediate Objectives
PO 201. *Identify successful aspects of his or her own artwork and possible revisions.*
PO 202. Identify and apply **technical, functiona**l, **formal,** and/or **expressive** criteria in the evaluation of his or her own artwork (e.g., self-evaluations, group critiques, artist's statements).

Strand 2 - Relate

Concept 1: Artworlds - The student will describe the role that art plays in culture and how it reflects, records, and interacts with history in various times, places, and traditions. Intermediate Objectives
PO 201. *Contribute to a discussion about who artists are, what they do, and why they create art.*
PO 202. *Discuss how artworks are used to communicate stories, ideas, and emotions.*
PO 203. *Discuss what an **artworl**d is and its place in a culture.*
PO 204. Discuss the roles of various **artworld** experts (e.g., critics, art historians, curators, archeologists, conservators and others).
PO 205. Make connections between art and other curricular areas (e.g., clay production relates to science, contextual information relates to social studies).
PO 206. Discuss how artworks reflect, ideas, images and symbols from the culture within which they were made.

Concept 2: Materials, Tools, and Techniques • The student will use materials, tools, and techniques in his or her own artwork . Intermediate Objectives
PO 201. *Identify the relationship between tools, materials, and/or techniques.*
PO 202. Describe what tools, materials, and techniques were used to create artwork from diverse cultures and times.
PO 203. Describe how scientific and technological advances influence the materials, tools, and techniques used by artists.

Concept 3: Elements and Principles - The student will judge the effectiveness of the artist's use of elements of art and principles of design in communicating meanings and/or purposes, in artworks. Intermediate Objectives
PO 201. *Identify visual/tactile characteristics of artworks from diverse cultures, different places, or times.*

ARIZONA ACADEMIC STANDARDS IN THE ARTS
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Strand 2 – Relate (continued)

Concept 4: Meanings or Purposes - The student will judge an artist's success in communicating meaning or purpose in their artwork. Intermediate Objectives
PO 201. *Interpret meanings and/or purposes of an artwork using subject matter,* **symbols,** *and/or* **themes**.
PO 202. ***Discuss*** *themes* **in artworks that illustrate common human experiences that transcend culture, time, and place.**
PO 203. Use **contextual** information to investigate and interpret meanings and purposes in artworks from the viewpoint of the culture in which it was made.

Concept 5: Quality - The student will apply criteria for judging the quality of specific artwork. Intermediate Objectives
PO 201. *Contribute to a discussion about why artworks have been valued within the context of the culture in which they were made*
PO 202. *Demonstrate respect while responding to others' artwork.*
PO 203. Compare the characteristics of artworks valued by diverse cultures.

Strand 3 – Evaluate

Concept 1: Art Issues and Values - The student will justify general conclusions about the nature and value of art. Intermediate Objectives
PO 201. *Form and support opinions about art (e.g., what art is and why it is important)*
PO 202. Debate whether art is different from **visual culture** in general.
PO 203. *Discuss reasons why people value art (e.g., sentimental, financial, religious, political, and historical).*
PO 204. Discuss people's criteria for determining how, or whether, art should be cared for and/or protected.

Concept 2: Materials, Tools, and Techniques • The student will use materials, tools, and techniques in his or her own artwork . Intermediate Objectives
PO 201. Explain how an artist's use of tools, materials, and techniques affect an artwork's meaning, purpose, and value.
PO 202. Develop and use criteria to evaluate **craftsmanship** in an artwork.

Concept 3: Elements and Principles - The student will judge the effectiveness of the artist's use of elements of art and principles of design in communicating meanings and/or purposes, in artworks. Intermediate Objectives
PO 201. Describe an artist's use of elements and **principles** *in an artwork support its meaning and/or purpose.*

Strand 3 – Evaluate (continued)

Concept 4: Meanings or Purposes - The student will judge an artist's success in communicating meaning or purpose in their artwork. Intermediate Objectives
PO 201. *Discuss how an artist* <u>uses subject matter, symbols, and/or themes to</u> *communicate meaning and/or purpose in an artwork.*

Concept 5: Quality - The student will apply criteria for judging the quality of specific artwork. Intermediate Objectives
PO 201. Understand how the difference in quality between an original and a reproduction affects the viewer's interpretation of an artwork *(e.g. ,make a museum/artist's studio visit to compare details, size, luminosity, three dimensionality, surface texture).*
PO 202. Distinguish art preferences "I like it because..." from art judgments "It is good because…" from cultural judgments "It is important because. ..".
PO 203. Use established criteria to make and support a judgment about the quality of an artwork.

Comprehensive Health Education/ Physical Activity Standards 1997

Essentials (Grades 4-8)

Comprehensive Health Rationale

Parents and Guardians

It is understood that parents and guardians are the primary educators in their children's health; therefore, it is important to include the applicable statutes and state Board of Education rule in the comprehensive health education standards. Parents and guardians must be provided opportunities to preview school district policies, curriculum and take-home materials.

The ultimate goal of comprehensive health education is to help young people in Arizona achieve their fullest potential by attaining their highest level of health and wellness as students and adults. Basic to health education is the knowledge about the importance of the interrelationships of physical, behavioral, and social well-being and the prevention of diseases and other health problems. Students should learn to accept responsibility for personal health decisions and practices, work with others to maintain a healthy environment, as well as become informed consumers.

Rationale for Standard 1: Students comprehend concepts related to health promotion and disease prevention.

Comprehension of health promotion strategies and disease prevention concepts enables students to become health literate, self-directed learners, which establishes a foundation for leading healthy and productive lives.

Rationale for Standard 2: Students demonstrate the ability to access accurate health information.

Accessing valid health information and health promoting products and services is important in the prevention, early detection and treatment of most health problems. Applying skills of information analysis, organization, comparison, synthesis and evaluation to health issues provides a foundation for individuals to move toward becoming health literate and responsible, productive citizens.

Rationale for Standard 3: Students demonstrate the ability to practice health-enhancing behaviors and reduce health risks.

Research confirms that many diseases and injuries can be prevented by reducing harmful and risk-taking behaviors. Accepting responsibility and practicing health-enhancing behaviors can contribute to a positive quality of life.

Rationale for Standard 4: Students analyze the influence of culture, media, technology and other factors on health.

Health is influenced by a variety of factors that coexist within society. The ability to analyze, evaluate and interpret the influence of culture, media and technology on health

is important in a rapidly changing world. The health literate, responsible and productive citizen draws upon the contributions of these factors to strengthen individual, family and community health.

Rationale for Standard 5: Students demonstrate the ability to use interpersonal skills to enhance health.

Personal, family and community health are enhanced through effective communication. The ability to organize and to convey information, beliefs, opinions, and feelings (both verbal and nonverbal) are skills that strengthen interactions and can reduce or avoid conflict. When communicating, individuals who are health literate demonstrate care, consideration, and respect for self and others.

Rationale for Standard 6: Students demonstrate the ability to use goal setting and decision-making skills to enhance health.

Decision-making and goal setting are essential lifelong skills needed to implement and sustain health-enhancing behaviors. These skills make it possible for individuals to transfer health knowledge into healthy lifestyles, thus improving the quality of life.

Rationale for Standard 7: Students demonstrate the ability to advocate for personal, family and community health.

Quality of life is dependent on an environment that protects and promotes the health of individuals, families and communities. Responsible citizens who are health literate communicate and advocate for positive health in their communities.

§ 15-102. Parental involvement in the school; definition
A. The governing board, in consultation with parents, teachers and administrators, shall develop and adopt a policy to promote the involvement of parents and guardians of children enrolled in the schools within the school district, including:
   1. A plan for parent participation in the schools which is designed to improve parent and teacher cooperation in such areas as homework, attendance and discipline.
   2. Procedures by which parents may learn about the course of study for their children and review learning materials.
   3. Procedures by which parents who object to any learning material or activity on the basis that it is harmful may withdraw their children from the activity or from the class or program in which the material is used. Objection to a learning material or activity on the basis that it is harmful includes objection to a material or activity because it questions beliefs or practices in sex, morality or religion.
B. The policy adopted by the governing board pursuant to this section may also include the following components:
   1. A plan by which parents will be made aware of the district's parental involvement policy and the provisions of this section, including:
      (a) Rights under the family educational rights and privacy act of 1974 relating to access to children's official records.
      (b) The parent's right to inspect the school district policies and curriculum.

2. Efforts to encourage the development of parenting skills.
3. The communication to parents of techniques designed to assist the child's learning experience in the home.
4. Efforts to encourage access to community and support services for children and families.
5. The promotion of communication between the school and parents concerning school programs and the academic progress of the parents' children.
6. Identifying opportunities for parents to participate in and support classroom instruction at the school.
7. Efforts to, with appropriate training, support parents as shared decision makers and to encourage membership on school councils.
8. The recognition of the diversity of parents and the development of guidelines that promote widespread parental participation and involvement in the school at various levels.
9. The development of preparation programs and specialized courses for certificated employees and administrators that promote parental involvement.
10. The development of strategies and programmatic structures at schools to encourage and enable parents to participate actively in their children's education.
C. For the purposes of this section, "parent" means the parent or person who has custody of the child.

R7-2-303. Sex Education

A. Instruction in sex education in the public schools of Arizona shall be offered only in conformity with the following requirements.
1. Common schools: Nature of instruction; approval; format.
   a. Supplemental/elective nature of instruction. The common schools of Arizona may provide a specific elective lesson or lessons concerning sex education as a supplement to the health course study.
      i. This supplement may only be taken by the student at the written request of the student's parent or guardian.
      ii. Alternative elective lessons from the state-adopted optional subjects shall be provided for students who do not enroll in elective sex education.
      iii. Elective sex education lessons shall not exceed the equivalent of one class period per day for one-eighth of the school year for grades K-4.
      iv. Elective sex education lessons shall not exceed the equivalent of one class period per day for one-quarter of the school year for grades 5-8.
   b. Local governing board approval. All elective sex education lessons to be offered shall first be approved by the local governing board.
      i. Each local governing board contemplating the offering of elective sex education shall establish an advisory committee with membership representative of district size and the racial and ethnic composition of the community to assist in the development of lessons and advise the local governing board on an ongoing basis.
      ii. The local governing board shall review the total instruction materials for lessons presented for approval.

iii. The local governing board shall publicize and hold at least two public hearings for the purpose of receiving public input at least one week prior to the local governing board meeting at which the elective sex education lessons will be considered for approval.

iv. The local governing board shall maintain for viewing by the public the total instructional materials to be used in approved elective sex education lessons within the district.

c. Format of instruction.
   i. Lessons shall be taught to boys and girls separately.
   ii. Lessons shall be ungraded, require no homework, and any evaluation administered for the purpose of self-analysis shall not be retained or recorded by the school or the teacher in any form.
   iii. Lessons shall not include tests, psychological inventories, surveys, or examinations containing any questions about the student's or his parents' personal beliefs or practices in sex, family life, morality, values or religion.

2. High Schools: Course offering; approval; format.
   a. A course in sex education may be provided in the high schools of Arizona.
   b. The local governing board shall review the total instructional materials and approve all lessons in the course of study to be offered in sex education.
   c. Lessons shall not include tests, psychological inventories, surveys, or examinations containing any questions about the student's or his parents' personal beliefs or practices in sex, family life, morality, values or religion.
   d. Local governing boards shall maintain for viewing by the public the total instructional materials to be used in all sex education courses to be offered in high schools within the district.

3. Content of instruction: Common schools and high schools.
   a. All sex education materials and instruction shall be age appropriate, recognize the needs of exceptional students, meet the needs of the district, recognize local community standards and sensitivities, shall not include the teaching of abnormal, deviate, or unusual sexual acts and practices, and shall include the following:
   i. Emphasis upon the power of individuals to control their own personal behavior. Pupils shall be encouraged to base their actions on reasoning, self-discipline, sense of responsibility, self-control and ethical considerations such as respect for self and others; and
   ii. Instruction on how to say "no" to unwanted sexual advances and to resist negative peer pressure. Pupils shall be taught that it is wrong to take advantage of, or to exploit, another person.
   b. All sex education materials and instruction which discuss sexual intercourse shall:
   i. Stress that pupils should abstain from sexual intercourse until they are mature adults;
   ii. Emphasize that abstinence from sexual intercourse is the only method for avoiding pregnancy that is 100 percent effective;
   iii. Stress that sexually transmitted diseases have severe consequences and constitute a serious and widespread public health problem;

iv. Include a discussion of the possible emotional and psychological consequences of preadolescent and adolescent sexual intercourse and the consequences of preadolescent and adolescent pregnancy;

v. Promote honor and respect for monogamous heterosexual marriage; and

vi. Advise pupils of Arizona law pertaining to the financial responsibilities of parenting, and legal liabilities related to sexual intercourse with a minor.

B. Certification of compliance. All districts offering a local governing board-approved sex education course of lesson shall certify, under the notarized signature of both the president of the local governing board and the chief administrator of the school district, compliance with this rule except as specified in paragraph (C). Acknowledgment of receipt of the compliance certification from the state Board of Education is required as a prerequisite to the initiation of instruction. Certification of compliance shall be in a format and with such particulars as shall be specified by the Department of Education.

C. All districts offering state Board approved sex education lessons or courses prior to the effective date of this rule shall comply with this rule on or before June 30, 1990.

§ 15-716. Instruction on acquired immune deficiency syndrome; department assistance

A. Each common, high and unified school district may provide instruction to kindergarten programs through the twelfth grade on acquired immune deficiency syndrome and the human immunodeficiency virus.

B. Each district is free to develop its own course of study for each grade. At a minimum, instruction shall:
1. Be appropriate to the grade level in which it is offered.
2. Be medically accurate.
3. Promote abstinence.
4. Discourage drug abuse.
5. Dispel myths regarding transmission of the human immunodeficiency virus.

C. No district shall include in its course of study instruction which:
1. Promotes a homosexual life-style.
2. Portrays homosexuality as a positive alternative life-style.
3. Suggests that some methods of sex are safe methods of homosexual sex.

D. At the request of a school district, the department of health services or the department of education shall review instruction materials to determine their medical accuracy.

E. At the request of a school district, the department of education shall provide the following assistance:
1. A suggested course of study.
2. Teacher training
3. A list of available films and other teaching aids.

F. At the request of a parent, a pupil shall be excused from instruction on the acquired immune deficiency syndrome and the human immunodeficiency virus as provided in subsection A of this section. The school district shall notify all parents of their ability to withdraw their child from the instruction.

ADDENDUM
A Brief Description of Ten Major Content Areas in
Comprehensive School Health Education

1. **Community Health** includes topics such as individual responsibility; healthful school, home and community environments; community health resources and facilities; official and nonofficial health agencies; health service careers; pollution control; community involvement; current issues; and trends in medical care.

2. **Consumer Health** addresses health care resources i.e., knowing what is available and how to be an educated consumer.

3. **Environmental Health** addresses individual and community responsibility, pollution, effects of environment on health, environmental protection agencies, population density, world health, waste disposal, sanitation, laws and career choices.

4. **Family Life Education** covers information about family dynamics, building relationships, child abuse, choices about relationships, family planning, parenting skills, sex education, and sexually transmitted diseases such as HIV infection and AIDS.

5. **Injury Prevention and Safety** includes learning about first aid and emergency health care and addresses the prevention of unintentional injuries. (Many schools include violence prevention and homicide as health issues within this content area.)

6. **Mental and Emotional Health** includes building self-esteem, effectively coping with stress, and communication skills, among others.

7. **Nutrition** addresses a balanced diet, food preparation, reading and understanding food labels, differences in nutritional needs for pregnant women, and more.

8. **Personal Health** includes physical fitness and lifetime activities, cardiovascular health, sleep, rest, relaxation, recreation, growth and development, oral health, vision and hearing, body systems and their functions, aging, personal wellness plans, and positive health habits and choices.

9. **Prevention and Control of Disease** addresses heart disease, stroke, diabetes, cancer, HIV/AIDS and others.

10. **Substance Use and Abuse** refers to the use and misuse of tobacco, alcohol, and other drugs and often includes topics such as positive decision-making, individual responsibility, substances beneficial to humankind, the classification of substances and their effects on the body, and the formation of habits and their influence.

The ten major content areas in this addendum are provided to assist local school districts in developing sequential curricula. It will be left to the discretion of the local district to determine the emphasis of each of the content areas. The Comprehensive Health Education and Physical Activity Standards are the required competency indicators, while the addendum is a tool to be used by school districts as a cross-reference.

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 4-5)

STANDARD 1
Students comprehend concepts related to health promotion and disease prevention.

- **1CH-E1. Explain the relationship between positive health behaviors and health care and the prevention of injury, illness, disease, disability and premature death**

  PO 1. Describe positive health behaviors which can prevent common injuries, diseases and other conditions
  PO 2. Describe harmful effects of substance use

- **1CH-E2. Describe the interrelationship of mental, emotional, social and physical health during adolescence**

  PO 1. Draw how thoughts, feelings, being with people and being healthy are all related

- **1CH-E3. Explain how health, growth and development are influenced by the interaction of body systems, genetics, environment and lifestyle**

  PO 1. Contrast healthy and unhealthy lifestyles
  PO 2. Describe the effects on healthy and unhealthy lifestyles on health, growth and development

- **1CH-E4. Describe how family and peers influence the health of adolescents**

  PO 1. Classify healthy and unhealthy choices that you have learned from family and peers

- **1CH-E5. Explain how environmental health and personal health are interrelated**

  PO 1. Describe the relationship between healthy people and a healthy environment

- **1CH-E6. Describe ways to reduce risks related to adolescent health problems**

  PO 1. Identify changes adolescents can make in their lifestyle to reduce health risks

- **1CH-E7. Describe how lifestyle and family history are related to the cause and prevention of disease and other health problems**

  PO 1. Explain how an individual lifestyle and family history can prevent or cause health problems

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 4-5)

- **1CH-E8. Explain how basic nutrients are utilized by the body and the relationship of a balanced diet and essential nutrients to appropriate weight, appearance and wellness**

    PO 1. Identify the basic nutrients and identify their uses in the body
    PO 2. Describe how a balanced and nutritious diet is related to weight, appearance and wellness

STANDARD 2
Students demonstrate the ability to access accurate health information.

- **2CH-E1. Obtain and utilize accurate health resources from home, school and community**

    PO 1. List accurate health information from home, school and community
    PO 2. Utilize accurate health information

- **2CH-E2. Describe how media influences the selection of health information and products (e.g., exercise equipment, cosmetics)**

    PO 1. Explain how media influences the selection of health information and products

- **2CH-E3. Compare the costs and effectiveness of health products**

    PO 1. Demonstrate effectiveness of a specific health product (e.g., shampoo, soap)
    PO 2. Compare cost of products

- **2CH-E4. Describe situations requiring professional health services**

    PO 1. Same as concept

- **2CH-E5. Identify emergency preparedness and emergency resources (e.g., first aid, CPR)**

    PO 1. List what you need to be prepared for a medical emergency
    PO 2. List emergency resources

STANDARD 3
Students demonstrate the ability to practice health-enhancing behaviors and reduce health risks.

- **3CH-E1. Explain the importance of assuming responsibility for personal health behaviors**

    PO 1. Illustrate examples of responsible healthy behavior

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 4-5)

- **3CH-E2. Identify strengths of, and risks to, one's personal and family health (e.g., heart disease, diabetes, high blood pressure) and implement strategies to improve or maintain both**

    PO 1. Compare personal and family health risks and strengths
    PO 2. Explain ways to reduce risks and increase strengths

- **3CH-E3. Distinguish between responsible and risky/harmful behaviors (e.g., responsible: exercise, sleep, nutrition; risky: the use of tobacco, alcohol and other drugs)**

    PO 1. List differences between responsible and risky behaviors

- **3CH-E4. Develop injury prevention and management strategies for personal and family health including ways to avoid and reduce threatening situations**

    PO 1. Identify ways to prevent personal and family injuries
    PO 2. Identify ways to avoid dangerous situations for yourself and your family

- **3CH-E5. Demonstrate strategies to manage stress**

    PO 1. Choose five ways to reduce stress

- **3CH-E6. Perform basic safety, first aid and life saving techniques**

    PO 1. Demonstrate basic safety techniques

STANDARD 4
Students analyze the influence of culture, media, technology and other factors on health.

- **4CH-E1. Describe health behaviors and the use of health services in different cultures and explain the factors responsible for the differences**

    PO 1. Compare how different cultures regard health
    PO 2. Distinguish the ways health services are used by different cultures

- **4CH-E2. Explain how messages from media and other sources influence health behaviors**

    PO 1. Determine the way media messages influence your health

- **4CH-E3. Describe the influence of technology on personal and family health**

    PO 1. Specify five ways that technology affects your health

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 4-5)

- **4CH-E4. Describe how information from peers influences health**

   PO 1. Same as concept

STANDARD 5
Students demonstrate the ability to use interpersonal skills to enhance health.

- **5CH-E1. Demonstrate ways to communicate care, consideration and respect of self and others**

   PO 1. Choose five ways to show that you care about self and others

- **5CH-E2. Identify the causes of conflict among youth in schools and communities and demonstrate refusal and negotiation skills to enhance health**

   PO 1. Explain what influences individuals to engage in conflict
   PO 2. List two problem solving strategies to avoid conflict

- **5CH-E3. Demonstrate strategies to manage conflict in healthy ways**

   PO 1. Classify techniques that will promote conflict resolution
   PO 2. Choose five healthy ways to control conflict

STANDARD 6
Students demonstrate the ability to use goal setting and decision-making skills to enhance health.

- **6CH-E1. Apply a sound decision-making process that includes an examination of alternatives and consequences and determines a course of action to resolve health issues and problems individually or collaboratively**

   PO 1. Demonstrate the decision-making process
   PO 2. Choose three alternatives and consequences regarding a health issue

- **6CH-E2. Explain how decisions regarding health behaviors have consequences for self and others**

   PO 1. Identify five (positive or negative) health behaviors
   PO 2. Define the consequences of the above health behaviors

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 4-5)

- **6CH-E3. Describe how personal health goals are influenced by information, abilities, priorities and responsibilities**

  PO 1. List five behaviors that maintain personal health
  PO 2. List five strategies for the above information that can impact personal health goals
  PO 3. List five health priorities and responsibilities based on the above list
  PO 4. Describe how these strategies affect health goals

- **6CH-E4. Develop a plan that addresses personal strengths, needs and health risks, and apply strategies and skills needed to attain personal health goals**

  PO 1. Develop three personal health goals
  PO 2. Design a plan to improve strengths, realize needs, and reduce health risks
  PO 3. Describe attainment of personal health goals

STANDARD 7
Students demonstrate the ability to advocate for personal, family and community health.

- **7CH-E1. Research various media for language, subject matter and visual techniques used to influence health-related information and decision-making**

  PO 1. Compare three different types of health information found in the media
  PO 2. Identify which visual techniques used above (in PO 1) about health information is the most dramatic and why

- **7CH-E2. Present information about health issues**

  PO 1. Choose a health issue of personal interest
  PO 2. Present the positive and negative aspects about your health issue

- **7CH-E3. Identify barriers to effective communication of information about health issues**

  PO 1. Name three barriers of communication about a health issue

- **7CH-E4. Demonstrate the ability to support others in making positive health choices**

  PO 1. Distinguish three positive strategies to support someone making health choices

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 4-5)

- **7CH-E5. Demonstrate the ability to work cooperatively when advocating for healthy individuals, families and schools**

  PO 1. Identify the various roles in a cooperative setting
  PO 2. Construct a cooperative group where everyone has a role toward promoting health awareness for a person, family or school
  PO 3. Determine ways to make this cooperative group successful

Physical Activity Standards Rationale

A wealth of information has been accumulated to point to the importance of physical activity in promoting health and wellness. Evidence also indicates that habits (lifestyles) established in youth are likely to influence adult lifestyles and associated health and wellness. Physical activity, a primary risk factor for many chronic health conditions, is an integral part of comprehensive school health education but also must be promoted as an important educational goal. Meeting physical activity standards includes both promotion of physical activity among youth and promotion of lifelong physical activity that will enhance workplace skills, fitness and wellness associated with quality of life. Achieving lifetime physical activity standards results in learning real life skills. Higher order skills include decision-making and problem solving required to become informed, lifetime physical activity consumers.

Rationale for Standard 1: Students demonstrate proficiency and the achievement of higher order cognitive skills necessary to enhance motor skills.

Movement competence implies the development of sufficient ability to enjoy participation in physical activities and re-establish a foundation to facilitate continued motor skill acquisition and increased ability to engage in developmentally appropriate daily physical activities. In addition to achieving competence in a few movement forms, which increases the likelihood of lifetime activity participation, the students apply concepts from exercise science disciplines that will help them achieve independence in developing movement competence in new movement forms. The focus is on movement forms appropriate for lifetime activity involvement and the establishment of personal competence.

Rationale for Standard 2: Students comprehend basic physical activity principles and concepts that enable them to make decisions, solve problems and become self-directed lifelong learners who are informed physical activity consumers.

Accessing accurate physical activity information, products and services is important to become informed, responsible physical activity consumers.

Rationale for Standard 3: Students exhibit a physically active lifestyle.

The intent of this standard is to establish patterns of regular participation in meaningful physical activity. This standard connects what is taught in school with students' choices for physical activity outside of school. Students are more likely to participate in physical activities if they have had opportunities to develop interests that are personally meaningful to them.

Rationale for Standard 4: Students achieve and maintain a health-enhancing level of physical fitness.

The intent of this standard is for the student to achieve a health-enhancing level of physical fitness. Students should be encouraged to develop personal fitness levels above those necessary for health-enhancement, based on unique personal needs and interests and necessary for many work situations and active leisure participation. Health-related fitness components include cardio-respiratory endurance, muscular strength and endurance, flexibility, and body composition. Expectations for students' fitness levels should be established on a personal basis, taking into account variation in entry levels, rather than setting a single standard for all children at a given grade level.

Rationale for Standard 5: Students develop self-initiated behaviors that promote effective personal and social interactions in physical activity settings.

The intent of this standard is achievement of self-initiated behaviors that promote personal and group success in activity settings. Behaviors such as safe practices, adherence to rules and procedures, etiquette, cooperation and teamwork, ethical behavior in sports, and positive social interaction are necessary for all students to develop effective communication skills.

Rationale for Standard 6: Students demonstrate understanding and respect for differences among people in physical activity settings.

The intent of this standard is to develop respect for similarities and differences through positive interaction among participants in physical activity. Similarities and differences include characteristics of culture, ethnicity, motor performance, disabilities, physical characteristics (e.g., strength, size, shape), gender, race and socioeconomic status.

Rationale for Standard 7: Students develop behavioral skills (self-management skills) essential to maintaining a physically active lifestyle.

The intent of this standard is for students to develop an awareness of the intrinsic benefits of participation in lifelong physical activity. Physical activity can provide opportunities for enjoyment, physical fitness and personal challenge.

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 4-5)

STANDARD 1
Students demonstrate proficiency and the achievement of higher order cognitive skills necessary to enhance motor skills.

- **1PA-E1. Demonstrate competence in a variety of movement forms**

  PO 1. Throw, catch, strike and kick using mature form in a variety of physical activity settings
  PO 2. Dribble and pass a variety of objects to a stationary target/receiver (e.g., hands, feet, equipment)
  PO 3. Balance with control on a variety of objects
  PO 4. Transfer weight from feet to hand at fast and slow speeds, using large extensions (e.g., mule kick, handstand, cartwheel)
  PO 5. Travel, changing speeds and directions, in response to a variety of rhythms

- **1PA-E2. Apply more advanced movement and game strategies**

  PO 1. Use basic offensive and defensive strategies in small group games

- **1PA-E3. Identify the critical elements of more advanced movement skills**

  PO 1. Identify the critical elements of a basic movement made by a fellow student and provide feedback to that student

- **1PA-E4. Identify the characteristics of highly skilled performance in a few movement forms**

  PO 1. Identify the characteristics of a highly skilled performer in a few movement forms

- **1PA-E5. Apply more advanced discipline-specific knowledge (e.g., conditioning and fitness in a selected sport)**

  PO 1. Demonstrate specialized movement skills

STANDARD 2
Students comprehend basic physical activity principles and concepts that enable them to make decisions, solve problems and to become self-directed lifelong learners who are informed physical activity consumers.

- **2PA-E1. Describe the relationship between a healthy lifestyle and feeling good**

  PO 1. Give examples of the benefits derived from regular physical activity
  PO 2. Identify several moderate to vigorous physical activities that provide personal pleasure

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 4-5)

- **2PA-E2. Apply basic principles of training to improve physical fitness**

   PO 1. Engage in appropriate activity that results in the development of muscular strength and endurance
   PO 2. Apply the concepts that impact the quality of physical fitness

- **2PA-E3. Describe physiological indicators of exercise during and after physical activity**

   PO 1. Demonstrate ability to calculate heart rate
   PO 2. Monitor intensity of exercise (e.g., heart rate, respiration, body temperature)

- **2PA-E4. Explain the concept of target zones for health-related physical fitness**

   PO 1. Same as concept

STANDARD 3

Students exhibit a physically active lifestyle.

- **3PA-E1. Participate regularly in health-enhancing physical activities to accomplish personal health goals**

   PO 1. Participate regularly in a physical activity that develops a healthy lifestyle
   PO 2. Describe health benefits that result from regular and appropriate participation in physical activity

- **3PA-E2. Participate in a variety of physical activities of personal interest**

   PO 1. Identify at least one enjoyable activity he/she participates in daily (formal or informal)
   PO 2. Identify opportunities for more formal participation in physical activities in the community
   PO 3. Design games, gymnastics, and dance sequences based on personal interests

STANDARD 4

Students achieve and maintain a health-enhancing level of physical fitness.

- **4PA-E1. Accomplish the health-related fitness standards as defined by Fitnessgram**

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 4-5)

PO1. Engage in appropriate activities that result in the development of muscular strength and endurance, flexibility, appropriate body composition, and aerobic endurance

- **4PA-E2. Apply basic principles of training to improve or maintain health-related physical fitness**

    PO 1. Participate in moderate to vigorous physical activities at least four days per week
    PO 2. Accumulate 30-60 minutes of moderate activity per day at least four days per week
    PO 3. Maintain continuous aerobic activity for a specified time and activity (e.g., 10 minutes or more)
    PO 4. Demonstrate how to balance food intake with physical activity

STANDARD 5
Students develop self-initiated behaviors that promote effective personal and social interactions in physical activity settings.

- **5PA-E1. Explain the influence of peer pressure in physical activity settings**

    PO 1. Explain the difference between acts of courage and reckless acts
    PO 2. Demonstrate responsibility when teaching or learning an activity with a partner or small group

- **5PA-E2. Identify potential consequences when confronted with a behavior choice**

    PO 1. Act in a safe manner during physical activity

- **5PA-E3. Cooperate with a group to achieve group goals in competitive as well as cooperative settings**

    PO 1. Work independently and on task for partner, small or large group activities
    PO 2. Participate in establishing rules and procedures that are safe and effective for specific activities

- **5PA-E4. Identify the social benefits of participation in physical activity**

    PO 1. Explain the difference between compliance and noncompliance of game rules and demonstrate compliance
    PO 2. Identify one's own performance problems without blaming others

STANDARD 6
Students demonstrate understanding and respect for differences among people in physical activity settings.

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 4-5)

- **6PA-E1. Explain the role of sports, games and dance in modern culture**

  PO 1. Explain the validity of games and activities reflecting one's own and others' heritage

- **6PA-E2. Identify behaviors that are supportive and inclusive in physical activity settings**

  PO 1. Demonstrate fairness in games and activities
  PO 2. Demonstrate acceptance of the skills and abilities of others through verbal and nonverbal behavior

- **6PA-E3. Participate in physical activities with others regardless of diversity and ability**

  PO 1. Identify the attributes that individual differences can bring to group activities

STANDARD 7

Students develop behavioral skills (self-management skills) essential to maintaining a physically active lifestyle.

- **7PA-E1. Establish personal physical activity goals**

  PO 1. Explain how appropriate practice improves performance
  PO 2. Use information from internal (self-evaluation) and external sources to set physical activity goals to improve performances

- **7PA-E2. Explore a variety of new physical activities for personal interest**

  PO 1. Identify opportunities for participation in physical activity in the school

- **7PA-E3. Participate in new and challenging activities**

  PO 1. Participate in a variety of physical activities, both in and out of school, based upon individual interests and capabilities

Foreign and Native
Language Standards 1997

Essentials (Grades 4-8)

Foreign and Native Language* Standards Rationale

Today's students prepare for the tomorrow in which they will need to function in varied contexts. The constant shrinking of the globe will expand their experience beyond that of previous generations to include contacts with other languages and cultures, both in their private lives and in their work. Languages are increasingly demanded in a wide range of professions. To succeed, students will need new tools, many of which are available primarily, if not solely, through the study of other languages. They include:

- ***the ability to communicate well for varied purposes.*** In other languages, as well as in English, effective communication requires an understanding of both the target language and culture under study and one's own, which implies the ability to interact confidently within many arenas, including the workplace and communities where the language is spoken.

- ***a solid foundation in basic subject matter and skills.*** All core subjects must contribute to this end, in an integrated fashion, to aid students in realizing the connections among the parts of their education. Basic subject matter includes the development of verbal reasoning, and listening skills and knowledge of the great achievements of human cultures, e.g., artistic, literary, scientific. The study of another language has been shown to enhance student performance in other academic fields. Learnings from other fields can also be reinforced in the foreign language classroom.

- ***an understanding and appreciation of the diversity of languages and cultures, including one's own.*** These tools aid students to function as responsible, informed, and confident citizens and enhance their personal development. They allow the finding of one's own place in the wider world.

Introduction to the Foreign Language Standards

The foreign language standards state what students need to know about languages and cultures, including their own; what students need to be able to do; and how this knowledge and these abilities relate to the subject matter of other core areas. The standards are stated clearly and in measurable terms:

- what students need to **know** in order to function successfully as they enter a new millennium that promises major changes in communications and contacts with other languages and cultures;

- what students need to be able to **do**. Knowing about a language and its culture(s), while essential, is not sufficient; students will develop skills for functioning effectively in varied contexts; and

- the integration of foreign languages into the rest of the curriculum so that the connections
  are clear and so that learning in all areas is facilitated, including the development of a deeper understanding of one's own language and culture. The five strands under which the standards are organized–Communication, Culture, Connections, Comparisons and Communities–are meant to be interwoven among themselves as well, rather than taught as separate entities. Meeting the standards for each one will contribute to reaching the standards of the others.

These standards for foreign language study are highly challenging for all students. They assume an extended sequence of learning throughout the students' school career, thus reflecting the likely nature of schools in the future. Meeting these standards will require the study of grammar–the forms and structures of the language–as well as effective learning strategies. Students will also need to use technologies that will bring the language and the culture to them in new ways and enhance their opportunities to learn.

In these standards we refer to "the target language," which may stand for "world language," "foreign language," "second language," or "heritage language" (i.e., the language that is the predominant language in the home).

Descriptions of Language Abilities for Each Level

Readiness

Students use basic vocabulary related to people, places, things and actions close to their own lives. They express themselves in phrases, short sentences and memorized material. Their language is characterized by an emerging control of the most common basic grammatical forms and structures. Because comprehension of oral and written language normally exceeds production, students are able to comprehend simple descriptions, narratives, and authentic materials such as advertisements, on topics studied in class. Pronunciation and fluency are such that students often might not be understood by native speakers. They are able to write accurately what they can say.

Foundations

Students speak and write extemporaneously using short sentences and sentence strings in present tense on topics within their experience with the language. They can describe, ask and answer questions; engage in simple conversations; and carry out simple realistic functions such as ordering a meal, buying something, or introducing themselves or others to a group. Since their knowledge of the forms and structures of the language has grown rapidly but their practice has been limited, their speech is likely to contain numerous linguistic errors. Students are comprehensible to sympathetic listeners who have experience with non-native speakers of their language. Their written language still mirrors their oral language, although they may be able to express more ideas more accurately in writing, given time to reflect, review and revise.

Essentials

Students speak with somewhat longer utterances and begin to display an ability to connect phrases and sentences to show relations between ideas expressed. Although patterns of errors are still common, students now speak and write extemporaneously in past, present and future time, using vocabulary related to their own lives and interests. Accent and intonation are generally accurate, although pauses and false starts may be common, as students give simple instructions and directions, make comparisons, solve problems together, and engage in conversations on a range of topics including leisure activities, professions and current events.

In written work, students' spelling and punctuation are mostly accurate; and they organize their ideas well.

Proficiency

Students use paragraph-length connected discourse to narrate, describe, and discuss ideas and opinions. On topics of interest to them and within their experience, they show few patterns of linguistic errors, they are generally comprehensible to native speakers of the language, and their vocabulary is sufficient to avoid awkward pauses. They are able to circumvent linguistic gaps or lapses by "finding another way to say it." Given time to reflect and revise, they are able to express their ideas completely and interestingly in writing, with generally accurate grammar, vocabulary, spelling, accents and punctuation. They comprehend most authentic expository and fictional material produced for contemporary native speakers.

Distinction

Students show almost no patterns of linguistic errors and are able to carry out almost any task that they can execute in English, albeit with less fluency and control or breadth of vocabulary and grammar. They can argue a point effectively and extemporaneously, explaining their point of view in detail. In writing, their ideas are well organized and clearly, completely, and interestingly presented, with accurate use of the language's writing system. They can comprehend any non-technical material produced for the general public of native speakers in the standard language.

FOREIGN AND NATIVE LANGUAGE STANDARDS
ESSENTIALS (GRADES 4-8)

STANDARD 1: COMMUNICATION
Students understand and interpret written and spoken communication on a variety of topics in the target language.

- **1FL-E1. Comprehend the main idea in authentic oral and written materials on a familiar topic**

- **1FL-E2. Comprehend well-developed paragraphs containing complex sentences and idiomatic expressions**

- **1FL-E3. Comprehend, interpret and analyze the style of a short piece of fiction or essay on familiar topics**

- **1FL-E4. Identify characteristics of a variety of literary genres, e.g., short stories, plays, essays**

- **1FL-E5. Identify emotions and feelings from selected reading material**

- **1FL-E6. Read a poem and analyze its components**

STANDARD 2: COMMUNICATION
Students engage in oral and written exchanges which include providing and obtaining information, expressing feelings and preferences, and exchanging ideas and opinions in the target language.

- **2FL-E1. Express and react to a variety of feelings**

- **2FL-E2. Develop and propose solutions to issues and problems cooperatively with other students**

- **2FL-E3. Support opinions with factual information**

- **2FL-E4. Use idiomatic expressions in oral and written communication**

STANDARD 3: COMMUNICATION
Students present information and ideas in the target language on a variety of topics to listeners and readers.

- **3FL-E1. Present understandable written reports and summaries**

- **3FL-E2. Perform short, student-created skits and scenes**

- **3FL-E3. Present a brief speech (monologue)**

FOREIGN AND NATIVE LANGUAGE STANDARDS
ESSENTIALS (GRADES 4-8)

- **3FL-E4. Prepare tape- (audio) or video-recorded materials**

- **3FL-E5. Retell a story**

STANDARD 4: CULTURE
Students know "what to do when" and "what to say while doing it" in the culture and use this knowledge to interact appropriately. They also understand the relationships between cultural perspectives, products and practices within cultures.

- **4FL-E1. Investigate and participate in age-appropriate cultural practices related to business, sports and entertainment**

- **4FL-E2. Use and respond appropriately to idiomatic verbal and nonverbal expressions**

- **4FL-E3. Identify, experience or produce expressive products of the culture, e.g., advertisements, stories, poems**

- **4FL-E4. Recognize simple themes, ideas or perspectives of the culture and the relationships to socially acceptable behavior**

- **4FL-E5. Identify the areas in the U.S. where the target language is most commonly spoken, noting the impacts**

- **4FL-E6. Recognize how the target language and its culture add to the richness of our own cultural diversity**

- **4FL-E7. Recognize when to switch between formal and informal language**

STANDARD 5: CONNECTIONS
Students use the target language and authentic sources to reinforce and/or learn other content from the other subject areas.

- **5FL-E1. Present reports in the target language orally and/or in writing on topics being studied in other classes**

- **5FL-E2. Generate reports for other content areas using information acquired through sources in the target language**

FOREIGN AND NATIVE LANGUAGE STANDARDS
ESSENTIALS (GRADES 4-8)

STANDARD 6: COMPARISONS
Students develop insights into their own language and their own culture through the study of the target language.

- **6FL-E1. Understand how idiomatic expressions impact communication and reflect culture**

- **6FL-E2. Demonstrate an awareness that there is more than one way to express ideas across languages**

- **6FL-E3. Recognize that there are linguistic and cultural concepts that exist in one language and not in another**

- **6FL-E4. Compare and contrast a variety of art forms (e.g., music, dance, visual arts, drama) with their own culture through oral and/or written descriptions and/or performance**

STANDARD 7: COMMUNITIES
Students use the target language within and beyond the school setting.

- **7FL-E1. Research and present a topic related to the target language or culture, using resources available outside the classroom**

- **7FL-E2. Write letters or electronic messages to native speakers**

- **7FL-E3. Interview community members who speak the target language on topics of personal or professional interest; report the results orally or in writing**

- **7FL-E4. Write letters to U.S. communities and other countries where the target language is used to request information on topics of interest; report orally or in writing about the information received**

- **7FL-E5. Identify and select written or oral materials of individual interest; report on them to others**

Reading Standard Articulated
by Grade Level 2003

Grade 4

Reading Standard Articulated by Grade Level

INTRODUCTION

Reading is a complex skill that involves learning language and using it effectively in the active process of constructing meaning embedded in text. It requires students to fluently decode the words on a page, understand the vocabulary of the writer, and use strategies to build comprehension of the text. It is a vital form of communication in the 21st century and a critical skill for students of this "information age" as they learn to synthesize a vast array of texts.

The Reading Standard Articulated by Grade Level will provide a clear delineation of what students need to know and be able to do at each grade level. This allows teachers to better plan instructional goals for students at any grade.

BACKGROUND

The state Board of Education adopted the Arizona Academic Standards in 1996 to define what Arizona's students need to know and be able to do by the end of twelfth grade. Developed by committees comprised of educators, parents, students, and business and community leaders, these standards were written in grade-level clusters with benchmarks at grades 3, 5, 8, and high school.

RATIONALE

Requirements in the *No Child Left Behind Act of 2001* (NCLB) and the standard practice of conducting periodic review of the state academic standards prompted the decision by the Arizona Department of Education to refine and articulate the academic standards for mathematics and reading by grade level. This refinement and articulation project was started in July 2002, and was completed in March 2003.

METHODOLOGY

Work teams for reading consisted of a representative sample of educators from around the state designed to include large and small schools, rural and urban schools, and ethnic diversity. National reading consultants, university professors, and test company consultants advised the teams. The goal was to articulate, or align, the current academic standards by grade level (K-12).

The Reading Articulation Teams utilized information from the National Council of Teachers of English and the findings of the National Reading Panel, which promote quality instruction, based on current, pedagogical, and researched practices.

The articulation process included a restructuring of the Arizona Academic Content Standards to better facilitate the alignment of performance objectives by grade level, while maintaining the content integrity of the existing standards. Over a period of

months, the articulation team and smaller sub-committees of the teams refined the documents. Reasonableness, usefulness, and appropriateness were the guidelines for the articulation process.

External reviews by nationally recognized consultants brought a broad perspective to the articulation process. Internal reviews by university and local experts provided additional validation.

Another important step in the project was the request for public comment. In December 2002, drafts of the Standards Articulated by Grade Level, along with a survey to gather feedback, were posted on the Arizona Department of Education website. This provided the public with easy access to the documents, and the survey allowed reviewers a means for submitting comments. The public and all educators had the opportunity to submit comments and suggestions, either electronically or in writing, until the survey closing date of January 31, 2003. In January, six public hearings were held throughout the state, offering further opportunities for public input.

After all the public comments were collected and organized by topic, the articulated teams met one last time to determine what modifications to the standards documents would be appropriate, based on this information. All public comments were given equal consideration.

The completion of the standards articulation process was followed by the development of rationales, glossaries, and crosswalks. These additional documents were designed to assist educators with the transition from the 1996 standards to the Reading Standard Articulated by Grade Level.

READING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 1: Reading Process

Reading Process consists of the five critical components of reading, which are Phonemic Awareness, Phonics, Fluency, Vocabulary and Comprehension of connected text. These elements support each other and are woven together to build a solid foundation of linguistic understanding for the reader.

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. Use knowledge of root words and affixes to determine the meaning of unknown words.

PO 2. Use context to determine the relevant meaning of a word.

PO 3. Determine the difference between figurative language and literal language.

PO 4. Identify figurative language, including similes, personification, and idioms.

PO 5. Determine 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 Internet when available.

PO 6. Identify antonyms, synonyms, and homonyms for given words within text.

Concept 5: Fluency
Read fluently.

PO 1. Read from familiar prose and poetry with fluency and appropriate rhythm, pacing, intonation, and expression relevant to the text.

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

READING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 2: Comprehending Literary Text

Comprehending Literary Text identifies the comprehension strategies that are specific in the study of a variety of literature.

Concept 1: Elements of Literature
Identify, analyze, and apply knowledge of the structures and elements of literature.

PO 1. Identify the main problem or conflict of a plot.

PO 2. Identify the resolution of a problem or conflict in a plot.

PO 3. Identify the moral of literary selection (e.g., fables, folktales, fairytales, legends).

PO 4. Distinguish between major characters and minor characters.

PO 5. Describe a character's traits using textual evidence (e.g., dialogue, actions, narrations, illustrations).

PO 6. Identify the speaker or narrator in a literary selection.

PO 7. Identify all aspects of the setting (e.g., time of day or year, historical period, place, situation).

PO 8. Compare (and contrast) the characters, events, and setting in a literary selection.

PO 9. Identify characteristics and structural elements (e.g., imagery, rhyme, verse, rhythm, meter) of poetry.

PO 10. Identify common forms of literature (e.g., poetry, novel, short story, biography, autobiography, drama) based upon their characteristics.

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.

Strand 3: Comprehending Informational Text

Comprehending Informational Text delineates specific and unique skills that are required to understand the wide array of informational text that is a part of our day-to-day experiences.

Concept 1: Expository Text
Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.

PO 1. Identify the main idea and supporting details in expository text.

PO 2. Distinguish fact from opinion in expository text.

PO 3. Determine author's main purpose (e.g., to inform, to describe, to explain) for writing the expository text.

PO 4. Locate specific information by using organizational features (e.g., table of contents, headings, captions, bold print, glossaries, indices, italics, key words, topic sentences, concluding sentences) of expository text. (Connected to Research Strand in Writing)

PO 5. Identify appropriate print and electronic reference sources (e.g., encyclopedia, atlas, almanac, dictionary, thesaurus, periodical, textbooks, CD-ROM, website) needed for a specific purpose. (Connected to Research Strand in Writing)

PO 6. Interpret information from graphic features (e.g., charts, maps, diagrams, illustrations, tables, timelines) in expository text. (Connected to Research Strand in Writing)

PO 7. Distinguish cause and effect.

PO 8. Draw valid conclusions based on information gathered from expository text.

Concept 2: Functional Text
Identify, analyze, and apply knowledge of the purpose, structures, clarity, and relevancy of functional text.

PO 1. Locate specific information from functional text (e.g., letters, memos, directories, menus, schedules, pamphlets, search engines, signs, manuals, instructions, recipes, labels, forms).

PO 2. Interpret details from functional text for a specific purpose (e.g., to follow directions, to solve problems, to perform procedures, to answer questions).

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 position regarding a particular idea, subject, concept, or object.

PO 2. Identify persuasive vocabulary (e.g., loaded/emotional words, exaggeration) used to influence readers' opinions.

Writing Standard Articulated by Grade Level 2004

Grade 4

Writing Standard Articulated by Grade Level

INTRODUCTION

The purpose of the Writing Standard Articulated by Grade Level is to equip students with the skills and knowledge needed to participate in society as literate citizens. The ability to communicate effectively in writing will be essential to their success in their communities and careers. Students may realize personal fulfillment and enjoyment as they learn to become proficient writers and continue as writers throughout their lives.

Writing is a complex skill that involves learning language and using it effectively to convey meaning through text. This standard recognizes that students' abilities in writing develop from their earliest stages with phonetic spelling; to limited understanding of a certain genre; to the ability to produce conventional, coherent, unified documents. Their ideas are expressed in various forms, such as notes, lists, letters, journal writing, stories, web postings, instant messaging, essays, and reports. Effective writing may be evaluated by examining the use of ideas, organization, voice, word choice, sentence fluency, and conventions.

The Writing Standard Articulated by Grade Level will provide a clear delineation of what students need to know and be able to do at each grade level. This allows teachers to better plan instructional goals for students at any grade.

BACKGROUND

The state Board of Education adopted the Arizona Academic Standards in 1996 to define what Arizona's students need to know and be able to do by the end of twelfth grade. Developed by committees comprised of educators, parents, students, and business and community leaders, these standards were written in grade-level clusters with benchmarks at grades 3, 5, 8, and high school.

RATIONALE

Requirements in the No Child Left Behind Act of 2001 (NCLB) and the standard practice of conducting periodic review of the state academic standards prompted the decision by the Arizona Department of Education to refine and articulate the academic standards for mathematics, reading, writing, and science by grade level. This refinement and articulation project was started in December 2003, and was completed in June 2004.

METHODOLOGY

Writing Standard refinement began in January 2004, expanding the standard to include performance objectives for all grade levels, kindergarten through twelfth grade. The writing articulation teams consisted of educators from around the state, representing large and small schools, rural and urban schools, and ethnic diversity. National consultants, university professors, and Arizona Department of Education staff advised the teams. The goal was to articulate and align the current academic standards by grade level (K-12).

The Writing Articulation Committee utilized resources and information from current, effective classroom practices, from other states' standards, and from the National Council of Teachers of English, which promotes quality literacy instruction.

The articulation process included a restructuring of the Arizona Academic Content Writing Standards to better facilitate the alignment of performance objectives by grade level, while maintaining the content integrity.

Over a period of months, the articulation team and smaller subcommittees of the teams refined the documents. Reasonableness, usefulness, and appropriateness were the guidelines for the articulation process.

External reviews by nationally recognized consultants brought a broad perspective to the articulation process. Internal reviews by university and local experts provided additional validation.

Another important step in the project was the request for public comment. In May 2004, a draft of the Writing Standard Articulated by Grade Level, along with a survey to gather feedback, was posted on the Arizona Department of Education website. This provided the public with easy access to the documents, and the survey allowed reviewers a means for submitting comments. The public and all educators had the opportunity to submit comments and suggestions, either electronically or in writing, until the public review closing date of May 27, 2004. In May, three public hearings were held throughout the state, offering further opportunities for public input.

Based on public comment and online survey results, the articulation team met to determine necessary modifications to the standard. All public comments were given equal consideration.

Included in the standard articulation process the development of a rationale, glossary, and a crosswalk (correlation between the 1996 Writing Standard and revised, articulated standard). These additional documents were designed to assist educators with the transition from the 1996 Writing Standards to the 2004 Writing Standard Articulated by Grade Level.

WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 1: Writing Process

Research has established the major steps of the writing process. These steps are identified in the five concepts of this strand, each supported with specific performance objectives. While all steps are needed and used by effective writers as they compose text, different skills may be emphasized in individual assignments. These steps may be used recursively as a piece moves toward completion. Throughout the process, students should reflect on their own writing skills, set goals, and evaluate their own progress.

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, **graphic organizers**, drawing, writer's notebook, group discussion, printed material).*
PO 2. Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade) of a writing piece.
PO 3. Determine the intended audience of a writing piece.
PO 4. *Use organizational strategies (e.g., **graphic organizer**, **KWL chart**, log) to plan writing.*
PO 5. Maintain a record (e.g., lists, pictures, journal, folder, notebook) of writing ideas.
PO 6. 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.

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 3: Revising
Revising includes evaluating and refining the rough draft for clarity and effectiveness. (Ask: Does this draft say what you want it to say?)

PO 1. Evaluate the draft for use of ideas and content, organization, voice, word choice, and sentence fluency. (See Strand 2)

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

PO 3. Rearrange words, sentences, and paragraphs to clarify the meaning of the draft.

*PO 4. Use a combination of sentence structures (i.e., **simple**, **compound**) to improve sentence fluency in the draft.*

PO 5. Modify word choice appropriate to the application in order to enhance the writing.

*PO 6. Apply appropriate tools or strategies (e.g., **peer review**, checklists, **rubrics**) to refine the draft.*

PO 7. Use resources and reference materials to select more precise vocabulary.

Concept 4: Editing
Proofread and correct the draft for conventions.

PO 1. Identify punctuation, spelling, and grammar and usage errors in the draft. (See Strand 2)

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 (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. Share the writing with the intended audience.

PO 3. Use margins and spacing to enhance the final product.

PO 4. Write legibly.

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 2: Writing Elements

This strand focuses on the elements of effective writing. Good writing instruction incorporates multiple performance objectives into an integrated experience of learning for the student. Throughout the process, students should reflect on their own writing skills, set goals, and evaluate their own progress. The order of the concepts and performance objectives is not intended to indicate a progression or hierarchy for writing instruction. Instructional activities may focus on just one concept or many.

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. Express ideas that are clear and directly related to the topic.

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

PO 3. Use relevant details to provide adequate support for the ideas.

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**, lines of poetry). (See Strand 3)

PO 2. Create a beginning that captures the reader's interest.

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

PO 4. Use a variety of **transitional words** that creates smooth connections between ideas.

*PO 5. Create an ending that provides a sense of **resolution** or closure.*

PO 6. Construct a paragraph that groups sentences around a topic.

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 and style.

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

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

Approved 6.28.04

WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

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 a variety of specific and accurate words that effectively convey the intended message.

PO 2. Use descriptive words and phrases that energize the writing.

PO 3. Apply vocabulary and/or terminology appropriate to the type of writing.

*PO 4. Use **literal** and **figurative language** in a variety of ways (e.g., imitating, creating new words, **rhyming**), although may be inconsistent or experimental.*
 (See R04-S1C4-04, -05)

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** and **compound sentences**.*

PO 2. Write 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 for:
   a. ***proper nouns** (i.e., names, days, months)*
   b. *titles*
   c. *names of place*
   d. *abbreviations*
   e. *literary titles (i.e., book, story, poem)*

PO 2. Punctuate endings of sentences using:
   a. *periods*
   b. *question marks*
   c. *exclamation points*

PO 3. Use commas to punctuate:
   a. *items in a series*
   b. *greetings and closings of letters*
   c. *dates*
   d. introductory words

PO 4. Use quotation marks to punctuate:
   a. ***dialogue** (although may be inconsistent or experimental)*
   b. titles

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

PO 5. Use a colon to punctuate time.

PO 6. Use apostrophes to punctuate:
- *a. contractions*
- *b. singular possessive*

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

PO 8. Use common spelling patterns/generalizations to spell words correctly, including:
- a. ***r-controlled***
- b. ***diphthong***
- c. **vowel digraphs**
- d. ***CVC words***
- e. ***CCVC***
- f. ***CVCC***
- g. **silent e**
- h. **irregular plurals**
- i. **affixes**

*PO 9. Spell simple **homonyms** correctly in context.*

*PO 10. Use resources (e.g., dictionaries, **word walls**) 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 verbs*
- *c. personal pronouns*
- *d. adjectives*
- *e. conjunctions*

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

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

Strand 3: Writing Applications

Writing skills particular to the modes listed here may be taught across the curriculum, although some modes may lend themselves more readily to specific content areas. It is imperative that students write in all content areas in order to increase their communication skills, and ultimately to improve their understanding of content area concepts. When appropriate, other content standards are referenced to show interdisciplinary connections.

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** based on imagined or real events, observations, or memories that includes:

   a. *characters*
   b. ***setting***
   c. ***plot***
   d. *sensory details*
   e. *clear language*
   f. *logical sequence of events*

PO 2. *Write in a variety of expressive forms (e.g., poetry, skit) that may 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 an expository paragraph that contains:*
   a. *a topic sentence*
   b. *supporting details*
   c. *relevant information*

PO 3. *Write in a variety of expository forms (e.g., essay, summary, newspaper article, reflective paper, log, journal).*

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

Approved 6.28.04

WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

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 text (e.g., directions, recipes, procedures, **rubrics**, labels, graphs/tables).*
(See R04-S3C2; M04-S2C1)

PO 2. Write communications, including:
- *a. thank-you notes*
- *b. **friendly letters***
- *c. **formal letters***
- *d. messages*
- *e. invitations*

PO 3. 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., advertisements, paragraph) that attempts to influence the reader.
(See R04-S3C3)

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 reflection to a literature selection (e.g., journal entry, book review).
(See R04-S2C1)

PO 2. Write a book report or review that identifies the:
- a. **main idea**
- b. character(s)
- c. **setting**
- d. sequence of events
- e. **conflict/resolution**

(See R04-S2C1)

PO 3. Write a response that demonstrates an understanding of a literary selection, and depending on the selection, includes:
- a. evidence from the text
- b. personal experience
- c. comparison to other text/media

(See R04-S2C1)

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
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WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

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. Paraphrase information from a variety of sources (e.g., Internet, reference materials).

(See R04-S3C1-04, -05, -06)

PO 2. Organize notes in a meaningful sequence.

(See R04-S3C1-04, -05, -06)

*PO 3. Write an informational report that includes **main idea**(s) and relevant details.*

(See R04-S3C1-04, -05, -06)

Italics denotes a repetition of a performance objective (learned in an earlier grade) that is to be applied to more complex writing.
The bulleted (lettered) items within a performance objective indicate specific content to be taught.
Words shown in bold print are referenced in the glossary.

Language Arts Standards 1996

Standard 3: Listening and Speaking
Standard 4: Viewing and Presenting

Essentials (Grades 4-8)

Language Arts Standards Rationale
A Vision for Arizona's Students

Arizona's students must be able to communicate effectively in their schools and communities. The communication skills of reading, writing, listening, speaking, viewing and presenting form the core of language and literacy. The ultimate purpose of the following language arts standards is to ensure that all students be offered the opportunities, the encouragement and the vision to develop the language skills they need to pursue lifelong goals, including finding personal enrichment and participating as informed members of society. The language art standards presented in this document are organized into four areas:

- Reading
- Writing
- Listening and Speaking
- Viewing and Presenting

Reading, writing, listening and speaking are commonly recognized as language skills. Visual communication skills have long been applied in language arts classrooms through the use of media and visual resources. However, with the increase in the availability and variety of media, students are faced with numerous demands for interpreting and creating visual messages. In this document, viewing (interpreting visual messages) and presenting (creating visual messages) are the two aspects of visual communication. Resources available for teaching visual communication range from charts, graphs and photographs to the most sophisticated electronic media.

The interdependency of reading, writing, listening, speaking, viewing and presenting requires that language arts skills be integrated in two ways:

- Within language art
- Across other content areas

Students use language skills to understand academic subject matter and to enrich their lives. They develop literacy at different rates and in a variety of ways. Consequently, interdependent language arts skills and processes should be taught in a variety of learning situations.

Assessment of language arts skills and processes should be comprehensive, authentic and performance based. Multiple assessment methods should be used to evaluate a student's knowledge base and the application of reading, writing, listening, speaking, viewing and presenting. Assessment tasks should reflect those experiences encountered in the home, community and workplace. Issues concerning assessment of specific populations pose complex questions with no simple solutions. As programs and assessments are developed, these issues must be resolved to enable all students to meet the standards.

In conclusion, the standards in the language arts framework form the core of every student's ability to function effectively in society. Students will need a wide repertoire of communication strategies and skills to succeed as learners, citizens, workers and fulfilled individuals in the 21st century.

LANGUAGE ARTS STANDARD
STRAND 3 – LISTENING AND SPEAKING AND
STRAND 4 – VIEWING AND PRESENTING
ESSENTIALS (GRADES 4-8)

STANDARD 3: LISTENING AND SPEAKING

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

- **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**

STANDARD 4: VIEWING AND PRESENTING

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

- **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**

Mathematics Standard Articulated by Grade Level 2008

Grade 4

Mathematics Standard Articulated by Grade Level

The Arizona Mathematics Standard Articulated by Grade Level describes a connected body of mathematical understandings and competencies that provide a foundation for all students. This standard is coherent, focused on important mathematics, and well articulated across the grades. Concepts and skills that are critical to the understanding of important processes and relationships are emphasized.

The need to understand and use a variety of mathematical strategies in multiple contextual situations has never been greater. Utilization of mathematics continues to increase in all aspects of everyday life, as a part of cultural heritage, in the workplace, and in scientific and technical communities. Today's changing world will offer enhanced opportunities and options for those who thoroughly understand mathematics.

Communication, problem solving, reasoning and proof, connections, and representation are the process standards as described in the *Principles and Standards for School Mathematics* from the National Council of Teachers of Mathematics (NCTM). These process standards are interwoven within each of the content strands of the Arizona Mathematics Standard and are explicitly connected to the teaching of specific performance objectives in the grade level documents. The process standards emphasize ways to acquire and apply the content knowledge. Mathematics education should enable students to fulfill personal ambitions and career goals in an informational age. In the NCTM *Principles and Standards* document it asks us to "*Imagine a classroom, a school, or a school district where all students have access to high-quality, engaging mathematics instruction. There are ambitious expectations for all, with accommodations for those who need it".*[1] The Arizona Mathematics Standard Articulated by Grade Level is intended to facilitate this vision.

BACKGROUND

The State Board of Education adopted the Mathematics Standard Articulated by Grade Level in 2003 to define what Arizona students need to know and be able to do at each grade level through the end of tenth grade. Developed by a committee comprised of a diverse group of educators, this standard was written in response to the requirements of *No Child Left Behind Act of 2001* (NCLB).

RATIONALE

In 2007 the State Board of Education began the process for increasing the high school graduation requirement in mathematics from two to four years. This requirement was approved in December 2007 effective with the graduating class of 2013. This increase, along with the need to complete a periodic review of the standard, prompted the Arizona Department of Education to initiate the process of refining and rearticulating the Mathematics Standard. This refinement and articulation project began in June 2007 and was completed in June 2008.

[1] National Council of Teachers of Mathematics, Principles and Standards for School Mathematics, NCTM Publications, Reston, VA, 2000, p. 3.

METHODOLOGY

Work teams representing populations from around the state were formed. These groupings were comprised of large and small schools, rural and urban schools, and were ethnically diverse. Included were classroom teachers, curriculum directors, mathematics teacher leaders, Career and Technical Education teachers, second-career teachers, and university/community college faculty. The goal was to revise and articulate the Mathematics Standard K-12 to align with the increased state requirement of four years of high school mathematics.

The mathematics revision teams utilized the National Council of Teachers of Mathematics *Principles and Standards* as a reference in the development of the revised Mathematics Standard. Additionally, the findings and recommendations from the National Mathematics

Advisory Panel, the American Diploma Project Benchmarks, the National Assessment of Educational Progress Framework, the Curriculum Focal Points, the Framework for 21st Century Skills, and other states' frameworks were used as guiding documents.

The revision grade level teams created draft documents with performance objectives articulated to the appropriate grade levels. Over a period of months, these teams and smaller sub-committees of teams refined the draft documents based on clarity, cohesiveness, and comprehensiveness. Reasonableness, usefulness, and appropriateness were key guidelines for the articulation process. The measurability of each performance objective was also a consideration.

External reviews by nationally recognized consultants brought a broader perspective to the refinement process. Another important step in the process was the gathering of public comment. In March 2008, drafts of the Revised Mathematics Standard Articulated by Grade Level, along with a survey to gather feedback, were posted on the Arizona Department of Education website. This provided the public with easy access to the documents, and a survey allowed reviewers a means for submitting comments. Also, crosswalks were created from the Draft 2008 Mathematics Standard to the 2003 Mathematics Standard and were posted on the website. The public had the opportunity to submit comments and suggestions, either electronically or in writing, until the survey closing date of March 28, 2008. Additionally, five public hearings were held in March throughout the state offering further opportunities for public feedback.

After all the public comments were collected, organized, and categorized by grade level and topic, the revision teams met to determine what modifications to the standard document would be appropriate. Upon completion of the revision work, crosswalks were created to assist educators with the transition from the 2003 Arizona Mathematics Standard Articulated by Grade Level to the revised 2008 Mathematics Standard.

ORGANIZATION OF THE MATHEMATICS STANDARD

The Mathematics Standard Articulated by Grade Level is divided into five main strands:
    Number and Operations
    Data Analysis, Probability, and Discrete Mathematics
    Patterns, Algebra, and Functions
    Geometry and Measurement
    Structure and Logic.

Each strand is divided into concepts that broadly define the skills and knowledge that students are expected to know and be able to do. Under each concept are performance objectives (POs) that more specifically delineate the ideas to be taught and learned.

The comprehensive document (K-12) is designed so that teachers can read the performance objectives across grade levels to incorporate learning from previous, current, and future grade levels. The standard is separated into two separate documents due to the addition of College Work Readiness (grades 11-12). The first document spans grade levels K through 6, and the second document covers grades 7 through College Work Readiness. Viewing the Mathematics Standard document from left to right helps the teacher to see the mathematics continuum across the grade levels. There is a purposeful clustering of performance objectives in order to emphasize certain key understandings. Every effort was made to eliminate repetitions. The intent was to build on the learning in previous grade levels, connect important ideas, and highlight new content each year. This coherency supports students in developing new understandings and skills. Looking down each individual column enables a teacher to see the performance objectives that students are expected to know and be able to do at any grade level.

This organization does not imply that the teaching and learning of mathematics should be fragmented or compartmentalized. Mathematics is a highly interconnected discipline; important mathematical ideas from all five mathematics strands need to be continuously integrated as needed to make meaning and connections to other concepts and performance objectives. In each grade level document, these connections are highlighted.

The order of the strands, concepts, and performance objectives (POs) in the Mathematics Standard document are not intended to be a checklist for mathematics instruction. Mathematical concepts develop with a spiraling of ideas/skills that are interconnected and dependent on each other, and this is reflected in the standard document. Effective instruction often incorporates several performance objectives into an integrated experience of learning for the student. The content in College Work Readiness (grades 11-12) is a new addition to the Mathematics Standard. This content is separated into the five main strands. Performance objectives highlighted in italics in the document have been identified as core to an Algebra II course. As districts/schools create additional high school mathematics courses, they may select from the comprehensive set of performance objectives contained within the five strands.

New to the 2008 Mathematics Standard is the development of more comprehensive grade level documents. The format of these documents will support the implementation of the revised standard. After each concept statement, there are summary expectations appropriate for that specific grade level. These statements provide a roadmap for instruction. Teachers will notice that there are now three columns of information. The first column lists the performance objectives with accompanying strand/concept and content area connections. The middle column highlights explicit connections to Strand 5, Concept 2 performance objectives. These performance objectives are grounded in the core processes of logic, reasoning, problem-solving and proof. The third column provides instructional support to teachers in the form of explanation and examples.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Every student should understand and use all concepts and skills from the previous grade levels. The standard is designed so that new learning builds on preceding skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of all mathematical strands.

Strand 1: Number and Operations
Number sense is the understanding of numbers and how they relate to each other and how they are used in specific context or real-world application. It includes an awareness of the different ways in which numbers are used, such as counting, measuring, labeling, and locating. It includes an awareness of the different types of numbers such as, whole numbers, integers, fractions, and decimals and the relationships between them and when each is most useful. Number sense includes an understanding of the size of numbers, so that students should be able to recognize that the volume of their room is closer to 1,000 than 10,000 cubic feet. Students develop a sense of what numbers are, i.e., to use numbers and number relationships to acquire basic facts, to solve a wide variety of real-world problems, and to estimate to determine the reasonableness of results.

Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, and the relationships among numbers and different number systems.

In Grade 4, students build on their prior knowledge of whole numbers, fractions, and decimals, making connections with percents. They also make connections between decimal notation and the base ten system. Students develop an understanding of how various representations for fractions, decimals, and percents are related.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Express whole numbers, fractions, decimals, and percents using and connecting multiple representations. Connections: M04-S1C1-03, M04-S1C1-04, M04-S1C1-05, M04-S1C2-01, M04-S1C3-01, M04-S2C2-01, M04-S4C4-02	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students write fractions and decimals (limited to hundredths). They connect models of fractions and decimals to symbols and then locate the equivalent symbols on a number line. Models may include base ten blocks, place value charts, grids, pictures, fraction manipulatives, etc. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
		Using 10 x10 grids give students opportunity to recognize that ½ = 0.5 = 0.50 as ½ of the grid can be shaded which can also be seen as 5/10 or 50/100 as well as 50% of the grid. Reading decimals such as 0.36 as "36 hundredths" while writing this also in fraction form, 36/100, helps reinforce the concept that decimals are fractions. Models of decimals and fractions may also be connected to metric measurement.
PO 2. Compose and decompose whole numbers using factors and multiples. Connections: M04-S1C2-03	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students are expected to determine the factors and multiples of whole numbers to 144. Models should be used to factor numbers and develop understanding of the meaning of the factors. Drawing pictures and recording the mathematics representation of the models is important. Examples: • To factor 12, group 12 objects into 3 groups of 4 to represent 3 x 4 or into 3 groups of 2 groups of 2 to represent 3 x (2 X 2). • Students can use cubes to build 5 groups of 3 to represent 15. They can also build the 5 groups of 3 two times to represent 2 x (5 x 3) and then count 10 groups of 3 (10 x 3) or 30 cubes total.

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	**Process Integration**	**Explanations and Examples**
Students are expected to:		
PO 3. Express fractions as fair sharing, parts of a whole, parts of a set, and locations on a real number line. Connections: M04-S1C1-01, M04-S1C1-05	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Fair sharing - Pictures work better for representing fair sharing problems since students often need to represent fractional parts. Examples: • Three sub sandwiches are shared among 2 friends. Each person gets $1\frac{1}{2}$ sub sandwiches. • Three sub sandwiches are shared among 4 friends. Each person gets $\frac{3}{4}$ of a sub sandwich. Parts of a set - Objects that students can group and regroup should be used as a starting point for representing parts of a set. Example: • Tanya has 24 stickers. She took $\frac{3}{4}$ of the stickers to school. How many did she take to school? In this example students can use 24 objects, break that into 4 groups and represent 3 of the 4 groups.
PO 4. Compare and order decimals to hundredths. Connections: M04-S1C1-01, M04-S1C3-01	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students need to understand the size of decimal numbers and relate them to common benchmarks such as 0, $\frac{1}{2}$ as 0.5 or 0.50, and 1. They also need to develop an understanding of the equivalence of numbers such as 0.8 and 0.80 before they are asked to compare tenths to hundredths. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
		Students begin by comparing 10ths only. Counting by 10ths, shading in 10ths on a 10x10 grid, and locating 10ths on a number line will give them a solid foundation. Recognizing that 0.5 is $\frac{1}{2}$ is imperative as students can reason that 0.7 is more than $\frac{1}{2}$ and 0.3 is less than $\frac{1}{2}$. Once students have a firm understanding of 10ths, they should experience similar activities to compare hundredths. Only after students have had opportunities to compare tenths to tenths and hundredths to hundredths should they compare tenths to hundredths.

The bulleted items within a performance objective indicate the specific content to be taught.
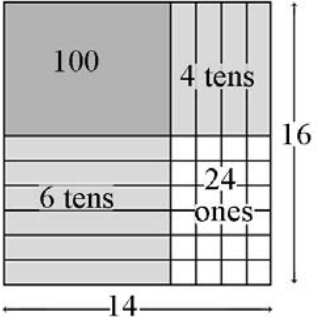
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	**Process Integration**	**Explanations and Examples**
Students are expected to:		
PO 5. Use simple ratios to describe problems in context. Connections: M04-S1C1-01, M04-S1C1-03, M04-S2C2-01	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	A ratio compares the relationship between two quantities. Ratios can compare the same types of measures or compare different types of measures. In Grade 4, students will learn about ratios that compare the same type of measures. There are two ways to compare the measures. Examples: • Part-to-whole: the number of blue crayons to the total number of crayons in a box • Part-to Part: the number of blue crayons to the number of red crayons There are three different ways to write ratios. Example: • The ratio for 4 blue crayons to 3 red crayons can be written as: 4 to 3, 4:3, or $\frac{4}{3}$.

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 1: Number and Operations
Concept 2: Numerical Operations

Understand and apply numerical operations and their relationship to one another.

In Grade 4, students apply strategies to add and subtract decimals and fractions with like denominators and fluently use multiplication and related division facts. They solve problems that require multiplication and division of whole numbers, application of properties, and order of operations.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Add and subtract decimals through hundredths including money to $1000.00 and fractions with like denominators. Connections: M04-S1C1-01, M04-S1C2-06, M04-S1C3-02, M04-S5C1-01, SS04-S5C1-01	M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	If students understand place value and the connection between decimals and fractions, the reasons for lining up decimal points, counting decimal places, and moving the decimal point in the divisor and dividend will make more sense. An important concept of addition and subtraction of decimals and fractions is that 10ths can only be added to or subtracted from 10ths, 100ths to and from 100ths, as well as 4ths to and from 4ths, etc. Adding by using the counting on strategy can help students understand these important concepts and lay the foundation for understanding the need to line up decimals points and why denominators are not added when we add fractions. Examples: • 0.5 + 0.3; count up from 0.5 (0.6, 0.7, 0.8) • 8/12 – 5/12; count back from 8/12 (7/12, 6/12, 5/12, 4/12, 3/12) • 0.4 + 0.03; can't count until both are the same so 0.40 + 0.03 allows counting up by hundredths (0.41, 0.42, 0.43) Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	**Process Integration**	**Explanations and Examples**
Students are expected to:		
		In addition, students should become accustomed to making estimates before they begin actual computation. Estimating is especially helpful when students try to add or subtract decimals with different numbers of decimal places. Example: • Johnny's watering can holds 1.50 liters of water. He watered his plants and used 0.85 liter. How much water is left in his watering can?

PO 2. Use multiple strategies to multiply whole numbers
• two-digit by two-digit and
• multi-digit by one-digit.
 	
Connections: M04-S1C2-03, M04-S1C2-05, M04-S1C2-06, M04-S1C3-02, M04-S3C3-02, M04-S5C1-01
	M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.
	
	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.
	
	M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.
		Computation strategies for multiplying whole numbers are more complicated than those used for addition. Students who develop flexibility in breaking numbers apart have a better understanding of the importance of place value and the distributive property in multi-digit multiplication. Students may use base ten blocks, area models, partitioning, compensation strategies, etc. when multiplying whole numbers.
		
		Examples:
		• 54 X 6 = (50 X 6) + (4 X 6) = 300 + 24 = 324
		
		• 25
		   x24
		   400 (20 x 20)
		   100 (20 x 5)
		    80 (4 x 20)
		    20 (4 x 5)
		   600
		
		• 25
		   x24
		   500 (20 x 25)
		   100 (4 x 25)
		   600
		Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
		 • 20 5 20 | 400 | 100 | 500 4 | 80 | 20 | 100 480 + 120 | 600
PO 3. Demonstrate fluency of multiplication and division facts through 12. Connections: M04-S1C1-02, M04-S1C2-02, M04-S1C2-04	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection.	In Grade 3, students developed conceptual understanding of multiplication facts. It is important that early in Grade 4, students are given many experiences to solidify these facts as knowing them enhances their ability to be successful with multiplication and division.
PO 4. Use multiple strategies to divide whole numbers. Connections: M04-S1C2-03, M04-S1C2-05, M04-S1C2-06, M04-S1C3-02, M04-S3C3-02, M04-S5C1-01	M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Students use invented ways for solving division problems in addition to the traditional algorithm. Division problems should represent: • partition or fair-sharing (Sharing 80 among 4 or making 4 groups of 20.) • repeated subtraction (Determining how many 4s are in 80 or making 20 groups of 4.) Students will be expected to know that a remainder can be expressed as either a number that cannot be subdivided or as a fraction, depending upon the context. Examples: • Share 25 books among 4 girls (6 with a remainder of 1) • Share 25 bananas among 4 girls. (6 ¼) Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
		Examples of possible strategies: • 79 ÷ 3 can be thought of as (75 + 4) ÷ 3. There are 25 threes in 75, 1 more 3 in the 4 with a remainder of 1 so 79 ÷ 3 is 26, R 1) • 750 ÷ 6 can be thought of as (600 + 120 + 30). Dividing each group by 6 results in 100 + 20 + 5 or 125.
PO 5. Apply associative and distributive properties to solve multiplication and division problems. Connections: M04-S1C2-02, M04-S1C2-04, M04-S1C2-06, M04-S5C1-01	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection.	The distributive property is applied in the area model below. The model shows the partial products. 14 x 16 = 224 $100 + 40 + 60 + 24 = 224$

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		

PO 6. Apply order of operations with whole numbers.
 	
Connections: M04-S1C2-01, M04-S1C2-02, M04-S1C2-04, M04-S1C2-05, M04-S5C1-01
	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection.	Students apply order of operations (Parentheses, Multiply or Divide, Add or Subtract). Students are not expected at this grade level to work with numerical expressions that have exponents.
		
		Example:
		 • $(4 + 2) + 1 \times 3 =$
		   $6 + 1 \times 3 =$
		   $6 + 3 = 9$

The bulleted items within a performance objective indicate the specific content to be taught.
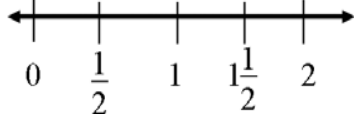
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 1: Number and Operations
Concept 3: Estimation

Use estimation strategies reasonably and fluently while integrating content from each of the other strands.

In Grade 4, students apply benchmarks in estimation of whole numbers, decimals, and fractions.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		

PO 1. Use benchmarks as meaningful points of comparison for whole numbers, decimals, and fractions.
 	
Connections: M04-S1C1-01, M04-S1C1-04, M04-S1C3-02, M04-S2C2-01, M04-S4C4-02
	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection.
	
	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.
		Fraction and decimal benchmarks include zero, quarter, half, and whole numbers. Whole number benchmarks include 5, 10s, 25, 75, 100s, and 1000s. Students should be able to make comparisons between and among fractions, decimals, and whole numbers interchangeably.
		
		Example:
		• Using the number line, find which benchmark number is
		  o about 1.88?
		  o about $\frac{5}{6}$?

PO 2. Make estimates appropriate to a given situation or computation with whole numbers and fractions. Connections: M04-S1C2-01, M04-S1C2-02, M04-S1C2-04, M04-S1C3-01, M04-S2C1-02, M04-S2C3-01, M04-S2C4-03, M04-S3C1-02, M04-S3C3-02, M04-S3C4-01, M04-S4C4-01, M04-S4C4-02, M04-S4C4-03, M04-S4C4-04, M04-S4C4-05,	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.	Students estimate using all four operations with whole numbers and fractions as appropriate. Requiring students to estimate mentally reinforces an understanding of the operations and develops a habit of examining numbers and their relationships before computing. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
M04-S5C1-01	M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies for calculations with fractions extend from students' work with whole number operations. Estimation strategies include, but are not limited to: • front-end estimation with adjusting (using the highest place value and estimating from the front end making adjustments to the estimate by taking into account the remaining amounts), • clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate), • rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values), • using friendly or compatible numbers such as factors (students seek to fit numbers together - i.e., rounding to factors and grouping numbers together that have round sums like 100 or 1000), and • using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate). Specific strategies also exist for estimating measures. Students should develop fluency in estimating using standard referents (meters, yard, etc) or created referents (the window would fit about 12 times across the wall).

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 2: Data Analysis, Probability, and Discrete Mathematics
This strand requires students to use data collection, data analysis, statistics, probability, systematic listing and counting, and the study of graphs. This prepares students for the study of discrete functions as well as to make valid inferences, decisions, and arguments. Discrete mathematics is a branch of mathematics that is widely used in business and industry. Combinatorics is the mathematics of systematic counting. Vertex-edge graphs are used to model and solve problems involving paths, networks, and relationships among a finite number of objects.

Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization, and representation to analyze and sort data.

In Grade 4, students continue to build their data collection tools from previous grade levels. They collect data and create bar, line, and circle graphs to display data. Students analyze data displays by formulating and answering questions.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Collect, record, organize, and display data using double bar graphs, single line graphs, or circle graphs. Connections: M04-S2C1-02, M04-S4C3-02, SC04-S1-C2-05, SC04-S1C4-02, SS04-S4C1-04	M04-S5C2-08. Make and test conjectures based on data (or information) collected from explorations and experiments.	Students begin to grapple with choosing the most appropriate data display for specific data. • Double bar graphs can be used to display two sets of related data. • Single line graphs are used to show change in data over time. • Circle graphs can be used to show relationships to the whole. A circle graph also can show data in percent form. Students need opportunities to determine how to display data including choosing appropriate units of measure and a scale for the graphs. Working with data that includes fractions and decimals will reinforce student's understanding of these concepts.

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Formulate and answer questions by interpreting and analyzing displays of data, including double bar graphs, single line graphs, or circle graphs. Connections: M04-S1C3-02, M04-S2C1-01, M04-S2C1-03, M04-S2C1-04, M04-S3C4-01, SC04-S1C1-02, SC04-S1C1-03, SC04-S1C3-01, SC04-S1C3-02, SC04-S1C3-04, SC04-S1C3-05, SS04-S1C1-01, SS04-S2C1-01, SS04-S4C6-03	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	
PO 3. Use median, mode, and range to describe the distribution of a given data set. Connections: M04-S2C1-02, M04-S2C1-04	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	Since this is a first exposure to these measures of center, it is important that students have many experiences collecting data and interpreting the data based on these measures. Example: • Collect data on the birth month of each student. After each student writes one number from 1-12 to represent their birth date, they can line up from 1-12. Pairing off the students from the ends will give the median. If the last pair has two 5s, then this median of 5 means there were more students born in the first half of the year than in the second half. Students can count to verify this. If the median is 6 ½ then the same number of students were born in each time frame To find the mode, the students can physically make a bar graph so that all 1s are in a column, all 2s in a column, etc. If the 7s column has the most, then the mode is 7 which means that more students were born in the 7th month or in July. The range in this context would indicate that from the 1st month to the last month there is a difference of 11 months. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

Explanations and Examples Updated 1.19.09   Grade 4

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
		Median: To find the median, list the data in order from least to greatest. If the set has an odd number of data points, find the number in the middle. • (3, 4, 6, 8, 9) Median: 6 If the data set has an even number of data points, the median will be halfway between the two data points in the center of the set. • (15, 22, 34, 35, 44, 45) Median: 34.5 or $34\frac{1}{2}$ Mode: To find the mode, find the number that occurs most often in the set. A set may have more than one mode. • (129, 134, 134, 156, 167, 171, 171) Modes: 134, 171 Range: To find the range, subtract the smallest number in the Set from the greatest number in the set. • (25, 26, 28, 35, 37, 39) Range: 39-25 = 14 Students should be able to describe the distribution of data in sets of data and in data displays. • Use the frequency graph to find the median, mode, and range of the number of siblings for Class 4A. **Siblings of Class 4A** Frequency × × × × × × × × × × × × × × × × × × × × × × × × × 0 1 2 3 4 5 6 **Number of Siblings of Class 4A** Solution: Median = 3 Range = 6 Mode = 1

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 4. Compare two sets of related data. Connections: M04-S1C2-02, M04-S1C2-03, M04-S2C1-03, SC04-S1C4-03	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	Besides comparing double line graphs, students should be given experiences to compare circle graphs to circle graphs and line graphs to line graphs that display similar kinds of data. Included in these comparisons should be examination of the median, mode and range of these data where appropriate. (M04-S2C1-03)

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 2: Probability

Understand and apply the basic concepts of probability.
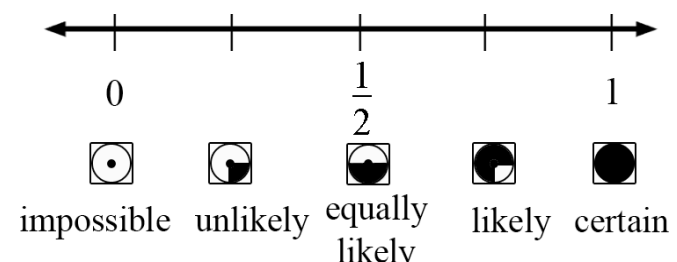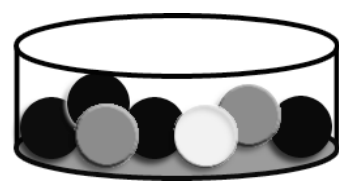
In Grade 4, students focus on the fundamental elements of theoretical probability.

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 1. Describe elements of theoretical probability by listing or drawing all possible outcomes of a given event and predicting the outcome using word and number benchmarks. Connections: M04-S1C1-01, M04-S1C1-05, M04-S1C3-01	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	Students should predict outcomes of everyday events such as • On a school day, the morning bell will ring at 8:00 am. • You will have two birthdays this year. In addition, students should list all the possible outcomes for several types of events, including spinning a spinner, pulling colored cubes from a bag of colored cubes, etc. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
		Probability can be expressed in terms such as impossible, unlikely, likely, or certain or as a number between 0 and 1. The number line below illustrates these ideas. Example: • The container below contains gray, white, and black marbles. Without looking, if you choose a marble from the container, will the probability be closer to 0 or to 1 that you will select a white marble? A gray marble?

The bulleted items within a performance objective indicate the specific content to be taught.

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 3: Systematic Listing and Counting

Understand and demonstrate the systematic listing and counting of possible outcomes.

In Grade 4, students focus on constructing tree diagrams to solve systematic listing and counting problems.

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
PO 1. Construct tree diagrams to solve problems in context by • representing all possibilities for a variety of counting problems, • explaining how its properties relate to the problem, • representing the same counting problem in multiple ways, and • drawing conclusions. Connections: M04-S1C3-02, M04-S2C3-02	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students use tree diagrams to solve problems such as finding the number of outfits that can be made from four shirts, three pairs of shorts, and two pairs of shoes. Example: • At Manuel's party, each guest can choose a meal, a drink, and a cupcake. There are two choices for a meal – hamburger or spaghetti; three choices for a drink – milk, tea, or soda; and three choices for a cupcake -- chocolate, lemon, or vanilla. Draw a tree diagram to show all possible selections for the guests. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
		Sample conclusions: ○ There are 18 different dinner choices that include a meal, a drink, and a cupcake. ○ Nine dinner choices are possible for the guest that wants spaghetti for her meal. ○ A guest cannot choose a meal, no drink, and two cupcakes.
PO 2. Justify that all possibilities have been enumerated without duplication. Connections: M04-S2C3-01	M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Students use an organized strategy to name possibilities when checking for duplication. Example: • Students may represent all possible ways using a list or chart or array as in M03-S2C3-01 or a tree diagram as in M04-S2C3-01. Students will develop organizational strategies to replace an initial random way of thinking about all possible arrangements. They justify, "all possible arrangements" by listing all possible ways, by making the connection to the multiplication principle if the count is a large number, by explaining the organization behind their systematic list, and by enumerating all possibilities without duplication.

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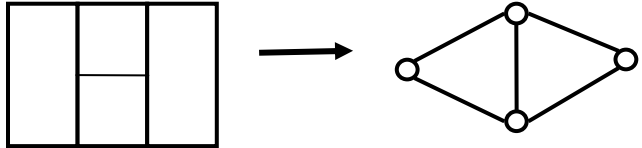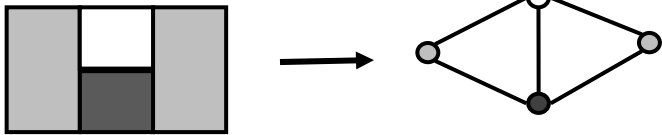
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 4: Vertex-Edge Graphs
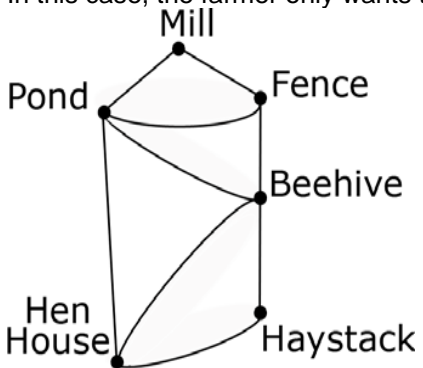
Understand and apply vertex-edge graphs.

In Grade 4, students build on their understanding of vertex-edge graphs from second and third grade by demonstrating the connection between coloring maps and coloring vertices. They apply their new understanding to real world problems involving conflict.

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
PO 1. Demonstrate the connection between map coloring and vertex coloring. Connections: M04-S2C4-03		In Grade 4, students learn that they can color vertex-edge graphs as they colored pictures and maps in second and third grade. The coloring of a map involves assigning different colors to regions that border each other.The coloring of a graph involves assigning colors to the vertices so that adjacent (neighboring) vertices are assigned different colors. In both cases the goal is the same, to minimize the number of colors used. Students learned in second grade how to create an associated graph from a picture or map. In grade 4, they build on that understanding and discover if a map is colored in three colors, then its associated graph is also colored using three colors.

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 2. Construct vertex-edge graphs to represent concrete situations and identify paths and circuits.

Connections: M04-S2C4-03, SS04-S4C1-03 | | Students build and/or draw vertex-edge graphs based on real-world situations. Children's literature offers opportunities to connect with meaningful contexts.

Example:
    • The graph below shows all the locations in the barnyard. The farmer is worried about his hen, Rosie, because he noticed fox tracks in the field. The farmer needs to find her quickly. Rosie is a creature of habit and always follows the same route around the barnyard. It is very important that the farmer travels each edge exactly once in his search. Find the path the farmer should take. Where does the farmer begin and end his search? Are there other paths the farmer can travel and still visit each edge only one time? If so, name those paths.

NOTE: A path in a graph is a connected sequence of edges that starts at a vertex and ends at a vertex. If the path starts and ends at the same vertex, then a circuit is created.

In this case, the farmer only wants to travel each edge once.

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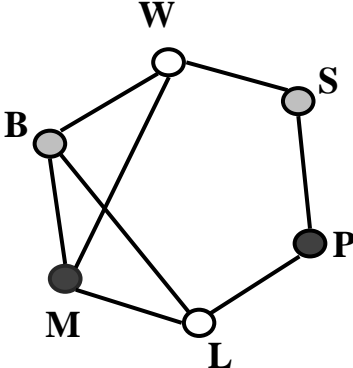
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
PO 3. Solve conflict problems by constructing and coloring vertex-edge graphs. Connections: M04-S1C3-02, M04-S2C4-01, M04-S2C4-02		Vertex-edge graphs can be used to represent problems dealing with conflict. These problems are similar to the map coloring problems introduced in second and third grade in that different colors are assigned to things that are "in conflict" or need to be separated. For instance, scheduling times for students to work on projects may be a challenge when students want to work on multiple projects. The goal is to schedule the fewest number of days for students to work on these projects. Projects are in conflict when they share the same students. The things that are in conflict (in this case, the projects) become the vertices and they are connected by an edge because they share common students. An edge represents the students the projects share. The idea of connecting things that are in conflict may be counterintuitive. The key understanding is that the conflict is really resolved by connecting the two things in conflict, because the connected vertices are assigned different colors or different days in the case of the scheduling problem. Example: • Eight students in the class are researching six different Arizona bats, but they are having a hard time arranging for times to meet together. Each meeting will require a full class period at the end of the day. The teacher wants to use as few class periods as necessary. What might the schedule look like? How many days will be required for these meetings? Continued on next page

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Explanations and Examples Updated 1.19.09 Grade 4

Arizona Department of Education: Standards and Assessment Division   Approved 6.24.08

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		

Bat Project	Students	Day Assigned
Western Red Bat	Sam, Barbie, Randy	
Spotted bat	Sam, Rob	
Pallid bat	Rob, Mary	
Little Brown Bat	Mary, Bob, Christie	
Mexican Free-tailed Bat	Barbie, Bob, Jenn	
Big Brown Bat	Randy, Christie, Jenn	

Solution:

Each of the six bat projects is a vertex labeled with the first letter of the bat name. When a student is working on more than one project then the two projects are "in conflict" and are connected by an edge. For instance, Sam is studying the Western Red Bat and the Spotted Bat so vertices W and S are connected by an edge. Below is a vertex-edge graph that represents the scheduling problem. Depending on how the vertices are initially placed, graphs may not look identical to the one below.

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	**Process Integration**	**Explanations and Examples**
Students are expected to:		
		In order to determine the minimum number of days required to schedule the six bat projects, the vertices of the graph are colored so that vertices that are adjacent (connected) to each other are assigned different colors. The minimum number of colors required is three, so three days are needed to schedule the projects.

The bulleted items within a performance objective indicate the specific content to be taught.

Explanations and Examples Updated 1.19.09

Arizona Department of Education: Standards and Assessment Division

Approved 6.24.08

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 3: Patterns, Algebra, and Functions
Patterns occur everywhere in nature. Algebraic methods are used to explore, model and describe patterns, relationships, and functions involving numbers, shapes, iteration, recursion, and graphs within a variety of real-world problem solving situations. Iteration and recursion are used to model sequential, step-by-step change. Algebra emphasizes relationships among quantities, including functions, ways of representing mathematical relationships, and the analysis of change.

Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically while integrating content from each of the other strands.

In Grade 4, students identify, describe, and extend numeric patterns involving all operations. They develop an understanding of the use of a rule to describe a sequence of numbers.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Recognize, describe, create, extend, and find missing terms in a numerical sequence involving whole numbers using all four basic operations. Connections: M04-S3C1-02	M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	When describing and extending a sequence or determining missing terms, students investigate the terms in order to identify a pattern of change. Students may need to build the sequence with manipulatives or draw it. Examples: • 3, 9, 27, 81, … • 64, 32, ____, 8, 4, … • 2, 5, 11, 23, … • 2, 2, 4, 6, ____, 16, …
PO 2. Explain the rule for a given numerical sequence, verify that the rule works, and use the rule to make predictions. Connections: M04-S1C3-02, M04-S3C1-01, M04-S3C3-01, M04-S3C4-01	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	Students focus on the changes in the sequence from term to term. This work lays the foundation for finding and expressing relationships which will develop into students' understanding of functions in later grades. Examples: • 2, 5, 11, 23, … Double the previous number and add 1 • 2, 2, 4, 6, ____, 16, … Add the previous two numbers

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 3: Patterns, Algebra, and Functions
Concept 2: Functions and Relationships

Describe and model functions and their relationships.

In Grade 4, there are no performance objectives in this concept.

Strand 3: Patterns, Algebra, and Functions
Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

In Grade 4, students use symbols to represent unknown quantities in expressions and equations as well as solve one-step equations with whole numbers.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Use a symbol to represent an unknown quantity in a simple algebraic expression involving all operations. Connections: M04-S3C1-02, M04-S3C3-02	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Connecting writing expressions with story problems and/or drawing pictures will give students a context for this work. It is important for students to read algebraic expressions in a manner that reinforces that the variable represents a number. Examples: • r + 21 as "some number plus 21" as well as "r plus 21" • n x 6 as "some number times 6" as well as "n times 6" • $\frac{s}{6}$ and s ÷ 6 as "as some number divided by 6" as well as "s divided by 6" • Bill earned \$5.00 mowing the lawn on Saturday. He earned more money on Sunday. Write an expression that shows the amount of money Bill has earned. Solution: \$5.00 + _n_

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
PO 2. Create and solve one-step equations that can be solved using addition, subtraction, multiplication, and division of whole numbers. Connections: M04-S1C2-02, M04-S1C2-04, M04-S1C3-02, M04-S3C3-01	M04-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students create and solve equations that are based on real world situations. It may be beneficial for students to draw pictures that illustrate the equation in problem situations. Beginning experiences in solving equations should require students to understand the meaning of the equation as well as the question being asked. Solving equations using reasoning and prior knowledge should be required of students to allow them to develop effective strategies. Example: • Joey had 26 papers in his desk. His teacher gave him some more and now he has 100. How many papers did his teacher give him? 26 + n = 100 Some number was added to 26 and the result was 100. What number was added to 26 to get 100? o Reasoning: 26 + 70 is 96. 96 + 4 is 100, so the number added to 26 to get 100 is 74. o Use knowledge of fact families to write related equations: n + 26 = 100, 100-n = 26, 100 – 26 = n. Select the equation that helps you find n easily. o Use knowledge of inverse operations: Since subtraction "undoes" addition then subtract 26 from 100 to get the numerical value of n.

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 3: Patterns, Algebra, and Functions
Concept 4: Analysis of Change

Analyze how changing the values of one quantity corresponds to change in the values of another quantity.

In Grade 4, students make predictions based on changes in data over time.

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
PO 1. Identify the change in a quantity over time and make simple predictions. Connections: M04-S1C3-02, M04-S2C1-02, M04-S3-C1-02, SS04-S5C5-01	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students' understanding of how the change in one quantity co-varies with the change in a second quantity builds the foundation for functions in later grades. Example: • The chart below shows the height of a bean plant over a four week period. ○ Identify the change in the height of the plant. (As the number of weeks increased by one, the height of the plant increased by $2\frac{1}{2}$ inches.) ○ Predict what the height of the bean plant might be in week 5. <table><tr><td>Week</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Height of Plant (in inches)</td><td>1</td><td>$3\frac{1}{2}$</td><td>6</td><td>$8\frac{1}{2}$</td></tr></table>

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 4: Geometry and Measurement

Geometry is a natural place for the development of students' reasoning, higher thinking, and justification skills culminating in work with proofs. Geometric modeling and spatial reasoning offer ways to interpret and describe physical environments and can be important tools in problem solving. Students use geometric methods, properties and relationships, transformations, and coordinate geometry as a means to recognize, draw, describe, connect, analyze, and measure shapes and representations in the physical world. Measurement is the assignment of a numerical value to an attribute of an object, such as the length of a pencil. At more sophisticated levels, measurement involves assigning a number to a characteristic of a situation, as is done by the consumer price index. A major emphasis in this strand is becoming familiar with the units and processes that are used in measuring attributes.

Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional figures and develop mathematical arguments about their relationships.
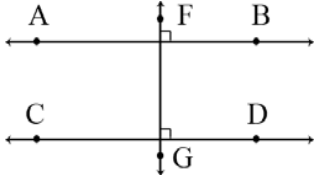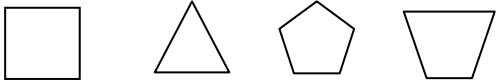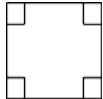
In Grade 4, students deepen their understanding of 2-dimensional figures by classifying triangles and other two-dimensional polygons using properties and attributes. Students also recognize nets for 3-dimensional figures.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Draw and describe the relationships between points, lines, line segments, rays, and angles including parallelism and perpendicularity. Connections: M04-S4C1-02, M04-S4C1-03, M04-S4C1-06	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Examples of points, line segments, angles, parallelism, and perpendicularity can be seen daily. Students do not easily identify lines and rays because they are more abstract. Students can arrange two pencils in as many different ways as possible to determine that the 2 pencils might intersect in one point or may never intersect. Further investigations could lead to pencils that are parallel, perpendicular or intersecting in some other way. This can lead to a discussion on points, angles, lines and rays. Students should become familiar with parallelism and perpendicularity. Parallelism is described as lines in the same plane that never intersect and are always equidistant. Perpendicularity is described as two lines in the same plane that intersect to form right (90⁰) angles. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
		Parallel and perpendicular lines are shown below:
PO 2. Justify which objects in a collection match a given geometric description. Connections: M04-S4C1-01, M04-S4C1-03, M04-S4C1-05, M04-S4C1-06, M04-S4C1-07, M04-S4C3-03	M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Example: • Identify which of these shapes have perpendicular or parallel sides and justify your selection. A possible justification that students might give is: The square has perpendicular lines because the sides meet at a corner, forming right angles.
PO 3. Describe and classify triangles by angles and sides. Connections: M04-S4C1-01, M04-S4C1-02, M04-S4C1-06	M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	A triangle can be described in more than one way. Examples: • A right triangle can be both scalene and isosceles. • A scalene triangle can be right, acute and obtuse. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		

		Triangles can be classified by:
		• Angles
		   o Right: The triangle has one angle that measures 90º.
		   o Acute: The triangle has exactly three angles that measure between 0º and 90º.
		   o Obtuse: The triangle has exactly one angle that measures greater than 90º and less than 180º.
		• Sides
		   o Equilateral: All sides of the triangle are the same length.
		   o Isosceles: At least two sides of the triangle are the same length.
		   o Scalene: No sides of the triangle are the same length.

The bulleted items within a performance objective indicate the specific content to be taught.
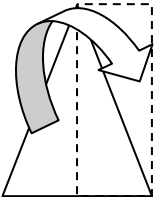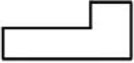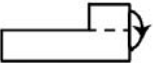
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 4. Recognize which attributes (such as shape or area) change and which do not change when 2-dimensional figures are cut up or rearranged. Connections: M04-S4C4-04	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Examples: •Students should recognize that the area of the triangle and the area of the rectangle are equal. •Students should recognize that when the shape is rearranged, the number of sides and vertices change, but the area remains the same.

The bulleted items within a performance objective indicate the specific content to be taught.

Explanations and Examples Updated 1.19.09

Approved 6.24.08

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 5. Recognize and draw congruent figures, and match them in a given collection. Connections: M04-S4C1-02, M04-S4C1-07	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Figures are congruent if they have the same shape and are the same size. Example: • Which of these figures are congruent? A B C D E Solution: Figure A $\cong$ Figure C

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
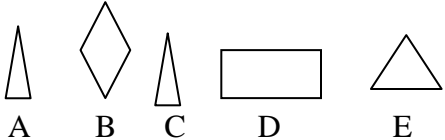## GRADE 4
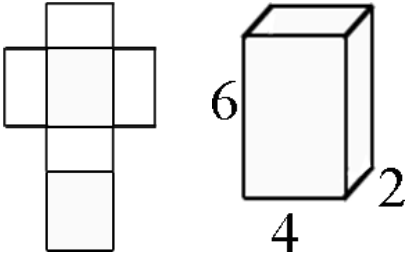
Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 6. Draw right, acute, obtuse, and straight angles and identify these angles in other geometric figures. Connections: M04-S4C1-01, M04-S4C1-02, M04-S4C1-03	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students use the benchmark angles of 90°, 180°, and 360° to approximate the measurement of angles to draw or identify right, acute, obtuse, and straight angles. Example: Right angle Acute angle Obtuse angle Straight angle

The bulleted items within a performance objective indicate the specific content to be taught.

Explanations and Examples Updated 1.19.09

Approved 6.24.08

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 7. Recognize the relationship between a 3-dimensional figure and its corresponding net(s). Connections: M04-S4C1-02, M04-S4C1-05	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	Students will recognize the relationship between a figure and its net by: • making a net(s) for a basic 3-dimensional figure, • identifying the 3-dimensional figure that corresponds to a given net, and • identifying the net that corresponds to a given 3-dimensional figure.

Strand 4: Geometry and Measurement
Concept 2: Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

In Grade 4, there are no performance objectives in this concept.

The bulleted items within a performance objective indicate the specific content to be taught.

Explanations and Examples Updated 1.19.09
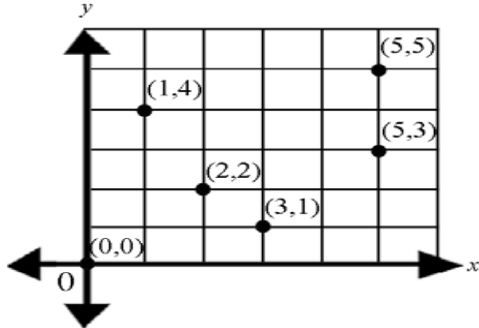
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
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Strand 4: Geometry and Measurement
Concept 3: Coordinate Geometry

Specify and describe spatial relationships using rectangular and other coordinate systems while integrating content from each of the other strands.

In Grade 4, students use coordinates to describe positions in the first quadrant on a grid. They plot line segments and connect the segments to construct geometric figures.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Name, locate, and graph points in the first quadrant of the coordinate plane using ordered pairs. Connections: M04-S4C3-02, M04- S4C3-03	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Example: • Students can use a classroom size coordinate grid to physically locate the coordinate point (5, 3) by starting at the origin point (0,0), walking 5 units along the x axis to find the first number in the pair (5), and then walking up 3 units for the second number in the pair (3). The ordered pair names a point on the grid.
PO 2. Plot line segments in the first quadrant of the coordinate plane using a set of ordered pairs in a table. Connections: M04-S2C1-01, M04-S4C3-01, M04-S4C3-03	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-05. Represent a problem situation using any combination of words,	As students plot line segments in the first quadrant of the coordinate plane, they build on the skills learned in M04-S4C3-01.

The bulleted items within a performance objective indicate the specific content to be taught.

Explanations and Examples Updated 1.19.09   Grade 4

Arizona Department of Education: Standards and Assessment Division   Approved 6.24.08

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
	numbers, pictures, physical objects, or symbols.	
PO 3. Construct geometric figures with vertices at points on the coordinate plane. Connections: M04-S4C1-02, M04-S4C3-01, M04-S4C3-02	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	As students construct geometric figures on the coordinate plane, they practice the skills used in previous performance objectives (M04-S4C3-01, M04-S4C3-02). Students investigate the relationship of coordinates of squares, rectangles and isosceles triangles to further enhance their understanding of coordinates and properties of these shapes.

Strand 4: Geometry and Measurement
Concept 4: Measurement

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

In Grade 4, students expand their understanding of measuring in standard units of measure from U.S. Customary to metric. They build on concepts of time by computing elapsed time. They explore and develop an understanding of the relationship between area and perimeter of plane figures.

Performance Objectives	Process Integration	Explanations and Examples
Students are expected to:		
PO 1. Compute elapsed time to the minute. Connections: M04-S1C3-02	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	Students may estimate and determine elapsed time using a calendar, a digital clock, or an analog clock. Students should have numerous experiences using the terminology for time (including, but not limited to, hour, half-hour, quarter of an hour, quarter past the hour, quarter until the hour, etc.). Example: • The game begins at 11:30 a.m. If the game lasts 2 hours and 15 minutes, what time will it end?

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 2. Apply measurement skills to measure length, mass, and capacity using metric units. Connections: M04-S1C1-01, M04-S1C3-01, M04-S1C3-02, M04-S4C4-03, M04-S4C4-04, SC04-S1C2-04	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection	Measurement skills include: • determining situations in which a highly accurate measurement is important, • selecting the appropriate unit of measure and degree of accuracy, • selecting the appropriate tool, and • estimating, measuring, and comparing estimates to actual measures.
PO 3. Solve problems involving conversions within the same measurement system. Connections: M04-S1C3-02, M04-S4C4-02	M04-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Students have been exposed to both the U.S customary and metric measurement systems. Examples: • Jill bought 3 meters of ribbon and cut it into pieces 25 centimeters long. How many 25 centimeter pieces of ribbon did she have? • How many quarts of lemonade are needed to make 40 one-cup servings?

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:		
PO 4. Solve problems involving perimeter of 2-dimensional figures and area of rectangles. Connections: M04-S1C3-02, M04-S4C1-04, M04-S4C4-02, M04-S4C4-05	M04-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Students contrast the concepts and relationships of area and perimeter including the units used to measure both. It is important for students to recognize that units used to measure area are 2-dimensional and cover a space. In order to distinguish between perimeter and area students may need to physically fill a rectangle with 1-inch color tiles or squares and use a string to measure around the rectangle to understand that area is a measure of the space within a specific region and perimeter is measuring the distance around a region. Squares can be cut from cardboard or construction paper. Square grid paper can also be used to measure area. Students don't usually connect to the formula *l* x *w* by filling a region with 1 unit squares. That realization occurs when students make the connection between multiplication and the rectangular array model. Example: • What is the area of the shape below? 2 in. [rectangle] 5 in. Using a grid will allow students to see the 5 square inches 2 times or the 2 square inches 5 times.
PO 5. Describe the change in perimeter or area when one attribute (length or width) of a rectangle changes. Connections: M04-S1C3-02, M04-S4C4-04	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	As students explore problems (M04-S4C4-04), they begin to notice similarities and differences in area and perimeter. They describe the relationship between the two ideas. Example: • Draw different rectangles, each with an area of 24 square units, and compare their perimeters. What patterns do you notice in the data? This data can be recorded in a table and graph.

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 5: Structure and Logic
This strand emphasizes the core processes of problem solving. Students draw from the content of the other four strands to devise algorithms and analyze algorithmic thinking. Strand One and Strand Three provide the conceptual and computational basis for these algorithms. Logical reasoning and proof draws its substance from the study of geometry, patterns, and analysis to connect remaining strands. Students use algorithms, algorithmic thinking, and logical reasoning (both inductive and deductive) as they make conjectures and test the validity of arguments and proofs. Concept two develops the core processes as students evaluate situations, select problem solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.

Concept 1: Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems.

In Grade 4, students use symbols, pictures, or mathematical language to explain the reasoning behind their decisions and solutions.

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:		
PO 1. Analyze common algorithms for computing (adding, subtracting, multiplying, and dividing) with whole numbers using the associative, commutative, and distributive properties. Connections: M04-S1C2-01, M04-S1C2-02, M04-S1C2-04, M04-S1C2-05, M04-S1C2-06, M04-S1C3-02	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection.	Students apply the commutative, associative, and distributive properties, as well as concepts of place value when solving problems. These properties focus on equivalency at this grade level. Examples: - Commutative Property: $30 + 9 = 9 + 30$ - Associative Property: $(84 + 7) + 5 = 84 + (7 + 5)$ - Distributive Property: $8 \times 23 = (8 \times 20) + (8 \times 3)$

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 5: Structure and Logic
Concept 2: Logic, Reasoning, Problem Solving, and Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.

In Grade 4, students become more adept at conjecturing and collecting evidence to make generalizations.

Performance Objectives	*Process Integration*	*Explanations and Examples*
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
PO 1. Analyze a problem situation to determine the question(s) to be answered.		
PO 2. Identify relevant, missing, and extraneous information related to the solution to a problem.		Identifying what is important in a problem should become common practice as students analyze situations. These skills build on the ideas in M04-S5C2-01.
PO 3. Select and use one or more strategies to efficiently solve the problem and justify the selection.		
PO 4. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.		Students connect their learning to previous learning by using similar strategies when solving similar problems. These ideas include making a simpler problem.
PO 5. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.		

The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Performance Objectives	_Process Integration_	_Explanations and Examples_
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
PO 6. Summarize mathematical information, explain reasoning, and draw conclusions.		Summarizing mathematical ideas, explaining reasoning, and drawing conclusions are the foundations of making generalizations.
PO 7. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.		Checking whether an answer makes sense and answers the question should become common practices as students analyze situations.
PO 8. Make and test conjectures based on data (or information) collected from explorations and experiments.		Making and testing conjectures are essential steps leading to making generalizations.

The bulleted items within a performance objective indicate the specific content to be taught.

Science Standard Articulated
by Grade Level 2004

Grade 4

Science Standard Articulated by Grade Level

INTRODUCTION

Students are naturally curious about the world and their place in it. Sustaining this curiosity and giving it a scientific foundation must be a high priority in Arizona schools. Application of scientific thinking enables Arizona students to strengthen skills that people use every day: solving problems creatively, thinking critically, working cooperatively in teams, using technology effectively, and valuing lifelong learning.

Science education is much more than merely learning content. It is the active process of investigation and the critical review of evidence related to the world around us, both visible and invisible. Science is a dynamic process of gathering and evaluating information, looking for patterns, and then devising and testing possible explanations. Active engagement in scientific investigation leads students to think critically and to develop reasoning skills that allow them to become independent, lifelong learners. Science methods and thought processes have application well beyond the bounds of science and support learning goals in all subject areas.

The Arizona Science Standard Articulated by Grade Level has been written for ALL students. The science standard is set with the expectation that science instruction occurs at all grade levels – beginning in early grades with simple exploration, progressing to increasingly organized and sophisticated science investigations in higher grades.

Underlying all of the science standard strands are the five unifying concepts as identified in the National Science Education Standards (1995):
- Systems, Order, and Organization
- Evidence, Models, and Explanation
- Constancy, Change, and Measurement
- Evolution and Equilibrium
- Form and Function

This conceptual framework provides students with productive and insightful ways of considering and integrating a range of basic ideas that explain the natural world. Because the understanding and abilities associated with major conceptual and procedural schemes need to be developed over an entire education, the unifying concepts and processes transcend disciplinary boundaries.

These unifying concepts can be introduced in early grades and developed appropriately through the elementary grades and high school. Students should be explicitly shown how each of these unifying concepts apply to and connect life, physical, and Earth and space sciences. These science content areas can be taught in conjunction with each other, as well as with other subject areas in an interdisciplinary approach. The unifying concepts in science education help focus instruction and provide a link to other disciplines.

BACKGROUND

The state Board of Education adopted the Arizona Academic Standards in 1998 to define what Arizona's students need to know and be able to do by the end of twelfth grade. Developed by committees comprised of educators, parents, students, and business and community leaders, these standards were written in grade-level clusters with benchmarks at 3, 5, 8, and high school.

RATIONALE

Requirements in the *No Child Left Behind Act of 2001* (NCLB) and the need for periodic review of the state academic standards prompted the decision by the Arizona Department of Education (ADE) to refine and articulate the academic standard for science by grade level. This refinement and articulation project was started in April 2003, and was completed in May 2004.

METHODOLOGY

The Science Standard Revision Committee was composed of a statewide representation of scientists and science educators to reflect school districts large and small, rural and urban, as well as the ethnic diversity of Arizona. National science consultants, university professors, and community members advised the committee and provided valuable reviews of the work in progress. The goal was to articulate, or align, the current academic standards by grade level (K-8) and in high school with the state requirement of two years of high school science.

The committee utilized several nationally recognized publications to establish content guidelines during the development of the draft:
- National Research Council (NRC)
    - *National Science Education Standards*
    - *Inquiry and the National Science Education Standards*
    - *Designing Mathematics or Science Curriculum Programs*
- The American Association for the Advancement of Science
    - *Atlas of Science Literacy*
    - *Benchmarks for Science Literacy*
    - *Design for Science Literacy*
    - *Science for All Americans*
- *Science Framework for the 1996 and 2000 National Assessment of Educational Progress (NAEP)*

The committee created draft documents by first reviewing the existing standards. The performance objectives were articulated, or aligned, to the appropriate grade levels. Over a period of months, subcommittees, composed of representatives of the full committee, met to refine the documents. A guiding principle in the articulation process

was whether a performance objective was reasonable, useful, and appropriate. The measurability of each performance objective was also considered.

External reviews by nationally recognized consultants and reviews by university and local experts provided additional guidance and perspective to the committees.

Public review of the Science Standard Articulated by Grade Level occurred during the month of February 2004. A draft of the standard was placed on the ADE website with the option for individuals to make comments online. Six public hearings occurred throughout the state to collect additional comments. After all public comments were collected and organized, the committee met to review them and to recommend appropriate modifications to the standard. This final draft was presented to the state Board of Education in May 2004 for adoption as the Arizona Science Standard Articulated by Grade Level.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

The goal in the development of the standard was to assure that the six strands and five unifying concepts are interwoven into a fabric of science that represents the true nature of science. Students have the opportunity to develop both the skills and content knowledge necessary to be scientifically literate members of the community.

Strands 1, 2, and 3 are designed to be explicitly taught *and* embedded *within* each of the content Strands 4, 5, and 6, and are not intended to be taught in isolation. The processes, skills, and content of the first three strands are designed to "umbrella" and complement the content of Life Science, Physical Science, and Earth and Space Science.

Strand 1: Inquiry Process

Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 1: Observations, Questions, and Hypotheses
Observe, ask questions, and make predictions.

PO 1. Differentiate inferences from observations.

PO 2. Formulate a relevant question through observations that can be tested by an investigation.
(See M04-S2C1-01)

PO 3. Formulate predictions in the realm of science based on observed cause and effect relationships.

PO 4. Locate information (e.g*.,* book, article, website) related to an investigation.
(See W04-S3C6-01 and R04-S3C1-05)

Concept 2: Scientific Testing (Investigating and Modeling)
Participate in planning and conducting investigations, and recording data.

PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

PO 2. Plan a simple investigation that identifies the variables to be controlled.

PO 3. Conduct controlled investigations (e.g*.,* related to erosion, plant life cycles, weather, magnetism) in life, physical, and Earth and space sciences.

PO 4. Measure using appropriate tools (e.g*.,* ruler, scale, balance) and units of measure (i.e*.,* metric, U.S. customary).
(See M04-S4C4-03 and M04-S4C4-07)

PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log).
(See W04-S3C2-01 and W04-S3C3-01)

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

Concept 3: Analysis and Conclusions
Organize and analyze data; compare to predictions.

PO 1. Analyze data obtained in a scientific investigation to identify trends.
(See M04-S2C1-03)

PO 2. Formulate conclusions based upon identified trends in data.
(See M04-S2C1-03)

PO 3. Determine that data collected is consistent with the formulated question.

PO 4. Determine whether the data supports the prediction for an investigation.

PO 5. Develop new questions and predictions based upon the data collected in the investigation.

Concept 4: Communication
Communicate results of investigations.

PO 1. Communicate verbally or in writing the results of an inquiry.
(See W04-S3C3-01)

PO 2. Choose an appropriate graphic representation for collected data:
* bar graph
* line graph
* Venn diagram
* model

(See M04-S2C1-02)

PO 3. Communicate with other groups or individuals to compare the results of a common investigation.

Strand 2: History and Nature of Science

Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the inclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor
Identify individual and cultural 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., Margaret Mead [anthropologist], supports Strand 4; Nikola Tesla [engineer, inventor] supports Strand 5; Michael Faraday [scientist], supports Strand 5; Benjamin Franklin [scientist], supports Strand 5).*

PO 2. *Describe science-related career opportunities.*

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 2: Nature of Scientific Knowledge
Understand how science is a process for generating knowledge.

PO 1. Explain the role of experimentation in scientific inquiry.

PO 2. Describe the interaction of components in a system (e.g*.,* flashlight, radio).

PO 3. Explain various ways scientists generate ideas (e.g*.,* observation, experiment, collaboration,
theoretical and mathematical models).

Strand 3: Science in Personal and Social Perspectives

Science in Personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world – as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 1. Describe how natural events and human activities have positive and negative impacts on
environments (e.g*.,* fire, floods, pollution, dams).

PO 2. Evaluate the consequences of environmental occurrences that happen either rapidly (e.g*.,* fire,
flood, tornado) or over a long period of time (e.g*.,* drought, melting ice caps, the greenhouse
effect, erosion).

Concept 2: Science and Technology in Society
Understand the impact of technology.

PO 1. Describe how science and technology (e.g*.,* computers, air conditioning, medicine) have improved
the lives of many people.

PO 2. Describe benefits (e.g*.,* easy communications, rapid transportation) and risks (e.g*.,* pollution,
destruction of natural resources) related to the use of technology.

*PO 3. Design and construct a technological solution to a common problem or need using common
materials.*

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 4: Life Science

Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Characteristics of Organisms
Understand that basic structures in plants and animals serve a function.

PO 1. Compare structures in plants (e.g*.,* roots, stems, leaves, flowers) and animals (e.g., muscles, bones, nerves) that serve different functions in growth and survival.

PO 2. Classify animals by identifiable group characteristics:
- vertebrates – mammals, birds, fish, reptiles, amphibians
- invertebrates – insects, arachnids

Concept 2: Life Cycles
Understand the life cycles of plants and animals.

No performance objectives at this grade level

Concept 3: Organisms and Environments
Understand the relationships among various organisms and their environment.

PO 1. Describe ways various resources (e.g*.,* air, water, plants, animals, soil) are utilized to meet the needs of a population.

PO 2. Differentiate renewable resources from nonrenewable resources.

PO 3. Analyze the effect that limited resources (e.g*.,* natural gas, minerals) may have on an environment.

PO 4. Describe ways in which resources can be conserved (e.g., by reducing, reusing, recycling, finding substitutes).

Concept 4: Diversity, Adaptation, and Behavior
Identify plant and animal adaptations.

PO 1. Recognize that successful characteristics of populations are inherited traits that are favorable in a particular environment.

PO 2. Give examples of adaptations that allow plants and animals to survive.
- camouflage – horned lizards, coyotes
- mimicry – Monarch and Viceroy butterflies
- physical – cactus spines
- mutualism – species of acacia that harbor ants, which repel other harmful insects

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SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Strand 5: Physical Science

Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in a system, and the processes by which energy is transferred between systems and surroundings.

Concept 1: Properties of Objects and Materials   Classify objects and materials by their observable properties.
No performance objectives at this grade level

Concept 2: Position and Motion of Objects   Understand spatial relationships and the way objects move.
No performance objectives at this grade level

Concept 3: Energy and Magnetism   Investigate different forms of energy.
PO 1. Demonstrate that electricity flowing in circuits can produce light, heat, sound, and magnetic effects.   PO 2. Construct series and parallel electric circuits.   PO 3. Explain the purpose of conductors and insulators in various practical applications.   PO 4. Investigate the characteristics of magnets (e.g.*,* opposite poles attract, like poles repel, the force between two magnet poles depends on the distance between them).   PO 5. State cause and effect relationships between magnets and circuitry.

Strand 6: Earth and Space Science

Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understandings of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, students can make informed decisions about issues affecting the planet on which they live.

Concept 1: Properties of Earth Materials   Identify the basic properties of Earth materials.
No performance objectives at this grade level

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SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
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Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth systems.

PO 1. Identify the Earth processes that cause erosion.

PO 2. Describe how currents and wind cause erosion and land changes.

PO 3. Describe the role that water plays in the following processes that alter the Earth's surface features:
- erosion
- deposition
- weathering

PO 4. Compare rapid and slow processes that change the Earth's surface, including:
- rapid – earthquakes, volcanoes, floods
- slow – wind, weathering

PO 5. Identify the Earth events that cause changes in atmospheric conditions (e.g., volcanic eruptions, forest fires).

PO 6. Analyze evidence that indicates life and environmental conditions have changed (e.g., tree rings, fish fossils in desert regions, ice cores).

Concept 3: Changes in the Earth and Sky
Understand characteristics of weather conditions and climate.

PO 1. Identify the sources of water within an environment (e.g., ground water, surface water, atmospheric water, glaciers).

PO 2. Describe the distribution of water on the Earth's surface.

PO 3. Differentiate between weather and climate as they relate to the southwestern United States.

PO 4.   Measure changes in weather (e.g., precipitation, wind speed, barometric pressure).

PO 5. Interpret the symbols on a weather map or chart to identify the following:
- temperatures
- fronts
- precipitation

PO 6. Compare weather conditions in various locations (e.g., regions of Arizona, various U.S. cities, coastal vs. interior geographical regions).

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Social Studies Standard Articulated by Grade Level 2006

Grade 4

Social Studies Standard Articulated by Grade Level

INTRODUCTION

To maintain the Union that supports our freedoms, we must rely on the knowledge, skills, and character of its citizens and those they elect to public office. Critical to the preservation and improvement of America's republican form of government is the study of our founding principles, namely those detailed in the United States Constitution, the Declaration of Independence, and *The Federalist Papers*. The standard includes the study of rich and diverse contributions that people of many backgrounds have made to American life and institutions while emphasizing our shared heritage. Well-informed citizens understand our political, cultural and economic interaction with the rest of the world. Geographic knowledge expands the understanding of our development and identity in the world. The standard requires that students attain knowledge of essential facts, concepts, people, and events as well as a firm grasp of reasoning, inquiry, and research skills. Students must learn how to frame and test hypotheses, distinguish logical from illogical reasoning, develop informed opinions based on different points of view, and employ reflective thinking and evaluation. In this way students will be prepared to fulfill their responsibilities as citizens of our democratic republic. The standard presents academic content and skills in the four interrelated disciplines of history, geography, civics/government, and economics that are essential to an understanding of our human experience, past and present.

BACKGROUND

The state Board of Education began the development process for the Arizona academic standards in 1996 to define what Arizona students need to know and be able to do by the end of twelfth grade. The Social Studies Standards were adopted in 2000 and partially revised in 2003. Developed by committees comprised of educators, subject matter experts, and business and community leaders, the Social Studies Standard was fully revised and written in articulated grade-specific performance objectives in 2004 - 2005.

RATIONALE

Requirements in the *No Child Left Behind Act of 2001* (NCLB) and the practice of periodic review of the state academic standards prompted the decision by the Arizona Department of Education to refine and articulate the academic standards for mathematics, reading, writing, and science by grade level. An articulation of the social studies standard was included in the process in order to provide consistency across content areas. The skills and content of social studies are not only a critical component of a comprehensive curriculum they also support student success in other areas.

METHODOLOGY

A committee to articulate the social studies standard was formed consisting of a representative sample of educators from around the state. It represented large and small schools, rural and urban districts, and ethnic diversity. Subject matter experts, university professors, and community members advised the committees. The goal was to articulate, or align, the current academic standards by grade level (K-12).

The Social Studies Articulation Committee utilized information from the National Council for the Social Studies, the National Council for Geographic Education, the Arizona Council on Economics Education, the Arizona Geographic Alliance, the Bill of Rights Institute, and other sources to promote quality instruction based on current, pedagogical, and research-based practices.

The articulation process included a restructuring of the Arizona Academic Content Standards to better facilitate the alignment of performance objectives by grade level, while maintaining the content integrity of the existing standards. Over a period of months, the articulation committees and smaller sub-committees refined the documents. Reasonableness, usefulness, and appropriateness were the guidelines for the articulation process.

External reviews by nationally recognized consultants and reviews by university and local experts provided additional guidance and perspective to the committee.

SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Fourth Grade History Strands emphasize the history of Arizona and the Southwest from its earliest civilizations to modern times. Early civilizations in Central and South America and their encounters with Europeans, as well as events in the Middle Ages which spurred exploration of the New World, are also studied to provide the historical foundation for the exploration and settlement of the Southwest.

Strand 1: American History

A study of American History is integral for students to analyze our national experience through time, to recognize the relationships of events and people, and to interpret significant patterns, themes, ideas, beliefs, and turning points in Arizona and American history. Students will be able to apply the lessons of American History to their lives as citizens of the United States.

Concept 1: Research Skills for History

Historical research is a process in which students examine topics or questions related to historical studies and/or current issues. By using primary and secondary sources effectively students obtain accurate and relevant information. An understanding of chronological order is applied to the analysis of the interrelatedness of events. These performance objectives also appear in Strand 2: World History. They are intended to be taught in conjunction with appropriate American or World History content, when applicable.

PO 1. Use the following to interpret historical data:
    a.   timelines – B.C.E. and B.C.; C.E. and A.D.
    b.   graphs, tables, charts, and maps

PO 2. Describe the difference between primary and secondary sources.

PO 3. Locate information using both primary and secondary sources.

PO 4. Describe how archaeological research adds to our understanding of the past.

Concept 2: Early Civilizations   Pre 1500

The geographic, political, economic and cultural characteristics of early civilizations made significant contributions to the later development of the United States.

(Note: Prehistoric tribes in Arizona were introduced in Grade 1.)

PO 1. Describe the legacy and cultures of prehistoric people in the Americas:
    a.   characteristics of hunter-gatherer societies
    b.   development of agriculture

PO 2. Describe the cultures and contributions of the Mogollon, Ancestral Puebloans (Anasazi), and Hohokam (e.g., location, agriculture, housing, arts, trade networks; adaptation and alteration of the environment).

PO 3. Identify other groups (e.g., Patayan, Sinagua, Salado) residing in the Southwest during this period.

PO 4. Identify the early civilizations (e.g., Maya, Aztec, Inca/Inka) that developed into empires in Central and South America.

PO 5. Recognize the achievements and features (e.g., mathematics, astronomy, architecture) of the Mayan, Aztec, and Incan/Inkan civilizations.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 3: Exploration and Colonization   1500s – 1700s

The varied causes and effects of exploration, settlement, and colonization shaped regional and national development of the U.S.

(Note: Exploration was introduced in Grades K, 1, and 3.)

PO 1. Describe the reasons for early Spanish exploration of Mexico and the Southwestern region of the United States by:
  a. Cabeza de Vaca
  b. Estevan
  c. Fray Marcos de Niza
  d. Francisco Vásques de Coronado

PO 2. Describe the impact of Spanish colonization on the Southwest:
  a. establishment of missions and presidios
  b. lifestyle changes of native people
  c. contributions of Father Kino

PO 3. Describe the location and cultural characteristics of Native American tribes (e.g., O'odham, Apache, Hopi) during the Spanish period.

Concept 4: Revolution and New Nation   1700s – 1820

The development of American constitutional democracy grew from political, cultural, and economic issues, ideas, and events.

No performance objectives at this grade.

Concept 5: Westward Expansion   1800 – 1860

Westward expansion, influenced by political, cultural, and economic factors, led to the growth and development of the U.S.

(Note: Westward expansion was introduced in Grade 2.)

PO 1. Recognize the change of governance of the Southwest from Spain to Mexico as a result of the Mexican Revolution.

PO 2. Describe the influence of American explorers and trappers (e.g., James O. Pattie, Kit Carson, Bill Williams) on the development of the Southwest.

PO 3. Describe events that led to Arizona becoming a possession of the United States:
  a. Mexican – American War
  b. Mexican Cession (Treaty of Guadalupe-Hidalgo)
  c. Gadsden Purchase

PO 4. Describe the impact of Native Americans, Hispanics, and newcomers from the United States and the world on the culture of Arizona (e.g., art, language, architecture, mining, ranching).

PO 5. Describe the conflict of cultures that occurred between newcomers and Arizona Native Americans:
  a. Indian Wars
  b. Navajo Long Walk
  c. formation of reservations

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 6: Civil War and Reconstruction   1850 – 1877
Regional conflicts led to the Civil War and resulted in significant changes to American social, economic, and political structures.

(Note: The Civil War was introduced in Grade 3.)

PO 1. Describe events in Arizona during the Civil War:
   a. Battle of Picacho Peak
   b. Battle of Apache Pass
   c. Arizona becomes a territory

Concept 7: Emergence of the Modern United States   1875 – 1929
Economic, social, and cultural changes transformed the U.S. into a world power.

PO 1. Describe the economic development of Arizona:
   a. mining
   b. ranching
   c. farming and dams

PO 2. Describe the advent of innovations in transportation (e.g., steamboats, freighting, stagecoaches, railroads) that helped Arizona's growth and economy.

PO 3. Identify key individuals and groups (e.g., Charles Poston, Sharlot Hall, Buffalo Soldiers, Geronimo, George W.P. Hunt, Manuelito, Cochise) related to Arizona territorial days and early statehood.

PO 4. Recognize that Arizona changed from a territory to a state on February 14, 1912.

PO 5. Recognize the formation of Native American communities and reservations in Arizona (e.g., Gila River Reservation, Yaquis, Colorado River Indian Tribes).

Concept 8: Great Depression and World War II   1929 – 1945
Domestic and world events, economic issues, and political conflicts redefined the role of government in the lives of U.S. citizens.

PO 1. Describe changes in the lives of U.S. and Arizona residents during the Great Depression:
   a. poverty
   b. unemployment
   c. loss of homes or businesses
   d. migration.

PO 2. Describe the reasons (e.g., German and Japanese aggression) for the U.S. becoming involved in World War II.

PO 3. Describe the impact of World War II on Arizona (e.g., economic boost, military bases, Native American and Hispanic contributions, POW camps, relocation of Japanese Americans).
PO 4. Describe how lives were affected during World War II (e.g., limited goods, women worked in factories, increased patriotism).

Concept 9: Postwar United States   1945 – 1970s
Postwar tensions led to social change in the U.S. and to a heightened focus on foreign policy.

PO 1. Describe changes (e.g., population growth, economic growth, cultural diversity, civil rights) that took place in Arizona during the postwar era.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 10: Contemporary United States   1970s – Present
Current events and issues continue to shape our nation and our involvement in the global community.

PO 1. Describe current events using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

PO 2. Discuss the connections between current and historical events and issues from content studied in Strand 1 using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

PO 3. Describe the influence of key individuals (e.g., Sandra Day O'Connor, Carl Hayden, Ernest W. McFarland, Barry Goldwater, César Chavez, John McCain) in Arizona.

PO 4. Discuss the contributions of diverse populations to Arizona.

Strand 2: World History
A study of World History is integral for students to analyze the human experience through time, to recognize the relationships of events and people, and to interpret significant patterns, themes, ideas, beliefs, and turning points in American and world history. Students should be able to apply the lessons of World History to their lives as citizens of the United States and members of the world community.

Concept 1: Research Skills for History
Historical research is a process in which students examine topics or questions related to historical studies and/or current issues. By using primary and secondary sources effectively students obtain accurate and relevant information. An understanding of chronological order is applied to the analysis of the interrelatedness of events. These performance objectives also appear in Strand 1: American History. They are intended to be taught in conjunction with appropriate American or World History content, when applicable.

PO 1. Use the following to interpret historical data:
   a.   timelines – B.C.E. and B.C.; C.E. and A.D.
   b.   graphs, tables, charts, and maps

PO 2. Describe the difference between primary and secondary sources.

PO 3. Locate information using both primary and secondary sources.

PO 4. Describe how archaeological research adds to our understanding of the past.

Concept 2: Early Civilizations
The geographic, political, economic and cultural characteristics of early civilizations significantly influenced the development of later civilizations.

No performance objectives at this grade.

Concept 3: World in Transition
People of different regions developed unique civilizations and cultural identities characterized by increased interaction, societal complexity and competition.

 (Note: The Middle Ages are introduced to establish reasons for Spanish and Portuguese exploration. As soldiers returned from the Crusades, European countries began to trade with the Indies. Spain and Portugal sought trade routes they could control, leading to their exploration of the New World.)

PO 1. Discuss life in Europe as it existed at the time of the Aztec and Incan/Inkan empires in the Americas:
   a. life in castles
   b. knights traveling to new places during the Crusades
   c. desire for new routes to the Indies

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Concept 4: Renaissance and Reformation
The rise of individualism challenged traditional western authority and belief systems resulting in a variety of new institutions, philosophical and religious ideas, and cultural and social achievements.

No performance objectives at this grade.

Concept 5: Encounters and Exchange
Innovations, discoveries, exploration, and colonization accelerated contact, conflict, and interconnection among societies world wide, transforming and creating nations.

(Note: European Exploration was introduced in Grade 3.)

PO 1. Describe the reasons (e.g., trade routes, gold) for Spanish and Portuguese explorations of the Americas.

PO 2. Describe the impact of European explorers' encounters with the Aztec and Inca/Inka.
  Connect with: Strand 1 Concept 3

Concept 6: Age of Revolution
Intensified internal conflicts led to the radical overthrow of traditional governments and created new political and economic systems.

No performance objectives at this grade.

Concept 7: Age of Imperialism
Industrialized nations exerted political, economic, and social control over less developed areas of the world.

No performance objectives at this grade.

Concept 8: World at War
Global events, economic issues and political ideologies ignited tensions leading to worldwide military conflagrations and diplomatic confrontations in a context of development and change.

No performance objectives at this grade.

Concept 9: Contemporary World
The nations of the contemporary world are shaped by their cultural and political past. Current events, developments and issues continue to shape the global community.

PO 1. Describe current events using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

Strand 3: Civics/Government
The goal of the civics strand is to develop the requisite knowledge and skills for informed, responsible participation in public life; to ensure, through instruction, that students understand the essentials, source, and history of the constitutions of the United States and Arizona, American institutions and ideals (ARS 15-710). Students will understand the foundations, principles, and institutional practices of the United States as a representative democracy and constitutional republic. They will understand the importance of each person as an individual with human and civil rights and our shared heritage in the United States. Students will understand politics, government, and the responsibilities of good citizenship. Citizenship skills include the capacity to influence policies and decisions by clearly communicating interests and the ability to build coalitions through negotiation, compromise, and consensus. In addition, students will learn that the United States influences and is influenced by global interaction.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 1: Foundations of Government
The United States democracy is based on principles and ideals that are embodied by symbols, people and documents.

PO 1. Describe state and national symbols and monuments that represent American democracy and values:
   a. Great Seal of the United States
   b. Arizona symbols (e.g., seal, flag)
   c. war memorials (e.g., Pearl Harbor- Arizona Memorial, WW II, Korean, and Vietnam Memorials)

PO 2. Identify the rights and freedoms supported by the following documents:
   a. Preamble of the U.S. Constitution
   b. Bill of Rights
   c. Statement of Natural Rights as found in the Declaration of Independence (We hold these truths to be self evident……….)   (Note: Aligns to State Statute)

PO 3. Describe Arizona's transition from territory to statehood:
   a. locations of capital
   b. founding people
   c. Arizona's constitution

PO 4. Describe the varied backgrounds of people living in Arizona:
   a. shared principles, goals, customs and traditions
   b. diversity in one's school and community
   c. benefits and challenges of a diverse population.

Concept 2: Structure of Government
The United States structure of government is characterized by the separation and balance of powers.

(Note: The three branches of government were introduced in Grade 3.)

PO 1. Describe the three branches of state and national government:
   a. Executive
   b. Legislative
   c. Judicial

PO 2. Describe different levels of government (e.g., local, tribal, state, national).

Concept 3: Functions of Government
Laws and policies are developed to govern, protect, and promote the well-being of the people.

PO 1. Describe the responsibilities of state government (e.g., making laws, enforcing laws, collecting taxes).   Connect with: Strand 5 Concept 2

PO 2. Describe the responsibilities (e.g., determining land use, enforcing laws, overlapping responsibilities with state government) of the local government.

PO 3. Describe the possible consequences of violating laws.

Concept 4: Rights, Responsibilities, and Roles of Citizenship
The rights, responsibilities and practices of United States citizenship are founded in the Constitution and the nation's history.

PO 1. Discuss ways an individual can contribute to a school or community.

PO 2. Identify traits of character (e.g., *responsibility, respect,* perseverance, loyalty, integrity, involvement, justice and tolerance) *that are important to the preservation and improvement of democracy.*

PO 3. Describe the importance of citizens being actively involved in the democratic process (e.g., voting, campaigning, civil and community service, volunteering, jury duty).

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 5: Government Systems of the World
Different governmental systems exist throughout the world. The United States influences and is influenced by global interactions.

No performance objectives at this grade.

Strand 4: Geography

The goal of the geography strand is to provide an understanding of the human and physical characteristics of the Earth's places and regions and how people of different cultural backgrounds interact with their environment. Geographic reasoning is a way of studying human and natural features within a spatial perspective. Through the study of geography, students will be able to understand local, national, regional, and global issues. Students will interpret the arrangement and interactions of human and physical systems on the surface of the Earth. As these patterns have changed over time and are important to governments and economies, geographic reasoning will enhance students' understanding of history, civics, and economics.

Concept 1: The World in Spatial Terms
The spatial perspective and associated geographic tools are used to organize and interpret information about people, places and environments.

PO 1. Use different types of maps to solve problems (i.e., road maps –distance, resource maps- products, historical maps- boundaries, thematic map- climates).

PO 2. *Interpret political and physical maps using the following map elements:*
   a. *title*
   b. *compass rose (cardinal and intermediate directions)*
   c. *symbols*
   d. *legend*
   e. *scale*
   f. road map index
   g. grid (latitude and longitude)

PO 3. *Construct maps using symbols to represent human and physical features.*

PO 4. *Construct charts and graphs to display geographic information.*

PO 5. *Describe characteristics of human and physical features:*
   a. *physical – (i.e., river, lake, mountain, range, coast, sea, desert, gulf, bay, strait, plain, valley, volcanoes*, isthmus, canyon, plateau, mesa, oasis, dunes)
   b. *human –* (i.e., *equator*, four hemispheres, *city, state, country*, harbor, dams, territory, county)

PO 6. *Locate physical and human features using maps, illustrations, images, or globes:*
   a. *physical (i.e., river, lake, mountain range, coast, sea, desert, gulf, bay, strait)*
   b. *human (i.e., equator,* four hemispheres*, city, state, country, roads, railroads)*

PO 7. Locate physical and human features in Arizona using maps, illustrations, or images:
   a. physical (e.g., Grand Canyon, Mogollon Rim, Colorado River, Gila River, Salt River)
   b. human (e.g., Phoenix, Yuma, Flagstaff, Tucson, Prescott, Hoover Dam, Roosevelt Dam)

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 4

Concept 2: Places and Regions
Places and regions have distinct physical and cultural characteristics.

PO 1. Describe how the Southwest has distinct physical and cultural characteristics.

PO 2. Describe ways in which Arizona has changed over time from statehood to today.

PO 3. Locate the landform regions of Arizona (plateau, mountain, desert) on a map.

PO 4. Compare the landform regions of Arizona according to their physical features, plants, and animals.

PO 5. Describe how regions and places (e.g., Grand Canyon, Colorado River, Casa Grande Ruin, Canyon de Chelly, Yucatan Peninsula) have distinct characteristics. (Connect to content studied.)

Concept 3: Physical Systems
Physical processes shape the Earth and interact with plant and animal life to create, sustain, and modify ecosystems.   These processes affect the distribution of resources and economic development. Science Strands are summarized as they apply to Social Studies content in Grades K-8. In High School, the Performance Objectives are a summary of skills and content for grades 9 -12. These concepts are reinforced in Social Studies classes, but assessed through Science.

 (Science Strands are summarized below as they apply to Social Studies content in Grades K-8. These concepts are reinforced in Social Studies classes, but assessed through Science.)

Connect with:
Science Strand 3 Concept 1 Describe how natural events and human activities impact environments.

Science Strand 4 Concept 3 Describe uses, types, and conservation of natural resources.

Science Strand 6 Concept 2 Understand processes acting on the earth (erosion, floods, earthquakes, volcanoes, forest fires) and evidence of their occurrence.

Science Strand 6 Concept 3 Understand characteristics of weather conditions and climate.

Concept 4: Human Systems
Human cultures, their nature, and distribution affect societies and the Earth.

PO 1. Describe the factors (push and pull) that have contributed to the settlement, economic development (e.g., mining, ranching, agriculture, and tourism), and growth of major Arizona cities.

PO 2. Describe how Mexico and Arizona are connected by the movement of people, goods, and ideas.

PO 3. Describe how the building of transportation routes (e.g., trails, stage routes, railroad) resulted in human settlement and economic development in Arizona.

PO 4. Describe the cultural characteristics (e.g., food, clothing, housing, sports, customs, beliefs) of Arizona's diverse population.

PO 5. Describe the major economic activities and land use patterns (e.g., agricultural, industrial, residential, commercial, recreational, harvesting of natural resources) of regions studied.

PO 6. Describe elements of culture in areas studied (e.g., Mexico, Central and South America).

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e.g. - (abbreviation for *for example*) precedes a list of examples provided as options; other examples may be appropriate but not included; e.g. examples *may* be used in a testing situation
italicized performance objectives - a performance objective repeated verbatim from year to year; it is understood that the depth, complexity, and difficulty level developmentally match the grade level expectations

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Concept 5: Environment and Society

Human and environmental interactions are interdependent upon one another.   Humans interact with the environment- they depend upon it, they modify it; and they adapt to it. The health and well-being of all humans depends upon an understanding of the interconnections and interdependence of human and physical systems.

PO 1. Describe human dependence on the physical environment and natural resources to satisfy basic needs.

PO 2. Describe the impact of extreme natural events (e.g., fires, volcanoes, floods, droughts) on human and physical environments.

PO 3. Describe the impact of human modifications (e.g., dams, mining, air conditioning, irrigation, agricultural) on the physical environment and ecosystems.

Concept 6: Geographic Applications

Geographic thinking (asking and answering geographic questions) is used to understand spatial patterns of the past, the present, and to plan for the future.

PO 1. Describe the impact of geographic features (e.g., rivers, mountains, resources, deserts, climate) on migration and the location of human activities (e.g., exploration, mining, transportation routes, settlement patterns).

PO 2. Discuss geographic knowledge and skills related to current events.

PO 3. Use geography concepts and skills (e.g., recognizing patterns, mapping, graphing) to find solutions for local, state or national problems (e.g., shortage or abundance of natural resources).

Strand 5: Economics

The goal of the economics strand is to enable students to make reasoned judgments about both personal economic questions and broader questions of economic policy. Students will develop an economic way of thinking and problem solving to understand and apply basic economic principles to decisions they will make as consumers, members of the workforce, citizens, voters, and participants in a global marketplace. This will prepare students to weigh both short-term and long-term effects of decisions as well as possible unintended consequences. The study of economics explains historical developments and patterns, the results of trade, and the distribution of income and wealth in local, regional, national, and world economies. Students will be able to analyze current issues and public policies and to understand the complex relationships among economic, political, and cultural systems.

Concept 1: Foundations of Economics

The foundations of economics are the application of basic economic concepts and decision-making skills. This includes scarcity and the different methods of allocation of goods and services.

PO 1. Explain the decision for a personal spending choice.

PO 2. Identify that specialization improves standards of living (e.g., medical care, home building, agriculture).

PO 3. Give examples of how voluntary exchanges of goods and services can be mutually beneficial (e.g., ice cream vendor receives money, child receives ice cream; doctor receives monetary benefit, patient receives care).

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Approved 9.26.05 Updated 5.22.06

Concept 2: Microeconomics

Microeconomics examines the costs and benefits of economic choices relating to individuals, markets and industries, and governmental policies.

PO 1. Explain how price incentives affect peoples' behavior and choices, such as colonial decisions about what crops to grow and which products to produce.

PO 2. Describe why (e.g., schools, fire, police, libraries) state and local governments collect taxes.

PO 3. Describe how education, skills, and career choices affect income.

PO 4. Discuss how profit is an incentive to entrepreneurs.

PO 5. Describe risks that are taken by entrepreneurs.

PO 6. Identify the role of financial institutions in providing services (e.g., savings accounts, loans).

Concept 3: Macroeconomics

Macroeconomics examines the costs and benefits of economic choices made at a societal level and how those choices affect overall economic well being.

No performance objectives at this grade.

Concept 4: Global Economics

Patterns of global interaction and economic development vary due to different economic systems and institutions that exist throughout the world.

No performance objectives at this grade.

Concept 5: Personal Finance

Decision-making skills foster a person's individual standard of living. Using information wisely leads to better informed decisions as consumers, workers, investors and effective participants in society.

PO 1. Describe how interest is an incentive to saving money.

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Technology Standards 2000

Essentials (Grades 4-8)

Technology Education Standards Rationale

Technology encompasses the tools and strategies for solving problems, using information, increasing productivity and enhancing personal growth. The word *technology* summons an image of a variety of tools ranging from shovels to gene splitters. When asked to develop the original Technology Standards, adopted in 1997, the Committee did so without the benefit of seeing the integration of various technologies into other curricular standards. Over the past four years, significant advances in technology have occurred. These changes have caused many national organizations to review what students need to know and be able to do in relation to technology. Therefore, when asked to review the current standards, the Revision Committee examined national standards (National Educational Technology Standards, Information Power, Information Technology in Education and Technology for All Americans), along with current Arizona standards. The Revision Committee also analyzed current research on technology skills important to business and industry. The Revision Committee reviewed technology that is currently integrated into other content area standards with the vision that as other standards are revised, technology will be seamlessly integrated.

The goal is to help students live, learn and work successfully and responsibly in an increasingly complex, technology-driven society. These Technology Standards are designed to provide foundational skills and processes that students need in order to work productively and creatively in their studies, at work and at home. Research on the transfer of learning strongly supports the position that instruction and educational activities should closely parallel the final desired behavior. It is essential that technology instruction be an integral part of a student's educational experience. Education's role is to help students meet the challenge of the future. Arizona must encourage, assist and provide all students with the required tools and instruction to enable them to acquire knowledge, develop skills and apply these tools successfully in our world.

The following definition of technology is supported in this document:

Technology is the application of tools to solve problems that extend human potential for the benefit of society

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

STANDARD 1: FUNDAMENTAL OPERATIONS AND CONCEPTS
Students understand the operations and function of technology systems and are proficient in the use of technology.

- **1T-E1. Communicate about technology using developmentally appropriate and accurate terminology**
    See: Language Arts (VP-E)

    PO 1. Use basic vocabulary related to technology (e.g., FireWire, USB, parallel, serial, scanning, digitizing, OCR)
    PO 2. Use basic vocabulary related to systems (e.g., network, infrastructure, Internet, Intranet, LAN, WAN, Ethernet, firewall, server, TCP-IP)

- **1T-E2. Demonstrate increasingly sophisticated operation of technology components**
    See: Arts {Music} (1AM-E9-10), Mathematics (1M-E6, 2M-E1), Science (1SC-E2) and Workplace Skills (7WP-E1)

    PO 1. Use touch-typing strategies to reach a minimum of 25 words per minute with accuracy (e.g., meets school-identified standard for accuracy)
    PO 2. Retrieve and save information remotely (e.g., network servers, Internet, Intranet, peripheral devices)
    PO 3. Demonstrate functional operation of technology devices (e.g., presentation devices, digital cameras, scanners, document cameras, scientific probes) (*See Technology 3T-E2, PO1*)

- **1T-E3. When a system is not working properly, demonstrate an understanding of hardware, software and connectivity problem solving processes**
    See: Science (1SC-E1)

    PO 1. Use troubleshooting strategies to solve applications problems (e.g., file management strategies, online help strategies, documentation, collaboration with others)
    PO 2. Use troubleshooting strategies to solve basic hardware problems (e.g., use online help, use documentation, collaboration with others)
    PO 3. Use troubleshooting strategies to identify basic connectivity problems (e.g., use online help, use documentation, collaboration with others)

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

STANDARD 2: SOCIAL, ETHICAL AND HUMAN ISSUES
Students understand the social, ethical and human issues related to using technology in their daily lives and demonstrate responsible use of technology systems, information and software.

- **2T-E1. Discuss basic issues related to responsible use of technology and information and describe personal consequences of inappropriate use**
  See: Comprehensive Health (4CH-E3), Science (2SC-E2) and Social Studies (2SS-E2, PO1, 2SS-E5, PO1, 2SS-E7, PO1)

  PO 1. Explain the purpose of an Acceptable Use Agreement/Policy and the consequences of in appropriate use
  PO 2. Describe and practice safe Internet/Intranet usage (e.g., do not post inappropriate or harmful material; do not reveal personal information; follow district Acceptable Use Policy)
  PO 3. Describe and practice "netiquette" when using the Internet and electronic mail (e.g., publish photographs of people only with their permission)

- **2T-E2. Exhibit legal and ethical behaviors when using technology and information and discuss consequences of misuse**

  PO 1. Follow the rules for deciding when permission is needed for using the work of others, (e.g., some sites specify whether permission is required or not, some work is in public domain)
  PO 2. Obtain permission to use the work of others (See Technology 5T-E2, PO3)
  PO 3. Provide complete citations from electronic media (e.g., use age-level appropriate, district developed standardized reference formats for citing source of information)
  (See Technology 5T-E2, PO5)
  PO 4. Explain copyright laws and "fair use" guidelines (e.g., in relationship to print, video, computer software, multimedia project, music)
  PO 5. Describe copyright guidelines[3] for multimedia creation and Internet development
  PO 6. State personal consequences (e.g., fines, loss of privileges, grade reduction, academic probation) related to violations of:
    a) Copyright (e.g., sheet music, prerecorded music, print, video, images)
    b) Password security
    c) Privacy (e.g., student files on a network, floppy disk and hard drive)
    d) Internet usage (e.g., inappropriate postings, accessing inappropriate material)
  PO 7. Discuss the negative impact of unauthorized intrusions into networked data and describe actions to prevent these intrusions

[3] http://literacy.kent.edu/Oasis/Workshops/copytoc.html; and http://lcweb.loc.gov/copyright/circs/circ1.html

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

- **2T-E3. Demonstrate knowledge of current changes in technologies and the effect those changes have on the workplace and society**
    See: Comprehensive Health (4CH-E2) and Social Studies (3SS-E6, PO8, 3SS-E7, PO5)

    PO 1. Compare information technologies from past to present and describe the implications of computer power doubling every 18 months (Moore's Law) (e.g., size, speed, cost)
    PO 2. Describe the impact of technology use on individuals at home and in the workplace (e.g., computer has replaced the TV for some individuals; free time is spent using technology versus outdoor activities; jobs have been created and/or eliminated due to technological advances; possible infringement of privacy)
    PO 3. Discuss the social implications of the "digital divide" (e.g., homes and schools with much technology and connectivity versus those with less or none)

STANDARD 3: TECHNOLOGY PRODUCTIVITY TOOLS
Students use technology tools to enhance learning, to increase productivity and creativity, and to construct technology-enhanced models, prepare publications and produce other creative works.

- **3T-E1. Use formatting capabilities of technology tools for communicating and illustrating**
    See: Language Arts (W-F1, PO5)

    PO 1. Use word processing editing tools to revise a document (e.g., cut and paste, tabs and margins, font size, font style, delete and undo, selecting, spell check, click and drag)
    PO 2. Design a word processing document with graphical elements (e.g., clip art, digital photographs, symbols, using text wrap, cropping, sizing, drawing tools)

- **3T-E2. Use a variety of technology tools for data collection and analysis**
    See: Mathematics (5M-E6) and Social Studies (1SS-E8, PO1)

    PO 1. Use technology device(s) to collect and record data (e.g., science probe, graphing calculator, PDA {personal digital assistant}, alternative keyboards, webcams, GPS and Internet)
    PO 2. Create and use a spreadsheet to analyze data (e.g., use formulas, create charts and graphs)
    PO 3. Create a database with multiple fields to manipulate data in a variety of ways (e.g., sort, merge, list and report)

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

- **3T-E3. Publish and present information using technology tools**
    See: Science (1SC-E3, PO2 grades 4-5, or PO1, grades 6-8)
  PO 1. Design and create a multimedia presentation or Web page using multiple digital sources (e.g., from camera, video, scanner, CD-ROM, Internet)
  PO 2. Publish or present the above production (*See Technology 4T-E2, PO1 or 4T-E3)*
- **3T-E4. Use technology tools to support system analysis and modeling**
    See: Mathematics (2M-E5,6M-E1), Science (1SC-E2, E5) and Workplace Skills (6WP-E1)

  PO 1. Manipulate several variables in a computer simulation to reach a desired outcome (e.g., simulation software, Web-based simulation, textbook support software)

STANDARD 4: TECHNOLOGY COMMUNICATIONS TOOLS
Building on productivity tools, students will collaborate, publish, and interact with peers, experts and other audiences using telecommunications and media.

- **4T-E1. Use telecommunications efficiently and effectively to access remote information and communicate with others in support of facilitated and independent learning**
    See: Language Arts (W-E3-E6)

  PO 1. Communicate independently via e-mail, Internet, and/or videoconference with people in a remote location *(For Internet safety see Technology 2T-E1)*

- **4T-E2. Use technology tools for individual and collaborative writing, communication and publishing activities to create curricular related products for audiences inside and outside the classroom**
    See: Language Arts (W-E2-E7, LS-E)

  PO 1. Plan, design and present an academic product using technology tools (e.g., multimedia authoring, presentation software, digital cameras, scanners, projection devices)

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

- **4T-E3. Collaboratively use telecommunications and online resources**
    See: Arts {Theatre} (2AT-E1) and Social Studies (1SS-E8, PO2, grades 6-8)
    (For Internet safety issues see Technology 2T-E1)

    PO 1. Request collaborative exchanges among people in local and/or remote locations (e.g., e-mail, online discussions, Web environments)
    PO 2. Communicate electronically to collaborate with experts, peers and others to analyze data and/or develop an academic product (e.g., e-mail, discussion group, videoconferencing)
    PO 3. Present an academic product to share data and/or solutions (e.g., Web site, multimedia presentation, video)

STANDARD 5: TECHNOLOGY RESEARCH TOOLS
Students will utilize technology-based research tools to locate and collect information pertinent to the task as well as evaluate and analyze information from a variety of sources.

> *Note: The performance objectives described in Standard 5 rely upon the mastery of skills and understanding of concepts from Standards 1-4 of this document*

- **5T-E1. Locate information from electronic resources**
    See: Arts {Theatre} (2AT-E4), Language Arts (W-E8) and Mathematics (2M-E1, PO1)

    PO 1. Identify electronic research resources
    PO 2. Define subject searching and devise a search strategy to locate information using available electronic research resources (i.e., electronic card catalog, online or CD-ROM reference sources, grade level appropriate Internet resources)
    PO 3. Explain the difference between subject and keyword searching
    PO 4. Construct keyword searches including basic Boolean logic using available electronic research resources (i.e., electronic card catalog, online or CD-ROM reference sources and grade level appropriate Internet resources)
    PO 5. Identify the author, copyright date and publisher of information located in electronic resources, including Internet resources

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

- **5T-E2. Evaluate the accuracy, relevance, appropriateness, comprehensiveness and bias of electronic information sources**
    See: Social Studies (1SS-E1, PO2 and 1SS-E8, PO5-6)

    PO 1. Create citations for electronic research sources following a prescribed format (*See Technology 2T-E2,PO2*)
    PO 2. Gather research from a variety of electronic sources and identify the most appropriate information for answering the research question (*See Technology 5T-D2, PO2*)
    PO 3. Obtain permission, when appropriate, to use the work of others (*See Technology 2T-E2, PO3*)
    PO 4. Identify the components of a URL to determine the source of the information
    PO 5. Identify the author of the information found from electronic resources and determine whether the author is an authority, displays bias and is a primary or secondary source

STANDARD 6: TECHNOLOGY AS A TOOL FOR PROBLEM SOLVING AND DECISION-MAKING

Students use technology to make and support decisions in the process of solving real-world problems.
> *Note: Problem solving is inherent in all disciplines. Technology Standard 6 is designed to provide a cumulative (capstone) experience*
> *See: Science 3SC in its entirety and Workplace Skills 3WP in its entirety*

- **6T-E1. Determine when technology is useful and select and use the appropriate tools and technology resources to solve problems**

    PO 1. Based on a problem selected by the student, identify and use appropriate technology tools to:
    - a) collect data (e.g., counting versus using a probe, book index versus online index)
    - b) interpret data (e.g., use of a spreadsheet instead of a graphic organizer)
    - c) develop a solution to the problem (e.g., creating a model versus using a spreadsheet)
    - d) present findings (e.g., create a poster versus an electronic presentation)

Workplace Skills Standards 1997

Essentials (Grades 4-8)

Workplace Skills Standards Rationale

Most students will spend more than a third of their lives in a diverse and constantly changing workplace. Regardless of personal, career, or educational plans, students must demonstrate proficiency both in academics and the following workplace standards.

The Workplace Skills Standards are designed to be integrated into the traditional curriculum taught in schools at all levels and are most effectively learned in the context of an integrated effort involving parents, educators, business partners and members of the community. Student acquisition of critical workplace skills, with an emphasis on application, is a developmental process which encompasses an individual's entire lifetime. The demonstration of these skills is essential for individuals and contributes to the foundation of an educated citizenry.

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

STANDARD 1
Students use principles of effective oral, written and listening communication skills to make decisions and solve workplace problems.

- **1WP-E1. Deliver a speech clearly, with expression and in an organized fashion, making eye contact with audience, and convey the message through nonverbal as well as verbal communications**

  PO 1. Prepare a coherent speech with an introduction, body, and conclusion
  PO 2. Present verbal and non-verbal forms of communication in presenting the speech
  PO 3. Select a variety of forms of print and non-print material to convey the message

- **1WP-E2. Describe communications practices used with sensory-impaired individuals**

  PO 1. Describe more than one way to communicate with a visually-impaired individual
  PO 2. Describe more than one way to communicate with a hearing-impaired individual

- **1WP-E3. Demonstrate correct grammar and punctuation in writing**

  PO 1. Spell correctly
  PO 2. Punctuate correctly (e.g., sentence endings, commas, semicolons, colons)
  PO 3. Apply rules of capitalization correctly (e.g., sentence beginnings, titles, abbreviations, proper nouns)
  PO 4. Apply standard grammar and usage (e.g., subject/verb agreement, simple and compound sentence, appropriate verb tenses, plurals)
  PO 5. Organize paragraphs with a variety of sentence structures (e.g., simple, compound, complex)

- **1WP-E4. Respond to oral and written presentations by formulating relevant feedback, expressing opinions, discerning the main idea and distinguishing fact from opinion**

  PO 1. Summarize main ideas of an oral or written presentation
  PO 2. Differentiate between facts and opinions in a presentation *(Grades 6-8)*
  PO 3. Formulate related questions in a presentation
  PO 4. Express opinions relating to the main idea in a presentation

- **1WP-E5. Interpret, clarify, and evaluate a presenter's point of view**

  PO 1. Explain the presenter's point of view *(Grades 4-5)*
  PO 2. Compare the presenter's point of view with personal point of view *(Grades 6-8)*

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

- **1WP-E6. Speak in a content area (e.g., science, social studies, literature), using vocabulary of the subject accurately; locate and interpret information in documents such as manuals, graphs, and schedules**

  PO 1. Deliver a factual presentation using appropriate terminology
  PO 2. Use a variety of formats such as data, graphs and technical manuals to support a presentation

- **1WP-E7. Identify the relevant details and facts of written materials**

  PO 1. Identify the purpose of written material and response expected from reader
  PO 2. Identify relevant facts contained in selected written material

- **1WP-E8. Write formal communications that have a definite audience and clear purpose; contain no gaps, omissions or assumptions which impede comprehension; and follow the proper form whether it be a personal or business letter, message, memo, manual directions or applications**

  PO 1. Write a formal communication in an appropriate format for a specific audience and purpose
  PO 2. Organize ideas in a meaningful sequence using transitional words or phrases
  PO 3. Write ideas that are clear and directly related to the topic

STANDARD 2

Students apply computation skills and data analysis techniques to make decisions and solve workplace problems.

> *Note: The Essentials Level is central to preparation for the workplace and is adequately covered in the Mathematics Standards document. The Proficiency and Distinction Levels include additional references to what students need to know and do as it relates to the workplace.*

- **2WP-E1.   Apply math standards 1-6 to a variety of workplace scenarios**

STANDARD 3

Students apply critical and creative thinking skills to make decisions and solve workplace problems.

- **3WP-E1. Utilize information acquired from several sources and transfer information learned in one situation to another**

  PO 1. Research a designated topic using a wide array of information sources
  PO 2. Analyze the information obtained from the research
  PO 3. Classify the information obtained from the research
  PO 4. Compare the information to a new situation

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

- **3WP-E2. Devise and implement a plan of action by specifying goals and constraints**

  PO 1. Define goals and objectives
  PO 2. Develop appropriate time line
  PO 3. Identify constraints to achieving goals
  PO 4. Identify resources needed to accomplish goals
  PO 5. Develop criteria to evaluate plan of action

- **3WP-E3. Generate alternatives, consider risks, evaluate and choose solutions**

  PO 1. Select from possible solutions in a designated scenario
  PO 2. Evaluate possible solutions in a designated scenario
  PO 3. Identify risks in a designated scenario
  PO 4. Assess risks and risk factors in a designated scenario

- **3WP-E4. Monitor progress and make adjustment to meet stated objectives**

  PO 1. Identify activities for given objectives
  PO 2. Designate assessment tasks to measure progress towards objectives
  PO 3. Evaluate progress towards objective
  PO 4. Revise activities when necessary to achieve objective

- **3WP-E5. Reflect on the action taken to determine what has been gained, lost or achieved**

  PO 1. Evaluate what has been gained, lost or achieved

- **3WP-E6. Identify a need for data, obtain it and develop a validation instrument for determining its accuracy**

  PO 1. Compare the results with the criteria for accuracy
  PO 2. Collect data to analyze workplace problems

STANDARD 4
Students work individually and collaboratively within team settings to accomplish objectives.

- **4WP-E1. Identify ways to build mutual trust and respect and develop an action plan for negotiating concerns**

  PO 1. Identify characteristics of mutual trust
  PO 2. Identify characteristics of mutual respect
  PO 3. Describe ways to build mutual trust and respect
  PO 4. Design action plan for negotiating concerns

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

- **4WP-E2. Analyze the difference between individual and group decisions and accomplishments**

  PO 1. Identify the characteristics of individual decisions and accomplishments
  PO 2. Identify the characteristics of group decisions and accomplishments
  PO 3. Compare the characteristics of individual and group decisions and accomplishments

- **4WP-E3. Exert a high level of effort and perseverance toward goal attainment, as a team member**

  PO 1. Identify the team goal
  PO 2. Identify the team member roles and responsibilities
  PO 3. Develop tool to measure effort and perseverance of individual team members

- **4WP-E4. Assume leadership roles in team settings**

  PO 1. Define leadership skills
  PO 2. Examine self roles/skills in a group setting
  PO 3. Demonstrate leadership roles/skills in a group
  PO 4. Develop a tool to evaluate the roles/skills of self and group

STANDARD 5

Students will demonstrate a set of marketable skills that enhance career options.

- **5WP-E1. Evaluate areas of interest and/or potential career choices**

  PO 1. Identify areas of interest (e.g., personal, career)
  PO 2. Evaluate individual skills
  PO 3. Evaluate a variety of potential career choices

- **5WP-E2. Demonstrate work ethics and behaviors for success as defined by school and community**

  PO 1. Identify characteristics of work ethics and behavior as defined by school and community
  PO 2. Demonstrate identified work ethics and behaviors in your school and community

- **5WP-E3. Demonstrate the connection between academic skills and career pathways by identifying required education and training to achieve career choice(s)**

  PO 1. Identify academic preparation necessary for a variety of careers

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

- **5WP-E4. Identify careers which capitalize on individual strengths and interests**

  PO 1. Identify areas of interest (e.g., personal, career)
  PO 2. Evaluate individual skills
  PO 3. Evaluate a variety of potential career choices

- **5WP-E5. Apply the basic academic skills to develop a resume, job application and interviewing techniques**

  PO 1. Develop a resume
  PO 2. Complete a job application
  PO 3. Participate in the interview process

STANDARD 6
Students illustrate how social, organizational and technological systems function.
> *Definition: A system equals an organized framework made up of interrelated components acting together as a whole, in which a change in one component may affect the entire operation. Examples of systems are social (e.g., family, school) and technological (e.g., local area network, telephone).*

- **6WP-E1.Identify the factors impacting the level of effectiveness of systems**

  PO 1. Define a system
  PO 2. Identify numerous systems that impact students' daily lives
  PO 3. Compare how systems vary in effectiveness
  PO 4. Identify how factors influence the effectiveness of a system

STANDARD 7
Students demonstrate technological literacy for productivity in the workplace.

- **7WP-E1. Demonstrate basic computer operation skills in a variety of applications to organize information**

  PO 1. Use technology to retrieve, organize and manipulate electronic information using media such as CD-ROM, videodisks and telecommunication systems

- **7WP-E2. Use technology to organize information resources such as library and interlibrary catalog databases**

  PO 1. Use organizational features of electronic information (e.g., microfiche headings and numbering; headings for accessing nested information in hypertext media, electronic media, library, interlibrary catalog databases)

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

STANDARD 8
Students apply principles of resource management and develop skills that promote personal and professional well-being.

- **8WP-E1. Set and prioritize a set of balanced goals related to school, home, education, and career planning and allocate sufficient time, materials and resources to each task**

  PO 1. Define a personal/professional goal
  PO 2. Create personal/academic goals
  PO 3. Develop a community service goal
  PO 4. Develop a time management program

- **8WP-E2. Describe the importance of balancing home, school and community activities to reduce stress**

  PO 1. Define personal stress factors
  PO 2. Identify how home, school, community activities can affect stress