ARIZONA ACADEMIC STANDARDS

GRADE 8

State of Arizona
Arizona Department of Education

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ARIZONA ACADEMIC STANDARDS
GRADE 8

CONTENTS

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 8

ARIZONA ACADEMIC STANDARDS IN THE ARTS
ARTICULATION IN MIDDLE/HIGH SCHOOL

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 Middle and High Schools

- The Arts Standards are divided into four discipline areas: **dance**, **music**, **theatre** and **visual arts.**
- The Arts Standards (Dance, Music, Theatre, Visual Arts) are articulated by **skill level**, reflecting the variety of ways in which the arts are taught in Arizona schools. The skill levels are: **Beginning**, **Intermediate**, **Advanced**, **Distinction** (Honors).
- In **Music**, the skill levels are tied to **performing ensembles**, broken down by Band, Choral and Strings/Orchestra. In addition, there are grade level general music standards available for grades 7 and 8.
- Instead of guessing at the skill level of your student artists, the Department encourages you to view the arts standards in their entirety at http://www.ade.az.gov/standards/contentstandards.asp and choose the appropriate skill level for your students. For guidance on appropriate skill level "fit" please call the Arts Education Specialist at 602-364-1534.

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.

Approved 6.26.06

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 6-8)

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. Illustrate how positive health behaviors can prevent common injuries, diseases and conditions
  PO 2. Illustrate the harmful effects of use of tobacco, alcohol and other drugs

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

  PO 1. Describe how thoughts, feelings, dealing with people and being physically healthy are all interconnected
  PO 2. Illustrate how the variables stated above (in PO 1) interact as seen in case studies, movies, etc.

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

  PO 1. Develop a plan for a healthy environment and lifestyle and apply it to health, growth and development

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

  PO 1. Illustrate how family and peers effect the choices you make regarding health

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

  PO 1. Compare healthy environments and healthy people with unhealthy environments and unhealthy people

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

  PO 1. Identify personal health behaviors that reduce health problems

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 6-8)

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

  PO 1. Describe how living a healthy lifestyle and knowing family health history can help a person live a more healthy life

- **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. Classify nutrients and their uses in the body
  PO 2. Apply this knowledge of nutrients and balanced diets to your 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. Apply health information from home, school and community

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

  PO 1. Illustrate how the media affects what you know about health and health products

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

  PO 1. Describe similar health products' cost and effectiveness in treating health problems

- **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. Describe a variety of emergency situations
  PO 2. List emergency resources

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 6-8)

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

- **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. Rank personal and family strengths and risks
  PO 2. Develop a plan that would improve health and reduce risks

- **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. Identify 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 existing prevention and management strategies regarding personal and family health
  PO 2. Identify ways to avoid threatening situations

- **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. Apply basic first aid and basic life saving techniques

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 6-8)

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. Distinguish how different cultures utilize health services
  PO 2. Describe the factors responsible for the differences in health care

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

  PO 1. Identify a variety of media messages and determine how they influence your health

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

  PO 1. Describe five ways that technology can hurt or improve your health

- **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 you can show respect for 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. Identify a minimum of two reasons for conflict among young people
  PO 2. Apply two ways to let the other person know that you mean “no” to something you do not want
  PO 3. Apply two things you can use to come to an agreement in a conflict and foster health

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 6-8)

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

PO 1. Determine which ways can control conflict
PO 2. Apply 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. Describe collaboratively the decision-making process
  PO 2. List three alternatives and consequences regarding a health issue
  PO 3. Collectively choose which solution best fits the 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 that relate to adolescence
  PO 2. Explain the consequences of the above health behaviors

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

  PO 1. Identify three personal health goals
  PO 2. Correlate the relationship between knowledge of health and personal selected 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

COMPREHENSIVE HEALTH STANDARDS
ESSENTIALS (GRADES 6-8)

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. Select which language, subject matter and visual techniques did the best job of informing you about health

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

  PO 1. Choose two health issues
  PO 2. Present positive and negative aspects of selected health issues

- **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

- **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 6-8)

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, strike and kick a variety of objects demonstrating both accuracy and force
  PO 2. Dribble and pass a variety of objects to a moving target/receiver (e.g., hands, feet, equipment)
  PO 3. Perform a variety of rhythmic movements

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

  PO 1. Utilize basic offensive and defensive skills in a modified version of a team sport
  PO 2. Adapt and combine locomotor and nonlocomotor and manipulative skills to meet the demands of increasingly complex movement activities

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

  PO 1. Identify the critical elements of a more advanced movement (e.g., golf swing, cartwheel, tennis serve) 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 which differentiate a highly skilled performer from other performers

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

  PO 1. Apply specialized movement skills that use similar patterns and transfer concepts from one to another (e.g., follow-through, opposition, force)

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 6-8)

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. Explain that success in physical activities leads to recognition
  PO 2. Explain the value of exercise in relieving stress

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

  PO 1. Participate in physical activities at home for personal enjoyment and benefit
  PO 2. Describe principles of training and conditioning for specific physical activities

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

  PO 1. Demonstrate ability to calculate resting and target heart rate
  PO 2. Maintain a record of moderate to vigorous physical activity
  PO 3. Monitor heart rate before, during and after vigorous physical activity

- **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 in an individualized physical activity program designed with the help of the teacher
  PO 2. List long-term physiological, psychological, and cultural benefits that may result from regular participation in physical activity

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

  PO 1. Participate in activities both in and out of school based on individual interests and capabilities (e.g., aquatics, self-defense, gymnastics, games, sports, dance and outdoor pursuits)
  PO 2. Design a program to improve skills in a favorite activity

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 6-8)

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**

  PO 1. Correctly demonstrate activities designed to improve and maintain muscular strength and endurance, flexibility, cardio-respiratory functioning, and proper body composition

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

  PO 1. Demonstrate proper warm-up and cool-down techniques and the reasons for using them
  PO 2. Engage in physical activity at the target heart rate for a minimum of 10 minutes
  PO 3. Calculate heart rate before, during and after vigorous physical activity
  PO 4. Examine the impact of such factors as nutrition, relaxation, stress and substance abuse on the body
  PO 5. Incorporate the FITT principle into a regular activity program to improve or maintain fitness

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. Identify positive and negative peer influence
  PO 2. List positive ways to exert independence

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

  PO 1. Remain on task without close teacher monitoring
  PO 2. Solve problems by analyzing causes and potential solutions

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

  PO 1. Participate in establishing rules, procedures and etiquette that are safe and effective for specific activity situations
  PO 2. Resolve interpersonal conflicts with a sensitivity to rights and feelings of others

PHYSICAL ACTIVITY STANDARDS
ESSENTIALS (GRADES 6-8)

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

  PO 1. Demonstrate appropriate sportsmanship

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

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

  PO 1. Explain the role of games, sports and dance in getting to know and understand others of like and different backgrounds
  PO 2. Demonstrate an understanding of the ways sport and dance influence American culture

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

  PO 1. Display sensitivity to the feelings of others during interpersonal interaction
  PO 2. Demonstrate cooperation (through verbal and nonverbal behaviors) with peers of different gender, race and ethnicity in a physical activity setting

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

  PO 1. Same as concept

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. Establish personal health-related fitness status and develop goals to meet health-related fitness
  PO 2. Participate daily in some sort of physical activity

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

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

- **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)**

- **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 8

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 8

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.

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Concept 1: Print Concepts
Demonstrate understanding of print concepts.

(Grades K-3)

Concept 2: Phonemic Awareness
Identify and manipulate the sounds of speech.

(Grades K-2)

Concept 3: Phonics
Decode words, using knowledge of phonics, syllabication, and word parts.

(Grades K-3)

Concept 4: Vocabulary
Acquire and use new vocabulary in relevant contexts.

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

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

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

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

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

Concept 5: Fluency
Read fluently.

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

READING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Concept 6: Comprehension Strategies
Employ strategies to comprehend text

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

PO 2. Confirm predictions about text for accuracy.

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

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

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

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

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

Strand 2: Comprehending Literary Text

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

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

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

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

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

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

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

READING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Concept 2: Historical and Cultural Aspects of Literature
Recognize and apply knowledge of the historical and cultural aspects of American, British, and world literature.

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

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

Strand 3: Comprehending Informational Text

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

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

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

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

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

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

PO 7. Differentiate between primary and secondary source materials. (Connected to Research Strand in Writing)

PO 8. Interpret graphic features (e.g., charts, maps, diagrams, illustrations, tables, timelines, graphs) of expository text. (Connected to Research Strand in Writing)

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

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

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

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

READING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

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

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

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

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

Concept 3: Persuasive Text
Explain basic elements of argument in text and their relationship to the author's purpose and use of persuasive strategies.

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

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

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

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

Writing Standard Articulated by Grade Level 2004

Grade 8

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 8

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., **prior knowledge**, discussion with others, printed material or other sources).*
PO 2. Determine the purpose (e.g., to entertain, to inform, to communicate, to persuade, to explain) of an intended writing piece.
PO 3. Determine the intended audience of a writing piece.
PO 4. Establish a central idea appropriate to the type of writing.
*PO 5. Use organizational strategies (e.g., outline, chart, table, graph, **Venn Diagram**, **web**, **story map**, **plot pyramid**) to plan writing.*
PO 6. Maintain a record (e.g., lists, journal, folder, notebook) of writing ideas.
*PO 7. Use **time management strategies**, when appropriate, to produce a writing product within a set time period.*

Concept 2: Drafting Drafting incorporates prewriting activities to create a first draft containing necessary elements for a specific purpose.
*PO 1. Use a **prewriting plan** to develop a draft with **main idea**(s) and supporting details.*
PO 2. Organize writing into a logical sequence that is clear to the audience.

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 8

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. Delete irrelevant and/or redundant information from the draft to more effectively accomplish the purpose.
PO 4. Rearrange words, sentences, and paragraphs to clarify the meaning or to enhance the writing style.
*PO 5. Add **transitional words**, phrases and/or sentences to clarify meaning or enhance the writing style.*
*PO 6. Use a variety of sentence structures (i.e., **simple**, **compound, complex)** to improve sentence fluency in the draft.*
*PO 7. Apply appropriate tools or strategies (e.g., **peer review**, checklists, **rubrics**) to refine the draft.*
PO 8. Use resources and reference materials to select more precise vocabulary.

Concept 4: Editing Editing includes proofreading and correcting the draft for conventions.
PO 1. Identify punctuation, spelling, and grammar and usage errors in the draft. (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 or strategies (e.g., **peer review**, checklists, **rubrics**) to edit the draft.*

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 8

Concept 5: Publishing Publishing includes formatting and presenting a final product for the intended audience.
PO 1. Prepare writing in a format (e.g., oral presentation, manuscript, multimedia) appropriate to audience and purpose.
PO 2. Use margins and spacing to enhance the final product.
PO 3. Use graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product.
PO 4. Write legibly.

Strand 2: Writing Components

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. Use clear, focused ideas and details to support the topic.
PO 2. Provide content and selected details that are well-suited to audience and purpose.
PO 3. Develop a sufficient explanation or exploration of the topic.
PO 4. Include ideas and details that show original perspective.

Concept 2: Organization Organization addresses the structure of the writing and integrates the central meaning and patterns that hold the piece together.
PO 1. Use a structure that fits the type or writing (e.g., letter format, **narrative**, play, essay). (See Strand 3)
PO 2. Develop a strong beginning or introduction that draws in the reader.
PO 3. Place details appropriately to support the main idea.
PO 4. Include effective transitions among all elements (sentences, paragraphs, ideas).
PO 5. Construct paragraphs by arranging sentences with an organizing principle (e.g., to develop a topic, to indicate a chronology).
*PO 6. Create an ending that provides a sense of **resolution** or closure.*

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 8

Concept 3: Voice Voice will vary according to the type of writing, but should be appropriately formal or casual, distant or personal, depending on the audience and purpose.
PO 1. Show awareness of the audience through word choice, style, and an appropriate connection with, or distance from, the audience.
PO 2. Convey a sense of identity through originality, sincerity, liveliness, or humor appropriate to the topic and application.
PO 3. Use language appropriate for the topic and purpose.
*PO 4. Choose appropriate voice (e.g., formal, informal, **academic discourse)** for the application.*

Concept 4: Word Choice Word choice reflects the writer's use of specific words and phrases to convey the intended message and employs a variety of words that are functional and appropriate to the audience and purpose.
PO 1. Use accurate, specific, powerful words that effectively convey the intended message.
PO 2. Use words that consistently support style and type of writing. (See R08-S2C1)
PO 3. Use vocabulary that is original, varied, and natural.
PO 4. Use **literal** and **figurative language** where appropriate to purpose. (See R08-S1C4-04)

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 8

Concept 5: Sentence Fluency
Fluency addresses the rhythm and flow of language. Sentences are strong and varied in structure and length.

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

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

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

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

Concept 6:Conventions
Conventions addresses the mechanics of writing, including capitalization, punctuation, spelling, grammar and usage, and paragraph breaks.

PO 1. Use capital letters correctly for:

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

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

PO 2. Use commas to correctly punctuate:

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

PO 3. Use quotation marks to punctuate:

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

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

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WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

PO 5. Use colons to punctuate business letter salutations.
PO 6. Use apostrophes to punctuate: *a. contractions* *b. singular possessives* *c. plural possessives*
PO 7. Spell high **frequency words** correctly.
PO 8. Use common spelling patterns/generalizations to spell words correctly.
*PO 9. Use **homonyms** correctly in context.*
PO 10. Use resources to spell correctly.
PO 11. Use paragraph breaks to indicate an organizational structure.
*PO. 12. Use the following parts of speech correctly in **simple sentences**:* *a. nouns* *b. action/linking verbs* *c. personal pronouns* *d. adjectives* *e. adverbs* *f. conjunctions* *g. prepositions* *h. interjections*
*PO 13. Use subject/verb agreement in **simple**, **compound**, and **complex sentences**.*

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WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Strand 3: Writing Applications

Writing skills particular to the applications listed here may be taught across the curriculum, although some applications 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.

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Concept 1: Expressive
Expressive writing includes **personal narratives**, stories, poetry, songs, and dramatic pieces. Writing may be based on real or imagined events.

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

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

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

a. ***figurative language***
b. ***rhythm***
c. ***dialogue***
d. ***characterization***
e. ***plot***
f. *appropriate format*

Concept 2: Expository
Expository writing includes nonfiction writing that describes, explains, informs, or summarizes ideas and content. The writing supports a **thesis** based on research, observation, and/or experience.

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

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

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

(See R08-S3C1-02)

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

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

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WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Concept 3: Functional
Functional writing provides specific directions or information related to real-world tasks. This includes letters, memos, schedules, directories, signs, manuals, forms, recipes, and technical pieces for specific content areas.

*PO 1. Write a variety of functional texts (e.g., directions, recipes, procedures, **rubrics**, labels, posters, graphs/tables).*
(See R08-S3C2; M08-S2C1)

*PO 3. Write a **friendly letter** that includes a:*
- a. *heading*
- b. *salutation*
- c. *body*
- d. *closing*
- e. *signature*

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

PO 5. Address an envelope for correspondence that includes:
- a. *an appropriate return address*
- b. *an appropriate recipient address*

Concept 4: Persuasive
Persuasive writing is used for the purpose of influencing the reader. The author presents an issue and expresses an opinion in order to convince an audience to agree with the opinion or to take a particular action.

PO 1. Write persuasive text (e.g., essay, paragraph, written communications) that:
- a. *establishes and develops a **controlling idea***
- b. *supports arguments with detailed **evidence***
- c. *includes **persuasive techniques***
- d. *excludes irrelevant information*
- e. *attributes sources of information when appropriate*

(See R08-S3C3)

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WRITING STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Concept 5: Literary Response
Literary response is the writer's reaction to a literary selection. The response includes the writer's interpretation, analysis, opinion, and/or feelings about the piece of literature and selected elements within it.

PO 1. Write a response to literature that:
- a. *presents several clear ideas*
- b. *supports **inferences** and conclusions with examples from the text, personal experience, references to other works, or reference to non-print media*
- c. *relates own ideas to supporting details in a clear and logical manner*
- d. provides support adequate to the literary selection (e.g. short poem vs. novel)

(See R08-S2C1)

Concept 6: Research
Research writing is a process in which the writer identifies a topic or question to be answered. The writer locates and evaluates information about the topic or question, and then organizes, summarizes, and synthesizes the information into a finished product.

PO 1. Write a summary of information from sources (e.g. encyclopedias, websites, experts) that includes:
- a. *paraphrasing to convey ideas and details from the source*
- b. ***main idea**(s) and relevant details*

(See R08-S3C1-05, -06, -07, -08)

PO 2. Write an informational report that includes:
- a. *a focused topic*
- b. *appropriate facts and relevant details*
- c. *a logical sequence*
- d. *a concluding statement*
- e. *a list of sources used*

(See R08-S3C1-05, -06, -07, -08)

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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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 8

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 8

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

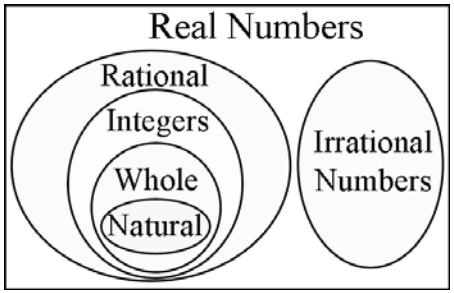
Understand and apply numbers, ways of representing numbers, and the relationships among numbers and different number systems.

In Grade 8, students extend their knowledge and skills with the classification, comparison, ordering, and modeling real numbers and the real number system.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Compare and order real numbers including very large and small integers, and decimals and fractions close to zero. Connections: M08-S1C3-02	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	Students order real numbers in a variety of forms (fractions, decimals, simple radicals, etc.) on a number line. Students compare real numbers within and among different subsets of the real number system.

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Classify real numbers as rational or irrational. Connections: M08-S1C1-03, M08-S1C3-02	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered.	Students differentiate the definitions of rational and irrational numbers. They use the definitions to classify a list of real numbers.
PO 3. Model the relationship between the subsets of the real number system. Connections: M08-S1C1-02	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Students can use graphic organizers to show the relationship between the subsets of the real number system. 
PO 4. Model and solve problems involving absolute value. Connections: M08-S1C2-05	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Students solve problems that include absolute values and graph their answers on a number line.

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Strand 1: Number and Operations
Concept 2: Numerical Operations

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

In Grade 8, students use exponents and scientific notation to describe very large and very small numbers. Students extend their facility with percents to include percentage increases, decreases, and interest rates. Students will simplify more complex numerical expressions that include grouping symbols, roots, and positive exponents.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Solve problems with factors, multiples, divisibility or remainders, prime numbers, and composite numbers.	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered.	Examples: • Use the rules of divisibility to classify numbers. Explain why some numbers may be listed in more than one group. • Compare the price of each of the jars of spaghetti sauce to determine the best deal. $\frac{\$2.12}{36\ oz}$ $\frac{\$1.34}{24\ oz}$ $\frac{\$0.88}{12\ oz}$ • You are planning a barbeque for 40 people. You will serve hot dogs. Each of the packages of hot dogs contains 8 hot dogs and each of the packages of hot dog buns contains 6 buns. You want to buy the minimum number of packages so that each hot dog is matched with a bun and there are no leftovers. How many packages of each must you buy? • A florist has 56 roses, 42 carnations, and 21 daisies that she can use to create bouquets. What is the greatest number of bouquets she can make containing at least one of each flower, without having any flowers left over?

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Describe the effect of multiplying and dividing a rational number by • a number less than zero, • a number between zero and one, • one, and • a number greater than one.	M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	Example: • Explain what happens to the number 2 when it is multiplied and divided by each of the real numbers listed below: o - 2 o $-\frac{1}{2}$ o $\frac{1}{2}$ o 2
PO 3. Solve problems involving percent increase, percent decrease, and simple interest rates. Connections: M08-S1C3-01, M08-S3C2-05, M08-S3C4-02	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Examples: • Gas prices are projected to increase 124% by April. A gallon of gas costs $4.17. How much will a gallon of gas cost in April? • A sweater is marked down 33%. Its original price was $37.50. What is the price of the sweater before sales tax?
PO 4. Convert standard notation to scientific notation and vice versa (include positive and negative exponents).		Examples: • Write the distance between the Earth and the Sun using scientific notation. The average distance between the Earth and the Sun is 150 million kilometers. • What is the average size of a red blood cell in meters written in standard notation? The average size of a red blood cell is 7.0×10^{-6} meters.

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 5. Simplify numerical expressions using the order of operations that include grouping symbols, square roots, cube roots, absolute values, and positive exponents. Connections: M08-S1C1-04		Students are expected to simplify expressions containing exponents, including zero. Examples: • $(5+7)^0+\lvert-13\rvert$ • $\frac{1}{3}(2+7^2)+\sqrt{84-35}$

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 8, students continue to use estimation strategies to check solutions for reasonableness. They extend their knowledge of estimation to approximate the location of real numbers on a number line.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Make estimates appropriate to a given situation. Connections: M08-S1C2-03, M08-S1C3-02, M08-S2C1-02, M08-S2C3-02, M08-S3C3-02, M08-S3C4-02, M08-S4C1-02 M08-S4C3-01, M08-S4C4-01, M08-S5C1-01	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered.	Students estimate using all four operations with whole numbers, fractions, and decimals. 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. 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 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
		Estimation strategies for calculations with fractions and decimals 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.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Estimate the location of rational and common irrational numbers on a number line. Connections: M08-S1C1-01, M08-S1C1-02, M08-S1C3-01		π, $\sqrt{2}$, and $\sqrt{3}$ are some examples of common irrational numbers that students should be able to estimate.

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 8, students build on their experiences of organizing and interpreting data and begin to apply principles to analyze statistical studies by identifying sources of bias. They create displays, including box and whisker plots, with two sets of data in order to compare and draw conclusions. Students use their knowledge of summary statistics to describe the data and the shape of their distribution.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Solve problems by selecting, constructing, interpreting, and calculating with displays of data, including box and whisker plots and scatterplots. Continued on next page	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Students calculate extreme values, mean, median, mode, range, quartiles, and interquartile ranges. They should approximate lines of best fit for scatterplots and analyze the correlation between the variables (positive, negative, and no correlation).

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
Connections: M08-S2C1-04, SC08-S1C3-01, SC08-S1C3-03, SC08-S1C4-02, SS08-S1C1-01, SS08-S1C1-02, SS08-S1C1-03, SS08-S2C1-01, SS08-S2C1-02, SS08-S4C1-01, SS08-S4C1-03		
PO 2. Make inferences by comparing the same summary statistic for two or more data sets. Connections: M08-S1C3-01, M08-S2C1-03	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	Summary statistics include: extreme values, mean, median, mode, range, quartiles, and interquartile ranges. Students will include scatterplots, box and whisker plots, and all other applicable representations taught in previous grade levels. They will compare two different populations or two subsets of the same population.
PO 3. Describe how summary statistics relate to the shape of the distribution. Connections: M08-S2C1-02	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Summary statistics include: extreme values, mean, median, mode, range, quartiles, and interquartile ranges.
PO 4. Determine whether information is represented effectively and appropriately given a graph or a set of data by identifying sources of bias and compare and contrast the effectiveness of different representations of data. Connections: M08-S2C1-01, SC08-S1C3-04, SC08-S1C3-05, SC08-S2C2-04, SS08-S1C1-02, SS08-S1C1-06, SS08-S2C1-02, SS08-S2C1-06, SS08-S4C1-03	M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	Graphical displays include representations taught from kindergarten through grade 8 (i.e., tally charts, pictographs, frequency tables, bar graphs (including multi bar graphs), line plots, circle graphs, line graph (including multi-line graphs), histograms, stem and leaf plots, box and whisker plots, and scatterplots).

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 5. Evaluate the design of an experiment. Connections: SC08-S1C2-02	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Students evaluate an experiment to determine if the design meets the intended purpose, is free of bias, and utilizes an appropriate sample. Example: • Students design an experiment to determine if there is a correlation between shoe size and height. All designs are evaluated to test for the characteristics above (i.e., intended purpose, free of bias, and appropriate sample size).

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

Understand and apply the basic concepts of probability.

In Grade 8, students expand their work with theoretical and experimental probability to include conditional probabilities in compound experiments.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Determine theoretical and experimental conditional probabilities in compound probability experiments.		Conditional probability is limited to situations with and without replacement.
PO 2. Interpret probabilities within a given context and compare the outcome of an experiment to predictions made prior to performing the experiment.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Students predict the outcomes of an experiment with and without replacement by calculating the theoretical probability. They compare the results of the experiment to their predictions. Example: • Tyrone takes two coins at random from his pocket, choosing one and setting it aside before choosing the other. Tyrone has 2 quarters, 6 dimes, and 3 nickels in his pocket. Make a prediction based upon the theoretical probability that he chooses a quarter followed by a dime. Try Tyrone's experiment by performing 50 trials. What is the experimental probability of drawing a quarter followed by a dime? How does the experimental probability compare to your prediction (theoretical probability)?

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Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 3. Use all possible outcomes (sample space) to determine the probability of dependent and independent events. Connections: M08-S2C3-01		Independent events are two events in which the outcome of the second event is not affected by the outcome of the first event (e.g., rolling two number cubes, tossing two coins, rolling a number cube and spinning a spinner). Dependent events are two events such that the likelihood of the outcome of the second event is affected by the outcome of the first event (e.g., bag pull without replacement, drawing a card from a stack without replacement, two cars parking in a parking lot).

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 8, students use more abstract reasoning and algebraic representation to solve counting problems. Understanding the concepts of probability is enhanced by the foundation of counting strategies. Factorial notation is introduced.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Represent, analyze, and solve counting problems with or without ordering and repetitions. Connections: M08-S2C2-03	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	By the end of Grade 8, students are able to solve a variety of counting problems using both visual and numerical representations. They should have had varied counting experiences that, over time, have helped to build these understandings. Initially, they begin by randomly generating all possibilities and then they begin to organize their thinking through visual representations such as charts, systematic listing, and tree diagrams. Finally, they are able to make connections from these visual representations to build numeric solutions. Continued on next page

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Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
		Through this process of connecting numeric representations with visual representations, even if they cannot be completely drawn but rather are mentally visualized, students are now able to solve a variety of counting problems numerically. Example: • Passwords are often a sequence of letters and numbers. A 6-character password is composed of 4 digits and 2 letters. o If no repetition of letters is allowed, how many passwords are there? o If no repeating letters or digits are allowed, how many passwords are there? o If repeating both letters and digits are allowed, how many passwords are allowed? Solution: Students should be able to represent the general counting problem as: ---- ---- ---- ---- ---- ---- digit digit digit digit letter letter and mentally visualize a tree diagram which, from some starting vertex, that spans either ten edges (if the initial position is a digit) or twenty-six edges (if the initial position contains a letter) and where each branch of the tree diagram has six levels that represent the next possible options for that position. Their visualization of this problem should convince students that the solution will involve many possibilities, that actually drawing the tree diagram will be hard work, and thus motivate them to find a numerical way to count all possibilities. Continued on next page

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Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
		o If no repetition of letters is allowed, students should count the number of possible passwords as 10 x 10 x 10 x 10 x 26 x 25 (or some equivalent arrangement of this multiplication problem, for example, 26 x 25 x 10 x 10 x 10 x 10). o If no repeating letters or digits are allowed, students should count the number of possible passwords as 10 x 9 x 8 x 7 x 26 x 25. o If repeating letters and digits are allowed, students should count the number of possible passwords as 10 x 10 x 10 x 10 x 26 x 26.
PO 2. Solve counting problems and represent counting principles algebraically including factorial notation. Connections: M08-S1C3-01	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution	Example: • Five athletes are entered in a race, and five places are awarded ribbons. In how many different possible ways might they finish? Solution: W= 5! or 5 x 4 x 3 x 2 x 1

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 4: Vertex-Edge Graphs

Understand and apply vertex-edge graphs.

In Grade 8, students explore using directed graphs as a means of problem solving. This will lay a foundation for network and adjacency matrix investigations in high school.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Use directed graphs to solve problems.	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Example: • Four players (Dom, Nathan, Ryan, & Zachary) are playing in a round-robin tennis tournament, where every player plays every other player. Dom beats Nathan and Ryan, Nathan beats Zachary, Ryan beats Nathan and Zachary, and Zachary beats Dom. o Represent this round-robin tournament using a directed graph. o How many matches are played in a round-robin tournament with four players? Systematically list all the matches. Explain your answer. o Find all Hamilton paths in this graph. o "A winner" can be defined as the first player in a Hamilton path. How many possible tournament "winners" are in this example? What conclusions can you draw from this example? Continued on next page

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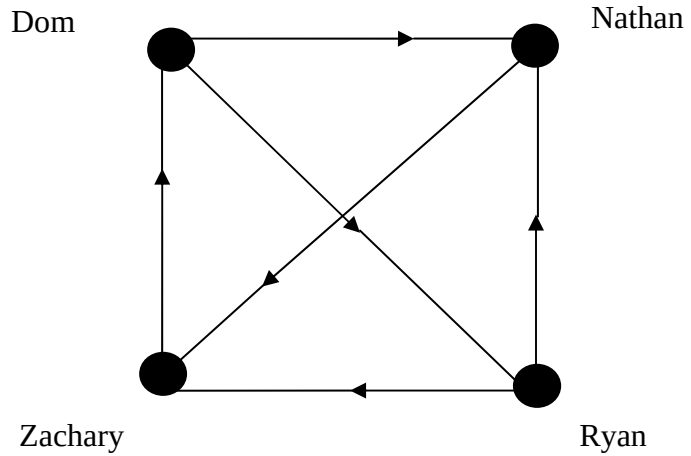
Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
		Solution:  o There are six matches played in a round-robin tournament with four players. These "matches" are represented by each edge in the graph above. One possible systematic list is below: MATCH #1 – Dom plays Nathan MATCH #2 – Dom plays Ryan MATCH #3 – Dom plays Zachary MATCH #4 – Nathan plays Ryan MATCH #5 – Nathan plays Zachary MATCH #6 – Ryan plays Zachary Continued on next page

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Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
		o Following the edges in the direction of the arrows, one can find a Hamilton path that starts with Nathan to Zachary to Dom to Ryan. Thus we can say that "Nathan" is a winner! Another Hamilton path can start with Ryan to Nathan to Zachary to Dom (or Ryan to Zachary to Dom to Nathan). In both such cases, we can call "Ryan" a winner! A third type of Hamilton path can start with Dom to Ryan to Nathan to Zachary, so we can call "Dom" a winner! And finally, the last type of Hamilton path can start with Zachary to Dom to Ryan to Nathan; we can call "Zachary" a winner! Therefore, in this tournament, we can have four different tournament winners! o How do we decide who is the tournament winner? On the basis of the Hamilton paths, there is no clear winner in this tournament. In one Hamilton path, Nathan wins, in another Hamilton path, Ryan wins; another Dom wins and yet another Zachary wins! Who is the overall winner? Unfortunately, there is no clear winner -- the ranking of these players is ambiguous. Students should enjoy deciding who should be ranked first and why that player should be ranked first! For tournament situations that can be modeled where one Hamilton path exists in the graph, the ranking is unambiguous.

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

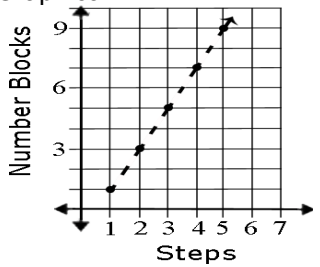
Strand 3: Patterns, Algebra, and Functions

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 8, students increase their fluency with numerical and geometric sequences by expressing their thinking using a variety of representations. Students describe and analyze patterns and have the opportunity to create both types of sequences.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Recognize, describe, create, and analyze numerical and geometric sequences using tables, graphs, words, or symbols; make conjectures about these sequences. Connections: M08-S3C2-02, M08-S3C2-03, M08-S3C2-05	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Given an equation, students should create a table, graph the points on a coordinate grid, and describe the sequence. Example: • Given a sequence such as 1, 4, 9, 16, … students need to create a table, graph the points on a coordinate grid, and describe algebraically the rule. Note the different representations of a sequence of blocks below: o Graphical:  Continued on next page

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<table>
<tr><th>Performance Objectives</th><th>Process Integration</th><th>Explanations and Examples</th></tr>
<tr><td>Students are expected to:</td><td></td><td></td></tr>
<tr><td></td><td></td><td>

Table:
<table>
<tr><th>Step</th><th>Number Blocks</th></tr>
<tr><td>1</td><td>1</td></tr>
<tr><td>2</td><td>3</td></tr>
<tr><td>3</td><td>5</td></tr>
<tr><td>.
.
.</td><td>.
.
.</td></tr>
<tr><td>n</td><td>2n-1</td></tr>
</table>

Written description:
Begin with a square, add 2 squares on each step.
Physical Models:
 
Equation: $y = 2n - 1$

</td></tr>
</table>

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

Describe and model functions and their relationships.

In Grade 8, students extend their understanding of functions by exploring proportional algebraic relationships and analyzing functions.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Sketch and interpret a graph that models a given context; describe a context that is modeled by a given graph. Connections: M08-S3C2-04, M08-S3C2-05, M08-S3C3-01, M08-S3C3-04	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-05. Apply a previously used problem-solving strategy in a new context.	Use graphs of experiences common to students. Students are expected to both sketch and interpret graphs. Example: • Sketch a graph of someone riding a bike to school that starts at home, travels two blocks at a constant speed, travels one block up a hill at a decreasing speed, then travels one block at a constant speed to reach school.
PO 2. Determine if a relationship represented by a graph or table is a function. Connections: M08-S3C1-01, M08-S3C2 - 05	M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem. M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Students justify their reasoning about why a graph or table is a function, or why a graph or table is not a function. Students use strategies such as graphing the ordered pairs from a table, applying the vertical line test, or analyzing the patterns in a table to determine if each value of the independent variable has a unique value for the dependent variable.
PO 3. Write the rule for a simple function using algebraic notation. Connections: M08-S3C1-01, M08-S3C2 - 05		Example: • Write a rule for the function illustrated by the table of values below. *x* | 2 | 3 | 5 | 8 | 12 *y* | 5 | 8 | 14 | 23 | 35

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 4. Identify functions as linear or nonlinear and contrast distinguishing properties of functions using equations, graphs, or tables. Connections: M08-S3C2-01	M08-S5C2-03. Identify relevant, missing, and extraneous information related to the solution to a problem. M08-S5C2-12. Make, validate, and justify conclusions and generalizations about linear relationships.	Properties of functions include increasing, decreasing, and constant growth and minimum and maximum values. Students use strategies to determine linearity such as creating a table and graph from an equation or looking for patterns in equations and tables.
PO 5. Demonstrate that proportional relationships are linear using equations, graphs, or tables. Connections: M08-S1C2-03, M08-S3C1-01, M08-S3C2-01, M08-S3C2-02, M08-S3C2-03, M08-S3C3-03, M08-S3C3-04, M08-S3C4-01, M08-S3C4-02, M08-S5C1-01	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem. M08-S5C2-12. Make, validate, and justify conclusions and generalizations about linear relationships.	Students model direct and indirect variation. Example: • Graph and/or make a table of these equations: o $y = 2x$ o $y = \frac{1}{2}x$ o $y = \frac{3}{x}$

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

Represent and analyze mathematical situations and structures using algebraic representations.

In Grade 8, students extend their understanding of algebraic expressions, equations, and inequalities through the analysis of contextual situations. Students evaluate expressions and solve equations and inequalities of increasing complexity.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Write or identify algebraic expressions, equations, or inequalities that represent a situation. Connections: M08-S3C2-01	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Example: • Florencia has at most $60 to spend on clothes. She wants to buy a pair of jeans for $22 dollars and spend the rest on t-shirts. Each t-shirt costs $8. Write an inequality for the number of t-shirts she can purchase.
PO 2. Evaluate an expression containing variables by substituting rational numbers for the variables. Connections: M08-S1C3-01		Any rational number (whole numbers, integers, fractions, and decimals) can be used as the value for a variable. Example: • $b^2 - 4ac$, where $b = 2$, $a = \frac{1}{2}$ and $c = -4$
PO 3. Analyze situations, simplify, and solve problems involving linear equations and inequalities using the properties of the real number system. Connections: M08-S3C2-05	M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.	The properties of real numbers and properties of equality include but are not limited to the following: associative, commutative, distributive, identity, zero, reflexive, and transitive. The property of closure is not expected at this grade level. Continued on next page

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

<table>
<tr><th>Performance Objectives</th><th>Process Integration</th><th>Explanations and Examples</th></tr>
<tr><td>Students are expected to:</td><td></td><td></td></tr>
<tr><td></td><td></td><td>Example:
Steven saved $25 dollars. He spent $10.81, including tax, to buy a new DVD. He needs to set aside $10.00 to pay for his lunch next week. If peanuts cost $0.38 per package including tax, what is the maximum number of packages that Steven can buy?

Write an equation or inequality to model the situation. Explain how you determined whether to write an equation or inequality and the properties of the real number system that you use to find a solution.</td></tr>
<tr><td>PO 4. Translate between different representations of linear equations using symbols, graphs, tables, or written descriptions.

Connections: M08-S3C2-01, M08-S3C2-05</td><td>M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.</td><td>Example:
Given one representation, students create any of the other representations that show the same relationship. Representations of linear equations include tables, graphs, equations, or written descriptions.

o Equation: y = 4x + 1

o Written description:
Susan started with $1 in her savings. She plans to add $4 per week to her savings.

o Table:<table><tr><th>x</th><th>y</th></tr><tr><td>-2</td><td>-7</td></tr><tr><td>-1</td><td>-3</td></tr><tr><td>0</td><td>1</td></tr><tr><td>1</td><td>5</td></tr><tr><td>2</td><td>9</td></tr></table>
Continued on next page</td></tr>
</table>

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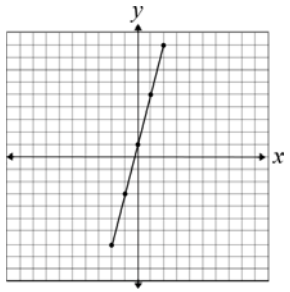
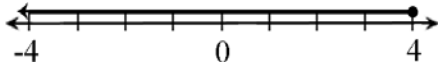
Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
		o Graph 
PO 5. Graph an inequality on a number line.		Example: • Graph $x \leq 4$. 

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 8, students are introduced to the slope-intercept form of an equation. Students analyze linear equations and graphs to identify key characteristics. They solve problems involving interest, distance, and percent change in the context of rate.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Interpret the relationship between a linear equation and its graph, identifying and computing slope and intercepts. Connections: M08-S3C2-05	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-12. Make, validate, and justify conclusions and generalizations about linear relationships.	Students determine the slope, *x*- and *y*- intercepts given an equation in slope intercept form. Students graph an equation given in slope intercept form.
PO 2. Solve problems involving simple rates. Connections: M08-S1C2-03, M08-S1C3-01, M08-S3C2-05	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Simple rates include interest, distance, and percent change. Examples: • Mark deposits $120 into a savings account that earns 4% interest annually. The interest does not compound. How much interest will Mark earn after 2 years? • Linda traveled 110 miles in 2 hours. If her speed remains constant, how many miles can she expect to travel in 4.5 hours? • At the end of the first quarter, Robin's overall grade percentage was 74%. At the end of the second quarter her grade percentage was 88%. Calculate the percent change in her grade from first and second quarter.

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

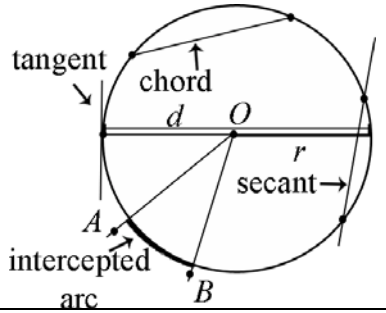
Strand 4: Geometry and Measurement

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 8, students investigate the "art" of geometric design by changing the shapes of figures and solids. Students increase their knowledge of circles as additional vocabulary is added. They accurately and thoroughly describe figures and their attributes as they work with geometric proof. Students investigate proportionality using triangles and use their knowledge of the Pythagorean Theorem to solve problems.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Identify the attributes of circles: radius, diameter, chords, tangents, secants, inscribed angles, central angles, intercepted arcs, circumference, and area.	M08-S5C2-11. Identify simple valid arguments using *if… then* statements.	Example: • Students will draw a circle and identify and label attributes or identify attributes from a diagram. 

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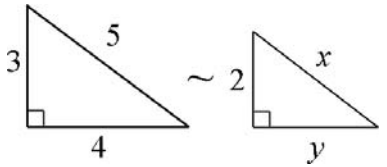
MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Predict results of combining, subdividing, and changing shapes of plane figures and solids. Connections: M08-S1C3-01, M08-S4C2-02	M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	Students need multiple opportunities to engage in activities such as paper folding, tiling, rearranging cut up pieces, modeling cross sections of solids, and constructing Frieze patterns and tessellations to accurately predict and describe the results of combining and subdividing two- and three-dimensional figures.
PO 3. Use proportional reasoning to determine congruence and similarity of triangles. Connections: M08-S4C4-02	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem. M08-S5C2-13. Verify the Pythagorean Theorem using a valid argument.	Proportional reasoning includes consideration of conservation of angle and proportionality of side length. Example: • The triangles shown in the figure are similar. Find the length of the sides labeled *x* and *y*.  Solution: $\frac{3}{4}=\frac{2}{y}$ $\quad$ $\frac{3}{5}=\frac{2}{x}$ $3y=8$ $\quad$ $3x=10$ $y=\frac{8}{3}=2\frac{2}{3}$ $\quad$ $x=\frac{10}{3}=3\frac{1}{3}$

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 4. Use the Pythagorean Theorem to solve problems. Connections: M08-S4C3-02, M08-S5C2-13	M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem. M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	Students should be familiar with the common Pythagorean triples. Examples: • Is a triangle with side lengths 5 cm, 12 cm, and 13 cm a right triangle? Why or why not? • Determine the length of the diagonal of a rectangle that is 7 ft by 10 ft.

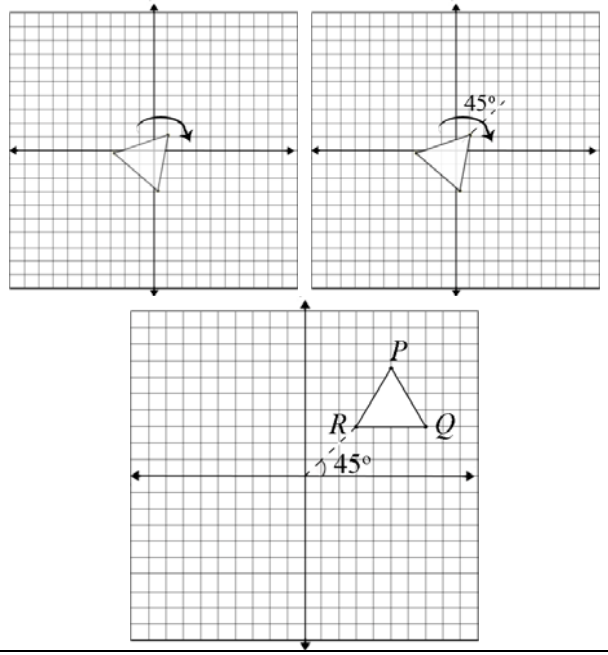
The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 8, students investigate transformations of shapes on a coordinate grid. Students expand their knowledge of symmetry by finding lines of symmetry and classifying 2-dimensional figures by their symmetry.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Model the result of rotations in multiples of 45 degrees of a 2-dimensional figure about the origin.	M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem. M08-S5C2-05. Apply a previously used problem-solving strategy in a new context.	Figures may be rotated with the origin at the center or another point on the figure or using the origin as the point of rotation where the figure does not contain the origin. 

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MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Describe the transformations that create a given tessellation. Connections: M08-S4C1-P02		Students will look at a tessellation or Frieze pattern. They will identify the original figure and the transformation(s) used to create the tessellation or Frieze pattern. Example: • Look at the pattern below. What figure was used to create the pattern? What transformation(s) did the figure undergo? 
PO 3. Identify lines of symmetry in plane figures or classify types of symmetries of 2-dimensional figures.		Students are expected to classify figures by symmetry including rotational symmetry and reflection symmetry and differentiate between them.

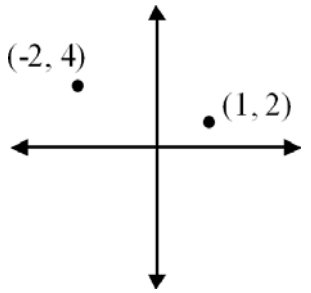
The bulleted items within a performance objective indicate the specific content to be taught.

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Strand 4: Geometry and Measurement
Concept 3: Coordinate Geometry

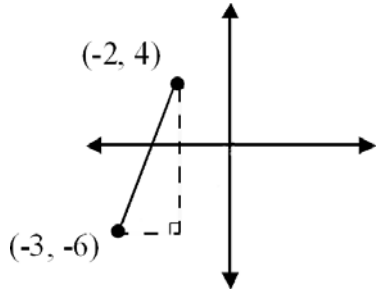
Specify and describe spatial relationships using rectangular and other coordinate systems while integrating content from each of the other strands.

In Grade 8, students develop algorithms and investigate midpoint and distance calculations using the coordinate plane.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Make and test a conjecture about how to find the midpoint between any two points in the coordinate plane. Connections: M08-S1C3-01	M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	Students are expected to find the midpoint between any two points including points that are not horizontal or vertical from each other as shown in the model below. Students should not be given the formula, but rather create a formula or process with which to find the midpoint. Students test their conjecture and the conjecture of others to determine their validity. Students can then compare their conjectures to the formula or to the graphical algorithm for finding the midpoint of a line segment. 

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 2. Use the Pythagorean Theorem to find the distance between two points in the coordinate plane. Connections: M08-S4C1-04	M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language. M08-S5C2-13. Verify the Pythagorean Theorem using a valid argument.	Students will create a right triangle from the two points given (as shown in the diagram below) and then use the Pythagorean Theorem to find the distance between the two given points. 

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Strand 4: Geometry and Measurement
Concept 4: Measurement

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

In Grade 8, students utilize and extend their proportional thinking to solve problems involving measurement conversions, geometric measurements, and calculations of surface area and volume.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Solve problems involving conversions within the same measurement system. Connections: M08-S1C3-01, M08-S5C1-01	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Examples: • U.S. Customary: A new carpet installer measured and found the tear in the carpet to be 75 square inches. When he went to order carpet for a patch, the carpet distributor wanted the measurement in square feet. What measurement should the installer give to the distributor? • Metric: The liquid in a beaker measures 250 milliliters. How many liters is this?
PO 2. Solve geometric problems using ratios and proportions. Connections: M08-S4C1-03, M08-S5C2-13	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Example: • Two rectangles are similar. The dimensions of the first rectangle are a length of 3 cm and width of 7 cm. The width of the second rectangle is 6 cm. What is its length?
PO 3. Calculate the surface area and volume of rectangular prisms, right triangular prisms, and cylinders.		Students understanding of volume can be supported by focusing on the area of base times the height to calculate volume. Students understanding of surface area can be supported by focusing on the sum of the area of the faces. Nets can be used to evaluate surface area calculations. Example: • Calculate the volume and surface area of a cylinder that has a diameter of 50 mm and a height of 35 mm.

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 8, students continue to further their understanding of proportion to create algorithms to solve a variety of problems.

Performance Objectives	***Process Integration***	***Explanations and Examples***
Students are expected to:		
PO 1. Create an algorithm to solve problems involving indirect measurements, using proportional reasoning, dimensional analysis, and the concepts of density and rate. Connections: M08-S1C3-01, M08-S3C2-05, M08-S4C4-01	M08-S5C2-05. Apply a previously used problem-solving strategy in a new context. M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Dimensional analysis uses ratios to simplify the conversion among or between units of measure. There is a strong connection between this performance objective and converting within measurement systems (M08-S4C4-01). Example: • Below, a student determined how many square inches are in a square yard. Write an algorithm for this process. Test the algorithm with a different conversion. $1\ yd^2 = 3\ ft \bullet 3\ ft = 9\ ft^2$ $1\ ft^2 = 12\ in \bullet 12\ in = 144\ in^2$ $1\ yd^2 \ x \frac{9\ ft^2}{1\ yd^2} \ x \frac{144\ in^2}{1\ ft^2}$ $= 9 \bullet 144\ in^2$ $= 1296\ in^2$

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 8, students continue to build their understanding and application of problem solving strategies and processes. Students' solution paths include the analysis of the situation; identification of possible strategies; efficient method in solving the problem; and justification of why the solution is reasonable. Students use multiple representations in their problem solving process.

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.		Students need multiple opportunities to think about and dissect mathematical problems before undertaking the steps to find the problem's solution. Descriptions of solution processes, explanations, and justifications can include numbers, words (including mathematical language), pictures, physical objects, or equations. Students use all of these representations as needed.
PO 2. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.		Example: • The dimensions of a room are 12 feet by 15 feet by 10 feet. What is the furthest distance between any two points in the room? Explain your solution.

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 3. Identify relevant, missing, and extraneous information related to the solution to a problem.		
PO 4. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.		Students should be able to explain or show their work using multiple representations and verify that their answer is reasonable.
PO 5. Apply a previously used problem-solving strategy in a new context.		Example: • Miranda's cellular phone service contract ends this month. She is looking for ways to save money and is considering changing cellular phone companies. Her current cell phone carrier, X-Cell, calculates the monthly bill using the equation $C = \$15.00 + \$0.07m$, where C represents the total monthly cost and m represents the number of minutes of talk time during a monthly billing cycle. Another company, Prism Cell, offers 300 free minutes of talk time each month for a base fee of $30.00 with an additional $0.15 for every minute over 300 minutes. Miranda's last five phone bills were $34.95, $35.70, $37.82, $62.18, and $36.28. Using the data from the last five months, help Miranda decide whether she should switch companies. Justify your answer. 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 8

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.	
		How can this problem help you determine which car to buy given different payment plans? How can this problem help you determine whether to buy an apartment with paid utilities or without paid utilities? Are there other situations where you would use the same problem solving strategies?
PO 6. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.		Students use mathematical vocabulary and data in explanations of their mathematical thinking and in their justifications of the conclusions drawn.
PO 7. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.		Students need multiple opportunities to think about and dissect mathematical problems before undertaking the steps to find the problem's solution. Descriptions of solution processes, explanations, and justifications can include numbers, words (including mathematical language), pictures, physical objects, or equations. Students use all of these representations as needed.
PO 8. Describe when to use proportional reasoning to solve a problem.		Students differentiate when it is appropriate to use multiplicative versus additive comparisons, and they understand that proportional reasoning makes use of multiplicative comparisons.

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 9. Make and test conjectures based on information collected from explorations and experiments.		Students draw conclusions based on actual collected data (qualitative and/or quantitative) and not solely on previously understood beliefs or expected data.
PO 10. Solve logic problems involving multiple variables, conditional statements, conjectures, and negation using words, charts, and pictures.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	Example: • A small high school has 57 tenth-graders. Of these students, 28 are taking geometry, 34 are taking biology, and 10 are taking neither geometry nor biology. If a tenth grader is taking neither geometry nor biology, then they are taking either Algebra II or Algebra I. There are 4 students enrolled in Algebra I that are in the 10^{th} grade. How many students are taking both geometry and biology? How many students are taking geometry but not biology? How many students are taking biology but not geometry? How many students are taking Algebra II? Represent your solution with a chart, picture, or a written paragraph.
PO 11. Identify simple valid arguments using *if… then* statements.	M08-S5C2-03. Identify relevant, missing, and extraneous information related to the solution to a problem.	Example: • All chords are line segments with both endpoints on the circumference of the circle. If a diameter is a line segment that passes through the center of a circle and connects two points of the circumference, is a diameter a chord?

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

MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 12. Make, validate, and justify conclusions and generalizations about linear relationships.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Example: • Bailey's cross-country coach records her time at half-mile intervals throughout a 3.25-mile race. Would the coach's recorded times and distances represent a linear relationship? Explain your reasoning.
PO 13. Verify the Pythagorean Theorem using a valid argument. Connections: M08-S4C1-04, M08-S4C3-02	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	Example: • Verify, using a model, that the sum of the squares of the legs is equal to the square of the hypotenuse in a right triangle.

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

Science Standard Articulated by Grade Level 2004

Grade 8

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 8

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
Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

PO 1. Formulate questions based on observations that lead to the development of a hypothesis.
(See M08-S2C1-01)

PO 2. Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis.
(See W08-S3C6-01, R08-S3C1-06, and R08-S3C2-03)

PO 3. Generate a hypothesis that can be tested.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

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

PO 2. Design a controlled investigation to support or reject a hypothesis.

PO 3. Conduct a controlled investigation to support or reject a hypothesis.

PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).

PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.
(See W08-S3C2-01 and W08-S3C3-01)

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 1. Analyze data obtained in a scientific investigation to identify trends.
(See M08-S2C1-08)

PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

PO 3. Interpret data that show a variety of possible relationships between two variables, including:
- positive relationship
- negative relationship
- no relationship

PO 4. Formulate a future investigation based on the data collected.

PO 5. Explain how evidence supports the validity and reliability of a conclusion.

PO 6. Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).

PO 7. Critique scientific reports from periodicals, television, or other media.

PO 8. Formulate new questions based on the results of a previous investigation.

Concept 4: Communication
Communicate results of investigations.

PO 1. Communicate the results of an investigation.

PO 2. Choose an appropriate graphic representation for collected data:
- *line graph*
- *double bar graph*
- *stem and leaf plot*
- *histogram*

(See M08-S2C1-03)

PO 3. Present analyses and conclusions in clear, concise formats.
(See W08-S3C6-02)

PO 4. Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns).
(See W08-S3C3-01)

PO 5. Communicate the results and conclusion of the investigation.
(See W08-S3C6-02)

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 8

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, cultural, and technological contributions to scientific knowledge.

PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson and Crick [scientists], support Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).

PO 2. Evaluate the effects of the following major scientific milestones on society:
- Mendelian Genetics
- Newton's Laws

PO 3. Evaluate the impact of a major scientific development occurring within the past decade.

PO 4. Evaluate career opportunities related to life and physical sciences.

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

PO 1. Apply the following scientific processes to other problem solving or decision making situations:
- *observing*
- *questioning*
- *communicating*
- *comparing*
- *measuring*
- *classifying*
- *predicting*
- *organizing data*
- *inferring*
- *generating hypotheses*
- *identifying variables*

PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.

PO 3. Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.

PO 4. Explain why scientific claims may be questionable if based on very small samples of data, biased samples, or samples for which there was no control.

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 8

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. Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:
- waste disposal of industrial chemicals
- greenhouse gases

PO 2. Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.

Concept 2: Science and Technology in Society
Develop viable solutions to a need or problem.

PO 1. Propose viable methods of responding to an identified need or problem.

PO 2. Compare solutions to best address an identified need or problem.

PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.

PO 4. Compare risks and benefits of the following technological advances:
- radiation treatments
- genetic engineering (See Strand 4 Concept 2)
- airbags (See Strand 5 Concept 2)

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 8

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: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

No performance objectives at this grade level

Concept 2: Reproduction and Heredity
Understand the basic principles of heredity.

PO 1. Explain the purposes of cell division:
- growth and repair
- reproduction

PO 2. Explain the basic principles of heredity using the human examples of:
- eye color
- widow's peak
- blood type

PO 3. Distinguish between the nature of dominant and recessive traits in humans.

Concept 3: Populations of Organisms in an Ecosystem
Analyze the relationships among various organisms and their environment.

No performance objectives at this grade level

Concept 4: Diversity, Adaptation, and Behavior
Identify structural and behavioral adaptations.

PO 1. Explain how an organism's behavior allows it to survive in an environment.

PO 2. Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.

PO 3. Determine characteristics of organisms that could change over several generations.

PO 4. Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).

PO 5. Analyze the following behavioral cycles of organisms:
- hibernation
- migration
- dormancy (plants)

PO 6. Describe the following factors that allow for the survival of living organisms:
- protective coloration
- beak design
- seed dispersal
- pollination

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SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 and Changes of Properties in Matter
Understand physical and chemical properties of matter.

PO 1. Identify different kinds of matter based on the following physical properties:
- states
- density
- boiling point
- melting point
- solubility

PO 2. Identify different kinds of matter based on the following chemical properties:
- reactivity
- pH
- oxidation (corrosion)

PO 3. Identify the following types of evidence that a chemical reaction has occurred:
- formation of a precipitate
- generation of gas
- color change
- absorption or release of heat

PO 4. Classify matter in terms of elements, compounds, or mixtures.

PO 5. Classify mixtures as being homogeneous or heterogeneous.

PO 6. Explain the systematic organization of the periodic table.

PO 7. Investigate how the transfer of energy can affect the physical and chemical properties of matter.

Concept 2: Motion and Forces
Understand the relationship between force and motion.

PO 1. Demonstrate velocity as the rate of change of position over time.

PO 2. Identify the conditions under which an object will continue in its state of motion (Newton's 1st Law of Motion).

PO 3. Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton's 2nd Law of Motion).

PO 4. Describe forces as interactions between bodies (Newton's 3rd Law of Motion).

PO 5. Create a graph devised from measurements of moving objects and their interactions, including:
- position-time graphs
- velocity-time graphs

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

Concept 3: Transfer of Energy Understand that energy can be stored and transferred.
No performance objectives at this grade level

Strand 6: Earth and Space Science

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: Structure of the Earth Describe the composition and interactions between the structure of the Earth and its atmosphere.
No performance objectives at this grade level

Concept 2: Earth's Processes and Systems Understand the processes acting on the Earth and their interaction with the Earth systems.
No performance objectives at this grade level

Concept 3: Earth in the Solar System Understand the relationships of the Earth and other objects in the solar system.
No performance objectives at this grade level

Social Studies Standard Articulated by Grade Level 2006

Grade 8

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 8

Eighth Grade History Strands emphasize the historical foundations and democratic principles that framed our Constitution and led to our form of democracy. The history of World War II to the contemporary world is also studied.

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**. Construct charts, graphs, and narratives using historical data.*

***PO 2.** Interpret historical data displayed in graphs, tables, and charts.*

***PO 3**. Construct timelines (e.g., presidents/ world leaders, key events, people) of the historical era being studied.*

***PO 4.** Formulate questions that can be answered by historical study and research.*

PO 5. Describe the difference between a primary source document and a secondary source document and the relationships between them.

***PO 6**. Determine the credibility and bias of primary and secondary sources*

***PO 7**. Analyze cause and effect relationships between and among individuals and/or historical events.*

PO 8. Analyze two points of view on the same historical event.

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.

No performance objectives at this grade.

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.

No performance objectives at this grade.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

Concept 4: Revolution and New Nation 1700s – 1820

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

(Note: The American Revolution was taught in Grade 5. The Foundations and Structure of American Government are taught in Grade 8, Strand 3.)

PO 1. Analyze the following events which led to the American Revolution:
- a. Tea Act
- b. Stamp Act
- c. Boston Massacre
- d. Intolerable Acts
- e. Declaration of Independence

PO 2. Describe the significance of key events of the Revolutionary War:
- a. major battles (e.g., Lexington, Saratoga, Trenton)
- b. aid from France
- c. surrender at Yorktown

PO 3. Describe the impact of the following key individuals on the Revolutionary War:
- a. Benjamin Franklin
- b. Thomas Jefferson
- c. George Washington
- d. Patrick Henry
- e. Thomas Paine
- f. King George III

PO 4. Describe the significance of the following documents:
- a. Declaration of Independence
- b. Articles of Confederation
- c. Constitution
- d. Bill of Rights

PO 5. Explain the influence of the following individuals in the establishment of a new government:
- a. Thomas Jefferson
- b. James Madison
- c. John Adams
- d. Benjamin Franklin

PO 6. Describe how one nation evolved from thirteen colonies:
- a. Constitutional Convention
- b. George Washington's presidency
- c. creation of political parties (e.g., Federalists, Whigs, Democratic-Republicans)

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.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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.

No performance objectives at this grade.

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

No performance objectives at this grade.

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.

(Note: The Great Depression was taught in Grade 7 and World War II in Arizona was introduced in Grade 4.))

PO 1. Review the impact of the Great Depression on the United States.

PO 2. Explain how Pearl Harbor led to United States involvement in World War II.

PO 3. Explain the impact of World War II on economic recovery from the Great Depression.

PO 4. Explain how the following factors affected the U.S. home front during World War II:
- a. war bond drives
- b. war industry
- c. women and minorities in the work force
- d. rationing
- e. internment of Japanese-, German-, and Italian –Americans

PO 5. Describe Arizona's contributions to the war effort:
- a. Native American Code Talkers
- b. Ira Hayes
- c. mining
- d. training bases
- e. POW and internment camps

PO 6. Summarize the United States' role in the following events:
- a. D-day invasion
- b. battles of the Pacific
- c. development and use of the atomic bomb
- d. V-E Day / V-J Day

PO 7. Analyze the following individuals' significance to World War II:
- a. Franklin D. Roosevelt
- b. Dwight Eisenhower
- c. George Patton
- d. Douglas MacArthur
- e. Harry Truman
- f. Eleanor Roosevelt

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 the following origins of the Cold War:
- a. Western fear of communist expansion
- b. Soviet fear of capitalist influences
- c. development of nuclear weapons
- d. Truman Doctrine

PO 2. Describe the impact of the Cold War on the United States:
- a. McCarthyism
- b. arms race
- c. space race
- d. Cuban Missile Crisis
- e. creation of the CIA

PO 3. Identify the role of the United States in the Korean War:
- a. Communist containment
- b. military involvement
- c. resolution of conflict

PO 4. Identify the role of the United States in the Vietnam Conflict:
- a. containment of Communism – Domino Theory
- b. Gulf of Tonkin Resolution
- c. Tet Offensive
- d. anti-war protests
- e. Vietnam Peace Accords

PO 5. Describe life (e.g., transportation, communication, technology, medical, entertainment, growth of suburbs) in the U.S. during the Post War period.

PO 6. Describe the importance of the following civil rights issues and events:
- a. Jim Crow Laws
- b. nonviolent protests
- c. desegregation
- d. Civil Rights Act of 1964
- e. Voting Rights Act of 1965

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 events (e.g., opening of foreign relations with China, Watergate, resignation) of the presidency of Richard Nixon.

PO 2. Describe events (e.g., succession to presidency, pardoning of Nixon) of the presidency of Gerald Ford.

PO 3. Describe events (e.g., Camp David Peace Accords, Iran Hostage Crisis) of the presidency of Jimmy Carter.

PO 4. Describe events (e.g., Star Wars, Iran-Contra Affair) of the presidency of Ronald Reagan.

PO 5. Describe events (e.g., Persian Gulf War, Berlin Wall falls) of the presidency of George H.W. Bush.

PO 6. Describe events (e.g., economic growth, impeachment) of the presidency of William Clinton.

PO 7. Describe events (e.g., September 11 Terrorist Attacks, Afghanistan, Iraq War) of the presidency of George W. Bush.

PO 8. *Describe current events using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).*

PO 9. *Identify the connection between current and historical events and issues studied at this grade level using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).*

PO 10. *Describe how key political, social, geographic, and economic events of the late 20th century and early 21st century affected, and continue to affect, the United States.*

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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**. Construct charts, graphs and narratives using historical data.*

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***PO 7.** Analyze cause and effect relationships between and among individuals and/or historical events.*

PO 8. Analyze two points of view on the same historical event.

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.

No performance objectives at this grade.

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.

No performance objectives at this grade.

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Approved 9.26.05 Updated 5.22.06

SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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.

(Note: WW I was taught in Grade 7.)

PO 1. Review the rise of totalitarianism in Europe following World War I.

PO 2. Analyze the major causes of World War II:
- a. aggressive search for resources by Japan
- b. political ideologies Fascism and Nazism
- c. resentment toward theTreaty of Versailles

PO 3. Trace the series of invasions and conquests in the European and Pacific Theaters in World War II.

PO 4. Describe the following events leading to the Allied victory:
- a. D-Day Invasion
- b. Battle of the Bulge
- c. Japanese defeat in Iwo Jima and Okinawa
- d. atomic bombing of Hiroshima and Nagasaki

PO 5. Describe how racism and intolerance contributed to the Holocaust.

PO 6. Summarize each of the following outcomes of World War II:
- a. redrawing of political boundaries in Europe
- b. tensions leading to Cold War
- c. formation of the United Nations
- d. beginning of atomic age
- e. rebuilding of Japan

PO 7. Compare the rebuilding of Japan with the rebuilding of Germany following World War II.

PO 8. Describe the following events resulting from World War II:
- a. Nuremburg Trial
- b. Marshall Plan
- c. NATO / Warsaw Pact
- d. creation of United Nations
- e. creation of Israel

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

PO 9. Describe the spread of Communism after World War II:
- a. China – Mao Tse-tung and Chinese Revolution
- b. Korea – 38th parallel and division of country
- c. Cuba – Fidel Castro and Cuban Missile Crisis
- d. Vietnam – Ho Chi Minh

PO 10. Describe the impact of the Cold War (i.e., creation of the Iron Curtain, arms race, space race) that led to global competition.

PO 11. Describe the following events of the Korean War:
- a. Chinese involvement
- b. U.N. police actions
- c. containment of Communism
- d. partition of Korea at the 38th Parallel

PO 12. Describe how the following impacted the Vietnam War:
- a. historical relationship of China and Vietnam
- b. French Indochina War
- c. containment of Communism
- d. Ho Chi Minh Trail
- e. conflict resolution

PO 13. Examine the fall of Communism and the unification of European nations:
- a. Germany – reunification, Berlin Wall torn down
- b. Russia – Gorbachev, Glasnost and Perestroika
- c. Union of Soviet Socialist Republics – countries regained independence
- d. European Union formed

PO 14. Describe the following events in the Middle East during the 20th and 21st centuries:
- a. creation of Israel
- b. conflicts between Israeli and Palestinian governments
- c. Camp David Peace Treaty
- d. Persian Gulf War
- e. Iraq War

PO 15. Compare independence movements in various parts of the world (e.g., India/ Pakistan, Latin America, Africa, Asia) during the 20th century.

PO 16. Examine human rights issues during the 20th century (e.g., Apartheid, genocide, famine, disease).

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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).*

PO 2. Identify the connection between current and historical events and issues studied at this grade level using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

PO 3. Analyze how world events of the late 20th century and early 21st century affected, and continue to affect, the social, political, geographic, and economic climate of the world (e.g., terrorism, globalization, conflicts, interdependence, natural disasters, advancements in science and technology and environmental issues).

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.

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 how the following philosophies and documents influenced the creation of the Constitution:

a. Magna Carta
b. English Bill of Rights
c. Montesquieu's separation of power
d. John Locke's theories – natural law, social contract
e. Mayflower Compact
f. Declaration of Independence
g. Articles of Confederation

PO 2. Analyze the purpose (e.g., weaknesses of the Articles of Confederation) and outcome (e.g., compromises) of the Constitutional Convention.

PO 3. Analyze the struggle (e.g., Federalists' Papers, Bill of Rights) between the federalists and the anti-federalists over the ratification of the Constitution.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

PO 1. Describe the following principles on which the Constitution (as the Supreme Law of the Land) was founded:

a. federalism (i.e., enumerated, reserved, and concurrent powers)
b. popular sovereignty
c. Separation of Powers
d. checks and balances
e. limited government
f. flexibility (i.e., Elastic Clause, amendment process)

PO 2. Differentiate the roles and powers of the three branches of the federal government.

PO 3. Explain the electoral process (e.g., primary and general elections, electoral college).

PO 4. Explain how a candidate can be elected president (e.g., Adams-Jackson, Hayes-Tilden, Bush-Gore) without receiving a majority of popular vote.

PO 5. Describe the line of succession to the presidency as stated in the 25th Amendment.

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

PO 1. Compare the ways the federal and Arizona governments operate:

a. three branches
b. Constitution
c. election process (e.g., congressional and legislative districts, propositions, voter registration)

PO 2. Compare the process of how a bill becomes a law at the federal and state level.

PO 3. Describe the following forms of direct democracy in Arizona:

a. initiative
b. referendum
c. recall process

PO 4. Compare the roles and relationships of different levels of government (e.g., federal, state, county, city/town, tribal).

PO 5. Describe the significance of the Amendments to the Constitution.

PO 6. Compare the adult and juvenile criminal justice systems.

PO 7. Summarize the significance of the following Supreme Court cases:

a. Marbury v. Madison
b. Plessy v. Ferguson
c. Brown v. Board of Education
d. Gideon v. Wainright
e. Miranda v. Arizona
f. Korematsu v. United States

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

PO 8. Describe the impact of the following executive orders and decisions:
- a. Executive Order 9066 – creation of internment camps on U.S. soil
- b. Manhattan Project
- c. use of Atomic Bomb

PO 9. Describe the impact that the following Acts had on increasing the rights of groups and individuals:
- a. Civil Rights Act of 1964
- b. Voting Rights Act of 1965
- c. Indian Rights Act of 1968
- d. Americans with Disabilities Act

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. *Describe the benefits of community service.*

PO 2. *Discuss the character traits (e.g., respect, responsibility, fairness, involvement) that are important to the preservation and improvement of constitutional democracy in the United States*

PO 3*. Describe the importance of citizens being actively involved in the democratic process (i.e., voting, student government, involvement in political decision making, analyzing issues, petitioning public officials).*

PO 4. *Explain the obligations and responsibilities of citizenship:*
- *a. upholding the Constitution*
- *b. obeying the law*
- *c. paying taxes*
- *d. registering for selective service*
- *e. jury duty*

PO 5. Describe the impact that the following had on rights for individuals and groups:
- a. Jim Crow Laws – literacy test, poll taxes, Grandfather Clause
- b. Civil Rights Movement (i.e., Martin Luther King, Jr., Rosa Parks)
- c. desegregation - military, schools, transportation, sports
- d. United Farm Workers (i.e., César Chavez)
- e. National Organization for Women (NOW) – Equal Rights Amendment (ERA)

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

(Note: Students were introduced to different forms of government in Grades 6 and 7.)

PO 1. Compare the different world governments and ideologies:
- a. dictatorship
- b. totalitarian (fascist, Nazis)
- c. democracy
- d. Socialism
- e. Communism

PO 2. Explain U.S. and world foreign policies leading to the Cold War:
- a. Truman Doctrine
- b. NATO
- c. Warsaw Pact
- d. Marshall Plan

PO 3. Identify U.S. and world foreign policies (e.g., economic sanctions, arms reduction agreements) resulting from the Cold War.

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**. Construct maps, charts, and graphs to display geographic information.*

***PO 2**. Identify purposes and differences of maps, globes, aerial photographs, charts, and satellite images.*

***PO 3**. Interpret maps, charts, and geographic databases using geographic information.*

***PO 4**. Locate physical and cultural features (e.g., continents, cities, countries, bodies of water, landforms, mountain ranges, climate zones) throughout the world.*

***PO 5.** Interpret thematic maps, graphs, charts, and databases depicting various aspects of the United States and world regions. (Apply to regions studied.)*

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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

PO 1. Identify common characteristics of contemporary and historical regions on the basis of climate, landforms, ecosystems, and culture.

PO 2. Explain the factors that contribute to political and social change in various world regions (e.g., USSR/Russia, Israel, European Union, China, Korea, Germany).

PO 3. Examine relationships and interactions (e.g., Middle East Conflicts, NATO, European Union) among regions.

PO 4. Identify how the role of the media, images, and advertising influences the perception of a place.

PO5. *Describe how a place changes over time. (Connect with 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 Analyze risk factors of and possible solutions to chemical and biological hazards.

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

PO 1. Identify the push and pull factors (e.g., economic conditions, human rights conditions, famines, political strife/wars, natural disasters, changes in technology) that drive human migrations.

PO 2. Describe the effects (e.g., economic, environmental, cultural, political) of human migrations on places and regions.

PO 3. Describe the characteristics and locations of various cultures throughout the world.

PO 4. Identify the factors (e.g., breakup of USSR, unification of Germany, cheap labor forces, outsourcing of services, oil industry) that influence the location, distribution and interrelationships of economic activities in different regions. **PO 5.** Explain how cooperation contributes to political, economic, and social organization (e.g., United Nations, European Union, NAFTA).

PO 6. Describe the aspects of culture (e.g., literacy, occupations, clothing, property rights) related to beliefs and understandings that influence the economic, social, and political activities of men and women.

PO 7. Describe how changes in technology, transportation, communication, and resources affect economic development.

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 how (e.g., deforestation, desertification) humans modify ecosystems.

PO 2. Describe why (e.g., resources, economic livelihood) humans modify ecosystems.

PO 3. Explain how changes in the natural environment can increase or diminish its capacity to support human activities.

PO 4. Explain how technology positively and negatively affects the environment.

PO 5. Analyze changing ideas and viewpoints on the best use of natural resources (e.g., value of oil, water use, forest management).

PO 6. Explain how societies and governments plan for and respond to natural disasters (e.g., evacuation routes, changing farming techniques, warning systems).

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 ways geographic features and conditions influence history. (Connect to time periods studied as well as current events.)*

PO 2. Describe ways different groups of people (i.e., Native Americans, Hispanics, retirees) create and shape the same environment.

PO 3. *Use geographic knowledge and skills (e.g., recognizing patterns, mapping, graphing) when discussing current events.*

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SOCIAL STUDIES STANDARD ARTICULATED BY GRADE LEVEL
GRADE 8

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 how limited resources and unlimited human wants cause people to choose some things and give up others*.

PO 2. *Analyze how scarcity, opportunity costs, and trade-offs, influence decision-making.*

PO 3. Analyze how individuals, governments and businesses make choices based on the availability of resources.

PO 4. Apply Adam Smith's ideas of a market economy to:

a. property rights
b. freedom of enterprise
c. competition
d. consumer choice
e. limited role of government

PO 5. Describe the impact of the availability and distribution of natural resources on an economy.

Concept 2: Microeconomics

Microeconomics examines the costs and benefits of economic choices relating to individuals, markets and industries, and governmental policies.

PO 1. *Identify the functions and relationships among various institutions (e.g., business firms, banks, government agencies, labor unions, corporations) that make up an economic system.*

PO 2. Explain the impact of government investment in human capital:

a. health (e.g., immunizations)
b. education (e.g., college grants, loans)
c. training of people (e.g., Job Corps)

PO 3. Explain the impact of government investment in physical capital (e.g., NASA, transportation).

PO 4. Describe how income for most people is determined by the value of the goods and services they sell.

PO 5. Describe the impact of entrepreneurs (e.g., Bill Gates, Martha Stewart, Oprah Winfrey, Ted Turner Donald Trump) in the free enterprise system.

PO 6. Analyze how investment in physical capital (e.g., factories, medical advancements, new

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technologies) leads to economic growth.

PO 7. Describe how competition (e.g., Microsoft/Apple, Wal-Mart/Target) affects supply and demand from the vantage point of the consumer and producer.

PO 8. Describe how market prices provide incentives to buyers and sellers.

PO 9. Describe how protection of private property rights provides incentives to conserve and improve property (e.g., resale market).

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.

PO 1. Identify the organization and functions of the Federal Reserve System.

PO 2. Identify the effects of inflation on society.

PO 3. Analyze the government's role in economic recovery.

Concept 4: Global Economics

Patterns of global interaction and economic development vary due to different economic systems and institutions that exist throughout the world.

PO 1. Compare how private property rights differ in market (capitalism) economies versus command (communist) economies.

PO 2. Identify the effects of trade restrictions between national and world regions.

PO 3. Describe the role of the United States government in influencing international commerce in regions studied.

PO 4. Identify interdependence (e.g., North American Free Trade Agreement, European Union, International Monetary Fund/ World Bank) between nations.

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. Explain how scarcity influences personal financial choices (e.g., budgeting, saving, investing, credit).

PO 2. Describe types of personal investments (e.g., saving accounts, stocks, mutual funds, bonds, retirement funds, land).

PO 3. Describe the role of the stock market in personal investing.

PO 4. Describe various forms of credit. (e.g., personal loans, credit cards, lines of credit, mortgages, auto loans).

PO 5. Analyze the, advantages, disadvantages, and alternatives to consumer credit.

PO 6. Analyze the costs and benefits of producing a personal budget.

PO 7. Create a personal budget to include fixed and variable expenses.

PO 8. Identify the benefits of future financial planning.

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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)

- **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)

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

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

- **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

TECHNOLOGY EDUCATION STANDARDS
ESSENTIALS (GRADES 4-8)

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

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

- **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)***

- **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**

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

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

- **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

- **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

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

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

- **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

WORKPLACE SKILLS STANDARDS
ESSENTIALS (GRADES 4-8)

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)

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