MAINE STATE LEGISLATURE

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State of Maine

Learning Results

July 1997

"...to provide an education adapted to the years, to the capacity, and the condition of every one, and directed to their freedom and happiness."

Thomas Jefferson

"To furnish the means of acquiring knowledge is ... the greatest benefit that can be conferred upon mankind. It prolongs life itself and enlarges the sphere of existence."

John Quincy Adams (1846)

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The Maine Department of Education insures equal employment, equal education opportunities, and affirmative action regardless of race, sex, color, national origin, religion, marital status, age, or handicap.
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Preface

PURPOSE

The *Learning Results* identify the knowledge and skills essential to prepare Maine students for work, for higher education, for citizenship, and for personal fulfillment. Strongly supported by the public, the *Learning Results* are built on the premises that:

- **all students should aspire to high levels of learning;**
- **achievement should be assessed in a variety of ways; and**
- **completion of public school should have common meaning throughout the state.**

The *Learning Results* express what students *should know* and *be able to do* at various checkpoints during their education. The *Learning Results* serve to focus discussion and to develop consensus on common goals for Maine education. In identifying essential knowledge and skills to be achieved by Maine students, the *Learning Results* do not represent a curriculum nor do they reduce the school's responsibility for curriculum planning or determining instructional approaches. In fact, the *Learning Results* challenge communities, schools and teachers to work together in implementing effective instructional strategies to achieve high expectations for all students.

This document defines only the core elements of education that should apply to all students without regard to their specific career and academic plans. Every student is expected to achieve goals that are broader than those outlined by the *Learning Results*. At the high school level, for instance, many students heading directly to post-secondary study or to the workplace may require learning experiences that exceed the *Learning Results* in specific content areas.

The overriding purpose of the *Learning Results* is to provide teachers and parents with guidance to improve an existing education system that is already working well for many students in most Maine communities. The adoption of common standards and an accompanying mix of measures which assess learning is widely regarded as the most important next step in improving the quality of public education for all students.

BACKGROUND

Following enactment of the Education Reform Act of 1984, Maine schools undertook a wide variety of initiatives designed to improve the quality of teaching and learning. Many of the lessons learned from those initiatives informed *Maine's Common Core of Learning*, a document published in 1990 that articulates a common vision for education in Maine by defining the knowledge, skills, and attitudes that all students should possess upon graduation from high school. In 1993, the Legislature directed the State Board of Education to undertake the next step in education reform by establishing a Task Force on *Learning Results* that was directed to:

> "develop long-range education goals and standards for school performance and student performance to improve learning results and recommend to the commissioner and to the Legislature a plan for achieving those goals and standards."

After substantial work, the Task Force presented to the Legislature, in January of 1996, a report which contained a series of recommendations together with a set of standards, a plan for implementation, and proposed legislation. After a series of intense hearings during the 1996 Legislative Session, the Legislature adopted much of the work of the Task Force and directed the Department of Education and the State Board of Education to continue to develop the *Learning Results*.

Acting on the recommendations of the Task Force, the Legislature adopted six Guiding Principles which describe the characteristics of a well-educated person. To fulfill these principles, the Legislature required that the Department of Education and the State Board of Education develop *Learning Results* within the following eight areas:

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Career Preparation
English Language Arts
Health and Physical Education
Mathematics
Modern and Classical Languages
Science and Technology
Social Studies
Visual and Performing Arts

These are not "subjects" in the same sense that we use the word when referring to courses in school. They are areas of learning that will in some cases cut across a number of discrete courses or disciplines.

In response to the legislative directive, the Commissioner appointed a working group, known as the Critical Review Committee, to prepare a draft of standards for consideration by the State Board of Education and by the Legislature. The Committee met on numerous occasions during the summer and fall of 1996 to produce this revised document, which was approved in May of 1997 by the 118th Legislature.

STRUCTURE

As a structure for *Learning Results*, each subject area has been divided into **Content Standards** which are broad descriptions of the knowledge and skills that students should acquire. Within each content standard is a series of **Performance Indicators** which help to define in more specific terms the stages of achievement, or checkpoints, toward meeting the content standard within each of four grade spans:

pre-school to second grade (Pre-K-2);
third and fourth grades (3-4);
fifth through eighth grades (5-8); and
secondary school.

Performance indicators describe what students *should know* and *be able to do* from one level to the next to demonstrate attainment of a **content standard.** Good performance indicators are those that:

focus on academics and are grounded in important content;
combine both knowledge and skills;
describe development in a concrete way from one stage to the next;
define results and not methods of teaching;
are clear and useful to parents, teachers, and students; and
can be assessed, tested, and measured in a variety of ways.

Broadly defined content standards are lettered, labeled, and described in the introduction to each area of learning. Under each content standard, the specific performance indicators are given numbers merely to identify them and not to imply an order of significance.

Examples are given after some of the indicators to clarify what the indicator means and how it might be addressed in the classroom. **Examples** are not part of the indicator or the content standard; they merely illustrate the standard by suggesting what a student might do as one step toward attainment. Please note that the examples may not demonstrate how learning can and should be integrated across content areas.

INTEGRATED LEARNING

While the division of learning into content areas is necessary to form a structure for writing performance standards, this does not mean that teaching should be divided in any similar way. In many schools, both learning and assessment are often successfully integrated across several content areas at one time. For example, a science project may include historical research, data collection and mathematical analysis, followed by preparation of a narrative report with freehand illustrations, and conclude with a computer-assisted oral presentation to the class, thus combining, in this example, elements from at least five content areas into one project.

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Teachers are encouraged to approach the standards from an interdisciplinary perspective when designing curriculum and planning instructional activities.

Maine's Common Core of Learning articulated knowledge, skills, and attitudes in a non-disciplinary organization that is helpful when thinking about integrated teaching and learning. The four interdisciplinary areas identified in the *Common Core* are as follows:

Personal and Global Stewardship
Responsible citizenship requires awareness and a concern for oneself, others, and the environment. It involves interactions not only within the self and family, but between the self and friends, the community, the nation, and the world. It includes the knowledge and care of all dimensions of our selves as humans, an understanding of the group process, and a willingness to exercise the rights and responsibilities of citizenship. Stewardship also includes the study of current geography and foreign language and an appreciation of pluralism and human rights.

Communication
The ability of human beings to communicate through a variety of media with a high degree of specificity is one of our most remarkable achievements. In a rapidly-changing world, communications skills will become ever more essential to our students' future success.

Reasoning and Problem Solving
Knowledge is power. We must help students want to gain knowledge, show them how to get it, and encourage them to use it to reach a new understanding or to create a new product. We must help students learn to reflect on their processes of learning, regardless of their field of study.

The Human Record
The study of the human record not only includes the actions and events of the past but also the constructs of human thought and creativity as they have evolved through time. The human record includes works of literature and the arts; scientific laws and theories; and concepts of government, economic systems, philosophy, and mathematics. In fact, much of what we now think of as "subject matter" in today's curriculum belongs in this section.

CONTENT AND CRITICAL THINKING

Wherever education is publicly discussed, there is much debate over the balance between student acquisition of factual knowledge and critical thinking skills.

This debate is embraced, but not resolved by the *Learning Results*. The truth is that both content and thinking processes are important. Students need a common factual frame of reference grounded in the events of history, the structure of geography, the discoveries of science, and the richness of art, music, and literature; and they must also learn how to think, how to search and investigate, and how to evaluate, filter, and process the information that they uncover. All students need to learn, at least at some level, how to investigate like a scientist, evaluate like an historian, reason like a mathematician, and communicate like a writer and an artist.

Across the content areas of the *Learning Results* the higher order reasoning and thinking skills are often embedded within the language chosen for the performance indicator. For example, in Social Studies, students are often challenged to "evaluate," "analyze," and "explain," as much as to "identify," "recognize," or "describe" the content included within the standard.

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RESULTS AND METHODS

In Maine and throughout the United States, there is controversy over the means and methods by which children are taught. In reading, there is the familiar debate over the merits of phonics versus whole language instruction. In mathematics, there is concern whether it is appropriate to de-emphasize mental computing skills that can now be performed using a pocket calculator, and in some communities parents are distressed by an apparent lack of structure or formality within certain classrooms.

It is not the place of this document to address methods of teaching or the organization of the classroom. Rather, this document focuses on results - not the means or methods by which students are taught. Some teachers prefer a structured classroom while others use a less formal setting. Further, it is not the place of this document to specify how many students should be in a classroom, what level of formality should prevail, or what instructional methods are most appropriate. These are matters for teachers, parents, and local administrators to resolve.

However, the state does have an obligation to monitor the results of student learning within our communities. That is the role of the state as dictated by the Maine Constitution.

FOR ALL STUDENTS

One of the most commonly asked questions regarding the *Learning Results* is whether they apply to all students. These standards establish goals for what all students *should know* and *be able to do*, including students with unique learning needs and/or identified disabilities.

In order for all students to have appropriate opportunities to move toward achievement of the *Learning Results* and demonstrate mastery as they progress, schools will continue to design curriculum, instruction, and assessment opportunities that meet the needs of a diverse student population. A comprehensive, personalized planning approach will be helpful in this effort to identify and meet the unique needs of individual students.

Currently, students with identified disabilities have rights under federal and state special education laws - this does not change with the adoption of the *Learning Results*. A continuum of services and appropriate adaptations and modifications will still be available to students.

ASSESSMENT

These *Learning Results* are just one part of an educational system. As goals for what all students should know and be able to do upon finishing school, they are not written to prescribe a minimum or "passing" standard. The setting of minimum requirements is the function of assessments that are separate from the creation of academic goals.

Because some students are ready for assessment at earlier stages than others, no assumption is made about when a standard might be achieved.

The statute passed in April of 1996 includes the following provisions relating to assessment:

> Student achievement of the learning results . . . must be measured by a combination of state and local assessments to measure progress and ensure accountability. The 4th-grade, 8th-grade, and 11th-grade results of the Maine Education Assessment, the "MEA," are the state assessments used to measure achievement of the learning results. The 4th-grade and 8th-grade MEA must be used to measure achievement of the learning results beginning in the 1998-99 school year. The 11th-grade MEA must be used to measure achievement of the learning results beginning in the 1999-2000 school year. Local school administrative units may develop additional assessments to measure achievement of the learning results, including student portfolios, performances, demonstrations and other records of achievements.

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An Assessment Design Team comprised of Maine educators and assessment specialists has been established to redesign state level assessments and to assist in development of high quality local assessments that will be used to measure student achievement of the *Learning Results*. The statewide assessment system they are developing will:

align with Maine's *Learning Results;*
utilize multiple measures of learning;
ensure fair and equitable assessment for all students;
utilize recognized, relevant technical standards for assessment;
provide understandable information to educators, parents, students, the public, and the media;
provide professional development opportunities for teachers, administrators, and future educators; and
be practical and manageable.

IMPLEMENTATION AND RESOURCES

Implementation of *Learning Results* is a local function. The *Learning Results* does not identify the resources, the methods, the relationships, and the concerns that need to be addressed to enable all students to achieve these standards. Schools and communities will establish their own unique approach to such issues as school organization and climate, innovative instruction and assessment, the fostering of higher order thinking skills, professional development, differences in student needs and learning styles, use of emerging technologies, and collaboration among participating groups and individuals.

Learning Results are not a curriculum. A full curriculum contains the detail about what students should know and be able to do within each area of learning at every grade level. It often prescribes materials and methods, contains reading lists and texts, while specifying course content and instructional sequence. The *Learning Results* describe a new literacy for all students in terms of knowledge and skills which schools may use in forming local curricula and designing assessment.

Aware that meeting the standards is neither easy nor without expense, the Legislature has stated that implementation is conditioned on added state funding for professional development. Further, districts may delay meeting the standards for career preparation, modern and classical languages, and visual and performing arts if they cannot be achieved within existing local resources.

REVISION

This document was initially revised during the summer of 1996 by the Critical Review Committee. 3000 copies were circulated to schools primarily for peer review by educators. Over 2000 educators answered questionnaires and offered suggestions for further revision.

Based on those responses, the *Learning Results* were modified and broadly distributed to the public for hearings and formal reviews conducted jointly by the Department of Education and the State Board of Education during early 1997. The revision that finally resulted from that rule-making process was then presented to the Legislature for its review and approval, which, as mentioned previously, was granted in May of 1997.

Be advised that this is not a static or finished document, but rather a dynamic one designed to stimulate continuing discussion. The *Learning Results* will need to be revised periodically in light of experience, research, public commentary, and the products available from many other groups that are creating and refining similar documents.

Under their rule-making responsibilities, the Department of Education and the State Board of Education will retain jurisdiction to make changes in future years. Comments and suggestions are appropriately addressed to:

Learning Results
Maine Department of Education
23 State House Station
Augusta, ME 04333-0023

This document is available at http://www.state.me.us/education, the Department of Education's home page on the World Wide Web.

...the democratic promise of equal educational opportunity, half fulfilled, is worse than a promise broken. It is an ideal betrayed.

MORTIMER J. ADLER

Terminology

GUIDING PRINCIPLES

Each Maine student must leave school as:

A CLEAR AND EFFECTIVE COMMUNICATOR ← **Guiding Principle**

a) uses oral, written, visual, artistic and technological modes of expression;
b) reads, listens to and interprets messages from multiple sources; and
c) uses English and at least one other language.

← **Descriptors**

CONTENT AREAS, STANDARDS, AND PERFORMANCE INDICATORS

SCIENCE AND TECHNOLOGY ← **Content Area**

The explosive growth of scientific knowledge and continuing developments in technology are transforming society. These rapid changes require that students learn to access, understand, and evaluate current information by utilizing the skills and knowledge of science and technology. Science includes processes and a body of knowledge.

← **Introduction**

A. CLASSIFYING LIFE FORMS ← **Standard Label**

Students will understand that there are similarities within the diversity of all living things. ← **Standard (in bold)**

Modern classification systems are based on comparisons of the structure, function, life-cycles, and behavior of organisms.

← **Descriptor (in italics)**

ELEMENTARY GRADES Pre-K-2 ← **Grade Level**

1. Identify the differences between living and non-living things.
2. Describe characteristics of different living things.
3. Explain, draw, or otherwise demonstrate the life cycle of an organism.
4. Design and describe a classification system for objects.

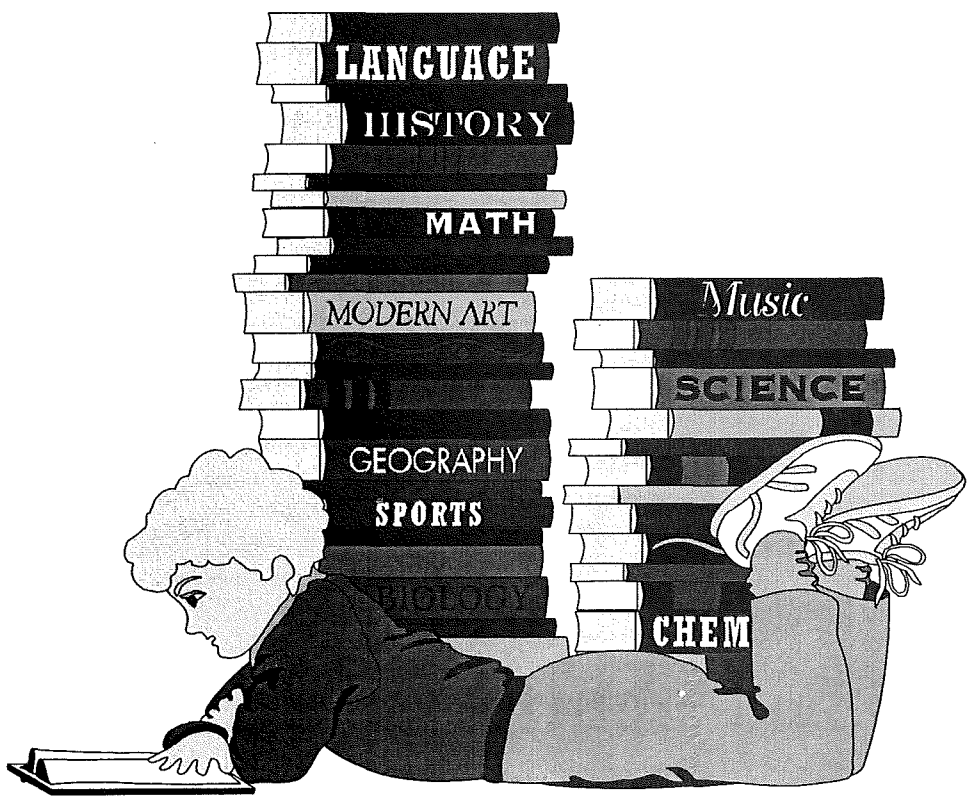
← **Performance Indicators**

EXAMPLE

- Given a collection of shells, sort them into groups and describe the "rule" for each group.

← **Example**

LEARNING RESULTS



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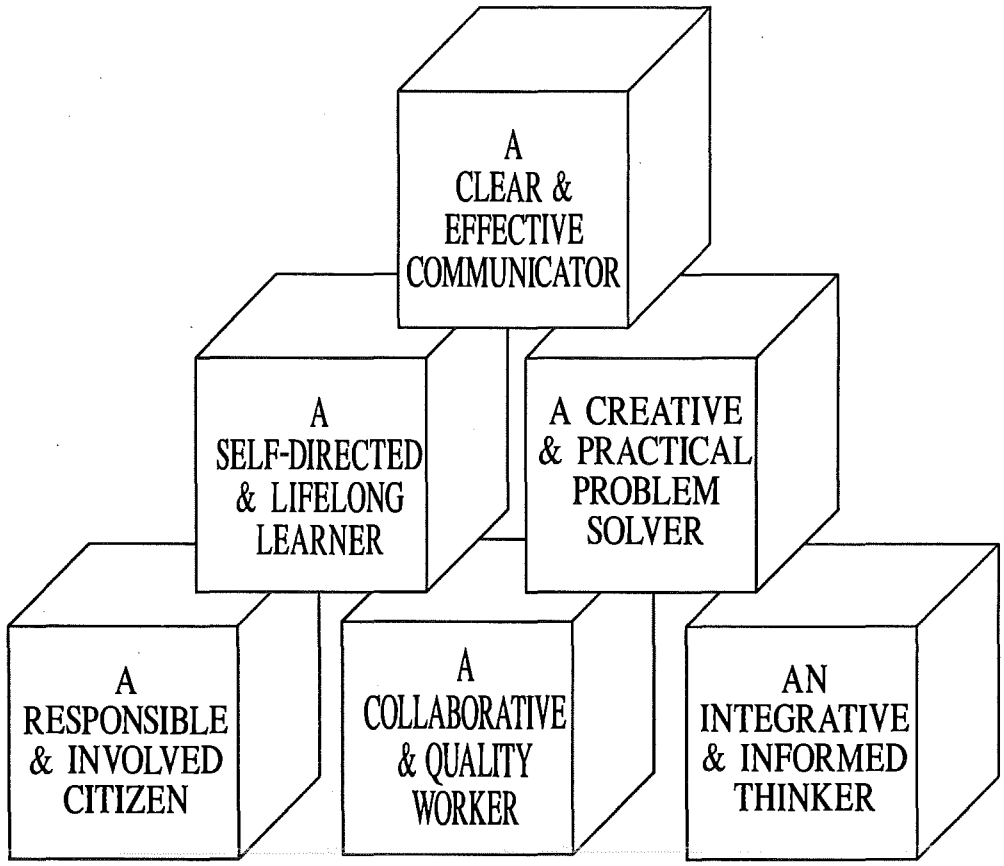
Guiding Principles



The building blocks for successful and fulfilled adulthood in the 21st century.

Designed and Created by
Sarah Simmonds
Maine Department of Education

July 1997

Guiding Principles

Each Maine student must leave school as:

I. A CLEAR AND EFFECTIVE COMMUNICATOR

A. uses oral, written, visual, artistic, and technological modes of expression;
B. reads, listens to and interprets messages from multiple sources; and
C. uses English and at least one other language.

II. A SELF-DIRECTED AND LIFE-LONG LEARNER

A. creates career and education plans that reflect personal goals, interests and skills, and available resources;
B. demonstrates the capacity to undertake independent study; and
C. finds and uses information from libraries, electronic data bases, and other resources.

III. A CREATIVE AND PRACTICAL PROBLEM SOLVER

A. observes situations objectively to clearly and accurately define problems;
B. frames questions and designs data collection and analysis strategies from all disciplines to answer those questions;
C. identifies patterns, trends, and relationships that apply to solutions to problems; and
D. generates a variety of solutions, builds a case for the best response, and critically evaluates its effectiveness of this response.

IV. A RESPONSIBLE AND INVOLVED CITIZEN

A. recognizes the power of personal participation to affect the community and demonstrates participation skills;
B. understands the importance of accepting responsibility for personal decisions and actions;
C. knows the means of achieving personal and community health and well-being; and
D. recognizes and understands the diverse nature of society.

V. A COLLABORATIVE AND QUALITY WORKER

A. knows the structure and functions of the labor market;
B. assesses individual interests, aptitudes, skills, and values in relation to demands of the workplace; and
C. demonstrates reliability, flexibility, and concern for quality.

VI. AN INTEGRATIVE AND INFORMED THINKER

A. applies knowledge and skills in and across English language arts, visual and performing arts, foreign languages, health and physical education, mathematics, science, social studies, and career preparation; and
B. comprehends relationships among different modes of thought and methods associated with the traditional disciplines.

Career Preparation

> ***"The return from your work must be the satisfaction which that work brings you and the world's need of that work. With this, life is heaven, or as near heaven as you can get."***
>
> William Edward Burghardt Du Bois
> (To His Newborn Great-Grandson; address on his ninetieth birthday - 1958)

A successful career in the twenty-first century will differ significantly from the model of career success that has prevailed in this century. New ways of working and new technology already dictate the importance of bringing new skills to the workplace, but other changes are even more fundamental. Lifelong employment for the same employer has virtually vanished. Initial career decisions are no longer seen as lifetime determinations, but rather as first steps in a career that is likely to include work for several employers in a variety of positions.

Career preparation helps students develop the ability to handle changes. In a world of work where being a "good worker" is no longer an assurance of continued employment, career preparation serves students in several ways. It helps them acquire the basic skills and attitudes for successful entry to the world of work, it teaches them to be effective career managers and to be knowledgeable about their talents, to acknowledge their strengths, and to address their weaknesses. Career preparation enables students to recognize that challenges present opportunities and that they must be prepared to acquire new skills and new knowledge to take advantage of those opportunities.

As part of career preparation, students learn to see education, not as something to be completed in 13 or 17 years, but as a continuing process, available throughout their lives, to assist in coping with a fast-changing world. As one community college president put it, "education is a train and students must be able to get on and off as their needs change."

A. PREPARING FOR THE FUTURE
Students will be knowledgeable about the world of work, explore career options, and relate personal skills, aptitudes, and abilities to future career decisions. *To interact successfully with people and organizations students need to adapt to the changing nature of the workplace. Strong interpersonal, teamwork, leadership, and negotiation skills are essential for this success.*

B. EDUCATION/CAREER PLANNING AND MANAGEMENT
Guided by self assessment and personal career interests, students will integrate school- and work-based experiences to develop their career goals. *Once career goals have been determined, students will evaluate continuously their progress and make necessary modifications. Students' success in the competitive world will depend on their ability to manage their own careers using job seeking, retention, and advancement skills.*

C. INTEGRATED AND APPLIED LEARNING
Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings. *Students will select and apply appropriate technological resources and problem-solving strategies to real life situations using problem solving strategies in purposeful ways.*

D. BALANCING RESPONSIBILITIES
Students will acquire and apply skills/concepts required to balance personal, family, community, and work responsibilities. *The skills to manage work, family, and community responsibilities for the well being of themselves and others are critical for personal success.*

> ***"All work is as seed sown; it grows and spreads, and sows itself anew."***
>
> Thomas Carlyle (*On Boswell's Life of Johnson* - 1832)

Career Preparation

A. PREPARING FOR THE FUTURE

Students will be knowledgeable about the world of work, explore career options, and relate personal skills, aptitudes, and abilities to future career decisions. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Develop effective ways to interact with others during school and after-school activities.
2. Identify strengths and interests required in a job, at home, at school, or in the community.
3. Identify local career opportunities.
4. Demonstrate workplace behaviors such as punctuality, flexibility, teamwork, and perseverance.

EXAMPLES

- Resolve playground conflict using negotiation skills.
- Identify favorite school subjects and special talents and relate them to jobs.
- Volunteer for specific roles in cooperative learning situations.

ELEMENTARY GRADES 3-4

1. Demonstrate how positive and negative attitudes affect one's ability to work with others.
2. Use communication and listening skills that result in successful interactions with others.
3. Demonstrate an understanding of the connections between locally generated products and services and the efforts required to create those products and services.
4. Explain the value of work to the individual and to society in general.
5. Demonstrate awareness of their own interests, aptitudes, and abilities.

EXAMPLES

- Students are interviewed for a school newspaper to identify personal information which is used to develop a class profile.
- Select a career and role-play a scenario depicting why people do this work and how it benefits others.

MIDDLE GRADES 5-8

1. Determine effective workplace behaviors and skills.
2. Use teamwork strategies and apply communication and negotiation skills to decision making.
3. Demonstrate an understanding of the characteristics of a successful business.
4. Demonstrate an understanding of the relationship among personal interests, skills and abilities, and career research.

EXAMPLES

- Create a collage using advertisements from successful businesses and identify common elements.
- Given a variety of case studies showing an individual's problems on the job, create possible solutions (e.g., a worker, who is often late, has conflicts with a supervisor).

SECONDARY GRADES

1. Demonstrate the leadership and membership skills necessary to succeed as a member of a team.
2. Analyze skills and abilities required in a variety of career options and relate them to their own skills and abilities.
3. Demonstrate an understanding of the relationship between the changing nature of work and educational requirements.
4. Demonstrate an understanding of basic business concepts such as profit and loss, the availability of skilled labor, market share, and customer service.

EXAMPLES

- Prepare a personal balance sheet showing an inventory of acquired skills, qualities, and experiences needed for successful employment in a career option.
- As a member of a team or club, analyze the importance of using collective abilities in achieving group goals and objectives.
- Analyze and chart various aspects of personal work experiences.

B. EDUCATION/CAREER PLANNING AND MANAGEMENT

Guided by self assessment and personal career interests, students will integrate school- and work-based experiences to develop their career goals. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explore reasons why people work.
2. Identify preparation necessary for a career of interest.
3. Identify personal strengths and interests.

EXAMPLES

- As a classroom, create a bar graph to classify hobbies, favorite school subjects, interests, and special talents and their relationship to working with people, information, or things.
- Brainstorm possible questions to ask invited guest speakers who represent different careers.

ELEMENTARY GRADES 3-4

1. Use a variety of resources to learn about a personally interesting career topic.
2. Gather data and information about personal interests, abilities, and aptitudes and project likely career options.
3. Identify job-hunting strategies and the skills necessary to hold a job.

EXAMPLE

- Develop a personal career plan after interviewing family, relatives, or friends to determine the requirements for a career choice.

MIDDLE GRADES 5-8

1. Develop a personal portfolio that contains critical personal, educational, and career information.
2. Compare workplace environments and the education required for different occupations.
3. Integrate school- and work-based experience to identify possible initial career goals.

EXAMPLES

- Develop a personal learning plan with a portfolio that contains a career information survey and its findings, results of interviews, and evidence of other career research.
- Use the World Wide Web to research a career and identify its skill standards, based upon a personal career interest.

SECONDARY GRADES

1. Use a career planning process that includes self-assessment, personal development, and a career portfolio as a way to gain initial entry into the workplace.
2. Demonstrate job seeking skills.
3. Assess personal, educational, and career skills that are transferable among various jobs.
4. Explain the problems and possible benefits of involuntary changes in employment, including information on what actions the employee can take to make it easier to find a new position or to become self-employed.

EXAMPLES

- Complete the School-To-Work Individual Opportunity Plan leading to a portfolio that contains aptitude and employability assessments, interview and research methods, and a learning plan.
- Develop a resume and model interviewing skills.
- Interview professional employment counselors to determine the top ten skills individuals must demonstrate to get and retain a job.
- Interview someone who has changed careers.

C. INTEGRATED AND APPLIED LEARNING

Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify examples of technology being applied at home, school, or work.
2. Demonstrate the effects of technology on where people choose to live, how they communicate, how they travel, and how they acquire goods and services.
3. Use academic skills to solve real life problems.

EXAMPLES

- Relate a story about how a school cafeteria employee uses math and English language arts skills on the job.
- Make a diorama showing a person applying technology while at work.

ELEMENTARY GRADES 3-4

1. Illustrate how products evolve as a result of technological systems.
2. Identify the major components of a technological system (input, process, output, feedback) and cite examples in the school and/or community.
3. Identify academic knowledge and skills required in specific careers.

EXAMPLES

- Prepare a presentation on a career of your choice and explain how academic skills are important to success.
- Illustrate graphically the evolution of the wheel.
- Identify the major components of the school's water supply system.

MIDDLE GRADES 5-8

1. Research the need for ethical and legal standards concerning the application of technology (including communication systems, product liability, copyright/patent, and safety).
2. Research recent technological developments and predict their possible spin-offs.
3. Use academic knowledge and skills to solve career related problems.

EXAMPLES

- Use on-line sources to collect information about water quality in nearby areas and make recommendations to your local water company.
- Design and create a next generation product and research the steps needed for a patent.

SECONDARY GRADES

1. Demonstrate an understanding of the integration and application of academic and occupational skills in school learning, work, and personal lives.
2. Demonstrate knowledge of customer satisfaction strategies.
3. Demonstrate an understanding of how humans change and adapt technology to their benefit.
4. Use mathematical, scientific, and technological tools to design and apply solutions to a community problem.
5. Demonstrate an understanding of workplace safety and human factors in the development of products, services or processes.

EXAMPLES

- Identify and examine a problem in the community or school, evaluate technological resources or systems that might be used to solve the problem, justify the technological resources or systems selected, and present the results.
- Work in a team to design and produce playground equipment for a local recreation site.
- Work in teams to formulate an historical presentation on specific careers and to demonstrate how job requirements and training are changing due to new technology.

D. BALANCING RESPONSIBILITIES

Students will acquire and apply skills/concepts required to balance personal, family, community, and work responsibilities. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify different roles they play.
2. Demonstrate an understanding of the concept of saving.
3. Demonstrate an understanding of the importance of the conservation of resources.

EXAMPLES

- Create a classroom recycling project.
- With their pictures in the center of a planning web, students will depict six roles they play.

ELEMENTARY GRADES 3-4

1. Exhibit, during the school day, the personal qualities that lead to responsible behavior.
2. Develop time management strategies for school and after-school activities.
3. Demonstrate an understanding of earning, spending, and saving in relation to personal security and the economic stability of the family.

EXAMPLES

- Use computer technology to create a week-long schedule for school and after-school activities.
- Explain why arriving at school and completing assignments on time would be important to an employer.
- Create a family nutrition plan that includes basic budgeting and family menus.

MIDDLE GRADES 5-8

1. Identify how critical factors such as history, the environment, the economy, or personal characteristics may affect individual and family choices.
2. Understand and apply theories of child development and human behavior.
3. Demonstrate an understanding of budgeting and the use of financial tools and services.
4. Develop strategies to balance multiple responsibilities and conflicting priorities.
5. Assume personal responsibility during their time in school.

EXAMPLES

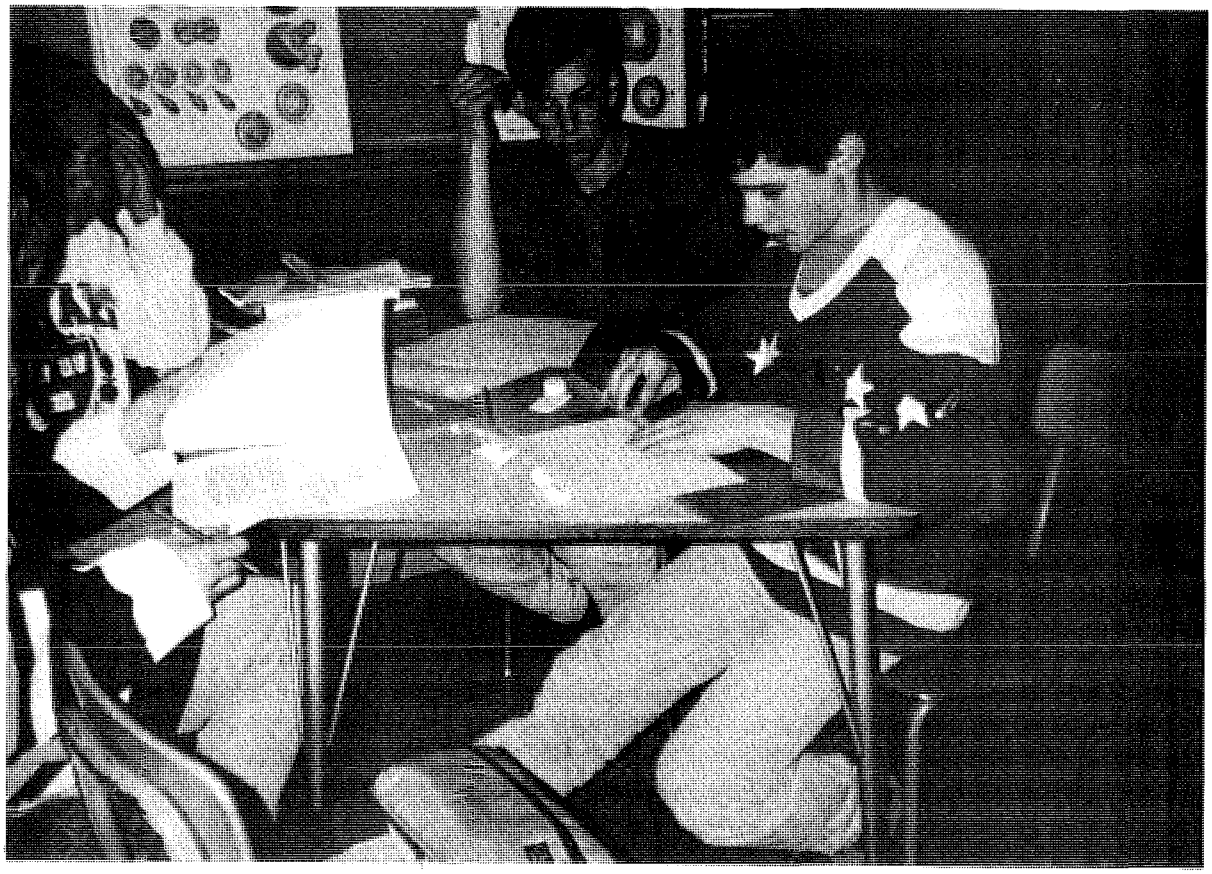
- Create a data base to log progress in meeting three key personal responsibilities.
- Design a day care environment that promotes the growth and development of children.
- Create a budget for a class field trip.

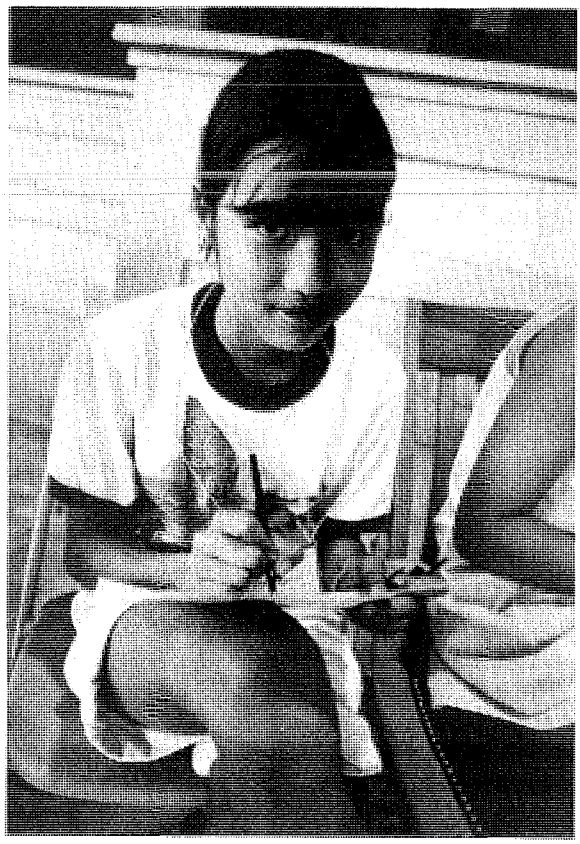
SECONDARY GRADES

1. Illustrate how resources and support systems, available within a community, assist individuals in their roles as workers and family members.
2. Use knowledge and theories of growth and development to help balance multiple responsibilities.
3. Demonstrate an understanding of the importance of community involvement to family and community life.
4. Demonstrate an ability to manage personal resources.

EXAMPLES

- Develop personal financial plans, justify the need for such plans, and explain their relationship to a career choice and desired lifestyle.
- Document their current responsibilities; then, considering their own best interests and those of an elderly relative, decide whether nursing home or other types of care are indicated.
- Create a community resource directory and put it on a World Wide Web site.





English Language Arts

"The love of learning, the sequestered nooks,
And all the sweet serenity of books."

Henry Wadsworth Longfellow
(Morituri Salutamus (1875) st. 21)

The fundamental need for an exchange of meaning and the sharing of human experience is a special province of the English language arts. All students share this need. They learn best when it is frequently addressed in their schooling and when they are invited to explore it effectively through literature.

The English language arts form the foundation for effective communication which depends upon a person's ability to construct meaning through reading, listening, and viewing and to present ideas through writing, speaking, and visual media. These skills, essential to the health of our democracy and the quality of our culture, have become ever more important since the modern explosion of communications media. Devices that allow us to communicate more quickly over distances can be used effectively only to the extent that we are skilled in basic language arts.

The study of language helps students to control their lives and become more effective thinkers--through communication, reflection, and understanding. To develop good thinking strategies, students must become engaged as active learners. To help them improve, students need to practice English language skills and receive frequent feedback across all areas of study. Parents, teachers, and other adults must encourage the interest in language that students bring with them when they first enter school. Students need to make the experience and enjoyment of English language arts a central part of their lives.

Collectively, the English language arts – writing, reading, speaking, and listening – constitute both a discipline in its own right, like mathematics or science, and a means of communicating about all other disciplines. Without a command of these arts it is impossible to think about, understand, or explain other disciplines.

A. PROCESS OF READING
Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read. *Readers apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on prior experience, interactions with others, knowledge of word meaning and knowledge of other texts, word identification strategies, and understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).*

B. LITERATURE AND CULTURE
Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture. *Literary texts that are rich in quality, add to the understanding of history and various cultures and build an appreciation of the many dimensions (e.g., philosophical, ethical, aesthetic) of human experience.*

C. LANGUAGE AND IMAGES
Students will demonstrate an understanding of how words and images communicate. *Language and images enable people to get things done, to take charge of their lives, to express opinions and feelings, to experience emotions, and to function as productive citizens. Students will consider such things as the relationship between thought and language, the ways people use language and other symbol systems to communicate, the history and structure of English, and the similarities and differences in the ways various social, occupational, and cultural groups use language.*

English Language Arts

D. INFORMATIONAL TEXTS

Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum. *When reading, listening, and viewing critically, students will ask pertinent questions, recognize assumptions and implications, and evaluate information and ideas. In a world that surrounds them with information, they have to be able to connect with this information and make sense of it.*

E. PROCESSES OF WRITING AND SPEAKING

Students will demonstrate the ability to use the skills and strategies of the writing process. *Effective communication can improve the work of writers and speakers. Students will use a wide range of strategies to address different audiences for a variety of purposes. Students will write or speak for reflective, creative and informational purposes.*

F. STANDARD ENGLISH CONVENTIONS

Students will write and speak correctly, using conventions of standard written and spoken English. *Knowledge of language structure and conventions (e.g., spelling, punctuation, level of formality) is used to create, critique, discuss, and present print and nonprint texts.*

G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING

Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions. *Spoken, written, and non-verbal visual language (e.g., facial expressions, styles of clothing) accomplish many purposes (e.g., enjoyment, learning, persuasion, and the exchange of information). Writing and speaking for various purposes and for different audiences requires rhetorical skill and stylistic competence.*

H. RESEARCH-RELATED WRITING AND SPEAKING

Students will work, write, and speak effectively in connection with research in all content areas. *Research involves generating ideas and posing questions. It includes gathering, evaluating, and synthesizing data from a variety of sources (e.g., print, nonprint, and electronic texts, examination of artifacts, interviews with people). Researching and reporting use a variety of informational and technological resources to gather and synthesize information and to create and communicate knowledge.*

"I cannot live without books."

Thomas Jefferson (Letter to John Adams - June 10, 1815)

English Language Arts

A. PROCESS OF READING

Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Seek out and enjoy experiences with books and other print materials.
2. Demonstrate an understanding that reading is a way to gain information about the world.
3. Make and confirm predictions about what will be found in a text.
4. Recognize and use rereading as an aid to developing fluency and to understanding appropriate material.
5. Figure out unknown words using a variety of strategies including rereading, context clues, and knowledge of word structures and letter-sound relationships.
6. Recognize and use clues within the text (sentence structure, word meanings), rereading, and other strategies as aids in developing fluency and comprehension.
7. Ask questions and give other responses after listening to presentations by the teacher or classmates.

ELEMENTARY GRADES 3-4

1. Determine the meaning of unknown words by using a dictionary, glossary, or other reference sources.
2. Adjust reading speed to suit purpose and difficulty of the material.
3. Recognize when a text is primarily intended to persuade.
4. Select texts for enjoyment.
5. Read a variety of narrative and informational texts independently and fluently.

MIDDLE GRADES 5-8

1. Formulate questions to be answered while reading.
2. Reflect on what has been discovered and learned while reading, and formulate additional questions.
3. Identify specific devices an author uses to involve readers.
4. Use specific strategies (e.g., rereading, consultation) to clear up confusing parts of a text.
5. Understand stories and expository texts from the perspective of the social and cultural context in which they were created.
6. Identify accurately both the author's purpose and the author's point of view.
7. Summarize whole texts by selecting and summarizing important and representative passages.
8. Read for a wide variety of purposes (e.g., to gain knowledge, to aid in making decisions, to receive instructions, to follow an argument, to enjoy).
9. Explain orally and defend opinions formed while reading and viewing.
10. Adjust viewing and listening strategies in order to comprehend materials viewed and heard.
11. Generate and evaluate the notes they have taken from course-related reading, listening, and viewing.

SECONDARY GRADES

1. Demonstrate an understanding that reading is a gradual process of constructing meaning and revising initial understandings.
2. Demonstrate an understanding that a single text will elicit a wide variety of responses, each of which may be the point of view of the individual reader or listener.
3. Identify the author's purpose and analyze the effects of that purpose on the text.
4. Identify the author's point of view and analyze the effects of that point of view on the text.
5. Identify the devices an author uses to persuade readers and critique the effectiveness of the use of those devices.
6. Use the context of a work to determine the figurative, idiomatic, and technical meanings of terms.
7. Use the context of a work to determine the meanings of abbreviations and acronyms.
8. Find the meaning of relatively uncommon technical terms used in informational texts.
9. Identify the philosophical assumptions and basic beliefs underlying a particular text.
10. Analyze how the cultural context of a literary work is evident in the text.
11. Represent key ideas and supporting details in various written forms (e.g., outline, paraphrase, concise summary).

B. LITERATURE AND CULTURE

Students will use reading, listening, and viewing strategies to experience, understand, and appreciate literature and culture. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Understand the basic plot of simple stories.
2. Draw logical conclusions about what will happen next or how things might have turned out differently in a story.
3. Identify differences and similarities in story elements (e.g., plot, setting, characters, conflict resolution) in works from various cultures.
4. Distinguish between fiction and nonfiction.

ELEMENTARY GRADES 3-4

1. Demonstrate awareness of the culture and geography pertinent to the texts they read.
2. Use literary pieces to better understand and appreciate the actions of others.
3. Respond to speakers in a variety of ways (e.g., listening attentively, responding politely).
4. Share responses to quality literature with peers, citing reasons and making comparisons to other reading, or viewing, or to life experiences.
5. Identify important characters in quality works containing several characters.
6. Make and justify conclusions about the motives of characters and the consequences of their actions.
7. Identify and explain how characters and situations found in various materials are like people or events in their own lives or in other works.
8. Understand how dialogue relates and contributes to a story or text.
9. Recognize basic elements of plot and recount events, ideas, and important details from material read, heard, or viewed.
10. Apply effective strategies to the reading and interpretation of fiction (e.g., fantasies, fables, myths, mysteries, realistic and historical fiction, adventures, and humorous tales) that is appropriately complex in terms of character, plot, theme, and dialogue and appropriately sophisticated in style, point of view, and use of literary devices.
11. Apply effective strategies to the reading and use of nonfiction (e.g., reference sources, articles, histories, biographies, autobiographies, diaries, and letters) using texts with an appropriate complexity of content and sophistication of style.
12. Demonstrate understanding of enduring themes of literature (e.g., themes of coming of age, love and duty, heroism, and appearance versus reality).

MIDDLE GRADES 5-8

1. Demonstrate an understanding that people respond to literature in different and individual ways.
2. Identify specific interests and questions and pursue them by identifying pertinent literature and media.
3. Identify the main and subordinate characters in literary works.
4. Explain how the motives of characters or the causes of complex events in texts are similar to and distinct from those in their own experience.
5. Demonstrate an understanding of lengthy, complex dialogues and how they relate to a story.
6. Recognize the use of specific literary devices (e.g., foreshadowing, flashback, different time frames such as the future or the past).
7. Recognize complex elements of plot (e.g., setting, major events, problems, conflicts, resolutions).
8. Apply effective strategies to the reading and interpretation of fiction (e.g., science fiction, myths, mysteries, realistic and historical fiction, poems, adventure stories, and humorous tales), using texts that are appropriately complex in terms of character, plot, theme, structure, and dialogue and appropriately sophisticated in style, point of view, and use of literary devices.
9. Apply effective strategies to the reading and use of moderately long nonfiction texts (e.g., reference sources, articles, editorials, histories, biographies, autobiographies, diaries, letters, and commentaries) which have an appropriate complexity of content and sophistication of style.

MIDDLE GRADES 5-8 continued on next page

MIDDLE GRADES 5-8 continuation from previous page

10. Demonstrate an understanding of the defining features and structure of literary texts encountered at this level.
11. Read literature and view films which illustrate distinct cultures in various types of works and formulate and defend opinions gathered from the experience.
12. Identify the universality of themes and examine the connections among various expressive forms (e.g., films, fiction, drama) by drawing on their broad base of prior knowledge.
13. Demonstrate understanding of enduring themes of literature by differentiating between main ideas and themes after they study story elements.

SECONDARY GRADES

1. Distinguish between the purpose of a literary work and the personal response of an individual reader.
2. Identify the simple and complex actions and interactions involving main and subordinate characters in a work.
3. Make abstract connections (e.g., connections about thoughts, ideas, values) between their own lives and the characters, events, and circumstances represented in various works.
4. Demonstrate an understanding of the stylistic effect of dialogues on the style of a work.
5. Identify and analyze the details and effects of complex literary devices on the overall quality of a work (e.g., foreshadowing, flashbacks, time frames in the future or past).
6. Identify and analyze how complex elements of plot (e.g., setting, major events, problems, conflicts, resolutions) effect the overall quality of a work.
7. Apply mature strategies to the reading and interpretation of lengthy adult level fiction, (e.g., satires, parodies, plays, poems, novels) using texts that are complex in terms of character, plot, theme, structure, and dialogue and sophisticated in style, point of view, and use of literary devices.
8. Apply mature strategies to the reading and interpretation of lengthy adult level nonfiction texts with appropriate complexity of content and sophistication of style.
9. Demonstrate an understanding of the defining features and structure of literary texts encountered at this level.
10. Draw from a broad base of knowledge about literature of the United States and the world to examine and critique how print and visual texts explore the human experience and condition.
11. Examine, evaluate, and elaborate on universal themes in literature, using reading and viewing to explain how themes are developed and achieved.

C. LANGUAGE AND IMAGES

Students will demonstrate an understanding of how words and images communicate. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Distinguish between and make observations about formal and informal uses of English.
2. Recognize characteristic sounds and rhythms of language, including the relationship between sounds and letters.
3. Make valid observations about the use of words and visual symbols.

ELEMENTARY GRADES 3-4

1. Identify and evaluate how language use varies according to personal situations and settings (e.g., school, home, and community).
2. Identify the social context of conversations and its effect on how language is used.
3. Identify the use of nonverbal cues in conversations.
4. Make observations about the use of language and graphic symbols encountered in various real-life situations.
5. Investigate the languages of other cultures and compare/contrast them to English.
6. Make observations about specific uses and idioms of language.

MIDDLE GRADES 5-8

1. Form conclusions regarding formal, informal, and other varieties of language use, based upon experience.
2. Understand factors that commonly affect language change and use.
3. Consult pertinent information sources on language use (e.g., a dictionary, a thesaurus, a handbook on style).
4. Use knowledge of the fundamental parts of speech when writing and speaking.
5. Demonstrate an understanding of the concept of propaganda.

SECONDARY GRADES

1. Demonstrate an understanding of the relationship among perception, thought, and language.
2. Demonstrate an understanding of how language considerations and representations involving gender affect communication.
3. Compare the ways various social, occupational, and cultural groups use language, and comment on the impact of language use on the way people are viewed and treated.
4. Compare form, meaning, and value of different kinds of symbol systems (e.g., religious symbols, holiday symbols, the symbolism of particular types of architecture).
5. Demonstrate understanding of the history of and changes in the English language by explaining examples.
6. Use dictionaries, handbooks, and other language-related resources to evaluate the accuracy of their use of English.
7. Demonstrate an understanding of the political implications of different forms of language.
8. Identify propaganda techniques used by writers and speakers.

D. INFORMATIONAL TEXTS

Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Understand the main idea of simple expository information.

ELEMENTARY GRADES 3-4

1. Use information contained in chapter and section headings, topic sentences, and summary sentences to construct the main ideas.
2. Use various informational parts of a text (e.g., index, table of contents, glossary, appendices).
3. Read for a variety of purposes (e.g., to answer specific questions, to form an opinion, to skim for information).
4. Summarize informational texts (e.g., identify the main idea or concept and the supporting detail).
5. Recognize when a text is primarily intended to instruct or to persuade.
6. Understand common technical terms used in instructional and informational texts.
7. Recognize when and how new information in a text connects to prior knowledge.

MIDDLE GRADES 5-8

1. Seek appropriate assistance when attempting to comprehend challenging text.
2. Identify useful information organizing strategies.
3. Identify both the author's purpose and the author's point of view when reading expository information.
4. Identify different ways in which informational texts are organized.
5. Produce and support generalizations acquired from informational text.
6. Describe new knowledge presented in informational texts and how it can be used.
7. Identify common technical terms used in informational texts.
8. Use the various parts of a text (index, table of contents, glossary) to locate specific information.

SECONDARY GRADES

1. Scan a passage to determine whether a text contains relevant information.
2. Distinguish between apparent fact and opinion in nonfiction texts.
3. Use discussions with peers as a way of understanding information.
4. Identify complex structures in informational texts and the relationships between the concepts and details in those structures using texts from various disciplines.
5. Analyze and synthesize the concepts and details in informational texts.
6. Explain how new information from a text changes personal knowledge.

English Language Arts

E. PROCESSES OF WRITING AND SPEAKING

Students will demonstrate the ability to use the skills and strategies of the writing process. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Tell about experiences and discoveries, both orally and in writing.
2. Respond to stories orally and in writing.
3. Respond to remarks or statements orally and in writing.

ELEMENTARY GRADES 3-4

1. Identify strengths and weaknesses in their own writing and seek effective help from others.
2. Improve their finished product by revising content from draft to final piece.
3. Use planning, drafting, and revising to produce, on-demand, a well-developed, organized piece that demonstrates effective language use, voice, and command of mechanics.
4. Report orally and summarize personal discoveries they have made as a result of reading and viewing.
5. Give accurate directions.
6. Summarize central concepts from oral presentations.

MIDDLE GRADES 5-8

1. Identify specific personal strategies, strengths, and weaknesses in writing, and use direct feedback from peers and teachers to revise and polish the content of their finished pieces.
2. Use planning, drafting, and revising to produce, on demand, a well-developed, organized piece that demonstrates effective language use, voice, and command of mechanics.
3. Ask questions and apply personal interpretations in class discussion following speeches and oral presentations.

SECONDARY GRADES

1. Ask pertinent questions during writing conferences and when working alone, using knowledge of personal writing strategies, strengths, and weaknesses to improve one's own writing.
2. Reflect on, evaluate, revise, and edit a sequence of drafts to improve and polish finished work.
3. Use planning, drafting, and revising to produce, on demand, a well-developed, organized piece that demonstrates effective language use, voice, and command of mechanics.
4. Evaluate the remarks and oral presentations of others to find the key ideas, and explain the ways in which these ideas were developed.

English Language Arts

F. STANDARD ENGLISH CONVENTIONS

Students will write and speak correctly, using conventions of standard written and spoken English. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Edit their own written work for standard English spelling and usage, as evidenced by pieces that show and contain:
   - complete sentences.
   - initial understanding of the use of pronouns and adjectives.
   - evidence of correct spelling of frequently used words.
   - few significant errors in the capitalization of proper nouns and of the words that begin sentences.
   - few significant errors in the use of end stop punctuation (e.g., periods, question marks).
2. Use oral language appropriate to the level of formality required.

ELEMENTARY GRADES 3-4

1. Edit written work for standard English spelling and usage, evidenced by pieces that show and contain:
   - few significant errors in the use of pronouns and adjectives.
   - attention to the proper use of adverbial forms and conjunctions.
   - few significant errors in the spelling of frequently used words.
   - no significant errors in the capitalization of words that begin sentences and few significant errors in the capitalization of proper nouns and titles.
   - no significant errors in the use of ending punctuation marks and an understanding of how to use commas.
2. Use the level of language formality required in a variety of speaking situations.

MIDDLE GRADES 5-8

1. Edit written work for standard English spelling and usage, evidenced by pieces that show and contain:
   - no significant errors in the use of nouns, pronouns, and adjectives.
   - few significant errors in the use of adjective forms (e.g., comparative, superlative), adverbial forms, prepositions, and prepositional phrases.
   - attention to the proper use of conjunctions.
   - no significant errors in the spelling of common, frequently used words, and attention to the correct spelling of commonly misspelled words and less common words.
   - no significant errors in the common conventions of capitalization (e.g., proper nouns, names, titles) and attention to the less common capitalization conventions (e.g., capitalizing the names of nationalities).
   - no significant errors in the use of ending punctuation marks, few significant errors in the common uses of commas, and attention to the proper use of the colon, semicolon, hyphen, dash, apostrophe, and quotation marks.
   - attention to the correct use of commonly confused terms (e.g., *affect* and *effect*).
   - attention to the proper use of italics, marginal notes, and footnotes.
2. Demonstrate command of the conventions necessary to make an informal speech or presentation, effectively engaging peers and fielding responses.

SECONDARY GRADES

1. Edit written work for standard English spelling and usage, evidenced by pieces that show and contain:
   - no significant errors in the use of pronouns, nouns, adjectival and adverbial forms
   - coordinating and subordinating conjunctions.
   - no significant errors in the spelling of frequently used words and the correct use of commonly confused terms.
   - no significant errors in the common conventions of capitalization and ending punctuation marks and common uses of the comma.
   - few significant errors in the spelling of commonly misspelled and rare words, the less common capitalization conventions, the colon, semicolon, hyphen, dash, apostrophe, quotation marks, italics, marginal notes, and footnotes.
2. Demonstrate how language usage may depend on the situation.
3. Demonstrate command of the conventions involved in a formal speech, effectively engaging peers during presentation and fielding responses afterwards.

G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING

Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Dictate or write stories or essays which convey basic ideas, have sequences that make sense, and show evidence of a beginning, middle, and ending.

ELEMENTARY GRADES 3-4

1. Write pieces and make remarks that begin to use descriptive language that clarifies, enhances, and develops ideas.
2. Write stories (or other pieces) that show a definite beginning (introduction), middle (body), and ending (conclusion).
3. Write essays and make remarks that clearly state or suggest a central idea and provide supporting detail.
4. Write pieces that show awareness of a variety of intended audiences and identifiable purposes.
5. Explain the various purposes of spoken communications.
6. Explain how speakers use physical gestures and eye contact and use this knowledge in their own presentations.
7. Use a variety of media and technological resources to make creative and expository oral presentations.

MIDDLE GRADES 5-8

1. Write stories with an identifiable beginning, middle, and ending.
2. Write stories that include major events, develop settings, and deal with problems and solutions.
3. Write pieces and deliver oral presentations that use structures appropriate to audience and purpose.
4. Write essays and deliver oral presentations which identify a clear topic and reliably support that topic.
5. Write for both public and private audiences.
6. Write and deliver oral presentations that achieve distinct purposes (e.g., to summarize, to narrate, to inform, to explain).
7. Write pieces and make remarks that use descriptive language to clarify, enhance, and develop ideas.
8. Write pieces and deliver oral presentations that include a variety of sentence structures appropriate to the purpose.
9. Write pieces that use a variety of transitional devices (i.e. phrases, sentences, paragraphs).
10. Deliver oral presentations that use a variety of strategies of address (e.g., eye contact, hand gestures, voice modulation, changes of rhythm).

SECONDARY GRADES

1. Write stories that effectively develop such elements as setting, major events, problems and solutions.
2. Write pieces and deliver oral presentations that effectively use descriptive language to clarify, enhance, and develop ideas.
3. Write pieces and deliver oral presentations that include a variety of sentence structures and lengths.
4. Write pieces and deliver oral presentations that are targeted for various audiences (e.g., informed or uninformed, sympathetic or hostile).
5. Write pieces and deliver oral presentations that achieve distinct purposes (e.g., to persuade, evaluate, analyze, defend).
6. Write pieces and deliver oral presentations that effectively employ explicit transitional devices in order to change a situation or to move the reader/listener through the piece.
7. Write pieces and deliver oral presentations in which the organization of the work follows from the purpose.
8. Write pieces and deliver oral presentations in a personal style, with a discernible voice and effective wording.
9. Write essays and deliver oral presentations that reliably support and provide details for the explicitly stated generalizations.
10. Make effective use of a variety of techniques to provide supporting detail (e.g., analogies, anecdotes, illustrations, detailed descriptions, restatements, paraphrases, examples, comparisons) in written work and oral presentations.
11. Make effective use of a variety of techniques for introducing and representing ideas and insights in written work and oral presentations.

English Language Arts

H. RESEARCH-RELATED WRITING AND SPEAKING

Students will work, write, and speak effectively when doing research in all content areas. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Develop a search strategy which uses appropriate and available resources.
2. Formulate questions to ask when gathering information.
3. Record and share information gathered.

ELEMENTARY GRADES 3-4

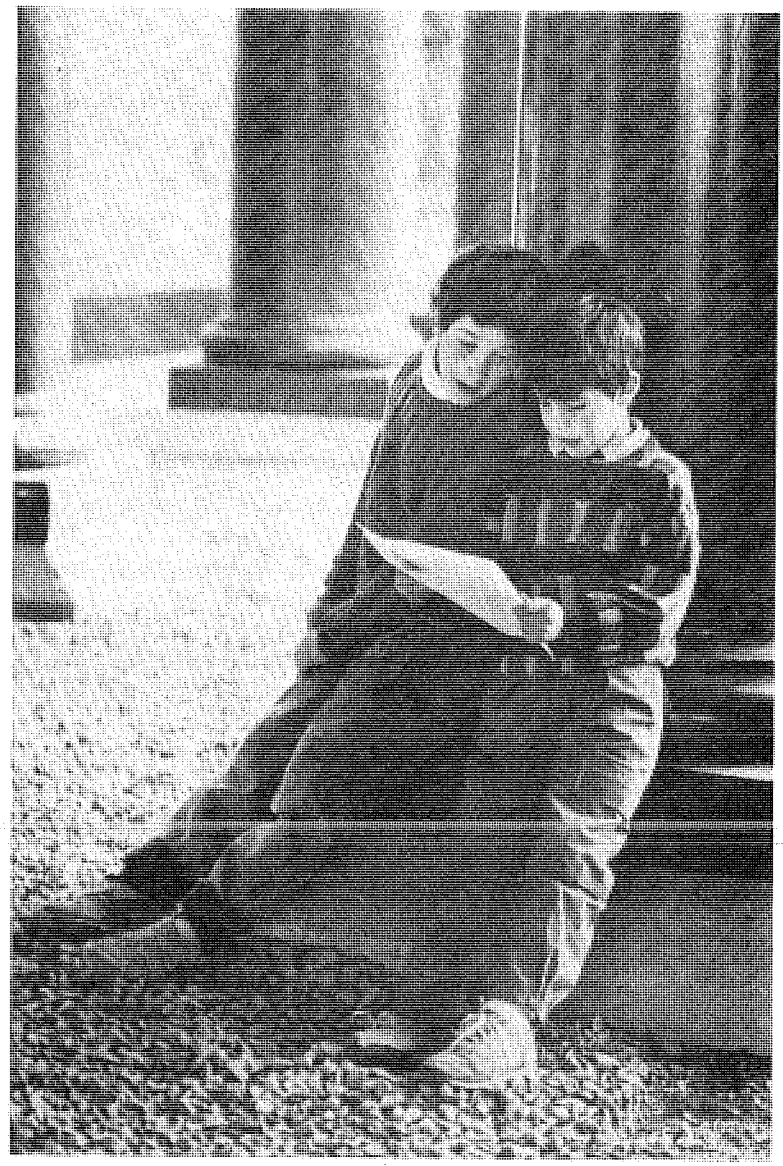
1. Ask and seek answers to questions.
2. Use print and non-print resources (e.g., encyclopedias, dictionaries, people, indexes) to gather information on research topics.
3. Present information obtained from research in a way that combines various forms of information (e.g., maps, charts, photos).
4. Distinguish between facts encountered in documents, narratives, and other sources and the generalizations or interpretations a person draws concerning those facts.
5. Demonstrate initial understanding of how to cite sources.

MIDDLE GRADES 5-8

1. Collect and synthesize data for research topics from interviews and field work, using notetaking and other appropriate strategies.
2. Separate information collected for research topics into major components based on relevant criteria.
3. Create bibliographies.
4. Use available catalogs to locate materials for research reports.
5. Use indexes to periodical literature to locate information for research.
6. Use magazines, newspapers, dictionaries, journals, and other print sources to gather information for research topics.
7. Use search engines and other Internet resources to collect information for research topics.
8. Make limited but effective use of primary sources when researching topics.
9. Explain the importance of primary sources in evaluating the validity and reliability of collected information.
10. Demonstrate initial understanding of proper attribution (e.g., footnotes).

SECONDARY GRADES

1. Develop an appropriate strategy for finding information on a particular topic.
2. Use referencing while doing research.
3. Record significant information from events attended and interviews conducted.
4. Identify and use library information services.
5. Use government publications, in-depth field studies, and almanacs for research.
6. Use CD-ROM, microfiche, and similar resource media for research.
7. Identify and use a variety of news sources (e.g., newspapers, magazines, broadcast and recorded media, artifacts), informants, and other likely sources for research purposes.
8. Use search engines and other Internet resources to do research.
9. Make extensive use of primary sources when researching a topic and carefully evaluate the motives and perspectives of the authors.
10. Analyze the validity and weigh the reliability of primary information sources and make appropriate use of such information for research purposes.
11. Evaluate information for accuracy, currency, and possible bias.
12. Report orally, using a variety of technological resources to present the results of a research project.



"Knowledge is power."

Francis Bacon (*Meditationes Sacrae*, 1597, De Haeresibus)

Health And Physical Education

"The health of the people is really the foundation upon which all their happiness and all their powers as a state depend."

Benjamin Disraeli, Earl of Beaconsfield (Speech - July 24, 1877)

Every day, students make decisions affecting their health and well-being: What foods to eat. What company to keep. What risks to take. What to do for exercise. These decisions often lead to habits that stay with them throughout life. The standards for health education and physical education can help students make better decisions about their health. They learn that their decisions can affect their health and set a pattern for their lives. Students learn to protect their health by acquiring good information, by seeking good advice and friendships, and by taking responsibility for their own health.

Health education gives students the knowledge and skills to thrive physically, mentally, emotionally, and socially. This knowledge helps students meet the challenges of growing up. It helps students to recognize the causes of ill health and to understand the benefits of prevention, good hygiene, and appropriate medical care. Through health education, students become aware of the dimensions of good health: physical soundness and vigor; mental alertness and ability to concentrate; expressing emotions in a healthy way; resiliency; and positive relations with family and peers. Health education also includes a set of skills to help students be better consumers of information, to manage stress and conflict, and to make better decisions in the face of conflicting messages, thus assisting them to live healthier lives.

Physical education gives students the knowledge and skills to make the most of their physical and mental abilities. It gives them building blocks for good health: physical fitness and skills, coordination, and good sportsmanship. Students learn to assess their own physical fitness and maintain healthy levels of physical activity. They learn new skills and improve performance, while gaining the self discipline to take part in individual and group activities. Students who participate in physical education activities on a regular basis, learn the benefits of that participation and value its contribution to a healthy lifestyle.

HEALTH EDUCATION

A. HEALTH CONCEPTS

Students will understand health promotion and disease prevention concepts. *Knowledge of how disease and injury affect the body and learning about the health benefits of preventive care, timely treatment, and appropriate personal behaviors are at the heart of health education. Students who protect their health have a better chance of remaining healthy and productive throughout their lives.*

B. HEALTH INFORMATION, SERVICES, AND PRODUCTS

Students will know how to acquire valid information about health issues, services, and products. *People need good information about prevention, early detection, and treatment of health problems. An important step in learning to protect health is developing the skills to find and analyze information about health issues.*

C. HEALTH PROMOTION AND RISK REDUCTION

Students will understand how to reduce their health risks through the practice of healthy behaviors. *In taking responsibility for personal health, students lay a foundation for a healthy, productive life. Many diseases and injuries can be prevented by avoiding harmful behaviors and taking fewer risks. More importantly, students can take steps to improve their health such as eating better foods, exercising regularly, and paying attention to preventive care.*

D. INFLUENCES ON HEALTH

Students will understand how media techniques, cultural perspectives, technology, peers, and family influence behaviors that affect health. *Students receive an almost constant stream of information about their health and behavior. As a first step to making decisions that protect health, students need to recognize how different messages influence their actions.*

Health And Physical Education

E. COMMUNICATION SKILLS

Students will understand that skillful communication can contribute to better health for them, their families, and the community. *Students need effective communication skills to develop and maintain healthy personal relationships. The ability to organize and convey information, beliefs, opinions, and feelings is a skill that can reduce and avoid conflict. Communication skills enable individuals to be advocates for a healthy school, home, workplace, and community.*

F. DECISION-MAKING AND GOAL SETTING

Students will learn how to set personal goals and make decisions that lead to better health. *Knowledge of good health practices will not help students unless they have the foresight and discipline to act on that knowledge. The practical application of knowledge requires students to develop skills such as goal setting and decision making. Students who have the right combination of knowledge and skills can begin to contribute to their own good health, to healthy families, and to safer communities.*

PHYSICAL EDUCATION

A. PHYSICAL FITNESS

Students will acquire the knowledge needed to be physically fit and take part in healthful physical activity on a regular basis. *Students who develop healthful patterns of physical activity and enjoyment are more likely to stay physically fit and active in their adult lives.*

B. MOTOR SKILLS

Students will develop motor skills and apply these to enhance their movement and physical performance. *Successful development of motor skills provides an opportunity to enjoy participation in physical activities, and reach advanced levels of performance, which in turn, increases the likelihood of continued participation.*

C. PERSONAL AND SOCIAL INTERACTIONS

Students will demonstrate responsible personal and social behaviors in physical activity settings. *Whether working alone, with another individual, or with a group, students engaged in physical activities are expected to demonstrate self respect and consideration of others as they seek to meet a challenge or solve a problem.*

Health And Physical Education

HEALTH EDUCATION

A. HEALTH CONCEPTS

Students will understand health promotion and disease prevention concepts. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Recognize that there are multiple components of health.
2. Describe the transmission and prevention of communicable diseases.
3. Demonstrate an understanding of basic health terms.

EXAMPLES

- Using any art medium, students will make visuals which show children participating in health activities (e.g., eating healthful foods, learning to do crafts, spending time with family, or playing with friends).
- Practice proper handwashing.

ELEMENTARY GRADES 3-4

1. Describe the relationship between healthy practices and personal health (e.g., eating well and exercise).
2. Identify indicators of physical, mental, emotional, and social health during childhood.
3. Describe the basic structures and functions of the human body systems.
4. Identify common health problems of children that should be detected and treated early.
5. Describe ways in which a healthful school and community environment influences personal health.
6. Explain the difference between positive and negative responses to stress.
7. Demonstrate essential understanding of basic health concepts.

EXAMPLES

- Role-play situations that cause stress for students (special events, tests, friends moving) showing that for some it has a positive effect (motivation to study or practice) and for some, negative effects (physical symptoms).
- List three things that should be included on a medicine label and explain why each is important.

MIDDLE GRADES 5-8

1. Explain the relationship between healthy behaviors and the prevention of injury, illness, and disease.
2. Describe the relationship among physical, mental, emotional, and social health.
3. Analyze the effects that risky behaviors have on personal health (e.g., tobacco, drugs, poor nutrition, sexual activity, sedentary life-style, and behaviors resulting in injury).
4. Evaluate how health is influenced by the interaction of body systems (e.g., physical fitness and the respiratory and circulatory systems).
5. Analyze how the environment relates to personal health.
6. Explain how appropriate health care can prevent premature death and disability.
7. Identify the characteristics and stages of human growth and development.
8. Demonstrate thorough understanding of key health concepts.

EXAMPLES

- Write a short essay describing how a broken leg, riding a bike with a friend, or other activities would affect all four components of adolescent's health.
- Explain why tobacco, alcohol, and marijuana are called gateway drugs.
- Analyze the health effects of tobacco, alcohol, and other drugs.
- Discuss the relationship between the endocrine and reproductive systems.

Health And Physical Education

SECONDARY GRADES

1. Analyze the relationship between personal health practices and individual well-being.
2. Describe the interrelationship of physical, mental, emotional, and social health throughout the stages of life.
3. Evaluate the short- and long-term effects of risky behavior.
4. Analyze the impact of personal health behaviors on body systems.
5. Analyze how the environment relates to personal and community health.
6. Describe health issues common at different stages of life.
7. Analyze how public health policies and laws influence health promotion and disease prevention.
8. Analyze how the prevention and control of health problems are influenced by research and medical advances.
9. Describe how disease-causing microorganisms, family history, nutrition, and other factors relate to the cause or prevention of disease and other health problems.
10. Describe how stress management relates to disease prevention.
11. Demonstrate in-depth understanding of complex health concepts.

EXAMPLES

- Analyze how particular health practices prevent the transmission of communicable diseases.
- Evaluate the short- and long-term effects of the use of tobacco, alcohol, and other drugs.
- Discuss how personal hygiene practices affect physical and social well-being.
- Analyze the possible negative and positive impacts of industrial development on the environment of a community and the health of local residents.

Health And Physical Education

HEALTH EDUCATION

B. HEALTH INFORMATION, SERVICES, AND PRODUCTS

Students will know how to acquire valid information about health issues, services, and products. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify which school and community health helpers are needed in given situations.

EXAMPLE

- Link specific tasks to specific healthcare providers such as family doctor, dentist, or nurse.

ELEMENTARY GRADES 3-4

1. Identify characteristics of valid health information and products, and services that promote health.
2. Demonstrate ways to locate school and community health helpers.
3. Identify community agencies that advocate healthy individuals, families, and communities.

MIDDLE GRADES 5-8

1. Analyze the validity of health information, products, and services and describe situations requiring their use.
2. Identify resources from home, school, and community that provide valid health information and services.

EXAMPLE

- Prepare a healthful menu using the Food Guide Pyramid.

SECONDARY GRADES

1. Provide evidence to support the validity of health information, products, and services.
2. Evaluate factors that influence personal selection of health products and services (e.g., cost and accessibility).
3. Access school and community health services (e.g., school nurse, family physician, emergency care).
4. Analyze various health problems and identify those that require professional health care services (e.g., dental cavities, sports injuries).

EXAMPLE

- Compare and contrast ingredients, packaging, and cost of three common acne products.

Health And Physical Education

HEALTH EDUCATION

C. HEALTH PROMOTION AND RISK REDUCTION

Students will understand how to reduce their health risks through the practice of healthy behaviors. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Differentiate between safe and harmful substances found at home and school.
2. Demonstrate personal hygiene skills.
3. Choose healthful foods.
4. Demonstrate a variety of safety skills for different situations (e.g., pedestrian, bus, fire, auto, and bicycle safety).
5. Apply coping strategies when they feel too excited, anxious, angry, or out of control.

EXAMPLE

- Demonstrate slowly counting to ten when role-playing a situation where the student feels out of control.

ELEMENTARY GRADES 3-4

1. Compare behaviors that are safe to those that are risky or harmful (e.g., bicycle safety, handling weapons, use of medicines).
2. Develop injury prevention and safety strategies for personal health.
3. Demonstrate basic care of human body systems.
4. Demonstrate healthful and safe ways to deal with or avoid threatening and stressful situations.

EXAMPLES

- Describe safe behavior in and near water.
- Demonstrate basic first aid for a scrape or first degree burn.

MIDDLE GRADES 5-8

1. Explain the importance of assuming responsibility for personal health.
2. Analyze a personal health assessment to determine health strengths and risks.
3. Develop strategies to improve or maintain personal and family health.
4. Develop injury prevention and response strategies for personal safety, including first aid.
5. Demonstrate ways to avoid or change situations that threaten personal safety.
6. Distinguish between healthy and unhealthy stress management techniques.

EXAMPLES

- Discuss physical, emotional, and sexual abuse.
- Demonstrate the proper technique used to administer the Heimlich maneuver.
- Conduct a self-examination of health practices using an inventory or self-appraisal.

SECONDARY GRADES

1. Analyze the extent to which individuals are responsible for enhancing health and safety in the community and the workplace.
2. Demonstrate strategies to avoid, change, and report unsafe situations.
3. Design, implement, and evaluate a plan of stress management.

EXAMPLES

- Using computer technology or other media, create a brochure that outlines healthy strategies for the workplace.
- Analyze the school's sexual harassment policy and recommend ways to inform school staff and students about the prevention and consequences of inappropriate behavior.

Health And Physical Education

HEALTH EDUCATION

D. INFLUENCES ON HEALTH

Students will understand how media techniques, cultural perspectives, technology, peers, and family influence behaviors that affect health. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe the influences of media on health.
2. Explain how information from school and family influences health.

ELEMENTARY GRADES 3-4

1. Evaluate the influences of culture on health.
2. Explain how media influences health decisions.
3. Describe ways technology affects personal health.
4. Describe ways to be a responsible friend and family member.

MIDDLE GRADES 5-8

1. Investigate the influence of cultural beliefs on health behaviors and the use of health services.
2. Analyze how messages from media influence both health behaviors and the selection of health information, products, and services (e.g., eating disorders, teen magazines, acne products, dental care).
3. Analyze the effect of technology on personal and family health.
4. Describe how school, family, and peers influence the health of adolescents.

EXAMPLE

- Discuss, from a historical perspective, the use of alternative medical practices in the Native American culture.

SECONDARY GRADES

1. Analyze how different cultures affect health beliefs and practices (gender equity).
2. Evaluate the effect of media and other factors on personal, family, and community health.
3. Evaluate the impact of technology on personal, family, and community health.
4. Analyze how the family, peers, and community influence the health of individuals.

EXAMPLE

- Use critical thinking skills to analyze marketing and advertising techniques and their influence on alcohol and tobacco use, eating habits, and sexual behaviors.

Health And Physical Education

HEALTH EDUCATION

E. COMMUNICATION SKILLS

Students will understand that skillful communication can contribute to better health for themselves, their families, and the community. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Demonstrate healthy ways to express needs, wants, and feelings.
2. Distinguish between verbal and nonverbal communication.

ELEMENTARY GRADES 3-4

1. Use appropriate communication and listening skills to enhance health.
2. Differentiate between negative and positive ways to deal with conflict.
3. Demonstrate non-violent strategies to resolve conflicts.
4. Express opinions and give accurate information about health issues.

MIDDLE GRADES 5-8

1. Demonstrate effective verbal and non-verbal communication skills to enhance health and to build and maintain healthy relationships (e.g., positive peer pressure).
2. Demonstrate refusal and negotiation skills which can enhance health by enabling them to deal with negative peer pressure.
3. Demonstrate conflict resolution strategies.
4. Analyze various communication methods which can be used to give information, ideas, and opinions about health issues.

EXAMPLES

- Select a newspaper story about a conflict involving violence and discuss the issues involved on all sides. Describe how conflict resolution and negotiation skills could be used to defuse the violence.
- Write a fictitious or real letter to someone who is trying to change a health behavior (e.g., stop smoking, start exercising), and give them encouragement by citing the benefits of the change (e.g., reduced risk of lung cancer and heart disease).

SECONDARY GRADES

1. Demonstrate healthy ways to listen and communicate effectively with family, peers, and others.
2. Demonstrate strategies that can be used to prevent or solve conflicts without harm.
3. Analyze the possible causes of conflict in schools, families, and communities.
4. Evaluate the effectiveness of various communication methods for accurately delivering health information and ideas.
5. Utilize strategies to overcome barriers when communicating information, ideas, feelings, and opinions about health issues.
6. Demonstrate the ability to work cooperatively as an advocate for healthy individuals, families, schools, and communities.
7. Adapt health messages and communication techniques to the characteristics of a particular audience.

EXAMPLE

- Translate health information (e.g., risks of using drugs, how to prevent transmission of colds and flu) from a secondary health text to language and format understandable to elementary students.

Health And Physical Education

HEALTH EDUCATION

F. DECISION-MAKING AND GOAL SETTING

Students will learn how to set personal goals and make decisions that lead to better health. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explain when assistance is needed in making health-related decisions and setting health goals.
2. Set a short-term personal health goal.

EXAMPLE

- During a "Health Day" at school each student chooses one health goal to work on (e.g., flossing teeth, exercising).

ELEMENTARY GRADES 3-4

1. Demonstrate the ability to apply a decision-making process to health issues and problems.
2. Predict the results of positive health decisions.

MIDDLE GRADES 5-8

1. Demonstrate individual and collaborative decision-making processes to resolve health problems.
2. Analyze how health-related decisions are influenced by individuals, families, and community values.
3. Explain how decisions regarding health behaviors have consequences for them and others.
4. Describe how personal health goals are influenced by changing information, abilities, priorities, and responsibilities.
5. Develop a plan to attain personal health goals by employing personal strengths and addressing needs and health risks.

EXAMPLE

- Write a story for the school newspaper explaining how teenage smoking is positively and negatively influenced by friends, role models, and community norms.

SECONDARY GRADES

1. Demonstrate various decision making strategies that can be used to address behaviors which lead to trouble.
2. Analyze health concerns that require collaborative decision making.
3. Predict the immediate and long-term impact of health decisions on the individual, family, and community.
4. Implement a plan and evaluate progress in attaining personal health goals.
5. Formulate an effective long-range personal health plan.

EXAMPLE

- Discuss how a local school board could use a collaborative decision-making process to develop a tobacco-free-school policy.

Health And Physical Education

PHYSICAL EDUCATION

A. PHYSICAL FITNESS

Students will acquire the knowledge needed to be physically fit and take part in healthful physical activity on a regular basis. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify the physical changes that accompany moderate to vigorous activity (e.g., sweating, increased heart rate, heavy breathing).
2. Engage in moderate to vigorous physical activity.
3. Identify activities associated with each component of health-related fitness (e.g., cardiovascular endurance, muscular endurance, muscular strength, body composition).
4. Move with an awareness of others.
5. State reasons for safe and controlled movements.

EXAMPLES

- Student is aware that the heart beats rapidly during physical activity.
- Explain the relationship of running to cardiovascular endurance, stretching to flexibility, etc.

ELEMENTARY GRADES 3-4

1. Identify the components of health-related fitness (cardiovascular endurance, muscular endurance, muscular strength, flexibility, body composition).
2. Demonstrate specific activities to improve each of the components of health-related fitness.
3. Identify the benefits of regular participation in physical activity.
4. Participate in physical activity for the purpose of improving health-related fitness.
5. Participate in health-related fitness assessments.
6. Analyze potential risks of physical activities.
7. Utilize safety principles during activities.

EXAMPLE

- Complete a series of exercises (e.g., curl-ups, v-sit, shoulder stretch, pushups, jogging in place) and explain the benefit of each and why they are done together.

MIDDLE GRADES 5-8

1. Define the components of skill-related fitness (agility, balance, coordination, power, reaction time, and speed) and health-related fitness and identify activities which contribute to the development of each component.
2. Participate in and distinguish among a variety of health-related fitness activities.
3. Assess health-related fitness levels and develop personal fitness goals.
4. Establish personal physical activity goals and participate regularly in health-enhancing activities to accomplish these goals.
5. Demonstrate understanding of and apply the following principles of training: specificity (use of a specific exercise to develop skill in a particular activity); progression (increasing the level of intensity); and overload (e.g., increasing the weights used in an exercise in order to build muscle more quickly, rather than increasing the speed of the exercise).
6. Assess physiological indicators of exercise during and after physical activity (e.g., pulse rate, sweating).
7. Demonstrate appropriate stretching and warm up exercises that enhance the learning and performance of activities.
8. Identify and apply rules and procedures designed for safe participation.

EXAMPLE

- Participate, at least three times a week, in a multi-week program of walking, jogging, and running in which the time spent increases each week (2-minutes per session in the first week, 5 minutes in the second, and 7 minutes in the third). Students will keep a log and will record, for each session, the time spent, distance covered, and perceived level of exertion.

Health And Physical Education

SECONDARY GRADES

1. Design and implement a personal fitness program based on an accurately assessed fitness profile applying the principles of training.
2. Participate in a variety of health-enhancing physical activities.
3. Demonstrate an understanding of how patterns of participation change throughout life, and develop strategies to deal with those changes.
4. Demonstrate the knowledge, skills, and behaviors needed to maintain or modify levels of fitness.
5. Analyze and compare physical fitness activities for their health-enhancing potential and benefits.

EXAMPLE

- Develop a personal fitness portfolio which may contain:
    a) Reports on their own health-related fitness status over a period of one year.
    b) Personal fitness goals.
    c) Records of physical activity, eating, and other behaviors that affect physical fitness.
    d) An end-of-the-year assessment of physical fitness.

Health And Physical Education

PHYSICAL EDUCATION

B. MOTOR SKILLS

Students will develop motor skills and apply these to enhance their movement and physical performance. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Demonstrate progress in mastering locomotor skills (skills used to move from one place to another, e.g., walking, running, jumping, hopping) and non-locomotor skills (skills used to move in place e.g., turning, twisting).
2. Demonstrate improving form when using various sports accessories (e.g., throwing a ball, catching a bean bag, hitting a hockey puck).
3. Demonstrate simple combinations of motor patterns (e.g., dribbling while running).
4. Make smooth transitions between sequential motor skills (e.g., running into a jump).
5. Adapt and adjust movement skills to uncomplicated, changing, environmental conditions and expectations (e.g., tossing a ball to a moving partner).
6. Identify the critical elements of fundamental movement patterns (e.g., throwing; ready position, arm preparation, turn side to target, step in opposition, etc.).
7. Apply movement concepts (e.g., patterns of movement, direction, speed, etc.) to a variety of fundamental skills (e.g., running in different directions without bumping into others or falling).

EXAMPLE

- Use a series of motor skills to create and perform a movement pattern (skip-walk-hop-run-jump).

ELEMENTARY GRADES 3-4

1. Create movement patterns in combination and/or sequence using movement concepts.
2. Distinguish between locomotor and non-locomotor skills in physical activities.
3. Demonstrate mature form in all locomotor patterns, non-locomotor skills, and selected sports accessories.
4. Adapt a skill to the demands of the environment (e.g., dribble and pass a ball to a moving receiver).
5. Demonstrate beginning skills of two or more specific movement forms (e.g., a beginner level gymnastics routine or a simple folk dance).
6. Combine movement skills in applied settings (e.g., run, jump, and land for distance).
7. Apply critical elements to improve personal performance (e.g., transfer weight from feet to hands at an increased speed, thus changing a mule kick into a handstand).
8. Recognize and apply concepts that have an impact on the quality of movement (e.g., appropriate practice improves performance).
9. Identify and demonstrate appropriate safety practices and rules for activities.

EXAMPLES

- Perform a jump rope routine to a simple jingle.
- Balance, with control, on a variety of objects (e.g., balance board, large apparatus, skates).

MIDDLE GRADES 5-8

1. Demonstrate the correct use of skills in simplified versions of a variety of physical activities (e.g., a 3-on-3 basketball game, a simple folk or square dance).
2. Identify the critical elements of more advanced movement skills (e.g., describe elements of a sprinter's stance in track).
3. Describe and apply principles of practice and conditioning that enhance performance (e.g., warm-up before and cool-down after an activity).
4. Recognize general characteristics of movement that can be applied to specific settings (e.g., the "ready" position is similar for volleyball and softball or baseball).
5. Use offensive and defensive strategies in simple games and in non-complex settings (e.g., strategies for a singles or doubles tennis match).
6. Differentiate among the characteristics of highly skilled performances in different movement forms (e.g., explain the difference between a long distance run and a sprint).

MIDDLE GRADES 5-8 continued on next page

MIDDLE GRADES 5-8 continuation from previous page

7. Explain and apply more advanced knowledge of sport/activities (e.g., positional play in a game of basketball).
8. Use feedback from others to improve a skill by focusing on critical elements of the skill.
9. Create a safe environment for skill practice.

EXAMPLES

- Use their hands to "set" the volleyball above the height of the net several times, consecutively (i.e., push the ball in the air or advance it so another player can hit it).
- Perform a country line dance.

SECONDARY GRADES

1. Demonstrate competency (basic skills, strategies, and rules) in more complex versions of different types of movement forms (e.g., team sports, individual and dual sport, outdoor pursuits, dance) .
2. Demonstrate proficiency in a few movement forms (e.g., passing the requirements of the Red Cross intermediate swimmer level).
3. Use biomechanical concepts and principles (concepts and principles related to the mechanics of the body) to develop skills for specific activities.
4. Apply biomechanical concepts and principles to analyze and improve their own performances and the performances of others (e.g., view a videotape of themselves performing a physical activity and analyze the performance).
5. Evaluate risk and safety factors that may affect physical activity preferences.
6. Design appropriate practice sessions to improve performance.
7. Analyze time, cost, and accessibility factors related to regular participation in physical activities.

EXAMPLE

- Create a line dance or gymnastics routine; choosing the music (if needed), developing the moves (steps), and sharing the routine with others.

Health And Physical Education

PHYSICAL EDUCATION

C. PERSONAL AND SOCIAL INTERACTIONS

The student will demonstrate responsible personal and social behaviors in physical activity settings. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify the rules of a given activity.
2. Demonstrate cooperative skills (following rules, taking turns, sharing equipment, etc.) while participating in physical activities.
3. Use equipment appropriately and responsibly.
4. Describe rules and behaviors that contribute to productive participation in physical activity.

ELEMENTARY GRADES 3-4

1. Demonstrate appropriate communication skills in a variety of physical activities and describe how these skills can enhance group/team cooperation and effort.
2. Follow activity-specific rules, procedures, and etiquette.
3. Demonstrate safety principles in physical activity settings.
4. Participate cooperatively with partners to improve skill performance during practice.
5. Assess their own performance problems without blaming others.

EXAMPLES

- Select a goal from options provided by the teacher (e.g., walk a certain distance, jump rope a number of minutes) that requires the group to work together to achieve the goal. Comment on individual as well as group progress towards the goal.
- Create a class mural entitled "Favorite Activities in Physical Education".

MIDDLE GRADES 5-8

1. Describe ways in which respect for individual similarities and differences among people is demonstrated in physical activity settings.
2. Participate safely and cooperatively with others to achieve group goals in competitive and cooperative physical activities.
3. Recognize the influence of peer pressure on individuals during physical activities.
4. Solve problems which occur in physical activities by analyzing causes and potential solutions.
5. Identify behaviors that are supportive and inclusive in physical activity.
6. Demonstrate appropriate etiquette, ways of interacting, care of equipment, and safety in the setting of an activity.
7. Apply a decision-making process to the safety of themselves and others in activity settings.

EXAMPLES

- Exclusionary behavior during physical activity can be very subtle. Students are asked to observe activity during a physical education class or on the playground and record instances of perceived exclusionary behavior. For example, the methods used to choose teams, differences in ability level, and gender or cultural/ethnic differences, can lead to exclusionary behaviors. In addition, students are asked to suggest strategies for maximizing inclusion.
- Choose two famous athletes, one who is generally admired for positive behavior and one who is known generally for negative behavior. Compare and contrast the image portrayed by each athlete and comment on the effect the images have on their own behavior or behavior of others their age.

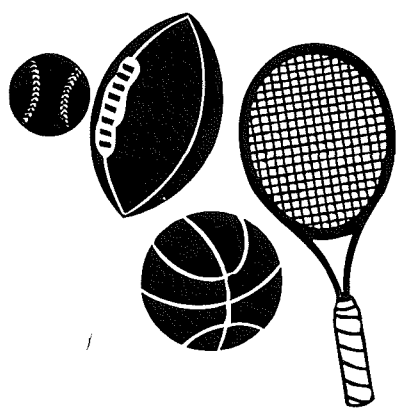
Health And Physical Education

SECONDARY GRADES

1. Describe personal and group conduct necessary to participate cooperatively and ethically in both competitive and noncompetitive physical activities.
2. Accommodate for the differences in skill and performance levels of participants by adapting activities to encourage individual success.
3. Initiate independent and responsible personal behavior in physical activity settings.
4. Identify potentially dangerous consequences and outcomes of participation in physical activity.
5. Identify opportunities to share and learn from others through physical activity.
6. Demonstrate appropriate etiquette, ways of interacting, care of equipment, and safety in the setting of an activity.
7. Apply a decision-making process to their safety and that of others in activity settings.

EXAMPLES

- Organize and conduct a sport or game adapted for physically challenged individuals. Invite non-disabled individuals to participate with the purpose of gaining insights into the challenges that persons with disabilities face while participating in physical activity. Interview participants after the activity and report (orally or in writing) insights gained from the experience.
- Demonstrate weight room etiquette, policies, and procedures and identify the potential dangers in not following the rules.



"In the fields of observation chance favors only the prepared mind."

Louis Pasteur (Inaugural Lecture,
University of Lille - December 7, 1854)

Mathematics

"Mathematics, rightly viewed, possesses not only truth, but supreme beauty - a beauty cold and austere, like that of sculpture, without appeal to any part of our weaker nature, without the gorgeous trappings of painting or music, yet sublimely pure, and capable of a stern perfection such as only the greatest art can show."

Bertrand Russell (*The Study of Mathematics* - 1902)

Education must equip all students with mathematical skills that provide them with the flexibility, adaptability, and creativity to function as productive citizens in the changing technological society of the twenty-first century. Mathematical skills must extend beyond the ability to calculate into the use of mathematics to investigate, analyze, and interpret.

Thinking mathematically is critical to every life skill from balancing a checkbook to understanding the newspaper. People use math skills daily to identify problems, look for information that will help solve the problems, consider a variety of solutions, and communicate the best solution to others.

A math classroom should provide practical experience in mathematical skills that are a bridge to the real world, as well as explorations which develop an appreciation of the beauty and value of mathematics. Using a variety of tools, such as calculators, computers, and hands-on materials, under the guidance of a skillful teacher creates a rich mathematical learning environment. Such an environment will help to prepare students for a world where using calculators and computers to carry out mathematical procedures is commonplace, a world where mathematics is rapidly growing and extensively being applied in diverse fields.

Maine should expect its students to enjoy, appreciate, and use mathematics, just as it expects them to enjoy, appreciate, and use music, art, and literature. Students who are challenged to reach these goals will be better prepared for a future in which mathematics will be increasingly important in all areas of endeavor.

A. NUMBERS AND NUMBER SENSE

Students will understand and demonstrate a sense of what numbers mean and how they are used. *Numbers are used to describe and interpret phenomena. Building a sense of number relationships is essential for developing the ability to deal with any set of numbers. Number sense involves understanding the meaning of numbers, relationships among numbers, relative number magnitudes, and the effects of operations on numbers. Skilled estimation is also an important component of number sense.*

B. COMPUTATION

Students will understand and demonstrate computation skills. *Understanding the fundamental operations of addition, subtraction, multiplication, and division is central to knowing mathematics. Proficiency in computational skills is essential to problem-solving and other mathematical activities. Estimating, evaluating reasonableness of answers, and obtaining accuracy in calculations are included in this proficiency. Understanding relationships in operations allows students greater facility with mental computation. Computational skill promotes efficient and confident learners.*

C. DATA ANALYSIS AND STATISTICS

Students will understand and apply concepts of data analysis. *We are faced with massive quantities of information which must be selected, sorted, and analyzed to reach conclusions. Sound decision making requires the ability to collect data effectively, organize data, discover patterns, summarize trends, make inferences, draw conclusions, and make predictions. The ethical use of statistics is a paramount concern in the Information Age.*

Mathematics

D. PROBABILITY

Students will understand and apply concepts of probability. *Probability is the study of uncertainty. Informed consumers of information understand the basic principles of probability. People need to understand the uncertainties and limitations involved when drawing conclusions from data.*

E. GEOMETRY

Students will understand and apply concepts from geometry. *Geometry is the study of the spatial world and its symmetries. The ideas of geometry are used to describe, interpret, represent, and change the spatial world in which we live. The understanding and development of spatial and visual skills strengthens problem-solving abilities.*

F. MEASUREMENT

Students will understand and demonstrate measurement skills. *Measurement is valuable as an integrating skill throughout the curriculum and in everyday life. The use of estimation is vital in determining the reasonableness of measurement. Measurement attributes (e.g., length, volume, minutes), units, and tools enhance the ability to describe and understand the world.*

G. PATTERNS, RELATIONS, FUNCTIONS

Students will understand that mathematics is the science of patterns, relationships, and functions. *Relationships are central to mathematical understanding. A study of patterns often reveals regularity, indicating the presence of a mathematical relationship. Studying relationships allows students to make generalizations and predictions about phenomena and occurrences.*

H. ALGEBRA CONCEPTS

Students will understand and apply algebraic concepts. *Algebra and analytic thinking are fundamental tools for working in and thinking about mathematics. These tools provide ways to generalize and predict problem solutions when not all information is known. Taught within the context of mathematical and practical applications, the concept of functions is a unifying theme for algebraic concepts.*

I. DISCRETE MATHEMATICS

Students will understand and apply concepts in discrete mathematics. *Discrete mathematics studies discrete processes (e.g., all possible bus routes in a school district). This study includes the exploration of diagrams, networks, and flowcharts that students construct to model situations or use for planning, scheduling, and decision making. Three main concerns of discrete mathematics are: existence (Is there a solution?), counting (How many solutions are there?), and efficiency (What is the best solution?).*

J. MATHEMATICAL REASONING

Students will understand and apply concepts of mathematical reasoning. *Reasoning is fundamental to the knowing and doing of mathematics. To give more students access to mathematics as a powerful way of making sense of the world, it is essential that an emphasis on reasoning pervade all mathematics. Students need a great deal of time and many experiences to develop their ability to construct valid arguments in problem settings and to evaluate the arguments of others.*

K. MATHEMATICAL COMMUNICATION

Students will reflect upon and clarify their understanding of mathematical ideas and relationships. *Communication plays a key role in helping make important connections among physical, pictorial, graphic, symbolic, verbal, and mental representations of mathematical ideas. Providing individual and collaborative opportunities for discussions about issues, people, and the cultural implications of mathematics reinforce student understanding of the connection between mathematics and our society.*

Mathematics

A. NUMBERS AND NUMBER SENSE

Students will understand and demonstrate a sense of what numbers mean and how they are used. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Demonstrate an understanding of what numbers mean (e.g., that the number 7 stands for a group of objects).
2. Understand the many uses of numbers (e.g., prices, recipes, measurement, directions in play).
3. Order, compare, read, group, and apply place value concepts to numbers up to 1,000.
4. Determine reasonableness of results when working with quantities.

EXAMPLES

- Show that 6 is larger than 3, using beans in a cup.
- Explain different ways to make 263, using hundreds, tens, and ones.

ELEMENTARY GRADES 3-4

1. Read, compare, order, classify, and explain whole numbers up to one million.
2. Read, compare, order, classify, and explain simple fractions through tenths.
3. Demonstrate knowledge of the meaning of decimals and integers and an understanding of how they may be used.

EXAMPLES

- Using pattern blocks, represent equivalent fractions, such as 1/3, 2/6, 4/12
- Show how three pizzas can be shared equally by four people.

MIDDLE GRADES 5-8

1. Use numbers in a variety of equivalent and interchangeable forms (e.g., integer, fraction, decimal, percent, exponential, and scientific notation) in problem-solving.
2. Demonstrate understanding of the relationships among the basic arithmetic operations on different types of numbers.
3. Apply concepts of ratios, proportions, percents, and number theory (e.g., primes, factors, and multiples) in practical and other mathematical situations.
4. Represent numerical relationships in graphs, tables, and charts.

EXAMPLES

- Use integers to write a play-by-play description of a game (e.g., football, soccer, or golf).
- Respond to the following in a journal: How can you get a smaller answer when you multiply? How can you get a larger answer when you divide?
- Estimate a 15% tip for a meal costing $38.60.

SECONDARY GRADES

1. Describe the structure of the real number system and identify its appropriate applications and limitations.
2. Explain what complex numbers (real and imaginary) mean and describe some of their many uses.

EXAMPLE

- Given two numbers such as 1/2 and 1/3, describe the real numbers between them.

Mathematics

B. COMPUTATION

Students will understand and demonstrate computation skills. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Use and apply estimation with quantities, measurements, computations, and problem-solving.
2. Use multiple strategies in solving problems involving addition and subtraction of whole numbers.
3. Show understanding of addition and subtraction by using a variety of materials, strategies, and symbols.

EXAMPLES

- Estimate reasonably and count accurately the number of seeds in a container.
- Solve a problem such as: we have 24 seats and 19 children. How many seats will be empty after all the children are in their chairs?
- Show different coin combinations to make 75¢.

ELEMENTARY GRADES 3-4

1. Solve multi-step, real-life problems using the four operations with whole numbers.
2. Solve real-life problems involving addition and subtraction of simple fractions.
3. Demonstrate and explain the problem-solving process using appropriate tools and technology and defend the reasonableness of results.
4. Develop proficiency with the facts and algorithms of the four operations on whole numbers using mental math and a variety of materials, strategies, and technologies.

EXAMPLES

- Solve problems such as finding the number of rectangular arrangements for 36 like objects.
- Organize a budget for a project.

MIDDLE GRADES 5-8

1. Compute and model all four operations with whole numbers, fractions, decimals, sets of numbers, and percents, applying the proper order of operations.
2. Create, solve, and justify the solution for multi-step, real-life problems including those with ratio and proportion.

EXAMPLES

- Show that there must have been at least one misprint in a newspaper report on an election that reads:
  - Yes votes 13,657 (42%)
  - No votes 186,491 (58%)

  and suggest two specific places a misprint may have occurred.
- On a number line, name the point located midway between 1/4 and 6.

SECONDARY GRADES

1. Use various techniques to approximate solutions, determine the reasonableness of answers, and justify the results.
2. Explain operations with number systems other than base ten.

EXAMPLE

- If 10% of U.S. citizens have a certain trait, and four out of five with the trait are men, determine what proportion of men have the trait and what proportion of women have the trait. Explain whether the answer depends on the proportion of U.S. citizens who are women, and if so, how?

C. DATA ANALYSIS AND STATISTICS

Students will understand and apply concepts of data analysis. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Formulate and solve problems by collecting, arranging, and interpreting data.
2. Make tallies and graphs of information gathered from immediate surroundings.

EXAMPLE

- Make a graph to represent the number of family members for students in the class and use this graph to determine the amount of refreshments needed for a family-night presentation.

ELEMENTARY GRADES 3-4

1. Make generalizations and draw conclusions using various types of graphs, charts, and tables.
2. Read and interpret displays of data.

EXAMPLE

- Predict the number of buttons per student in the room. Collect data on the number of buttons for each student in the room, display the data on a line plot, and analyze it to determine the average number of buttons per student.

MIDDLE GRADES 5-8

1. Organize and analyze data using mean, median, mode, and range.
2. Assemble data and use matrices to formulate and solve problems.
3. Construct inferences and convincing arguments based on data.

EXAMPLES

- Conduct an experiment to determine the effects of fertilizer on plant growth, recording and analyzing information on charts and graphs.
- Using the height of students in the room, calculate the mean, median, mode, and range.

SECONDARY GRADES

1. Determine and evaluate the effect of variables on the results of data collection.
2. Predict and draw conclusions from charts, tables, and graphs that summarize data from practical situations.
3. Demonstrate an understanding of concepts of standard deviation and correlation and how they relate to data analysis.
4. Demonstrate an understanding of the idea of random sampling and recognition of its role in statistical claims and designs for data collection.
5. Revise studies to improve their validity (e.g., in terms of better sampling, better controls, or better data analysis techniques).

EXAMPLES

- Draw a scatterplot of the height of each student in the class vs. their shoe length and find the line of best fit using a graphics calculator or computer software.
- Design and conduct an experiment to estimate the population of clams in a given clam flat.

Mathematics

D. PROBABILITY

Students will understand and apply concepts of probability. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Use concepts of chance and record outcomes of simple events.

EXAMPLE

- Investigate the possible and likely outcomes when rolling a number cube.

ELEMENTARY GRADES 3-4

1. Explain the concept of chance in predicting outcomes.
2. Estimate probability from a sample of observed outcomes and simulations.

EXAMPLE

- Determine the combinations that could occur when four coins are tossed, and predict which of the combinations would occur most often. Conduct an experiment to show how close the predictions are to actual events.

MIDDLE GRADES 5-8

1. Find the probability of simple events and make predictions by applying the theories of probability.
2. Explain the idea that probability can be represented as a fraction between and including zero and one.
3. Use simulations to estimate probabilities.
4. Find all possible combinations and arrangements involving a limited number of variables.

EXAMPLES

- Develop and analyze games of chance for a school carnival.
- Determine how many license plates are possible if the first two symbols are letters and the last four are numbers.

SECONDARY GRADES

1. Find the probability of compound events and make predictions by applying probability theory.
2. Create and interpret probability distributions.

EXAMPLE

- Determine the probability that a 90% free throw shooter will make exactly one of his/her upcoming two free throws.

E. GEOMETRY

Students will understand and apply concepts from geometry. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe, model, and classify 2D shapes and selected 3D figures.
2. Investigate and predict the results of combining, dividing, and changing 2D shapes.
3. Use positional words to describe the relationship of two or more objects (e.g., over, under, beside, to the left).

EXAMPLES

- Find all the shapes you can make with five squares of the same size if the sides touch completely.
- Create symmetrical designs with pattern blocks and indicate lines of symmetry.

ELEMENTARY GRADES 3-4

1. Describe, model, and classify shapes and figures using applicable properties.
2. Experiment with shapes and figures to make generalizations regarding congruency, symmetry, and similarity.
3. Use transformations such as slides, flips, and rotations.
4. Use the properties of shapes and figures to describe the physical world.

EXAMPLES

- Design a nine patch quilt in which each patch is a nine inch square. Squares, triangles, rectangles, and/or parallelograms can be used for the design of each square.
- Create symmetrical designs with pattern blocks and indicate the lines of symmetry.

MIDDLE GRADES 5-8

1. Compare, classify, and draw two dimensional shapes and three dimensional figures.
2. Apply geometric properties to represent and solve real-life problems involving regular and irregular shapes.
3. Use a coordinate system to define and locate position.
4. Use the appropriate geometric tools and measurements to draw and construct two and three dimensional figures.

EXAMPLES

- Collect magazine pictures of different styles of architecture and identify all the geometric figures and relationships seen in each building.
- Display data with an accurately drawn and divided pie chart.

SECONDARY GRADES

1. Draw coordinate representations of geometric figures and their transformations.
2. Use inductive and deductive reasoning to explore and determine the properties of and relationships among geometric figures.
3. Apply trigonometry to problem situations involving triangles and periodic phenomena.

F. MEASUREMENT

Students will understand and demonstrate measurement skills. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Estimate and measure length, time, temperature, weight, and capacity.
2. Identify and give the value of different coins.
3. Select standard and non-standard tools for determining length, time, temperature, weight, and capacity, and use them to solve every day problems.

EXAMPLE

- Put five objects, such as books, rocks, or pumpkins, in rank order by weight, first by estimating and then by measuring exactly.

ELEMENTARY GRADES 3-4

1. Solve and justify solutions to real-life problems involving the measurement of time, length, area, perimeter, weight, temperature, mass, capacity, and volume.
2. Select measuring tools and units of measurement that are appropriate for what is being measured.

EXAMPLES

- Find all of the rectangular areas, measured in whole square inches, for a particular perimeter, such as 24 inche and see if the same pattern of shapes holds for another perimeter.
- Determine what time it is necessary to leave the house for the fifteen minute walk to the bus stop and 1-1/4 hour bus ride to the 7:30 concert. Explain the answer.

MIDDLE GRADES 5-8

1. Demonstrate the structure and use of systems of measurement.
2. Develop and use concepts that can be measured directly, or indirectly (e.g., the concept of rate).
3. Demonstrate an understanding of length, area, volume, and the corresponding units, square units, and cubic units of measure.

EXAMPLES

- Calculate the rate of speed of a moving object after measuring the distance traveled and the elapsed time.
- Examine areas that can be enclosed using 24 feet of fencing and figuring out the maximum area.
- Calculate the volume and surface areas of cones and pyramids.

SECONDARY GRADES

1. Use measurement tools and units appropriately and recognize limitations in the precision of the measurement tools.
2. Derive and use formulas for area, surface area, and volume of many types of figures.

EXAMPLES

- Discover and explore the distance formula using the Pythagorean Theorem.
- Using generalizations, compare the formula for the area of an n-sided, regular polygon to the formula for the area of a circle.

G. PATTERNS, RELATIONS, FUNCTIONS

Students will understand that mathematics is the science of patterns, relationships, and functions. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Recognize, describe, extend, copy, and create a wide variety of patterns.
2. Explore the use of variables and open sentences to describe relationships.
3. Represent and describe both geometric and numeric relationships.

EXAMPLE

- Recognize and describe the inverse relationship between addition and subtraction, e.g. 3+__=7, __+3=7, 7-3=__, and 7-__=3.
- Show how the letters "aab, aab, ...," can represent the pattern "metal, metal, plastic, ...,", "leaf, leaf, rock, ...," or many other patterns.

ELEMENTARY GRADES 3-4

1. Use the patterns of numbers, geometry, and a variety of graphs to solve a problem.
2. Use variables and open sentences to express relationships.

EXAMPLES

- Find, make, and describe linear patterns on the 99-chart, for example 4, 14, 24, 34.

MIDDLE GRADES 5-8

1. Describe and represent relationships with tables, graphs, and equations.
2. Analyze relationships to explain how a change in one quantity can result in a change in another.
3. Use patterns and multiple representations to solve problems.

EXAMPLES

- Collect data on the cost of first class postage stamps for a one hundred year period of time and predict future costs for such stamps.
- Determine the units digit (ones' place) of $(3)^{78}$.

SECONDARY GRADES

1. Create a graph to represent a real-life situation and draw inferences from it.
2. Translate and solve a real-life problem using symbolic language.
3. Model phenomena using a variety of functions (linear, quadratic, exponential, trigonometric, etc.).
4. Identify a variety of situations explained by the same type of function.

EXAMPLES

- Express the diameter of a circle as a function of its area and sketch a graph.
- Determine which of two ways of rolling a 8.5"x11" piece of paper into a cylinder gives the greater volume and whether there is a way to get even greater volume using a sheet of paper with the same area but different shape.

H. ALGEBRA CONCEPTS

Students will understand and apply algebraic concepts. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Make drawings for problem situations and mathematical expressions in which there is an unknown, using a variety of tools and approaches.
2. Use language and symbols to express numerical and other relationships.

EXAMPLE

- Show all the ways to make 10 (e.g., $2 + x = 10$, $3 + x = 10$, and so forth) by using blocks or other objects to demonstrate the mathematical statements.

ELEMENTARY GRADES 3-4

1. Develop and evaluate simple formulas in problem-solving contexts.
2. Find replacements for variables that make simple number sentences true.

EXAMPLE

- Plot points on a coordinate graph according to the convention that (x,y) refers to the intersection of a given vertical line and a given horizontal line.

MIDDLE GRADES 5-8

1. Use the concepts of variables and expressions.
2. Solve linear equations using concrete, informal, and formal methods which apply the order of operations.
3. Analyze tables and graphs to identify properties and relationships in a practical context.
4. Use graphs to represent two-variable equations.
5. Demonstrate an understanding of inequalities and non-linear equations.
6. Find solutions for unknown quantities in linear equations and in simple equations and inequalities.

EXAMPLES

- Study the steepness of wheelchair ramps and stairs.
- Solve for x: $3x - 5 = 23 - x$.

SECONDARY GRADES

1. Use tables, graphs, and spreadsheets to interpret expressions, equations, and inequalities.
2. Investigate concepts of variation by using equations, graphs, and data collection.
3. Formulate and solve equations and inequalities.
4. Analyze and explain situations using symbolic representations.

EXAMPLES

- Use measurements from shopping carts which are nested together to find a formula for the number of carts that will fit in a given space and a formula for the amount of space needed for a given number of carts.
- Solve the following problem: Given the formula for height of an object thrown upward with velocity v: $h = h_o + vt + (1/2)\,gt^2$, use quadratic functions and the quadratic formula to answer questions about the motion of projectiles and falling objects.

Mathematics

I. DISCRETE MATHEMATICS

Students will understand and apply concepts in discrete mathematics. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Classify sets of objects into two or more groups using their attributes.
2. Create and use an organized list to determine possible outcomes or solve problems.

EXAMPLES

- Sort sets of tiles by color, size, and shape.
- Determine the possible arrangements for a triple ice cream cone given three flavors of ice cream.

ELEMENTARY GRADES 3-4

1. Create and use organized lists, tree diagrams, Venn diagrams, and networks.
2. Give examples of infinite and finite solutions.

EXAMPLE

- Use a Venn diagram to record the correlation between students who wore a sweater to school and students who walked to school.

MIDDLE GRADES 5-8

1. Create and use networks to explain practical situations or solve problems.
2. Identify patterns in the world and express these patterns with rules.

EXAMPLE

- Use graphs and matrices to determine delivery routes from Augusta to other major cities in Maine with a combination of one way and round-trip routes.

SECONDARY GRADES

1. Use linear programming to find optimal solutions to a system.
2. Use networks to find solutions to problems.
3. Apply strategies from game theory to problem-solving situations.
4. Use matrices as tools to interpret and solve problems.

EXAMPLE

- Given a decreasing linear relationship between the selling price of a magazine and the number of people who will buy it, and given a fixed cost per copy that goes to production, analyze the profitability of the product and recommend a price range.

J. MATHEMATICAL REASONING

Students will understand and apply concepts of mathematical reasoning. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe a simple argument's strengths and weaknesses.
2. Distinguish between "important" and "unimportant" mathematical information.

EXAMPLE

- Solve a simple word problem by finding and using the relevant information (Jack has 3 red marbles, 2 green marbles, and 4 toy cars. How many marbles does he have? 3+2=5.)

ELEMENTARY GRADES 3-4

1. Demonstrate an understanding that support for a claim should be based on evidence of various types (e.g., from logical processes, from measurement, or from observation and experimentation).

EXAMPLE

- Using data from the classroom and the entire school, prepare a report, including graphs, charts, and diagrams, on the optimal number and location of recycling containers.

MIDDLE GRADES 5-8

1. Support reasoning by using models, known facts, properties, and relationships.
2. Demonstrate that multiple paths to a conclusion may exist.

EXAMPLE

- Prepare proposals for a fixed-height bridge and a draw bridge. Make recommendations after considering total cost, steepness of incline, traffic patterns, time of construction, etc.

SECONDARY GRADES

1. Analyze situations where more than one logical conclusion can be drawn from data presented.

EXAMPLE

- Given information about travel patterns in a local community, develop a convincing proposal for the logical placement of a bypass.

Mathematics

K. MATHEMATICAL COMMUNICATION

Students will reflect upon and clarify their understanding of mathematical ideas and relationships. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Use numerals and symbols (>, <, =, +, -) to report numerical data and relationships.

ELEMENTARY GRADES 3-4

1. Use simple tables and graphs to communicate ideas and information in presentations in a concise and clear manner.

MIDDLE GRADES 5-8

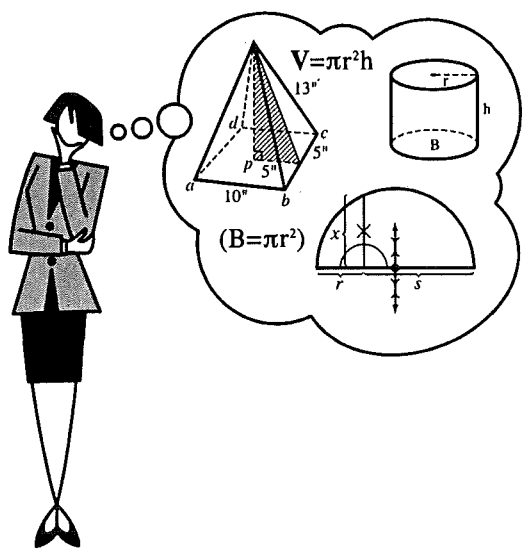
1. Translate relationships into algebraic notation.
2. Use statistics, tables, and graphs to communicate ideas and information in convincing presentations and analyze presentations of others for bias or deceptive presentation.

SECONDARY GRADES

1. Restate, create, and use definitions in mathematics to express understanding, classify figures, and determine the truth of a proposition or argument.
2. Read mathematical presentations of topics within the Learning Results with understanding.

EXAMPLES:

- Having read the definition of "kite", a student analyzes a collection of figures to decide which are kites. The student then proceeds to apply the kite definition to the families of quadrilaterals to determine which are kites and why.
- Student reads a manual or math text to successfully learn a new procedure.



"I must study politics and war that my sons may have the liberty to study mathematics and philosophy ... in order to give their children a right to study painting, poetry, [and] music."

John Adams, Second President of the United States

Modern and Classical Languages

> ***"Learning to speak another's language means taking one's place in the human community. It means reaching out to others across cultural and linguistic boundaries. Language is far more than a system to be explained. It is our most important link to the world around us".***
>
> Sandra J. Savignon, (*Communicative Competence: Theory and Classroom Practice: Texts and Contexts in Second Language Learning*, 1983)

Language and communication are at the heart of the human experience, whether communication takes place face-to-face, in writing, or across the centuries through the reading of literature. Maine people must have the linguistic and cultural skills to communicate successfully in a pluralistic society at home and abroad. All students will develop a level of proficiency in at least one other language. To succeed, all students must study language and culture in an integrated fashion, beginning in kindergarten and extending through their entire school experience.

The organizing principle in today's modern and classical language classrooms is communication, which highlights *how* (grammar) and *what* (vocabulary and content), as well as *why, to whom, and when* (social and cultural aspects of language). While grammar and vocabulary remain essential tools for communication, learning to use a second language in meaningful and appropriate ways is the ultimate goal of foreign language instruction. In the study of classical languages such as Latin or ancient Greek, proficiency will emphasize the ability to understand the written language over oral communication, and to recognize the linguistic and historical importance of the language and the people who spoke it. In the study of American Sign Language, modifications will need to be made in the communication terminology used in the following content standards and performance indicators.

A. PERSON-TO-PERSON COMMUNICATION

Students will develop communication skills for direct conversation and written correspondence. *In conversation or brief written exchanges with family members, friends, or classmates, students will have the skill and confidence to converse and write about familiar topics and events, to ask and answer questions, and to compare and contrast people, things, or events using strings of short sentences.*

B. READING, LISTENING, AND VIEWING FOR UNDERSTANDING

Students will develop reading, listening, and viewing skills so they can obtain and interpret information. *Students will be able to use a second language to obtain information from "authentic" resources such as newspapers, letters, literature, newscasts, videos, or musical recordings and to acquire new knowledge about people, events, and cultures.*

C. ORAL AND WRITTEN PRESENTATIONS

Students will develop skills in oral and written presentation for one-way communication with an individual or a group. *Students will use writing and oral presentation skills to address a broader range of topics in a wider variety of situations than found in person-to-person communication. Writing and speaking for presentation allows more time for careful planning and editing, so students can pay closer attention to such aspects of the structure and appropriate use of the language as pronunciation, vocabulary, spelling, grammar, and style in their finished work.*

D. WORKINGS OF LANGUAGE

Students will gain a deeper understanding of both their native language and of the way language works by discovering patterns among language systems. *They will be able to compare and contrast elements of the structure and use of English and the second language, and to increase their awareness of the nature of language, the influences of other languages on English, and the strategies used to communicate meaning.*

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E. CULTURAL PRACTICES, PRODUCTS, AND PERSPECTIVES

Students will gain insight into another culture through an understanding of its social practices, products, and perspectives. *Social practices describe the way people behave toward one another. Products include tangible things like food, tools, or a piece of art, and intangible things like laws, music, or rituals. Perspectives include ideas, attitudes, and values. Students will develop an awareness of other people's world views, their unique way of life, and the patterns of behavior which order their world. Students will be able to communicate more effectively through speech and behavior.*

F. CROSS-CULTURAL CONNECTIONS AND COMPARISONS

Students will recognize the connections that link people, countries, and historical periods such as cultural and religious traditions, historical events, political thought, or geography. *Students will become aware of the contributions of another culture to their own and further their knowledge of other disciplines through the second language.*

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A. PERSON-TO-PERSON COMMUNICATION

Students will develop communication skills for direct conversation and written correspondence. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Ask and answer simple questions about self and family by using learned phrases and recalled vocabulary.
2. Express needs, likes, and dislikes relating to the immediate environment.
3. Greet others and respond to greetings in social situations.

EXAMPLES

- Greet classmates and introduce themselves in the second language.
- In the second language, tell a friend which everyday activity is their favorite and which they like the least.

ELEMENTARY GRADES 3-4

1. Express personal information by using learned patterns in short sentences.
2. Describe people and things using short phrases.
3. Express feelings about familiar situations.
4. Make and respond to simple requests.
5. Ask and respond to questions in social situations.

EXAMPLE

- Tell a classmate what foods they like and dislike.

MIDDLE GRADES 5-8

1. Exchange information about personal events or familiar situations by using strings of short sentences.
2. Ask for and give directions and simple instructions.
3. Compare and contrast people, objects, and events by using short sentences.

EXAMPLE

- Prepare an audio or video tape in which they talk briefly about themselves in the second language; exchange the tape with a classmate and paraphrase in writing, in the second language, the content of the classmate's tape.

SECONDARY GRADES

1. Compare and contrast people, things, and events by using strings of sentences.
2. Clarify and ask for clarification in conversation or brief written exchanges.
3. Present and exchange information about current, past, and future events regarding issues of personal interest.

EXAMPLES

- Tape a conversation with a classmate, in which they discuss the previous summer vacation, the current school year, and their plans for the coming months.
- Pretend to tape a message on a famous person's answering machine, asking several pertinent questions, and have another student answer the questions.

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B. READING, LISTENING, AND VIEWING FOR UNDERSTANDING

Students will develop reading, listening, and viewing skills so they can obtain and interpret information. Indicators followed by an asterisk (*) may be accomplished in English or the second language. All other indicators are to be performed in the second language. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Follow simple classroom commands and directions.
2. Respond to simple, one-word written directions.
3. Respond, in the second language, to simple texts, in that language, by utilizing a variety of activities, e.g., picture clues, letter-sound associations, or simple sentences.
4. Demonstrate understanding of simple oral narratives and short conversations on familiar topics.*
5. Identify familiar people and objects through clues and illustrations.
6. Demonstrate comprehension of the main ideas of a video or song on a familiar topic.*

EXAMPLES

- Play "Simon Says" with commands given in the second language.
- Use props to act out the story of "The Very Hungry Caterpillar" as it is read in a second language.

ELEMENTARY GRADES 3-4

1. Demonstrate understanding of brief messages, commands, and directions.*
2. Paraphrase brief written passages and personal notes on a familiar topic.
3. Select the main ideas and identify principal characters in illustrated stories.*
4. Respond to one- and two-step written directions.
5. Demonstrate understanding of the main ideas of simple sentences in narratives and conversations.*
6. Use and react to gestures, intonation, and other visual or auditory cues.
7. Recognize sounds and speech patterns of the language studied.

EXAMPLES

- Identify the main ideas and characters in a folk tale or myth from the second language.*
- Indicate which phrases are correct when they hear familiar, simple second language phrases, some with words in the correct order and some with words in incorrect order.*

MIDDLE GRADES 5-8

1. Answer questions on the content of announcements and messages on familiar topics.*
2. Follow a set of directions to develop a product (e.g., origami bird, greeting card).
3. Read and evaluate simple written sentences by editing, revising, and creating a final draft.
4. Identify the primary messages in short written informational texts on familiar topics.*
5. Read and interpret multiple-step written directions.*
6. Read and interpret simple printed information such as advertisements and posters.*
7. Demonstrate understanding of the main ideas and supporting details of short narratives on familiar topics.*
8. Recognize common oral phrases and structures.
9. Collect data or identify main ideas and themes from authentic television, radio, or live programs from another culture.*

EXAMPLES

- Read real estate advertisements from a second language newspaper, find a place in that country where they and their families would like to live, and write a paragraph explaining why they chose the selected lodging and location.
- View a second language broadcast and identify in writing the main news items.

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SECONDARY GRADES

1. Demonstrate comprehension of selected short samples of spoken language.
2. Demonstrate understanding of the main ideas of non-fiction oral presentations such as newscasts and documentaries.
3. Demonstrate comprehension of short written texts that contain some unfamiliar content.
4. Identify the main ideas and supporting details of an informational text such as a letter, story, poem, or newspaper.
5. Demonstrate understanding of the main ideas and supporting details of brief discussions and presentations about familiar topics.
6. In the study of Latin or ancient Greek, recognize the grammatical structures essential to understanding a short narrative or reading passage.
7. In the study of Latin or ancient Greek, translate a narrative into English.

EXAMPLES

- Read a short story (in the second language) about a personal experience or event and then rewrite the story in that language using their own words.
- View a short video segment (e.g., music video) in the second language and then paraphrase the content.

Modern and Classical Languages

C. ORAL AND WRITTEN PRESENTATIONS

Students will develop skills in oral and written presentation for one-way communication with an individual or a group. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Recognize and produce letters and numbers.

EXAMPLE

- Play a number game and sing an alphabet song in the second language.

ELEMENTARY GRADES 3-4

1. Produce simple stories about everyday events or activities by using single words and phrases (pictures may be used to supplement the stories).
2. Describe daily life or personal likes and dislikes in short narratives.
3. Present information on a specific topic in short written or spoken sentences.
4. Produce appropriate sounds and speech patterns.

EXAMPLES

- Show photographs of members of their families and explain who they are using the second language.
- Write a short letter in the second language to a pen-pal introducing themselves and asking questions about the pal.
- Upon hearing or seeing a common letter combination in the second language, reproduce it orally.

MIDDLE GRADES 5-8

1. Write notes or short letters, on topics of personal interest, by using a series of connected sentences.
2. Use strings of short sentences to make informative oral presentations on topics of personal interest.
3. Prepare stories or brief written reports on daily life or on a topic studied in another subject area.
4. Write summaries of the main ideas, events, people, places, and things in various materials which are written in the second language.
5. Write about their feelings regarding a special person or event.

EXAMPLES

- Prepare a journal entry that describes one day of a trip they have taken or would like to take to a country where the second language is spoken.
- Prepare and present a narrative from the point of view of a character in a myth, tale, or story.

SECONDARY GRADES

1. Use short paragraphs to summarize the content of simple articles, documents, or oral texts written in the second language.
2. Write effective letters for various purposes.
3. Write an explanation supporting an opinion on a topic of personal importance.
4. Describe past, present, or future events in areas of public interest.
5. Give directions for carrying out a multi-step task.
6. Plan and deliver a report on a self-selected topic.
7. Use paraphrasing, predictions of what comes next, or other techniques to demonstrate their understanding of selected examples of authentic spoken language.

EXAMPLES

- Play the role of a city tour guide, describing various buildings, monuments, and other sights in the city being studied.
- Write autobiographies highlighting the main events and people in their lives.
- Prepare a report about contemporary entertainers of a country where the second language is spoken.

Modern and Classical Languages

D. WORKINGS OF LANGUAGE

Students will gain a deeper understanding of both their native language and of the way language works by discovering patterns among language systems. (Indicators followed by an asterisk (*) may be accomplished in English or the second language. All other indicators are to be performed in the second language.)
Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Distinguish between the sound systems of the first and second languages.*
2. Recognize that languages are interrelated and belong to language families.*

EXAMPLES

- Compare the various ways a letter combination such as "ch" is pronounced in the first and second languages (e.g., in English, cheese, chorus, itch, chute; and in German, ich, Bach, Chor, Chemie).*
- Respond to alphabet cards from the first and second languages and identify which are from the first and which are from the second language.*
- Make a mobile that shows the different languages within a language family (e.g., Indo-European).

ELEMENTARY GRADES 3-4

1. Recognize that languages are related to each other by identifying words and symbols (e.g., alphabets) derived from other languages.*
2. Identify idiomatic expressions in their own language and the second language.*
3. Recognize and use formal and informal forms of language in the second language and their own language.*

EXAMPLES

- Identify words and roots from the second language that are commonly used in English.*
- Listen to a simple scenario involving a classmate and a police officer and then appropriately use the formal and informal forms of the second language to ask each how he/she is feeling.
- Depict graphically the similarities and differences between their alphabet and those of other languages.*

MIDDLE GRADES 5-8

1. Recognize that words have grammatical gender (e.g., in French: "le gouvernement" and "la nation"), as well as natural gender (e.g., "lion" and "lioness").*
2. Demonstrate ways of expressing respect and communicating status differences in the second language and English.*
3. Demonstrate awareness that languages have critical sound distinctions that affect meaning, (e.g., "read" [present tense] and "read" [past tense]).*

EXAMPLES

- Role-play a dialogue in the second language between a customer and salesperson in a department store, using appropriate language and showing respect; then role-play a similar dialogue in an American store showing differences in language and behavior.
- Develop a simple scenario (in the second language) in which three forms of address are used to express respect. Compare this scenario with one in the first language.
- Depict graphically the similarity among words in modern languages such as French, Spanish, German, and English, which are derived from common Latin words.*

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SECONDARY GRADES

1. Demonstrate awareness that there are phrases, idioms, and words that do not translate directly from one language to another.*
2. Recognize noun and verb forms and how they function in the second language in relation to comparable elements in English.*
3. Compare variations of meanings of words, gestures, and intonation in the second language and English.*
4. Demonstrate knowledge of the relationship between grammatical structure (e.g., word order, verb tenses, noun cases, and number) and meaning.*
5. Demonstrate understanding of the processes of derivation and word borrowing from one language to another (e.g., soufflé from French, caucus from Algonquian, labor from Latin).*

EXAMPLES

- Identify phrases in ancient Greek that cannot be translated word for word into English.*
- Compare the way noun plurals are formed in both the first and second languages, using reading passages in each language.*
- Show with examples how word order and meaning are connected, in the second language, based on reading or hearing a passage in that language.*
- Cite and use examples of words that are borrowed from the second language by the first language.*
- Compare and contrast the use of word order and word endings in English and a second language.*

E. CULTURAL PRACTICES, PRODUCTS, AND PERSPECTIVES

Students will gain insight into another culture through an understanding of its social practices, products, and perspectives. (Indicators followed by an asterisk (*) may be accomplished in English or the second language. All other indicators are to be performed in the second language.) Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Associate a language with the dress, holidays, and music of a country or region with a different language.*
2. Identify the unique products of another culture such as toys, food, songs, currency, and crafts.*

EXAMPLES

- Sing from memory a popular folksong in the second language.
- Prepare, sample, and name typical dishes for a meal in a culture where the second language is spoken.*

ELEMENTARY GRADES 3-4

1. Identify how tangible products of the culture such as toys, dress, housing, food, currency, and crafts reflect life in that culture.*
2. Participate in cultural activities of another culture, such as games, songs, celebrations, storytelling, and dramatizations.*
3. Identify and produce types of artworks, crafts, or graphic representations enjoyed or made by their peer group within the culture studied.*

EXAMPLES

- Draw a floor plan for a typical house or apartment using the second language to identify the rooms.
- Make a list in the second language of items needed to furnish a new room, cut out pictures of the items from magazines, and make a collage to describe it to the class.
- Make models and demonstrate simple toys and games from a culture where the second language was/is spoken.*

MIDDLE GRADES 5-8

1. Discuss patterns of behavior typical of their peer group in another culture.*
2. Participate in cultural practices such as games (role of leader, taking turns, etc.), sports, and entertainment (e.g., music, dance, drama).*
3. Search for, identify, and investigate the function of utilitarian products (e.g., sports equipment, household and holiday items, foods, tools, clothing) of another culture as found within their own homes and communities.*

EXAMPLE

- Scan a magazine written for young people in the second language and identify from the articles and advertisements what they like to buy.*

SECONDARY GRADES

1. Experience (read, listen to, view, perform) the arts of another culture (e.g., stories, poetry, music, film, sculpture, dance, drama, myth, legend) and discuss their meaning to that cultural community.*
2. Engage in everyday activities of another culture (e.g., eating, shopping, entertaining, telephoning), using appropriate nonverbal cues and verbal cues in the second language.*
3. Identify and discuss connections between cultural values and socially approved behaviors of another culture.*
4. Identify and discuss social, political, and economic issues that affect youth or the community in the culture studied (e.g., legal rights, political organizing, employment opportunities).*

EXAMPLES

- Write a short essay in the second language describing the educational system in a country where that language is spoken and then compare it with his/her own.
- Write and perform a skit, in the second language, about shopping for food in grocery stores in a country where that language is spoken, using appropriate language and gestures.
- Act out the three forms of the Roman marriage ceremony and explain how each represented the social status of the participants.*

Modern and Classical Languages

F. CROSS-CULTURAL CONNECTIONS AND COMPARISONS

Students will recognize the connections that link people, countries, and historical periods such as cultural and religious traditions, historical events, political thought, or geography. (Indicators followed by an asterisk (*) may be accomplished in English or the second language. All other indicators are to be performed in the second language.) Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify similarities and differences between the dress, holidays, food, and music of another culture and those of their own culture.*

EXAMPLE

- Identify the contributions (food, songs, customs) made by countries where the second language is spoken to American holiday celebrations.*

ELEMENTARY GRADES 3-4

1. Demonstrate an understanding, in the second language, of terms and concepts learned in other subject areas, such as weather, math facts, measurements, plants and animals, and geography.
2. Compare literature, art or music of another culture with examples from their own culture.*

EXAMPLES

- Generate a weather report about a country where the second language is spoken and present it to the class in that language.
- Name, in the second language, some key geographic features of the state of Maine.

MIDDLE GRADES 5-8

1. Compare and contrast gestures and other forms of nonverbal behavior across languages and cultures.*
2. Identify cultural practices and values relating to family, school, work, and play of people both in their own and another culture.*
3. Understand short articles or videos in the second language on topics being studied in other classes.*
4. Demonstrate knowledge of the influence of the products and practices of another culture on their own culture.*

EXAMPLES

- Locate on a world map, and use the second language to name countries whose principal language is the language they are studying.
- Identify cultural practices in ancient Greece that have had an impact on our society.*
- Create a diorama representing a festival that is celebrated in their own culture, but which originated in a culture where the second language is spoken.*

SECONDARY GRADES

1. Acquire information from a variety of sources written in the second language about topics being studied in other school subjects, such as political and historical issues, worldwide health problems, and environmental concerns.
2. Present written or oral reports on topics being studied in other classes.
3. Compare information on a specific topic, gathered from a variety of sources in the second language, to information, written in English, on the same topic.*
4. Demonstrate an awareness of the relationship between cultural practices (e.g., rituals, work habits, sports, leisure activities) and values by comparing selected practices from another culture with their own.*
5. Demonstrate an understanding of the way tangible products (e.g., food, tools, artwork) and intangible products (e.g., laws, educational systems) define a culture and how they influence other cultures.*

EXAMPLES

- Summarize the main opinions presented in a short editorial from a newspaper written in the second language.*
- Write a letter or send an e-mail message to a second language pen-pal describing a film on a pertinent topic and their reactions to it.
- Combine information about environmental concerns from science and social studies classes with information available in the second language in order to make an oral presentation in that language.
- Make a collage representing both tangible and intangible products from a culture where the second language is spoken and explain how those products reflect certain cultural perspectives.*
- Make a video presentation which shows how American architecture has been influenced by the architecture of the country where the second language was/is spoken (e.g., Greek and Roman, German Bauhaus).

Science and Technology

"The most beautiful thing we can experience is the mysterious. It is the source of all true art and science."

Albert Einstein (*What I Believe* - 1930)

The explosive growth of scientific knowledge and continuing developments in technology are transforming society. These rapid changes require that students learn to access, understand, and evaluate current information by utilizing the skills and knowledge of science and technology. Science includes processes and a body of knowledge. Processes are the ways scientists investigate and communicate about the natural world. The body of knowledge includes concepts, principles, facts, laws, and theories. Technology utilizes tools, techniques, and an applied understanding of science to design products and solve problems.

Science and technology are connected. Technological problems create a demand for scientific knowledge and modern technologies make it possible to discover new scientific knowledge. In a world shaped by science and technology, it is important for students to learn how science and technology connect with all content areas.

Helping students develop curiosity and excitement for science and technology while they gain essential knowledge and skills is best achieved by actively engaging learners in multiple experiences that increase their ability to be critical thinkers and problem solvers. Standards A through I describe content standards that encompass the subject matter conventionally referred to as life, physical, earth, and space science. Standards J through M describe essential skills that should always be embedded throughout the curriculum, rather than taught separately.

A. CLASSIFYING LIFE FORMS
Students will understand that there are similarities within the diversity of all living things. *Modern classification systems are based on comparisons of the structure, function, life-cycles, and behavior of organisms.*

B. ECOLOGY
Students will understand how living things depend on one another and on non-living aspects of the environment. *Balance in ecosystems is based on an intricate web of relationships among populations of living organisms and on non-living factors such as water and temperature. Changes in specific populations or conditions affect other parts of the ecosystem. Individual systems continually change in response to human and other factors.*

C. CELLS
Students will understand that cells are the basic units of life. *The functions performed by organelles (specialized structures found in cells) within individual cells are also carried out by the organ system in multi-cellular organisms. This standard requires that students be conversant with magnifying devices, cell structure and function, body systems, and disease causes and the body's defense against them.*

D. CONTINUITY AND CHANGE
Students will understand the basis for all life and that all living things change over time. *Fossils show past life, extinct species, and environmental changes over time. Organisms change and new species may arise due to genetically coded adaptations.*

E. STRUCTURE OF MATTER
Students will understand the structure of matter and the changes it can undergo. *Matter is made of atoms, each with characteristic properties, which can combine to form all substances in the universe. The state and properties of matter may differ when it experiences chemical, physical, and nuclear changes.*

F. THE EARTH
Students will gain knowledge about the earth and the processes that change it. *The earth's surface undergoes steady or sudden changes due to forces of wind, water, ice, volcanism, and shifting of tectonic plates.*

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G. THE UNIVERSE

Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates. *This includes understanding the result of the relative positions and movement of the earth, moon, sun, stars, planets, and galaxies. It also entails an understanding of how scientists gather data and formulate explanations for phenomena in space.*

H. ENERGY

Students will understand concepts of energy. *Energy takes many forms which can exert forces and do work. The conversion of energy from one form to another offers useful applications and sometimes presents problems.*

I. MOTION

Students will understand the motion of objects and how forces can change that motion. *All objects are in motion, at least at an atomic/subatomic level. By understanding how forces (e.g., gravity, friction, and magnetism) act on objects, they can predict their effects on the motion of the object.*

J. INQUIRY AND PROBLEM SOLVING

Students will apply inquiry and problem-solving approaches in science and technology. *Scientific inquiry, problem solving, and the technological method provide insight into and comprehension of the world around us. A variety of tools, including emerging technologies, assist the inquiry processes. Models are used to understand the world.*

K. SCIENTIFIC REASONING

Students will learn to formulate and justify ideas and to make informed decisions. *This involves framing and supporting arguments, recognizing patterns and relationships, identifying bias and stereotypes, brainstorming alternative explanations and solutions, judging accuracy, analyzing situations, and revising studies to improve their validity.*

L. COMMUNICATION

Students will communicate effectively in the applications of science and technology. *Clear and accurate communication employs appropriate symbols and terminology, models, and a variety of media and presentation styles. Communication includes constructing knowledge through reflection, evaluation, refocusing, and critically analyzing information from a variety of sources. Individuals and collaborative groups must communicate effectively.*

M. IMPLICATIONS OF SCIENCE AND TECHNOLOGY

Students will understand the historical, social, economic, environmental, and ethical implications of science and technology. *Scientific and technological breakthroughs are influenced by prevailing beliefs and conditions which in turn are impacted by new ideas and inventions. By assessing the impacts of technological activity on the environment, students will develop their own sense of global stewardship.*

"The world looks so different after learning science. For example, trees are made of air, primarily. When they are burned, they go back to air, and in the flaming heat is released the flaming heat of the sun which was bound in to convert the air into tree. [A]nd in the ash is the small remnant of the part which did not come from air, that came from the solid earth, instead. These are beautiful things, and the content of science is wonderfully full of them. They are very inspiring, and they can be used to inspire others."

Richard Feynman

Science and Technology

A. CLASSIFYING LIFE FORMS

Students will understand that there are similarities within the diversity of all living things. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify the differences between living and non-living things.
2. Describe characteristics of different living things.
3. Explain, draw, or otherwise demonstrate the life cycle of an organism.
4. Design and describe a classification system for objects.

EXAMPLE

- Given a collection of shells, sort them into groups and describe the "rule" for each group.

ELEMENTARY GRADES 3-4

1. Group the same organisms in different ways using different characteristics.
2. Design and describe a classification system for organisms.
3. Describe the different living things within a given habitat.
4. Compare and contrast the life cycles, behavior, and structure of different organisms.

EXAMPLE

- Identify and describe living organisms in a selected plot of land by the school.

MIDDLE GRADES 5-8

1. Compare systems of classifying organisms including systems used by scientists.
2. Decipher the system for assigning a scientific name to every living thing.
3. Describe some structural and behavioral adaptations that allow organisms to survive in a changing environment.

EXAMPLE

- Use Internet resources to research and report on bird migration.

SECONDARY GRADES

1. Explain the role of DNA in resolving questions of relationship and evolutionary change.
2. Describe similarities and differences among organisms within each level of the taxonomic system for classifying organisms (kingdom through species).
3. Analyze the basic characteristics of living things, including their need for food, water, and gases and the ability to reproduce.

B. ECOLOGY

Students will understand how living things depend on one another and on non-living aspects of the environment. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify ways that organisms depend upon their environment.
2. Describe how almost all animals' food can be traced back to plants.
3. Give examples of how one change in a system affects other parts of the system.
4. Describe different ecological systems on earth.
5. Describe a familiar local environment.

EXAMPLES

- Draw a food chain. (Example: plant→mouse→snake→eagle)
- Predict what would be affected if a disease caused the death of all the rabbits in the area.

ELEMENTARY GRADES 3-4

1. Describe a food web and the relationships within a given ecosystem.
2. Explain the difference between producers (e.g., green plants), consumers (e.g., those that eat green plants), and decomposers (e.g., bacteria that break down the "consumers" when they die), and identify examples of each.
3. Compare and contrast physical and living components of different biomes - i.e., regions characterized by their climate and plant life - (e.g., tundra, rain forest, ocean, desert).
4. Investigate the connection between major living and non-living components of a local ecosystem.

MIDDLE GRADES 5-8

1. Describe in general terms the chemical processes of photosynthesis and respiration.
2. Analyze how the finite resources in an ecosystem limit the types and populations of organisms within it.
3. Describe succession and other ways that ecosystems can change over time.
4. Generate examples of the variety of ways that organisms interact (e.g., competition, predator/prey, parasitism/mutualism).
5. Describe various mechanisms found in the natural world for transporting living and non-living matter and the results of such movements.

SECONDARY GRADES

1. Illustrate the cycles of matter in the environment and explain their interrelationships.
2. Compare the process of photosynthesis and respiration, and describe the factors that effect them.
3. Analyze the factors that affect population size (e.g., reproductive and survival rates).
4. Analyze the impact of human and other activities on the type and pace of change in ecosystems.

EXAMPLE

- Create a poster illustrating the cycles of water, oxygen, and carbon dioxide as they relate to photosynthesis and respiration.

C. CELLS

Students will understand that cells are the basic units of life. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Demonstrate that living things are made up of different parts.
2. Demonstrate an understanding that plants and animals need food, water, and gases to survive.
3. Explore magnifying devices and how they allow one to see in more detail.
4. Provide examples of causes of diseases.

EXAMPLES

- Grow plants with and without the necessary requirements for life.
- Use hand lenses to see details on a flower.

ELEMENTARY GRADES 3-4

1. Demonstrate an understanding that a cell is the basic unit of living organisms.
2. Describe how single-celled organisms exist.
3. Explore how the use of a microscope allows one to see cells in a variety of organisms.
4. Describe the functions of the major human organ systems.

EXAMPLE

- Describe how the circulatory system supplies nutrients and takes wastes away from cells in the body.

MIDDLE GRADES 5-8

1. Compare and contrast human organ systems with those of other species.
2. Prepare and examine microscope slides of single-celled and multi-celled organisms.
3. Describe the structure and function of major organs in human systems.
4. Identify the causes and effects of diseases, explain their transmission, and identify prevention strategies.
5. Describe how body systems work together.

EXAMPLES

- Identify the functions of different cells in multi-celled organisms.
- Use models to compare and contrast the structure and function of the circulatory system with the structure and function of the skeletal system.

SECONDARY GRADES

1. Relate the parts of a cell to its function.
2. Illustrate how cells replicate and transmit information, including the roles of DNA and RNA.
3. Discuss the function of the important "molecules of life" - proteins (including enzymes and hormones), carbohydrates, lipids, and nucleic acids.
4. Explain how the human body protects itself against disease and how the body might lose that ability.
5. Analyze and debate basic principles of genetic engineering: how it is done, its uses, and some ethical implications.

EXAMPLES

- Describe how the structure of a cell membrane is related to its function.
- Create a model contrasting the processes of meiosis and mitosis.

D. CONTINUITY AND CHANGE

Students will understand the basis for all life and that all living things change over time. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explain how fossils show the existence of past life.
2. Identify characteristics that help organisms live in their environment.
3. Draw or describe ways in which an organism can change over its lifetime, sometimes in predictable ways (e.g., butterfly, frog).
4. Describe ways in which individuals of the same species are alike and different.

EXAMPLES

- Explain why a fossil animal might not be alive now.
- Compare the similarities and differences of birds and mammals.
- Illustrate the changes in the life cycle of a Monarch butterfly.

ELEMENTARY GRADES 3-4

1. Identify present day organisms that have not always existed, and past life forms that have become extinct.
2. Describe how fossils form.
3. Explain how adaptations, in response to change over time, may increase a species' chances of survival.
4. Describe ways in which organisms may be similar to and different from their parents and explore the possible reasons for this.

EXAMPLE

- Make a drawing or poster to illustrate how the horse has changed over millennia.

MIDDLE GRADES 5-8

1. Describe how fossils can be used by scientists to trace the history of a species.
2. Explain how scientists use fossils to prove that life forms, climate, environment, and geologic features in a certain location are not the same now as they were in the past.
3. Provide examples of the concept of natural and artificial selection and its role in species changes over time.
4. Compare how sexually and asexually reproducing species transfer genetic information to offspring.

EXAMPLES

- Explain how sexual reproduction can lead to offspring that have traits different from the traits of their parents.
- Describe how new varieties of plants and animals have been produced by humans through selective breeding for certain traits.
- Choose an animal and describe how environmental pressures may lead to changes in that species over time.

SECONDARY GRADES

1. Explain how mutations can be caused by gene mutation or chromosomal alteration and describe the possible results of such mutations on individuals or populations.
2. Describe why the offspring of sexually reproducing species have different survival rates than those of asexually reproducing species under a variety of conditions. Describe the advantages and disadvantages of each.
3. Explain and document the importance of relatively short-term changes (e.g., one generation) on a species' survival.
4. Describe how genetic manipulation can cause unusually rapid changes in species.
5. Compare and contrast fertilization, zygote formation, and embryo development in humans and other species.
6. Analyze a theory scientists use to explain the origin of life.
7. Explain both the evidence used to develop the geologic time scale and why an awareness of geologic time is important to an understanding of the process of change in the universe as well as on earth.

EXAMPLE

- Describe how scientists use radioisotopes and other technologies to verify fossil changes over time.

Science and Technology

E. STRUCTURE OF MATTER

Students will understand the structure of matter and the changes it can undergo. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Show that large things are made up of smaller pieces.
2. Describe some physical properties of objects.
3. Group objects based on observable characteristics (e.g., color, size, texture).

EXAMPLE

- Take apart and reassemble a toy truck.

ELEMENTARY GRADES 3-4

1. Describe how the physical properties of objects sometimes change when one object chemically combines with another.
2. Explain how matter changes in both chemical and physical ways.

EXAMPLE

- Investigate the rusting of steel wool and the burning of a candle.

MIDDLE GRADES 5-8

1. Predict and test whether objects will float or sink based on a qualitative and quantitative understanding of the concepts of density and buoyancy.
2. Describe the evidence that all matter consists of particles called atoms that are made up of certain smaller particles.
3. Use the Periodic Table to group elements based on their characteristics.
4. Describe how a substance can combine with different substances in different ways, depending on the conditions and the properties of each substance.
5. Describe how the motion of the particles of matter determines the state of that matter (e.g., solid, liquid, gas, plasma) and vice versa.
6. Explain how the relatively small number of naturally occurring elements can result in the large variety of substances found in the world.
7. Investigate the similarities and differences between elements, compounds, and mixtures.
8. Demonstrate the law of conservation of matter.

SECONDARY GRADES

1. Trace the development of models of the atom to the present and describe how each model reflects the scientific understanding of their time.
2. Analyze how matter is affected by changes in temperature, pressure, and volume.
3. Describe the characteristics and behavior of acids and bases.
4. Describe an application of the Law of Conservation of Matter.
5. Describe how atoms are joined by chemical bonding.
6. Compare the physical and chemical characteristics of elements.
7. Describe nuclear reactions, including fusion, fission, and decay, their occurrences in nature, and how they can be used by humans.

EXAMPLES

- Explain how advances in science and technology have increased our knowledge of the structure of atoms.
- Describe how physical properties of the ocean, such as salinity and temperature, effect its global circulation and localized motion.

Science and Technology

F. THE EARTH

Students will gain knowledge about the earth and the processes that change it. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe the way weather changes.
2. Analyze the relationships between observable weather patterns and the cycling of the seasons.
3. Observe changes that are caused by water, snow, wind, and ice.

EXAMPLES

- Chart weather conditions and compare and contrast changes over time.
- Find local examples of erosion (e.g., ditches, puddles).

ELEMENTARY GRADES 3-4

1. Describe the change in position of the continents over time.
2. Demonstrate an understanding that many things about the earth (e.g., climate) occur in cycles that vary in length and frequency.
3. Describe differences among minerals, rocks, and soils.
4. Illustrate how water and other substances go through a cyclic process of change in the environment.

EXAMPLE

- Distinguish between short-term changes (e.g., weather patterns and tides) and long-term changes (e.g., glaciers).

MIDDLE GRADES 5-8

1. Demonstrate how the earth's tilt on its axis results in the seasons.
2. Describe how soils are formed and why soils differ from one place to another.
3. Explain the evidence scientists use when they give the age of the earth.
4. Describe factors that can cause short-term and long-term changes to the earth.
5. Classify and identify rocks and minerals based on their physical and chemical properties, their composition, and the processes which formed them.
6. Describe the many products used by humans that are derived from materials in the earth's crust.
7. Demonstrate factors effecting the flow of groundwater.

EXAMPLES

- Collect and analyze soil samples from various locations in the community.
- Study weather fronts as well as short-term catastrophic events (e.g., hurricanes and tornadoes).

SECONDARY GRADES

1. Describe how air pressure, temperature, and moisture interact to cause changes in the weather.
2. Analyze potential effects of changes in the earth's oceans and atmosphere.
3. Describe the impact of plate movement and erosion on the rock cycle.
4. Describe ways that scientists measure long periods of time and determine the age of very old objects.
5. Demonstrate how rocks and minerals are used to determine geologic history.
6. Analyze the changes in continental position and the evidence that supports the concept of tectonic plates.

EXAMPLES

- Measure physical changes in the atmosphere to predict the weather.
- Research the location of rock types and fossils in different parts of the world.
- Conduct simulations to determine ways that global climate can be affected by large-scale circulation of the oceans and the atmosphere.

Science and Technology

G. THE UNIVERSE

Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explain the cycles of day/night and of seasons.
2. Demonstrate that shadows of objects change based on where light is coming from.
3. Demonstrate an understanding that the sun is one of many stars in the universe and is the closest star to earth.

EXAMPLES

- Model/role play the earth going around the sun.
- Use a flashlight to demonstrate the effect on shadows of changes in the location of light sources.

ELEMENTARY GRADES 3-4

1. Illustrate the relative positions of the sun, moon, and planets.
2. Trace the sources of earth's heat and light energy to the sun.
3. Describe earth's rotation on its axis and its revolution around the sun.
4. Explore the relationship between the earth and its moon.

EXAMPLES

- Observe and chart the phases of the moon.

MIDDLE GRADES 5-8

1. Compare past and present knowledge about characteristics of stars (e.g., composition, location, life-cycles) and explain how people have learned about them.
2. Describe the concept of galaxies, including size and number of stars.
3. Compare and contrast distances and the time required to travel those distances on earth, in the solar system, in the galaxy, and between galaxies.
4. Describe scientists' exploration of space and the objects they have found (e.g., comets, asteroids, pulsars).
5. Describe the motions of moons, planets, stars, solar systems, and galaxies.

EXAMPLE

- Use available satellite pictures to identify objects found in space.

SECONDARY GRADES

1. Describe how scientists gather data about the universe.
2. Research current explanations for phenomena such as black holes and quasars.
3. Explain how astronomers measure interstellar distances.

EXAMPLE

- Use a computer to analyze images of planetary bodies.

Science and Technology

H. ENERGY

Students will understand concepts of energy. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Demonstrate an understanding that the sun gives off light and heat energy.
2. Explain why living things need energy.

EXAMPLE

- Compare the growth of plants in different conditions of light.

ELEMENTARY GRADES 3-4

1. Identify different forms of energy (e.g., light, sound, heat).
2. Explain ways different forms of energy can be produced.

EXAMPLE

- Prove that sounds are caused by vibrational energy.

MIDDLE GRADES 5-8

1. Analyze the benefits and drawbacks of energy conversions (e.g., in electricity generation).
2. Demonstrate that energy cannot be created or destroyed but only changed from one form to another.
3. Compare and contrast the ways energy travels (e.g., waves, conduction, convection, radiation).
4. Describe the characteristics of static and current electricity.
5. Categorize energy sources as renewable or non-renewable and compare how these sources are used by humans.
6. Describe how energy put into or taken out of a system can cause changes in the motion of particles in matter.

SECONDARY GRADES

1. Analyze the evidence that leads scientists to conclude that light behaves somewhat like a wave and somewhat like a particle.
2. Examine and describe how light is reflected and refracted (deflected) by mirrors and lenses.
3. Explain or demonstrate how sound waves travel.
4. Analyze the relationship between the kinetic and potential energy of a falling object.
5. Use mathematics to describe the work and power in a system.
6. Describe the relationship between matter and energy and how matter releases energy through the processes of nuclear fission and fusion.
7. Use mathematics to describe and predict electrical and magnetic activity (e.g., current, resistance, voltage).
8. Compare and contrast how conductors, semiconductors, and superconductors work and describe their present and potential uses.
9. Demonstrate an understanding that energy can be found in chemical bonds and can be used when it is released from those bonds.

Science and Technology

I. MOTION

Students will understand the motion of objects and how forces can change that motion. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Develop a variety of ways to describe the motion of an object.
2. Demonstrate that the motion of an object can be changed.

EXAMPLE

- Describe the motion of an object using terms such as forward, backward, straight, zigzag, up, down, fast, slow, etc.

ELEMENTARY GRADES 3-4

1. Describe the effects of different types of forces (e.g., mechanical, electrical, magnetic) on motion.
2. Draw conclusions about how the amount of force affects the motion of more massive and less massive objects.
3. Generate examples illustrating that when something is pushed or pulled, it exerts a reaction force.

MIDDLE GRADES 5-8

1. Describe the motion of objects using knowledge of Newton's Laws.
2. Use mathematics to describe the motion of objects (e.g., speed, distance, time, acceleration).
3. Describe and quantify the ways machines can provide mechanical advantages in producing motion.

SECONDARY GRADES

1. Use mathematics to describe the law of conservation of momentum.
2. Explain some current theories of gravitational force.
3. Use Newton's Laws to qualitatively and quantitatively describe the motion of objects.
4. Describe how forces affect fluids (e.g., air and water).
5. Explain the relationship between temperature, heat, and molecular motion.
6. Describe how forces within and between atoms affect their behavior and the properties of matter.

EXAMPLE

- Investigate and describe the motion of an amusement park ride.

Science and Technology

J. INQUIRY AND PROBLEM SOLVING

Students will apply inquiry and problem-solving approaches in science and technology. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Make accurate observations using appropriate tools and units of measure.
2. Ask questions and propose strategies and materials to use in seeking answers to questions.
3. Use results in a purposeful way, which includes making predictions based on patterns they have observed.
4. Identify products which were invented to solve a problem.

ELEMENTARY GRADES 3-4

1. Make accurate observations using appropriate tools and units of measure.
2. Conduct scientific investigations: make observations, collect and analyze data, and do experiments.
3. Use results in a purposeful way: design fair tests, make predictions based on observed patterns, and interpret data to make further predictions.
4. Design and build an invention.
5. Explain how differences in time, place, or experimenter can lead to different data.
6. Explain how different conclusions can be derived from the same data.

MIDDLE GRADES 5-8

1. Make accurate observations using appropriate tools and units of measure.
2. Design and conduct scientific investigations which include controlled experiments and systematic observations. Collect and analyze data, and draw conclusions fairly.
3. Verify and evaluate scientific investigations and use the results in a purposeful way.
4. Compare and contrast the processes of scientific inquiry and the technological method.
5. Explain how personal bias can affect observations.
6. Design, construct, and test a device (invention) that solves a special problem.

EXAMPLE

- Given temperature data from hot liquids contained in a variety of cups, predict the relative insulating capacity of each. Then, test the prediction and formulate additional questions based on a comparison of the results.

SECONDARY GRADES

1. Make accurate observations using appropriate tools and units of measure.
2. Verify, evaluate, and use results in a purposeful way. This includes analyzing and interpreting data, making predictions based on observed patterns, testing solutions against the original problem conditions, and formulating additional questions.
3. Demonstrate the ability to use scientific inquiry and technological method with short term and long term investigations, recognizing that there is more than one way to solve a problem. Demonstrate knowledge of when to try different strategies.
4. Design and construct a device to perform a specific function, then redesign for improvement (e.g., performance, cost).

Science and Technology

K. SCIENTIFIC REASONING

Students will learn to formulate and justify ideas and to make informed decisions. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Examine strengths and weaknesses of simple arguments.
2. Distinguish between important and unimportant information in simple arguments.
3. Make observations.
4. Participate in brainstorming activities.
5. Use various forms of simple logic.
6. Discover relationships and patterns.

ELEMENTARY GRADES 3-4

1. Give alternative explanations for observed phenomena.
2. Describe how feelings can distort reasoning.
3. Draw conclusions about observations.
4. Use various types of evidence (e.g., logical, quantitative) to support a claim.
5. Demonstrate an understanding that ideas are more believable when supported by good reasons.
6. Practice and apply simple logic, intuitive thinking, and brainstorming.

MIDDLE GRADES 5-8

1. Examine the ways people form generalizations.
2. Identify exceptions to proposed generalizations.
3. Identify basic informal fallacies in arguments.
4. Analyze means of slanting information.
5. Identify stereotypes.
6. Support reasoning by using a variety of evidence.
7. Show that proving a hypothesis false is easier than proving it true, and explain why.
8. Construct logical arguments.
9. Apply analogous reasoning.

EXAMPLES

- Use logical connectors such as "if.....then" to accurately reflect cause and effect.
- Recognize the intermingling of fact and opinion in scientific explanations.

SECONDARY GRADES

1. Judge the accuracy of alternative explanations by identifying the evidence necessary to support them.
2. Explain why agreement among people does not make an argument valid.
3. Develop generalizations based on observations.
4. Determine when there is a need to revise studies in order to improve their validity through better sampling, controls or data analysis techniques.
5. Produce inductive and deductive arguments to support conjecture.
6. Analyze situations where more than one logical conclusion can be drawn.

Science and Technology

L. COMMUNICATION

Students will communicate effectively in the application of science and technology. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe and compare things in terms of number, shape, texture, size, weight, color, and behavior.
2. Read and write instructions to be followed or instructions which explain procedures.
3. Ask clarifying questions.
4. Explain problem-solving processes using verbal, pictorial, and written methods.
5. Make and read simple graphs.
6. Use objects and pictures to represent scientific and technological ideas.

EXAMPLE

- First grade students create a graph to record their daily weather observations. This might include bars for sunny, cloudy, rainy, snowy, and "mixed", as well as cold, warm, and hot. On a regular basis the students reflect on their graph. They describe and compare the weather on different days, weeks, or months, and draw conclusions about the weather based on the data.

ELEMENTARY GRADES 3-4

1. Record results of experiments or activities (e.g., interviews, discussions, field work) and summarize and communicate what they have learned.
2. Ask clarifying and extending questions.
3. Reflect on work in science and technology using such activities as discussions, journals, and self-assessment.
4. Make and/or use sketches, tables, graphs, physical representations, and manipulatives to explain procedures and ideas.
5. Gather and effectively present information, using a variety of media including computers (e.g., spreadsheets, word processing, programming, graphics, modeling).
6. Cite examples of bias in information sources and question the validity of information from varied sources.
7. Function effectively in groups within various assigned roles (e.g., reader, recorder).

EXAMPLE

- Create functioning models which demonstrate the ways in which simple machines make work easier (e.g., levers, inclined planes, gears, pulleys, wheels, and axles).

MIDDLE GRADES 5-8

1. Discuss scientific and technological ideas and make conjectures and convincing arguments.
2. Defend problem-solving strategies and solutions.
3. Evaluate individual and group communication for clarity, and work to improve communication.
4. Make and use scale drawings, maps, and three-dimensional models to represent real objects, find locations, and describe relationships.
5. Access information at remote sites using telecommunications.
6. Identify and perform roles necessary to accomplish group tasks.

EXAMPLE

- Given actual census data on populations and species in a wetland, present arguments in support of and against a proposition to develop the area.

SECONDARY GRADES

1. Analyze research or other literature for accuracy in the design and findings of experiments.
2. Use journals and self-assessment to describe and analyze scientific and technological experiences and to reflect on problem-solving processes.
3. Make and use appropriate symbols, pictures, diagrams, scale drawings, and models to represent and simplify real-life situations and to solve problems.
4. Employ graphs, tables, and maps in making arguments and drawing conclusions.
5. Critique models, stating how they do and do not effectively represent the real phenomenon.
6. Evaluate the communication capabilities of new kinds of media (e.g., cameras with computer disks instead of film).
7. Use computers to organize data, generate models, and do research for problem solving.
8. Engage in a debate, on a scientific issue, where both points of view are based on the same set of information.

Science and Technology

M. IMPLICATIONS OF SCIENCE AND TECHNOLOGY

Students will understand the historical, social, economic, environmental, and ethical implications of science and technology. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe how legends, stories, and scientific explanations are different ways in which people attempt to explain the world.
2. Describe at least two inventions, what they do, how they work, and how they have made life easier.
3. Identify commonly used resources, their sources, and where waste products go.
4. Demonstrate some practices for recycling and care of resources.
5. Explain how their lives would be different without specific inventions or scientific knowledge.

EXAMPLES

- Pick a simple invention (e.g., toothbrush, fork, lawnmower) and explain how its design conforms to function.
- Trace all the ways that they rely on electricity every day.

ELEMENTARY GRADES 3-4

1. Explore how cultures have found different technological solutions to deal with similar needs or problems (e.g., construction, clothing, agricultural tools and methods).
2. Investigate and describe the role of scientists and inventors.
3. Explore how technology (e.g., transportation, irrigation) has altered human settlement.
4. Explain practices for conservation in daily life, based on a recognition that renewable and non-renewable resources have limits.

EXAMPLES

- Look at a map of the town and explain why homes are concentrated in certain areas.
- Describe where faucet water comes from, where it goes, and how to conserve it.

MIDDLE GRADES 5-8

1. Research and evaluate the social and environmental impacts of scientific and technological developments.
2. Describe the historical and cultural conditions at the time of an invention or discovery, and analyze the societal impacts of that invention.
3. Discuss the ethical issues surrounding a specific scientific or technological development.
4. Describe an individual's biological and other impacts on an environmental system.
5. Identify factors that have caused some countries to become leaders in science and technology.
6. Give examples of actions which may have expected or unexpected consequences that may be positive, negative, or both.
7. Explain the connections between industry, natural resources, population, and economic development.
8. Recognize scientific and technological contributions of diverse people including women, different ethnic groups, races, and physically disabled.

EXAMPLES

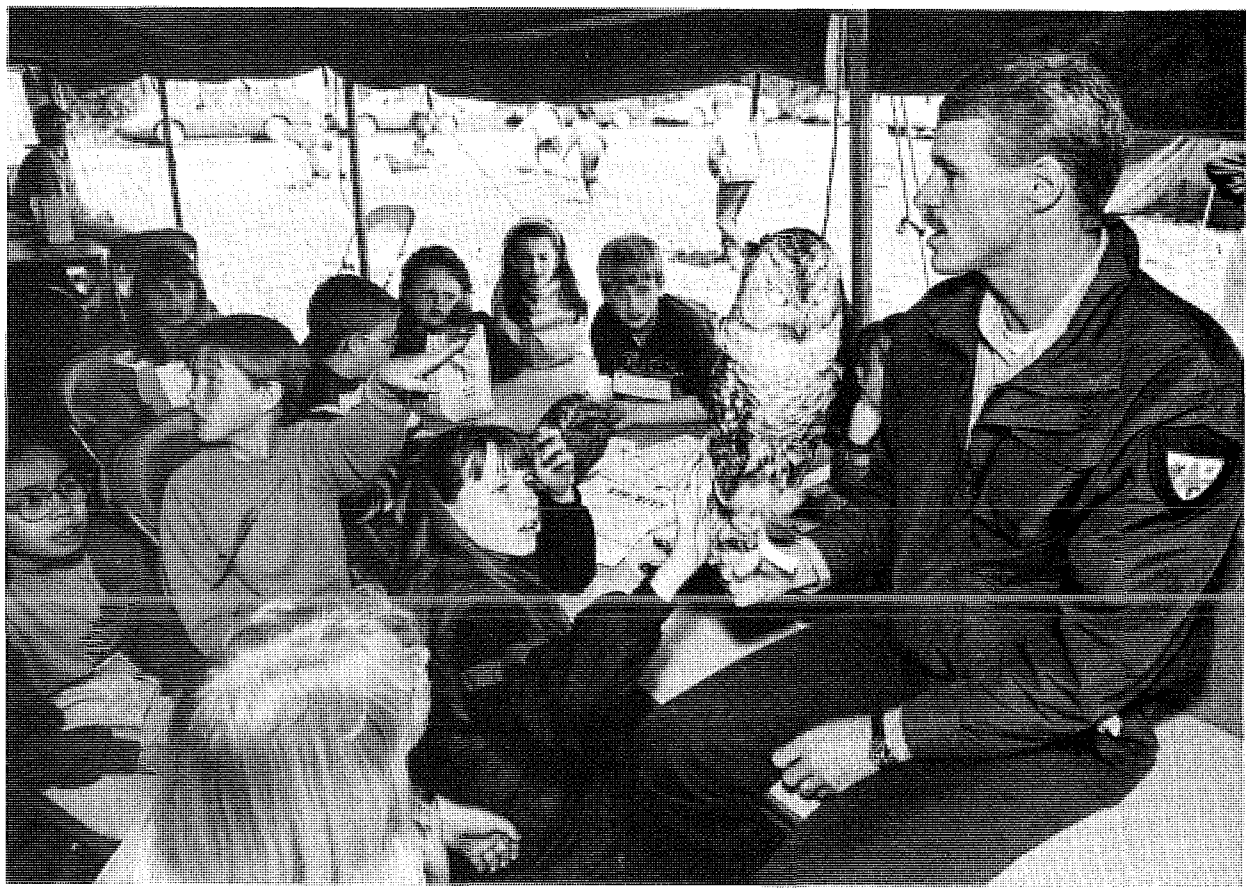
- Investigate the events and technology that led to the discovery of microorganisms and to the subsequent changes in medicine.
- Identify an historical human problem, describe the possible solutions available at the time the problem was discovered, explain how the problem was solved, and evaluate the positive and negative effects of the solution.

SECONDARY GRADES

1. Examine the impact of political decisions on science and technology.
2. Demonstrate the importance of resource management, controlling environmental impacts, and maintaining natural ecosystems.
3. Evaluate the ethical use or introduction of new scientific or technological developments.
4. Analyze the impacts of various scientific and technological developments.
5. Examine the historical relationships between prevailing cultural beliefs and breakthroughs in science and technology.
6. Research issues that illustrate the effects of technological imbalances and suggest some solutions.

EXAMPLES

- Design a sustainable community.
- Compare the costs, risks, and benefits to society of a scientific or technological development (e.g., nuclear fission, genetic engineering).



Social Studies

> ***"History is the witness that testifies to the passing of time; it illumines reality, vitalizes memory, provides guidance in daily life, and brings us tidings of antiquity."***
>
> Marcus Tullius Cicero (Pro Publio Sestio - circa 50 B.C.)

The great architects of American public education, such as Thomas Jefferson, Horace Mann, and John Dewey, considered a strong literacy essential to the preservation of democracy. Each believed that every student must be well versed in the nation's history, the principles which undergird citizenship, and the institutions which define our government. Understandings of commerce and geography were critical to their thinking as well.

In essence, Jefferson, Mann, and Dewey viewed the study of social studies as critical to the mission of public schools. Indeed, they would applaud the inclusion of a "responsible and involved citizen" in the Guiding Principles, as well as social studies as one of eight content areas in the *Learning Results*.

A strong social studies education depends upon a clear understanding of its interrelated disciplines. Without a knowledge of the geography and economics of earlier times, history offers only lists of people, events, and dates. Without a knowledge of history, the institutions of American government and the dynamics of today's global economy are difficult to understand.

Important contemporary issues such as health care, education, crime, the environment, and foreign policy are all multidisciplinary in nature. Understanding these issues and developing responses to them requires an integrated social studies education. In such a social studies program, students are actively engaged in inquiry, research, debate, and in-depth learning. Students can further enhance their knowledge of the world around them by using local communities as extended classrooms; they can learn to build on that knowledge and on their knowledge of history to construct insights into the future. A broad understanding of the perspectives central to social studies enables students to develop, practice, and apply the knowledge and experiences required to be contributing participants in a democratic society.

Although social studies curricula vary in their breadth and depth, the *Learning Results* have adopted a focused definition of this content area whereby government, history, geography, and economics stand as the pillars of the content with other disciplines within the social sciences deemed important, but not essential.

CIVICS AND GOVERNMENT

Students will learn the constitutional principles and the democratic foundations of national, state, and local systems and institutions. Further, students will learn how to exercise the rights and responsibilities of participation in civic life and to analyze and evaluate public policies. This understanding entails insight into political power, how it is distributed and expressed, the types and purposes of governments, and their relationships with the governed. Political relationships among the United States and other nations are also included in this content area.

A. RIGHTS, RESPONSIBILITIES, AND PARTICIPATION

Students will understand the rights and responsibilities of civic life and employ the skills of effective civic participation.

B. PURPOSE AND TYPES OF GOVERNMENT

Students will understand the types and purposes of governments, their evolution, and their relationships with the governed.

C. FUNDAMENTAL PRINCIPLES OF GOVERNMENT AND CONSTITUTIONS

Students will understand the constitutional principles and the democratic foundations of the political institutions of the United States.

D. INTERNATIONAL RELATIONS

Students will understand the political relationships among the United States and other nations.

HISTORY

Students will learn to analyze the human experience through time, to recognize the relationships of events and people, and to identify patterns, themes, and turning points of change using the chronology of history and major eras. In interpreting current and historical events, students will evaluate the credibility and perspectives of multiple sources of information gathered from technology, documents, artifacts, maps, the arts, and literature.

A. CHRONOLOGY

Students will use the chronology of history and major eras to demonstrate the relationships of events and people.

B. HISTORICAL KNOWLEDGE, CONCEPTS, AND PATTERNS

Students will develop historical knowledge of major events, people, and enduring themes in the United States, in Maine, and throughout world history.

C. HISTORICAL INQUIRY, ANALYSIS, AND INTERPRETATION

Students will learn to evaluate resource material such as documents, artifacts, maps, artworks, and literature, and to make judgments about the perspectives of the authors and their credibility when interpreting current historical events.

GEOGRAPHY

In order to understand and analyze the relationships among people and environments, students will learn how to construct and interpret maps and how to use globes and other geographic tools to locate and derive information about people, places, regions, and environments. In an integrated way, students will study people and the physical characteristics and processes of the earth's surface to understand causes and effects, ecosystems, human behavior, patterns of population, interdependence, resources, cooperation and conflict, and how these are shaped by economic, political, and cultural systems.

A. SKILLS AND TOOLS

Students will know how to construct and interpret maps and use globes and other geographic tools to locate and derive information about people, places, regions, and environments.

B. HUMAN INTERACTION WITH ENVIRONMENTS

Students will understand and analyze the relationships among people and their physical environments.

ECONOMICS

Students will learn and apply basic economic concepts of production, distribution, and consumption to make decisions as effective participants in an international economy. Students will understand the development, principles, institutions, relationships to culture, and change over time of economic systems in the United States and elsewhere. Students will also understand how these concepts apply to individuals, households, businesses, governments, and societies which make decisions based on the availability of resources, as well as on costs and benefits of choices. These concepts also help to explain the patterns and results of trade, interdependence, and distribution of wealth in local, regional, national, and world economies.

A. PERSONAL AND CONSUMER ECONOMICS

Students will understand that economic decisions are based on the availability of resources and the costs and benefits of choices.

Social Studies

B. ECONOMIC SYSTEMS OF THE UNITED STATES
Students will understand the economic system of the United States, including its principles, development, and institutions.

C. COMPARATIVE SYSTEMS
Students will analyze how different economic systems function and change over time.

D. INTERNATIONAL TRADE AND GLOBAL INTERDEPENDENCE
Students will understand the patterns and results of international trade.

"The study of the human past with all its triumphs and tragedies is necessary to the understanding of contemporary society and the issues facing humankind."

Risinger, 1992

Social Studies

CIVICS AND GOVERNMENT

A. RIGHTS, RESPONSIBILITIES, AND PARTICIPATION

Students will understand the rights and responsibilities of civic life and will employ the skills of effective civic participation. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify and practice classroom rights and responsibilities.

EXAMPLE

- Participate in a process to determine classroom rules that protect the rights and property of each student in the class, and establish guidelines for individual and cooperative learning.

ELEMENTARY GRADES 3-4

1. Identify important individual rights (e.g., freedom of religion, speech, ownership of property).
2. Explain why certain responsibilities of democratic society are important.
3. Identify the functions of government at school, locally, and at the state level.

MIDDLE GRADES 5-8

1. Identify the characteristics of an effective citizen.
2. Evaluate and defend positions on current issues regarding individual rights and judicial protection.
3. Describe and analyze the process by which a proposed law is adopted, including the role of governmental and non-governmental influences.
4. Identify ways in which citizens in a pluralistic society manage differences of opinion on public policy issues.
5. Explain the functions of and relationships among local, state, and national governments.

SECONDARY GRADES

1. Develop and defend a position on a public policy issue within our democracy.
2. Assess the reasons why participation of an attentive, knowledgeable, and competent citizenry is important to constitutional democracy, using examples from personal or historical experience.
3. Describe the circumstances under which civil disobedience might be justified.
4. Demonstrate an understanding of the processes of voter registration and voter participation.

Social Studies

CIVICS AND GOVERNMENT

B. PURPOSE AND TYPES OF GOVERNMENT

Students will understand the types and purposes of governments, their evolution, and their relationships with the governed. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Understand that all nations have governments.

ELEMENTARY GRADES 3-4

1. Describe why we need governments (e.g., law and order, defense, roads, schools).
2. Describe the basic structure of local and state governments.

MIDDLE GRADES 5-8

1. Compare leadership and civil rights in our democracy to their status under an authoritarian type government.
2. Compare and contrast the structures of local, state, and national government.
3. Contrast the roles of local, state, and national governments by investigating, evaluating, and debating a current civic issue.
4. Identify key representatives in legislative branches and the heads of executive and judicial branches in Maine and in the United States government.
5. Assess competing ideas about the purposes government should serve (e.g., individual rights versus collective rights).
6. Explain the history and functions of Maine state government including the Constitution of Maine.

SECONDARY GRADES

1. Compare and contrast the purpose and the structure of the United States government with other governments (parliamentary, dictatorship, monarchy) with respect to ideology, values, and histories.
2. Assess the different jurisdictions and roles of local, state, and federal governments in relation to an important public policy issue.
3. Analyze the major arguments for and against representative government as distinguished from direct democracy.
4. Assess the tension between the public's need for government services and the varying availability of revenue through taxes at the local, state, and federal levels.
5. Evaluate the role of the media and public opinion in United States politics, including ways the government and media influence public opinion.

CIVICS AND GOVERNMENT

C. FUNDAMENTAL PRINCIPLES OF GOVERNMENT AND CONSTITUTIONS

Students will understand the constitutional principles and the democratic foundations of the political institutions of the United States. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Understand that the United States has a constitution.

ELEMENTARY GRADES 3-4

1. Explain how the Constitution protects individual rights (e.g., Bill of Rights).

MIDDLE GRADES 5-8

1. Explain the meaning and importance of fundamental principles of American constitutional democracy (e.g., popular sovereignty, rule of law, three branches of government, representative institutions, shared powers, checks and balance, and separation of church and state).
2. Examine civil rights, liberties, and responsibilities established in the United States Constitution and Bill of Rights.
3. Take and defend positions on current issues involving the constitutional practice of individual rights (e.g., freedom of speech, separations of church and state).
4. Explain the importance, in a pluralistic society, of having certain shared political values and principles.

SECONDARY GRADES

1. Explain the historical foundations of constitutional government in the United States (e.g., Magna Carta, Roman Republic, colonial experience, Declaration of Independence, Articles of Confederation, Constitution of the United States).
2. Evaluate the Federalist and anti-Federalist positions on the ratification of the Constitution in light of historical developments.
3. Evaluate the effectiveness of the Constitution as a vehicle for change.
4. Demonstrate an understanding of the meaning and importance of traditional democratic assumptions such as individual rights, the common good, self-government, justice, equality, and patriotism.
5. Demonstrate how the United States Constitution uses checks and balances in order to prevent the abuse of power (e.g., Marbury vs. Madison, Gulf of Tonkin Resolution, Watergate).
6. Evaluate, take, and defend positions on current issues regarding judicial protection and individual rights.
7. Examine civil rights issues related to well-known Supreme Court decisions.

Social Studies

CIVICS AND GOVERNMENT

D. INTERNATIONAL RELATIONS

Students will understand the political relationships among the United States and other nations. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Recognize that there are other nations with different traditions and practices.

ELEMENTARY GRADES 3-4

1. Identify examples of how the United States interacts with other countries (e.g., trade, treaties).
2. Compare a foreign culture to that of the United States. Include an analysis of how decisions are made.

MIDDLE GRADES 5-8

1. Explain the foreign policy powers which the Constitution gives to the branches of the government.
2. Assess the ways in which the United States government has attempted to resolve an international problem (e.g., Vietnam, Northern Ireland, World War II).
3. Explain the reasons for alliances with some nations against others (e.g., with France during the American Revolution, with the Allied Powers in World War II, NATO).

SECONDARY GRADES

1. Analyze the processes used to develop foreign policy.
2. Trace the development of a current major world event and predict the possible outcomes (e.g., population, global warming).
3. Demonstrate how domestic policy may impose constraints or obligations on United States actions in the world, using current examples.
4. Evaluate the benefits and difficulties of international cooperation, using specific examples.

Social Studies

HISTORY

A. CHRONOLOGY

Students will use the chronology of history and major eras to demonstrate the relationships of events and people. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Place individual and family experiences in historical time and place.
2. Distinguish similarities and differences among historical events.

EXAMPLE

- After reading or hearing a folk tale, biography, or historical narrative, retell or dramatize the story with the events in the correct sequence.

ELEMENTARY GRADES 3-4

1. Identify similarities and differences in the characteristics of individuals who have made significant contributions to society in different eras.
2. Place in chronological order, significant events, groups, and people in the history of Maine.

EXAMPLE

- Given a set of photographs of the same community taken from the same vantage point at twenty-year intervals, examine them in order to make a list of changes which occurred between each pair of pictures. Speculate on how their own lives might have been different if they attained their current age during any of the periods represented.

MIDDLE GRADES 5-8

1. Describe the effects of historical changes on daily life.
2. Identify the sequence of major events and people in the history of Maine, the United States, and selected world civilizations. (See suggested list below in "Secondary Grades".)
3. Trace simultaneous events in various parts of the world during a specific era.

EXAMPLE

- Select a significant figure from Maine history and research the period of his or her life to discover what events that person might have witnessed or participated in.
- Trace movements of pastoral peoples (e.g., the Hebrews, Turks, Huns, Mongols) by examining references to them in the chronologies of other peoples, using these references to build a time-line specifically for the group chosen.

SECONDARY GRADES

1. Identify and analyze major events and people that characterize each of the significant eras in the United States and world history. (See suggested eras below.)

Eras in United States History

- The Americas to 1600
- The Colonial Era, 1500-1754
- The Revolutionary Era, 1754-1783
- Nation Building, 1783-1815
- The Expanding Nation, 1815-1850
- Civil War and Reconstruction, 1850-1877
- Development of the Industrial United States, 1865-1914
- The Progressive Era, 1890-1914
- Emergence of the United States as a World Power, 1890-1920
- The '20's: Prosperity and Problems
- Depression and The New Deal, 1929-1941
- World War II and Post War United States, 1939-1961
- Contemporary United States, 1961-Present

Eras in World History

- Emergence of Civilization to 1000 BC
- The Classical Civilizations of the Mediterranean Basin, India, and China, 1000 BC-600 AD
- The Expansion and Interaction of Civilizations, 600 AD-1450 AD
- The Early Modern World, 1450-1800
- The World in the Nineteenth Century
- The World in the Contemporary Era

Social Studies

HISTORY

B. HISTORICAL KNOWLEDGE, CONCEPTS, AND PATTERNS

Students will develop historical knowledge of major events, people, and enduring themes in the United States, in Maine, and throughout world history. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Demonstrate an understanding of the similarities between families now and in the past, including daily life today and in other times.
2. Demonstrate an understanding of cultural origins of customs and beliefs in several places around the world.

ELEMENTARY GRADES 3-4

1. Make connections between and among events in their personal lives and those occurring in the community.
2. Demonstrate an awareness of major events and people in United States and Maine history:
   - Who lives here? and how did they get here? (immigrants, demographics, ethnic and religious groups)
   - Important people in United States and Maine history.
   - Different kinds of communities in Maine, the United States, and selected world regions.

MIDDLE GRADES 5-8

1. Demonstrate an understanding of the causes and effects of major events in United States history and the connections to Maine history with an emphasis on events up to 1877, including but not limited to:

Declaration of Independence	The Constitution
Westward Expansion	Industrialization
Civil War	

2. Demonstrate an understanding of selected themes in Maine, United States, and world history (e.g., revolution, technological innovation, migration).
3. Demonstrate an understanding of selected turning points in ancient and medieval world history and the continuing influence of major civilizations of the past.
4. Demonstrate an understanding of selected twentieth century issues and events in United States and in Maine history including "modern" Maine history (1945 to present).

SECONDARY GRADES

1. Demonstrate an understanding of the causes and effects of major events in United States history and their connection to both Maine and world history with emphasis on events after 1877, including, but not limited to:

Industrialization	The Great Depression
The Cold War (and its ending)	WWI and WWII
The Vietnam Era	Civil Rights Movement
Watergate	

2. Demonstrate an understanding of selected major events in ancient and modern world history and their connection to United States history.
3. Demonstrate an understanding of the lives of selected individuals who have had a major influence on history.
4. Demonstrate an understanding of enduring themes in history (e.g., conflict and cooperation, technology and innovation, freedom and justice).
5. Explain how different ways of knowing and believing have influenced human history and culture.
6. Describe how the basic ideas of various schools of philosophy have affected societies (e.g., rationalism, liberalism, idealism, conservationism).
7. Explain the benefits and conflicts resulting from encounters among cultures.

EXAMPLES

- Describe how the development, expansion, and collapse of empires have affected the expansion of political power.
- Give examples of former colonies and dependent states that have gained independence in the twentieth century and explain how they have addressed political issues related to independence.

Social Studies

HISTORY

C. HISTORICAL INQUIRY, ANALYSIS, AND INTERPRETATION

Students will learn to evaluate resource material such as documents, artifacts, maps, artworks, and literature, and to make judgments about the perspectives of the authors and their credibility when interpreting current historical events. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Use artifacts and documents to gather information about the past.

EXAMPLE

- Given a "history box" containing artifacts belonging to a specific time, make deductions concerning form and use of the objects and what they tell us about life in the past.

ELEMENTARY GRADES 3-4

1. Identify changes currently occurring in their daily lives and compare these to changes in daily life during a specific historic era.

EXAMPLE

- Construct a time capsule in which students place artifacts and documents which they feel would serve as an accurate guide to life in the late twentieth century for future students.

MIDDLE GRADES 5-8

1. Judge the accuracy of historical fiction by comparing the characters and events described with descriptions in multiple primary sources.
2. Explain why historical accounts of the same event sometimes differ and relate this explanation to the evidence presented by the author or the point of view of the author.
3. Use information from a variety of primary and secondary sources to identify and support a point of view on a controversial historical topic.
4. Identify ethnic and cultural perspectives missing from an historical account and describe these points of view.
5. Formulate historical questions based on examination of primary and secondary sources including documents, eyewitness accounts, letters and diaries, artifacts, real or simulated historical sites, charts, graphs, diagrams, and written texts.

SECONDARY GRADES

1. Evaluate and use historical materials to formulate historical hypotheses regarding a specific issue (e.g., space travel), and to make predictions about the future of the issue.
2. Examine and analyze primary and secondary sources in order to differentiate between historical facts and historical interpretations, and to support or reject historical hypotheses.
3. Compare competing historical narratives by contrasting different historians' choice of questions, use and choice of sources, perspectives, beliefs, and points of view in order to demonstrate how these factors contribute to different interpretations.
4. Compare and contrast the reliability of information received from multiple sources (e.g., newspapers, radio or TV, biography, historical narrative) to assess an historical issue.

Social Studies

GEOGRAPHY

A. SKILLS AND TOOLS

Students will know how to construct and interpret maps and use globes and other geographic tools to locate and derive information about people, places, regions, and environments. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Use and construct maps and other visuals to describe geographic location, direction, size, and shape.

EXAMPLE

- Use maps of world climatic regions to discuss the types of clothing, housing, outdoor activity, etc., which might be found in a specific area.

ELEMENTARY GRADES 3-4

1. Construct and compare maps of Maine, the United States, and regions of the world to interpret geographical features and draw conclusions about physical patterns.
2. Locate major cities of the world and discuss why they emerged in that particular region.

MIDDLE GRADES 5-8

1. Visualize the globe and construct maps of the world and its sub-regions to identify patterns of human settlement, major physical features, and political divisions.
2. Develop maps, globes, charts, models, and databases to analyze geographical patterns on the earth.
3. Understand United States social, political, and economic divisions and the more significant social and political divisions in world geography.

EXAMPLE

- Speculate about the types of exchanges of goods and materials which might occur between economic regions, and the routes and types of transportation used.

SECONDARY GRADES

1. Use mapping to answer complex geographic and environmental problems.
2. Appraise the ways in which maps reflect economic, social, and political policy decision making.
3. Understand how cultural and technological features can link or divide regions.

EXAMPLE

- Use survey and map data which represent classmates' residential preferences, analyzing the factors which influence people's preferences about where to live and their decisions to move.

Social Studies

GEOGRAPHY

B. HUMAN INTERACTION WITH ENVIRONMENTS

Students will understand and analyze the relationships among people and their physical environment.
Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Describe the human and physical characteristics of the immediate environment.

EXAMPLE

- Using a variety of visual materials, data sources, and/or narratives, describe the human and physical characteristics of a region.

ELEMENTARY GRADES 3-4

1. Demonstrate an understanding of why certain areas of the world are more densely populated than others.
2. Explain ways in which communities reflect the backgrounds of their inhabitants.
3. Use a variety of materials and geographic tools to explain how the physical environment supports and constrains human activities.

EXAMPLE

- Explain how the founders of a settlement might have evaluated a site, in terms of its resources and environmental characteristics, relative to their needs.

MIDDLE GRADES 5-8

1. Analyze how technology shapes the physical and human characteristics of places and regions, including Maine.
2. Explain patterns of migration throughout the world.
3. Explain how cultures differ in their use of similar environments and resources.
4. Demonstrate an understanding of how society changes as a consequence of concentrated settlement.

SECONDARY GRADES

1. Explain factors which shape places and regions over time (e.g., physical and cultural factors).
2. Analyze the cultural characteristics that make specific regions of the world distinctive.
3. Analyze how technologies contribute to cultural sharing and separation, and identify examples of the spread of cultural traits.
4. Explain how conflict and cooperation among peoples contribute to the division of the earth's surface into distinctive cultural and political regions.

EXAMPLE

- Compare two places with similar environments and dissimilar cultures (e.g., Manaus, Brazil and Kinshasa, Zaire).

Social Studies

ECONOMICS

A. PERSONAL AND CONSUMER ECONOMICS

Students will understand that economic decisions are based on the availability of resources and the costs and benefits of choices. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Identify goods and services, giving examples.

ELEMENTARY GRADES 3-4

1. Describe barter and money and how each is used in the exchange of resources, goods, and services.
2. Identify a situation in which a personal decision is made about the use of scarce resources (e.g., deciding to use allowance to go the movies instead of buying a gift for a family member).

MIDDLE GRADES 5-8

1. Analyze how scarcity affects individuals' decisions about production and consumption of goods and services.
2. Identify and analyze the factors that contribute to personal spending and savings decisions.
3. Use an example to show how incentives affect economic decisions (e.g., tax deferred savings plans, a fast food restaurant's discount promotion).

SECONDARY GRADES

1. Conduct a cost benefit analysis of a personal or business decision.
2. Evaluate different forms of savings and investments for short and long term returns (e.g., stocks, bonds, money market funds).
3. Demonstrate an understanding of credit history and the positive and negative impacts that credit can have on an individual's financial life.

EXAMPLE

- Given a fixed amount of "money" for investment purposes, create a portfolio of stocks, bonds, and other investments, trading to maximize profits over a fixed period of time.

Social Studies

ECONOMICS

B. ECONOMIC SYSTEMS OF THE UNITED STATES

Students will understand the economic system of the United States, including its principles, development, and institutions. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explain the terms consumer and product.

ELEMENTARY GRADES 3-4

1. Identify the three basic economic questions all economic systems must answer: What to produce? how? and for whom?
2. Explain how the economy of Maine affects families and communities.

MIDDLE GRADES 5-8

1. Demonstrate knowledge of economic concepts of supply, demand, price, the role of money, and profit and loss.
2. Analyze how prices act as signals to producers and customers to answer the three basic economic questions: What to produce? how? and for whom?
3. Identify how the fundamental characteristics of the United States economic system (e.g., private property, profits, competition, and price system) influence economic decision making.
4. Explain the impact that major events and technological advancements have had on the Maine economy and predict future economic trends and career opportunities.
5. Describe the roles and contributions of the principal contributors to the economy (e.g., laborers, investors, entrepreneurs, managers).

SECONDARY GRADES

1. Describe the factors (i.e., physical, capital, technology, monetary resources) that impact the development and the distribution of a product.
2. Identify and analyze the role of government in the United States economic system (e.g., taxing, spending, setting interest rates, regulatory policy).
3. Explain the positive and the negative impacts of advertising techniques on consumer behavior.
4. Describe the full costs (including externalities) associated with the use of natural and human resources to produce economic goods and services (e.g., solar power versus nuclear power to provide electricity).

EXAMPLE

- After an examination of the role of the Federal Reserve in regulating the money supply and interest rates, analyze economic scenarios in terms of likely actions by the Federal Reserve.

Social Studies

ECONOMICS

C. COMPARATIVE SYSTEMS

Students will analyze how different economic systems function and change over time. Students will be able to:

ELEMENTARY GRADES Pre-K-2

ELEMENTARY GRADES 3-4

1. Explain how selected cultures or countries meet basic human needs.

MIDDLE GRADES 5-8

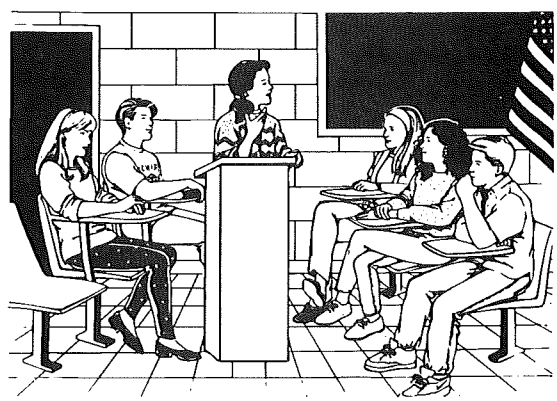
1. Describe the characteristics of traditional, command, market, and mixed economic systems.
2. Compare how different economies meet basic wants and needs over time.

SECONDARY GRADES

1. Explain the impact of cultural values on economic decisions, using at least two examples.
2. Compare strengths and weaknesses of the market economy with other economic models, using broad societal goals such as freedom, equity, security, employment, stability, and economic growth.

EXAMPLE

- Compare and contrast the Swedish economic system with that of the United States. Explain the differences in the role of government in each country (e.g., the different approaches to taxation and social policy).



Social Studies

ECONOMICS

D. INTERNATIONAL TRADE AND GLOBAL INTERDEPENDENCE

Students will understand the patterns and results of international trade. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explain where products come from and how we use them.

ELEMENTARY GRADES 3-4

1. Describe, with examples, how the exchange of goods and services helps to create economic interdependence between people in different places and countries.

MIDDLE GRADES 5-8

1. Describe how changes in transportation and communication technologies have affected trade over time.
2. Evaluate how world trade issues can affect a nation's economy and how trade can influence and transform societies.
3. Explain why trade allows specialization and identify specific examples of how nations specialize (e.g., Japan's focus on consumer electronics).

SECONDARY GRADES

1. Demonstrate an understanding that a nation has a competitive advantage when it can produce a product at a lower cost than its trading partner.
2. Evaluate the effect on international trade of domestic policies which either encourage or discourage exchange of goods and services (e.g., quotas, tariffs, skilled labor, stable government).

Visual and Performing Arts

> ***"Thanks to art, instead of seeing a simple world, our own, we see it multiply until we have before us as many worlds as there are original artists ..."***
>
> Marcel Proust

The arts include dance, music, theater and visual art. In an increasingly technological world, the arts help all students to develop multiple capabilities for creating, understanding, deciphering, and appreciating an image- and symbol-laden world. The arts are concerned with intellectual, emotional, and physical faculties and, in combination, can be used to present issues and ideas, teach or persuade, entertain, plan, beautify, and design both functional and expressive works. Experiencing and creating art brings lifelong enjoyment to students and an array of expressive, analytical, and developmental tools to use in their daily lives.

The arts play a valued role in creating cultures and developing and documenting civilizations. Students of the arts gain powerful tools for:

- communicating through creative expression;
- understanding human experiences, past and present;
- adapting to and respecting the ways others think, work, and express themselves;
- using artistic modes of problem solving, which, in turn, bring an array of expressive, analytical, and development tools to every human situation;
- understanding the power of the arts to create and reflect cultures;
- understanding the impact of design on virtually all we use in daily life;
- understanding the interdependence of work in the arts and the worlds of ideas and events;
- making decisions in situations where there are no standard answers;
- analyzing nonverbal communication and making informed judgments about cultural products and issues; and for
- communicating thoughts and feelings in a variety of modes, thereby providing a more powerful repertoire of self-expression.

Because each arts discipline appeals to different senses and expresses itself through different media, each adds a special richness to the learning environment. Arts education helps students learn to identify, appreciate, and participate in the traditional and non-traditional art forms of their own communities and the communities of others. As students imagine, create, and reflect, they are developing the verbal and non-verbal abilities necessary for life-long learning. The intellectual demands of the arts help students develop problem-solving abilities and such powerful thinking skills as analyzing, synthesizing, and evaluating. Numerous studies point toward a consistent and positive correlation between substantive education in the arts and student achievement in other subjects. A comprehensive, well-designed arts education program also engages students in a process that helps them develop the self-esteem, self-discipline, cooperation, and self-motivation necessary for success in life. Most importantly, the arts should be experienced and studied for their own intrinsic value.

A. CREATIVE EXPRESSION. Students will create and/or perform to express ideas and feelings. *Students communicate through their works, revise and problem-solve, use a variety of processes, and integrate their works with other disciplines.*

- *Each art form has specific vocabulary, elements, principles, and structures that allow for communication of ideas, feelings, and moods.*
- *Problem-solving skills, reflection, self-evaluation, revising, and refinement are part of the process used in the creation and development of art works.*
- *The development and creation of work in the arts use a variety of approaches, styles, media, and performance modes, including electronic technology.*
- *Students will understand that the roles, skills, relationships, and differences among the arts are transferable from one arts discipline to another as well as to other disciplines.*

Visual and Performing Arts

B. CULTURAL HERITAGE. Students will understand the cultural contributions (social, ethical, political, religious dimensions) of the arts, how the arts shape and are shaped by prevailing cultural and social beliefs and values, and recognize exemplary works from a variety of cultures and historical periods. *The arts are the record of our diverse world cultures and provide understanding of who we are, where we've been, and possible directions for our future.*

C. CRITICISM AND AESTHETICS. Students will reflect upon and assess the characteristics and merits of art works. *An understanding of how the senses are used to make artistic choices in daily life, together with an understanding of how these choices affect feelings, moods, and emotions, helps us to make judgments about the merits and meaning of work in the arts. The elements, principles, and structures of art forms can be composed in ways which enrich, persuade, and influence society, either directly, through performances, original works and exhibits or indirectly, through electronic and printed media..*

"The strongest and sweetest songs yet remain to be sung."

Walt Whitman (November Boughs
A Backward Glance O'er Travel'd Roads)

Visual and Performing Arts

A. CREATIVE EXPRESSION

Students will create and/or perform to express ideas and feelings. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Investigate the characteristics and purposes of each of the arts to communicate ideas, feelings, and meaning.
2. Experiment with art forms.
3. Demonstrate an understanding of the differences in the materials and techniques used to produce selected art works (e.g., the differences among musical instruments, the differences among a variety of materials used for sculpture or the differences in techniques used to performances such as singing, pantomime, etc.).
4. Recognize the functions and the expressive qualities of the elements and principles of each art form (visual art, music, dance, drama) and incorporate them into their own creative works.
5. Use improvisation to solve problems in the performing arts.
6. Perform and/or listen to a number of pieces on a given theme and create a variation.
7. Differentiate simple expressive forms within each arts discipline.
8. Use appropriate vocabulary to explain ideas in the arts.
9. Identify the use of the arts in daily experiences.
10. Demonstrate ways in which the arts can be used in interdisciplinary activities.
11. Understand and demonstrate acceptable rules of behavior when attending arts events (e.g., museums, galleries, plays, and concerts).
12. Recognize musical symbols.
13. Demonstrate ability to recreate an existing work alone and with others.
14. Use materials and tools in a safe and responsible manner.
15. Understand that the success of musical, theatrical, and dance groups depends on collaboration.

EXAMPLES

- Draw a self-portrait.
- Improvise a short piece of music using a given set of notes.
- Use space, costumes, and props to create a suitable environment in a scene or dance.
- Differentiate between a "verse" and a "refrain" in a song.
- Sing with a group, on pitch and together, following a conductor.

ELEMENTARY GRADES 3-4

1. Develop personal expression in works in each of the visual (2-D and 3-D) and performing arts (music, theater, and dance).
2. Apply previously learned principles to perform, create, revise, and/or refine works.
3. Refine and develop improvisations into completed works.
4. Create original works using different media, techniques, and processes to communicate ideas, feelings, and meaning.
5. Demonstrate awareness that there are a variety of careers in the arts.
6. Read simple musical compositions.
7. Listen to and/or view a dramatic, musical, dance, or visual art work and provide feedback to the artist (peer).
8. Begin to develop skill in playing a musical instrument and/or singing and performing simple compositions.

EXAMPLES

- Create a song from a poem or to accompany a dance.
- Show development of personal style by drawing a series of illustrations on a given theme.
- Use puppets to create characters and short scenes with a beginning, middle, and end.
- Play an instrument from a musical score or sing in two-part harmony.

MIDDLE GRADES 5-8

1. Explain how the arts originate from human experience, are a communal experience, and encourage kinship with others.
2. Use the expressive qualities of the elements and principles of each art form to explore a variety of styles in their work.
3. Discriminate among the qualities and characteristics of art media, techniques, and processes for the purposes of selecting appropriate media to communicate artistic ideas.
4. Use a variety of resources, materials, and techniques to design and execute art works.
5. Investigate the work of a professional who has an arts component within his/her work environment.
6. Demonstrate an understanding of how achievement in the arts can support achievement in other disciplines.
7. Demonstrate an understanding of how we make personal aesthetic choices in daily decisions.
8. Perform a variety of styles and types of music, dance, and theatre.
9. Develop skill in playing an instrument and/or singing and reading music.

EXAMPLES

- Create a series of ceramic pieces showing variations in personal style.
- Select a musical instrument for expressing a chosen emotion in an original composition.
- Identify the components of dance in a gymnastics or ice-skating routine.
- Develop three storyboards for a video sequence; then tape and edit the best into a completed piece.

SECONDARY GRADES

1. Create a visual or performance piece to communicate an idea, feeling, or meaning using:
    - a distinct style;
    - imagination and technical skill; and
    - the creative process, reflection, and self-evaluation (problem-solving skills).
2. Compare various classical and contemporary visual and/or performing arts techniques and methods and demonstrate the use of these in their own works.
3. Create a piece in one art form which complements one of the other art forms (e.g., music to complement poetry).
4. Use the elements and principles of design to demonstrate multiple solutions to specific visual or performing arts problems.
5. Create a portfolio of work that communicates new ideas, feelings, and moods using different media, techniques, and processes.
6. Demonstrate an understanding that the arts are a means of renewal and recreation, as well as an occupational opportunity.
7. Identify the value of participating in the arts and summarize possible involvement in personal and community arts.
8. Use arts knowledge and vocabulary to critique their own work.
9. Use skills and knowledge of arts elements and principles, whenever applicable, to solve problems or enhance meaning in other disciplines.

EXAMPLES

- Create a number of art works that represent their best work in a range of media they select.
- Create a character in a number of different acting styles and videotape the performances.
- Choreograph dances that interpret various other media such as poetry or visual art.
- Create a musical composition in their choice of media which may include the computer.
- Intern or apprentice with a professional in field of choice for a specific project.
- Use knowledge of color and design to create mathematical patterns.

B. CULTURAL HERITAGE

Students will understand the cultural contributions (social, ethical, political, religious dimensions) of the arts, how the arts shape and are shaped by prevailing cultural and social beliefs and values, and recognize exemplary works from a variety of cultures and historical periods. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Recognize samples of major styles and techniques of the arts from different cultural or ethnic groups.
2. Recognize common subjects and central ideas in works from different cultures.
3. Interpret or perform simple visual and performance pieces from different cultures and/or times.
4. Experiment with works exhibiting variety in style/technique, trends, and culture.
5. Create original works that integrate one or more of the characteristics and purposes of artworks from different cultures (include own community and culture).

EXAMPLES

- Use the rhythms from the music of other cultures in music to demonstrate different movements in dance.
- Perform dances based on Native American work.
- Use dramatic activities to explore a variety of occupations.
- Identify the common characteristics in art works which show nighttime scenes.

ELEMENTARY GRADES 3-4

1. Recognize selected major periods of the visual arts and performing arts and identify major artists and their work.
2. Explain how cultural values are shown through the arts.
3. Demonstrate an understanding of the roles of visual and performing artists in various settings and cultures.
4. Compare the characteristics of works in two or more visual and performing art forms that share a similar subject matter, historical period, or cultural context.

EXAMPLES

- Identify musical works of different genres such as classical or contemporary.
- Describe the role of artists in ancient Egypt.
- Identify origins of popular dance forms as either European or African.
- Explain the differences between an Indonesian Shadow Puppets performance and a Muppet puppet performance.
- Identify different kinds of music used in Maine such as sea chanteys or the music of the Abenaki, the lumbermen, or the textile mills, etc.

MIDDLE GRADES 5-8

1. Classify art works, which represent various cultures, by genre and style, identifying their distinguishing characteristics.
2. Compare and contrast the characteristics and purposes of the arts from various cultures, historical periods, and social groups.
3. Compare and contrast cultural values as expressed in works and explain how these values may differ from those of their own daily experience.
4. Compare the characteristics and purposes of works, in two or more arts forms, that share similar subject matter, historical periods, ethics, or cultural context.
5. Identify how the factors of time and place (such as climate, resources, ideas, and technology) are reflected in visual and performing arts.
6. Demonstrate an understanding of the ways various arts activities enrich people's artistic, intellectual, social, and emotional responses.

EXAMPLES

- Describe the social values expressed in modern dance as it grew out of ballet.
- Contrast the daily life of a Renaissance art student and a present day art student.
- Describe the value of theatre experience for self-development.

Visual and Performing Arts

SECONDARY GRADES

1. Compare two or more visual and/or performing arts by identifying the genre, style, historical period and conditions, probable artist, and cultural source.
2. Compare and contrast characteristics of visual and/or performing arts within a particular historical period or style with concepts about the period or style from other content areas.
3. Analyze common characteristics and purposes of various visual and/or performing art works across time and among cultural and social groups, and explain how these characteristics and purposes fulfill social, religious, or ceremonial functions in a particular cultural and historical context.
4. Create works that reflect concepts, theories, approaches, and styles from their own and other cultures.
5. Develop visual and/or performing art work in response to a historical, social or cultural condition using a variety of forms.

EXAMPLES

- Create and explain a time and theme line using several chosen works from different cultures.
- Create visual or performing art in the style of a particular artist.
- Create a musical fanfare that will be used during the lighting of the Olympic flame.
- Explain the relationship between the social climate of the 1960's and the social dances of the time.

Visual and Performing Arts

C. CRITICISM AND AESTHETICS

Students will reflect upon and assess the characteristics and merits of art works. Students will be able to:

ELEMENTARY GRADES Pre-K-2

1. Explain likes and dislikes of a work of art, music, dance, drama.
2. Describe the qualities of works of art, music, dance, and drama in relation to the senses of sight, hearing, movement, and feeling.
3. Attend exhibitions and performances (live, or film, or video if live not available locally).
4. Recognize visual and performing art work that attempts to influence and persuade.

EXAMPLES

- Describe how a performance of "The Stars and Stripes Forever" by Sousa makes them feel.
- Identify their favorite advertisement from printed or electronic media and explain why they like it.
- Explain likes and dislikes after viewing a play.
- Create a movement sequence using specific elements from Laban's theories of movement.

ELEMENTARY GRADES 3-4

1. Demonstrate an understanding of how the senses are used in daily life to make choices about purchases.
2. Provide rationale for personal feelings about works in the arts.
3. Listen to and/or view a dramatic, musical, dance, or visual art work and provide feedback to the artist (peer).
4. Explore and analyze content and styles in various art forms.
5. Use knowledge of the elements and principles of each art form to express opinions of the meaning of works.
6. Examine the effect of artistic choices on others and on the environment.
7. Investigate how the elements, principles, and structures of the arts can be manipulated by communication media to persuade and to influence.

EXAMPLES

- Explain why one choice of public sculpture design is more appropriate for a given site than another.
- Recognize how design, spatial relationship, gender, movement, and sound are used by advertisers to sell products.
- Explain why an individual chooses to buy a particular CD.
- Create a movement sequence for three dancers in which they use various arrangements of forms in space.

MIDDLE GRADES 5-8

1. Articulate and justify personal perceptions of meaning in works of visual art, music, dance, and drama.
2. Evaluate written reviews of visual and performing works of art.
3. Demonstrate an understanding of the difference between a personal opinion and an educated judgment about the meaning of various works.
4. Compare and contrast the effectiveness of selected media, techniques, and processes in communicating ideas.
5. Evaluate work, from their own and other cultures and historical periods, that uses arts elements and principles to persuade and influence.
6. Critique their own work and the work of others based upon an aesthetic criterion.

EXAMPLES

- Explain the difference between their views on whether they like or dislike a Sandy Skoglund work, and their views on the work's aesthetic value.
- Discuss characteristics common to political commercials from several campaigns.
- Read and analyze a written review of an exhibit, play, concert, or dance performance.
- Create a commercial using movemer , sound, and visual art.

Visual and Performing Arts

SECONDARY GRADES

1. Explain and justify personal aesthetic criteria for critiquing works of visual and performing art, texts, and events.
2. Research the work of critics, historians, aestheticians, and artists to analyze and interpret works and compare differing critiques of the same visual and performing art works.
3. Analyze, interpret, and evaluate subtle and complex meaning in visual and/or performing arts intended to persuade and influence (as in electronic media, theater, commercial, and political advertising).
4. Create visual and/or performing art work that is used to influence and persuade and explain how the design accomplishes its purpose.

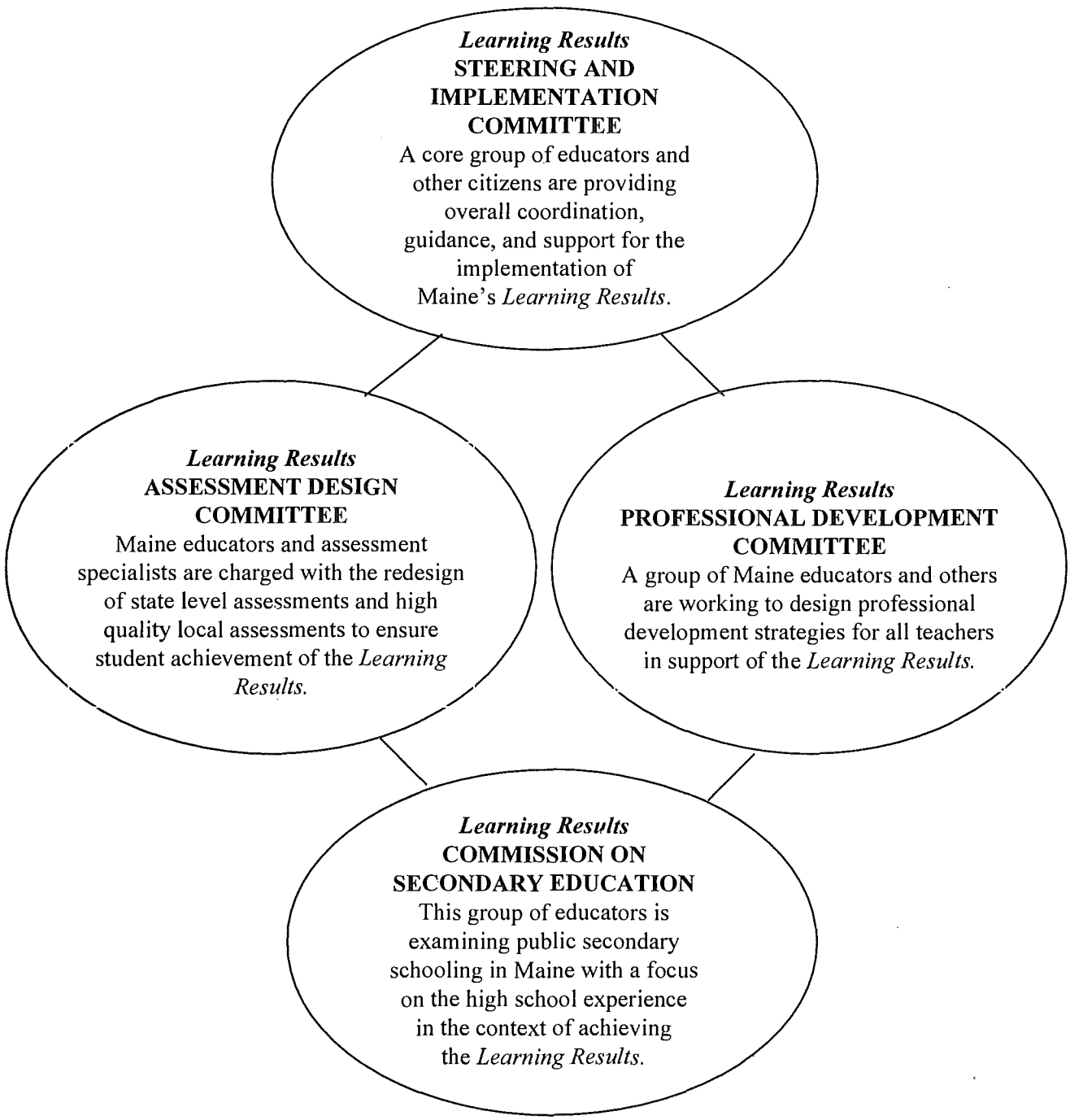
EXAMPLES

- Write a review of an artistic performance and compare it to one written by a professional critic.
- Interpret meanings in works by political artists in several cultures and/or historical periods.
- Research and use the written works of critics and historians to analyze works by a particular composer, artist, choreographer, or playwright.
- Create a public service announcement opposing the use of illegal drugs and explain why you think it is successful or unsuccessful.

APPENDIX

Structural Processes for Shaping and Implementing Education Reform

Implementation of the *Learning Results* will require substantial planning at both the state and local level. Several groups have been established at the state level to assist in this effort. The diagram below describes the three committees and one commission convened by the Commissioner of Education to help guide implementation of the *Learning Results.*



STATE OF MAINE

IN THE YEAR OF OUR LORD
NINETEEN HUNDRED AND NINETY-SIX

S.P. 701 - L.D. 1791

An Act to Initiate Education Reform in Maine

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 20-A MRSA §§6208 and 6209 are enacted to read:

§6208. Legislative intent

The Legislature finds that because all children can learn at significantly higher levels, it is essential that the Legislature, the State Board of Education, the Department of Education, school administrative units, educators and parents provide children with schools that reflect high expectations and create conditions where these expectations can be met. Through a shared sense of accountability and a cooperative spirit among State Government, school administrative units, educators, parents, business persons, and the community, school administrative units and educators can develop and teach to high standards that will enable students to become productive and fulfilled members of society. The Legislature further finds that the system of learning results established in section 6209 will serve as a foundation for education reform, will promote assessment of student learning, will reinforce accountability and will encourage equity. The Legislature, therefore, encourages the State Board of Education, the Department of Education and school administrative units to employ a high degree of creativity in developing content standards and performance indicators and to explore a wide range of programs and options so that the standards adopted will reflect the highest possible expectations

and assessments will be of the highest possible quality. The ultimate goal and intent of the Legislature is to ensure that the State's schools will enable today's students to gain the knowledge and skills necessary to be effective parents, citizens, workers and adults.

§6209. System of learning results established

The department in consultation with the state board shall establish and implement a comprehensive, statewide system of learning results, referred to in this section as the "system," no later than the 2002-03 school year. The system, based broadly upon guiding principles set forth in this section, must establish high academic standards at all grade levels in the areas of math; English; science and technology; social studies, including history, economics and civics; career preparation; visual and performing arts; health and physical education; and foreign languages. Only students in a public school or a private school approved by the State pursuant to section 2902 and approved for the receipt of public funds by private secondary schools pursuant to section 2951 are required to participate in the system of learning results. The commissioner shall develop accommodation provisions for instances where course content conflicts with sincerely held religious beliefs and practices of a student's parent or guardian. The system shall be adopted to accommodate exceptional students as defined in section 7001, subsection 2.

1. Guiding principles. Each student must leave school as:

A. A clear and effective communicator who:

(1) Uses oral, written, visual, artistic and technological modes of expression;

(2) Reads, listens to and interprets messages from multiple sources; and

(3) Uses English and at least one other language;

B. A self-directed and life-long learner who:

(1) Creates career and education plans that reflect personal goals, interests and skills, and available resources;

(2) Demonstrates the capacity to undertake independent study; and

(3) Finds and uses information from libraries, electronic data bases and other resources;

C. A creative and practical problem solver who:

(1) Observes situations objectively to clearly and accurately define problems;

(2) Frames questions and designs data collection and analysis strategies from all disciplines to answer those questions;

(3) Identifies patterns, trends and relationships that apply to solutions to problems; and

(4) Generates a variety of solutions, builds a case for the best response and critically evaluates the effectiveness of this response;

D. A responsible and involved citizen who:

(1) Recognizes the power of personal participation to affect the community and demonstrates participation skills;

(2) Understands the importance of accepting responsibility for personal decisions and actions;

(3) Knows the means of achieving personal and community health and well-being; and

(4) Recognizes and understands the diverse nature of society;

E. A collaborative and quality worker who:

(1) Knows the structure and functions of the labor market;

(2) Assesses individual interests, aptitudes, skills, and values in relation to demands of the workplace; and

(3) Demonstrates reliability, flexibility and concern for quality; and

F. An integrative and informed thinker who:

(1) Applies knowledge and skills in and across English language arts, visual and performing arts, foreign languages, health and physical education, mathematics, science and technology, social studies and career preparation; and

(2) Comprehends relationships among different modes o thought and methods associated with the traditiona disciplines.

2. Content standards. Each student shall study and achiev proficiency in the following content standard subject areas:

A. Career preparation;

B. English language arts;

C. Foreign languages;

D. Health and physical education;

E. Mathematics;

F. Science and technology;

G. Social studies; and

H. Visual and performing arts.

Sec. 2. Development of standards and indicators. The Department of Education and the State Board of Education, and the joint standing committee of the Legislature having jurisdiction over education matters shall jointly develop recommended content standards and student performance indicators for the subject areas described in the Maine Revised Statutes, Title 20-A, section 6209, subsection 2. Following development of those recommendations the content standards and performance indicators must be established subject to rules established jointly by the department and the board in accordance with the Maine Administrative Procedure Act, chapter 375, subchapter II. Proposed rules must be widely circulated to school administrative units and the public during the rule-making process. Rules adopted pursuant to this Act are major substantive rules as defined in Title 5, chapter 375, subchapter II-A, and must be reviewed by the joint standing committee of the Legislature having jurisdiction over education matters and cultural affairs and approved by the Legislature. The rules may not require a school administrative unit to incur additional expenditures unless the State pays for 90% of the costs.

Sec. 3. Schools to adopt system of learning results subject to availability of funds. Following approval of rules establishing content standards and student performance indicators and subject to state funding for professional development assistance, school administrative units shall adopt the system of learning results. A school

administrative unit may delay adoption of the system of learning results in the subject areas of career preparation, foreign languages and visual and performing arts if adoption in those subject areas can not be achieved within existing local resources. The Department of Education shall develop a reporting mechanism that permits a school administrative unit to report such a delay to the department at no cost to the unit.

Sec. 4. Department to review methods and potential costs of implementing learning results. By January 1, 1997, the Department of Education shall review and make recommendations to the joint standing committee of the Legislature having jurisdiction over education matters on methods for implementing learning results in the areas of career preparation, foreign languages and visual and performing arts within existing local resources. If the department finds that additional funds may be required to implement learning results in those subject areas, the department shall review and estimate the potential costs of implementation. The department shall also review and make recommendations on establishing a date by which all school administrative units must implement learning results in all subject areas.

Sec. 5. System must include plan to assist school administrative units. The system of learning results established in the Maine Revised Statutes, Title 20-A, section 6209 must include a plan to assist school administrative units in helping all students achieve the learning results. The Department of Education, in consultation with the State Board of Education and school administrative units, shall develop the plan for assistance. The plan must also include criteria to identify school administrative units experiencing difficulty meeting the learning results and the provision of intensive assistance to these school administrative units. The plan for assistance must be established by July 30, 1997 and implemented during the 1997-98 school year.

Sec. 6. System must include plan for professional development. The system of learning results established in the Maine Revised Statutes, Title 20-A, section 6209 must include a statewide plan for professional development designed to promote the learning results. The professional development plan must be established by the Department of Education in consultation with the State Board of Education, local school administrative units, higher education institutions in this State, regional partnerships and other interested stakeholders. The professional development plan must be completed by June 30, 1996. The plan must be implemented on July 3, 1997 and must include incentive funds awarded by the Department of Education to all school administrative

units participating in the plan. Incentive funds must be awarded at a rate of $8 per pupil or $10 per pupil for school administrative units whose professional development plans are accomplished in collaboration with one or more other school administrative units. School administrative units must submit to the Commissioner of Education a proposal outlining the unit's plan for professional development. Receipt of incentive funds is contingent upon approval of the proposal by the commissioner.

Sec. 7. State commitment to professional development. Continuation of the system of learning results established in the Maine Revised Statutes, Title 20-A, section 6209 is contingent on an annual General Fund appropriation for professional development of not less than $2,000,000. The annual appropriation must be in addition to customary and ongoing appropriations of General Fund dollars for education purposes, including grades kindergarten to 12 and higher education. Failure of the Legislature to annually appropriate a minimum of $2,000,000 for professional development will result in suspension of the system of learning results.

Sec. 8. Establish student assessments. Student achievement of the learning results established in the Maine Revised Statutes, Title 20-A, section 6209 must be measured by a combination of state and local assessments to measure progress and ensure accountability. The 4th-grade, 8th-grade and 11th-grade results of the Maine Education Assessment, the "MEA," are the state assessments used to measure achievement of the learning results. The 4th-grade and 8th-grade MEA must be used to measure achievement of the learning results beginning in the 1998-99 school year. The 11th-grade MEA must be used to measure achievement of the learning results beginning in the 1999-2000 school year. Local school administrative units may develop additional assessments to measure achievement of the learning results, including student portfolios, performances, demonstrations and other records of achievements.

Sec. 9. Recommendation on student achievement. By January 1, 1997, the State Board of Education and the Department of Education shall review and make recommendations to the Legislature on linking achievement of the learning results established in the Maine Revised Statutes, Title 20-A, section 6209 to completion of high school.

Sec. 10. Report. The State Board of Education and the Department of Education shall provide an annual report no later than December 15th to the joint standing committee of the Legislature having jurisdiction over education matters regarding progress toward implementation of the learning results. The annual report may include recommendations for legislation concerning implementation of the learning results.

STATE OF MAINE

IN THE YEAR OF OUR LORD
NINETEEN HUNDRED AND NINETY-SEVEN

H.P. 1093 - L.D. 1536

Resolve, Regarding Legislative Review of Chapter 131: Rules for Learning Results, a Major Substantive Rule of the Department of Education

Sec. 1. Adoption. Resolved: That final adoption of Chapter 131: Rules for Learning Results, a provisionally adopted major substantive rule of the Department of Education, and submitted to the Legislature for review pursuant to the Maine Administrative Procedure Act, is authorized with the following amendment to the rule.

In order to reaffirm the intent of the Legislature expressed in Public Law 1995, chapter 649, in establishing a statewide system of learning results, the department shall include an application section in the rules reading as follows:

"**1. Application of rules to local school administrative units.**

These rules may not require a school administrative unit to take any action that necessitates additional expenditures from local revenues unless the Department of Education pays for 90% of the additional costs. Implementation of these rules is at the discretion of the school administrative unit if additional local expenditures are required for implementation and the department has not paid its share of the additional, required costs.

A school administrative unit that determines that it is unable to implement the learning results in the areas of English language arts, health and physical education, mathematics, science and technology, and social studies within existing state and local resources must present its findings and supporting evidence to the Department of Education. The department shall

review the findings and evidence and, if necessary, assist the unit in planning for implementation.

Pursuant to Public Law 1995, chapter 649, section 3, school administrative units may delay implementation of the system of learning results in the areas of career preparation, foreign languages, and visual and performing arts if adoption in those areas can not be achieved within existing resources."

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Maine Governor Angus S. King, Jr.

Maine Governor John R. McKernan, Jr.

Representative Elizabeth H. Mitchell, Speaker, Maine House of Representatives

Senator Mark W. Lawrence, President, Senate of Maine

117th and 118th Maine Legislatures

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Learning Results Critical Review Committee Content Area Subcommittees

Maine Coalition for Excellence in Education

Maine Leadership Consortium

Maine Parent Teacher Association

Maine Education Association

Maine Superintendents Association

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Foreign Language Association of Maine

Maine Adult Education Association

Maine Alliance for Arts Education

Maine Arts Education Association

Maine Association for Health, Physical Education, Recreation and Dance

Maine Association for Supervision and Curriculum Development

Maine Association of Directors of Services for Children with Exceptionalities

Maine Association of Middle Level Educators

Maine Association of Vocational Education Administrators

Maine Center for Educational Services

Maine Children's Alliance

Maine Children's Cabinet

Maine Congress of Parents and Teachers

Maine Math and Science Alliance

Maine Principals' Association

Maine School Boards Association

Maine School counselors Association

Maine School Health Education Coalition

Maine Teacher of the Year Association

Maine Educators

Maine Chamber and Business Alliance

University of Maine Board of Trustees

Maine Technical College System

Commission on Maine's Common Core of Learning

UNUM

Champion Paper

Geiger Bros.

All those Maine residents who participated in the development of Maine's *Learning Results*

Academic and Personal Skills Across Disciplines

Certain skills and attitudes apply across all areas of study and are not new. They are, however, becoming more essential than ever to the future success of Maine's citizenry. These critical common skills and attitudes should be developed and encouraged in every classroom.

ACADEMIC SKILLS

- Curiosity and the habit of lifelong learning
- Clear oral, written, and graphic communication
- Ability to communicate and understand others in more than one language
- Ability to think creatively
- Ability to think logically and make informed judgments, especially in the use of evidence to support general statements or opinions
- Skill in solving problems: defining a problem, framing useful questions, gathering and selecting information, analyzing data, considering and testing possible solutions, and applying strategies to new situations
- Ability to find, select, evaluate, organize, and use information in various formats from libraries and other repositories
- Skill in evaluating the reliability of information from video, audio, and printed sources, including advertising and the mass media
- Ability to adapt quickly to new situations and react to new information
- Ease and flexibility in making connections and moving among various disciplines of thought
- Understanding that technology is a tool in the hand of the learner

PERSONAL SKILLS

- Ability to accept responsibility for personal decisions and actions
- Ability to state their own needs
- Academic honesty and the ability to face challenges with courage and integrity
- Ability to develop and maintain a healthful lifestyle
- Empathy and courtesy for others and respect for differences among people and cultures
- Self-confidence and a willingness to risk mistakes in order to learn
- Ability to concentrate and persevere on tasks
- Willingness to seek out a fair share of the work load and manage time responsibly
- Skill and a willingness to work cooperatively with others, including ability to listen, share opinions, negotiate, compromise, and help a group reach consensus
- Reverence for all forms of life and a regard for the interdependence of life forms

Maine's Common Core of Learning
1990