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ABSTRACT

The Oregon State System of Higher Education is developing a new approach to admission to any of the state's seven public baccalaureate granting institutions. This approach replaces the grade point average with proficiencies, clearly specified statements of the knowledge and skills students must master. The new system is known as the Proficiency-based Admission Standards System (PASS). This document contains the current version of the proficiencies and more detailed descriptions of each proficiency, called indicators. These proficiencies are to be presented to the State Board of Higher Education in July 1996 and will then remain in the form approved at that time for 2 years for review and public response. There are 6 content and 9 process proficiency areas, with 44 proficiencies in the 6 content areas. Performance levels are being developed and piloted by teachers at 30 partnership high schools. Proficiency will be assessed through criterion-referenced tests, common assessment tasks, and teacher verifications of student proficiency. The content proficiencies are listed for mathematics, science, social science, second languages, humanities and literature, and visual and performing arts. Process proficiencies are defined for: (1) reading; (2) writing; (3) listening and speaking skills; (4) analytic thinking; (5) integrative thinking; (6) problem solving; (7) technology as a learning tool; (8) teamwork; and (9) quality work. (SLD)

PASS Project

Proficiency-based Admission Standards System Project

Admission Standards: Content & Process Areas Proficiencies & Indicators

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Introduction & Background

The Oregon State System of Higher Education (OSSHE) has adopted new admission requirements for students admitted beginning fall term, 2001. Students will be required to demonstrate their knowledge and skills in six content areas. This new system of admission is known as the Proficiency-based Admission Standards System (PASS).

These changes are being made for several reasons. First, school reform legislation passed in 1991 and amended in 1995 will require students to demonstrate mastery of "rigorous academic content standards" in order to receive Certificates of Initial and Advanced Mastery. As the high school program and curriculum changes to offer these certificates, higher education must adapt its admission procedures to accept students who have attained performance-based certificates. Second, too many students who are admitted to college under the current system either fail to proceed in a timely fashion to obtain their bachelor's degree, or require remedial coursework along the way. A proficiency-based system clearly identifies the knowledge and skills needed to succeed in college. This helps reduce remedial education needs and increase completion rates. And, third, higher education in Oregon is changing as well. Budget cuts over the past five years have caused public colleges and universities to become more efficient and innovative. Students in the future can expect to work much more independently to demonstrate their mastery of college-level material. Performance-based admission criteria will help students be prepared for a college environment in which they will be expected to meet standards to move through their program of study successfully and in a timely fashion.

PASS grew out of a meeting of the Joint Boards of Education in July, 1993. The State Board of Higher Education agreed to provide the State Board of Education, which governs public schools and community colleges, with a list of the "knowledge and skills" students needed to be admitted to college. OSSHE's consultant on school reform, Dr. David Conley, associate professor of educational policy at the University of Oregon, was commissioned to develop such a list. With participation by higher education, community college, and high school faculty, the list was created, presented to the State Board of Higher Education, and adopted on January 28, 1994. PASS staff gathered input and reactions to the proficiencies from February through April, 1994 and the board approved the revised proficiencies at its May 27, 1994 meeting. During the 1995-96 academic year, more detailed descriptions of each proficiency were developed and initial work on the assessment system began in conjunction with 30 partnership sites consisting of a high school, community college, and OSSHE college or university.

This document contains the current version of the proficiencies and more detailed descriptions of each proficiency, called indicators. The proficiencies in this document are to be presented to the State Board of Higher Education in July, 1996. They will then remain in the form approved at that time for a period of two years. During that time, comments and suggestions will continue to be taken, and revisions will be considered for future adoption. Thank you for your interest in the PASS Proficiencies. I encourage you to contact our offices at the address and phone number listed on the cover if you have any questions or comments.

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Contents

Definition of Terms

EXTENDED DEFINITIONS describe the characteristics of each field of study students must master. These definitions help teachers and students understand the overall goals they should be pursuing in each proficiency area.

PROFICIENCIES identify the specific knowledge and skills students must master in each content area. Students are expected to meet specified performance levels for each proficiency via designated assessments.

INDICATORS provide more detail for the proficiencies. They indicate the knowledge and skill that make up each proficiency. Students are not assessed on each indicator, but are expected to be skillful on each.

Before reviewing this document, please read this:

1. There are SIX CONTENT and NINE PROCESS PROFICIENCY AREAS. There are 44 PROFICIENCIES in the six content areas. Students will be required to meet a designated level of performance for each of these proficiencies. The process proficiencies will be assessed in the context of the six content areas.
2. The PERFORMANCE LEVELS are being developed and piloted by teachers at 30 partnership high schools throughout the state in collaboration with college, university and community college faculty. These levels will be primarily derived by reviewing student work on each content proficiency.
3. Performance will be at a level required for general admission, not for a major. Students may demonstrate higher levels of performance.
4. The PROFICIENCY INDICATORS identify the domain of knowledge which students will be expected to have mastered when they enter college. Students will not be assessed on each indicator but will be assumed to have knowledge and skill in each adequate to do college-level work.
5. PROFICIENCY WILL BE ASSESSED IN THREE BASIC WAYS:
   a. *Criterion-Referenced Tests*, such as state-level tests for the CIM and CAM and other acceptable criterion-referenced tests including Advanced Placement, ACT subject tests, and International Baccalaureate exams.
   b. *Common Assessment Tasks*, such as a research paper, science project, speech, second language proficiency demonstration, or capstone project. These will be defined statewide and will be scored against the same criteria statewide.
   c. *Teacher Verifications of Student Proficiency*, where the teacher uses common scoring criteria to assign a proficiency score to a student, then documents the means by which the score was assigned. The teacher, in essence, verifies the student proficiency. Schools will be provided examples of work at acceptable levels on each proficiency. Teachers will be encouraged to exchange examples of student work and to compare scoring with one another and with the examples provided. Not all proficiencies are meant to be taught or assessed within the content area where they are listed. Some will be assessed more than

once. Some may be assessed in an interdisciplinary context.

6. ALL PROFICIENCIES WILL BE SCORED on a scale from 1-5. As currently proposed, a score of 3 will be required on each proficiency. OSSHE institutions do not intend to be more selective than they are presently. However, a 3 will be designed to reflect a higher level of knowledge and skill than currently exhibited by college-bound students, but will be within their grasp. Students may find they must apply themselves more diligently to meet these standards, but they can do so as performance levels become clear.
7. THE PROFICIENCIES WERE INITIALLY DEVELOPED from an analysis of 60 curriculum and standards documents. They were then reviewed and modified by teams of Oregon educators. Over the last three years, approximately 500 high school teachers, community college and college/university faculty have participated in the development of the proficiencies and indicators. The PASS Project facilitated this process and assumes responsibility for the proficiencies and indicators as written.

Content Proficienies — Extended Definitions

Mathematics

is a form of communication that complements natural language as a tool for describing, defining, expressing, and answering questions about the natural world. Mathematics is a compact, carefully defined, symbolic language that facilitates modeling, solving, and communicating problems from a wide variety of disciplines, not only science and technology. Much of its utility derives from the power of abstraction, the ability to generalize and then apply constructs to particular problems. Mathematics is the science of logical reasoning and of pattern identification. It is a mode of inquiry that provides fundamental insights into the order of our world. Learning mathematics is a dynamic endeavor to acquire skills, processes, and concepts. Numeric, algebraic, and geometric concepts are fundamental vehicles for developing competence in mathematics. The processes of problem clarification, deduction of consequences, formulation of alternatives, and development of appropriate tools are as much a part of the modern mathematician's craft as solving equations.

Science

is the rational and systematic observation, identification, description, experimental investigation, and theoretical explanation of natural phenomena. Natural and physical sciences include physics, chemistry, biology, geology, astronomy, and ecology. Science attempts to answer questions about the physical and living world. It involves critical thinking and logical reasoning. Science uses various methods of investigation, such as observation, comparison, experimentation, and mathematical manipulation of data. Science has practical application and has to be understood in its larger cultural context. It is through inquiry that students are able to view science as an interdisciplinary study applicable to society.

Social Science

focuses on a wide diversity of social relationships, group arrangements, and human understandings that characterize human affairs over time and throughout the world. They include the study of social, economic, political, and cultural events as well as appropriate content from the humanities, fine arts, mathematics, and sciences. They offer concepts and methods for studying social events and processes at global, national, regional, local,

and individual levels. The scope of the social sciences ranges from examining the mental processes of the human mind to the distribution of human beings on this planet, from understanding the functioning of human society to the causes and effects of technologies, from problem solving in small groups to the use of power internationally. Understanding the social sciences includes knowledge of theories regarding societal and group functioning, appreciation of the uses of empirical data and map analysis, awareness of how the careful study of contextual events explains the important influences that shape human life, and how this information can be used to address current issues.

Second Languages

include speaking, listening, reading, and writing in another language other than one's native language. Communication competence is attained through mastery of linguistic functions, grammatical structures, and lexical items. An awareness of different formal and informal registers, proper pronunciation, structural precision, and socio-linguistic appropriateness is gained with practice. Cultural knowledge is an integral part of all second language study. Such knowledge allows linguistic and paralinguistic behaviors to be recognized and executed, enhances understanding of societal norms and institutions, and deepens appreciation of the culture's artistic and intellectual achievements. Second language learning is a long-term and cumulative process providing a springboard for critical and analytic thinking, insight into and understanding of human diversity, and understanding of subject matter across disciplines.

Humanities/Literature

explores the human experience through historical, linguistic, cultural, philosophical, and literary lenses. Students, teachers, scholars, and authors study what it means to be human by engaging in ongoing dialogue, inquiry, reading, and reflection. Thus, it is not possible to "master" humanities, only to enhance levels of thought regarding the human condition. What may be learned are habits of the mind that will enable learners to acquire, create, and critique knowledge throughout their lives.

Visual & Performing Arts

are the cultural repositories of the qualitative dimension of life through the ages. They are also the contemporaneous expressions of the human condition. The fine arts serve both to improve the quality of life and to stimulate the senses in ways that enhance creativity and problem-solving in a variety of disciplines beyond the arts. Study in music, theater, dance, and visual arts involves history and appreciation, analysis and aesthetics, interpretation and criticism, and performance and production. These content areas are concerned with the capacity for individuals and society to communicate and to receive ideas, information, and feelings in a variety of media. The visual and performing arts prepare one to work both independently and cooperatively and develop one's ability to make independent critical judgments.

Reading

is the process of decoding abstract symbols in order to understand their underlying message or meanings. Effective readers employ a variety of strategies to improve comprehension, to self-correct, and to discover meaning in many types of text. A fluent reader can interpret a writer's literal and inferential meaning, recognize the differing goals of different types of writing use all of the features of a written document (e.g., tables, index, appendices, footnotes), vary the method of reading (skim, review, survey, analyze), and make connections between texts and personal experiences. Reading is undertaken for a variety of reasons, including enjoyment, information acquisition, comprehension, and critical analysis.

Writing

is a tool for learning, for communication, and for self-reflection. Writing may serve to inform, stimulate, and challenge a variety of audiences. The writer organizes and clarifies her or his thinking so that it is comprehensible, informative, moving or entertaining to others when read. Conventions of writing, including grammar, syntax, spelling, structure, and voice, must be understood and mastered. The writing process contains a number of recursive dimensions, including prewriting, drafting, organizing, revising, editing, and critiquing. Effective writers employ a variety of written forms (e.g., stories, essays, journals, technical reports, poetry, research papers), and can evaluate, monitor, and critique their own writing to produce a coherent and polished result.

Listening and Speaking Skills

are critical for competent oral expression. Such skills include the ability to ask clarifying and extending questions, express generalizations discovered through investigations and debate, persuade, initiate and sustain conversations. Other important skills include presenting feelings and emotions, sharing and exchanging ideas and opinions, giving directions, and critiquing oral presentations. Communication also involves understanding and appropriate use of verbal and non-verbal behaviors.

Analytic Thinking

is the ability to apply deductive and inductive thinking, make and test conjectures, follow logical arguments, judge the validity of arguments, construct simple valid proofs, understand and apply reasoning processes, develop appropriate criteria for analyzing data or opinions, distinguish fact from belief, identify cause and effect, and respond to multiple perspectives. Analytic thinking is necessary in all areas of study from the fine arts to mathematics.

Integrative Thinking

requires an understanding of the interactions within, between, and among natural, social, organizational, and technological systems, and the relationship of the individual to such interactions. Integrative thinking uses or combines information from a variety of disciplines in an integrated fashion to demonstrate understanding of the world, and to solve problems or create products. Integrative thinking requires the ability to synthesize and integrate information and observations from the parts to form a new pattern or framework for comprehending the whole.

Problem Solving

a series of skills, some systematic, some intuitive, that are developed over time as the result of attempting many complex, non-standardized problems. Problem solving may be inductive, deductive, or non-linear. Effective problem solvers employ many of the following techniques: identifying the critical elements of the problem; developing multi-step solutions in a non-routine fashion; generalizing familiar solutions and strategies to new problems and situations; generating alternative solutions and strategies for familiar problems and situations; conducting systematic observations and investigations to collect data; and considering the implications and unintended effects of proposed solutions.

Technology as a Learning Tool

means coming to view any technology as an extension and enhancement of the human mind, not as a separate mechanical system. While the use of technology requires "content" knowledge, a vital key is the "process" ability to integrate the technology to facilitate inquiry, understanding, and production of knowledge. Using technology includes such skills as knowing how to operate and when to employ computers, online databases, telephones, fax machines, electronic mail and bulletin boards, and calculators; audio-visual and multimedia tools, including video cameras and recorders, projection systems, LCD panels, CD-ROMs, sound recording devices, and slide projectors. There is a hardware and software dimension to many technologies. Competent learners master both, with greater emphasis on the potentialities of the software dimension.

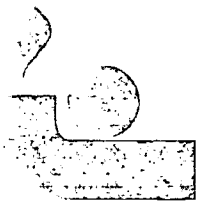
Teamwork

encompasses the social dimensions of learning and doing. A learner who is proficient at learning socially works well with others to create products, solve problems, reach consensus, negotiate, and cope with conflict. Effective team members:

a) understand the diversity present in any group and how it affects performance and goal attainment;
b) demonstrate an understanding of the various roles present in groups;
c) show the capacity to lead and follow, depending on the situation;
d) understand the balance between individual and group contributions and responsibilities;
e) understand both individual and group accountability; and
f) show awareness of the role and potential uses of humor when people work together.

Quality Work

is the relative degree of excellence present in a student's work as compared to defined standards or criteria. Quality work may be evaluated along any of a number of dimensions, including its content, structure, presentation, insights, conclusions, or entertainment value. Quality work demands students capable of comparing their work continuously to internal and external standards. Schools striving for quality create an ethos in which the nature of quality is discussed and standards for achieving quality are identified. Quality work involves ongoing critique and evaluation of products as they evolve. Students with an understanding of quality can describe the nature of quality and of standards and can critique and evaluate the quality of product as they are being developed and when they are completed.



A: Use computation, estimation, and mathematical properties to solve problems; use estimation to check the reasonableness of results, especially those obtained by technology.

1. Communicate an estimation process and a range of reasonable/unreasonable results prior to performing a computation.
2. Check the reasonableness of computed results. Identify the source of any discrepancy between an estimate and a calculated answer.
3. Select and apply an appropriate computational method (e.g., mental, paper and pencil, calculator, computer).
4. Use technology to perform calculations and judge the reasonableness of results.

B: Use algebraic operations and mathematical expressions to solve equations and inequalities including, but not limited to, exponentials and logarithms.

1. Describe characteristics of functions and interpret their graphs as they relate to solving equations and inequalities.
2. Solve linear, quadratic, higher degree, exponential, and logarithmic equations and inequalities, using graphical, algebraic, or numerical methods.
3. Use arrays of numbers (e.g., matrices) to organize information and solve problems.
4. Perform mathematical operations on expressions, matrices, tables, and systems of equations to solve problems.

C: Use patterns and functions to represent relationships between variables and to solve problems; interpret and understand the connections among symbolic, graphic, and tabular representations of functions. (Note: Classes of functions should include, in varying degrees, linear, quadratic, general polynomial, exponential, logarithmic, and trigonometric functions.)

1. Understand functions as relationships between inputs and outputs (in which one quantity determines another), between variables, constants, and unknowns.
2. Evaluate functions including, but not limited to, linear, quadratic, polynomial, exponential, logarithmic, trigonometric, and rational functions.
3. Interpret functions in the context in which they arise.
4. Interpret slope as a rate of change.
5. Identify limitations, if any, on the domain of functions.
6. Understand the composition, addition, and multiplication of functions.
7. Recognize classes of functions based on their graphs.
8. Represent, translate, and analyze functional relationships using tables, verbal descriptions, equations, and graphs.
9. Make explicit the implicit references to functions in phenomena such as the Richter scale, inflation, etc.
10. Model situations and solve problems using a variety of functions.

D: Represent problem situations with two- and three-dimensional geometric models; apply properties of figures, analytic geometry and trigonometry to solve problems.

1. Use coordinate systems to derive equations for lines, circles, and parabolas.
2. Apply reflections, translations, and rotations to a given plane figure and recognize when congruent figures are related by one such transformation.
3. Recognize and use relationships between figures involving congruence, similarity, and symmetry.
4. Use proportions as they apply to similar figures.
5. Determine and compute:
    a. the perimeter and area of basic plane figures (e.g., circles, triangles, and quadrilaterals),
    b. the volume and surface area of basic solids (e.g., spheres, cones, cylinders, and prisms),
    c. angle measures and trigonometric relationships.
6. Develop geometric models, draw diagrams, use coordinate systems, vectors and geometric procedures as part of solving a problem.
7. Recognize trigonometric relationships and use trigonometric functions as part of solving a problem.

E: Use probability and statistics in the study of various disciplines, situations, and problems; understand and apply valid statistical methods and measures of central tendency, variability, and correlation in the collection, organization, analysis and interpretation of data.

1. Extract and interpret descriptive statistics from data.
2. Prepare graphs and charts such as histograms, scattergrams, and box plots.
3. Analyze and interpret statistical graphs and charts.
4. Compare sets of data in terms of variability, measures of central tendency (e.g., mean, median, mode, standard deviation) and correlation.
5. Determine experimental and theoretical probabilities, compare probabilities, and use either, as appropriate, to represent and solve problems involving uncertainty.
6. Understand and apply the concept of a random variable to generate and interpret probability distributions.
7. Recognize and utilize valid sampling techniques in drawing inferences.
8. Use probability and statistics to examine the validity of a claim, test a hypothesis, study a problem, or make defensible predictions based on data.

F: Apply integrated mathematical problem-solving strategies to problems from within and outside mathematics; devise, implement, and evaluate processes and solutions; select and use appropriate models, operations, and technologies for problem solving.	1. Use various problem-solving strategies to investigate, interpret, clarify and represent a given problem situation; determine, select or locate information necessary to solve the problem. 2. Consider and apply several mathematical problem-solving strategies during the stages of solving a problem, including but not limited to: modeling (tables, graphs, finding and expressing patterns); guess and check; expressing relationships as equations/inequalities. 3. Model real-world situations and data using functions, graphs, tables, charts, and diagrams. 4. Choose and apply appropriate mathematical operations, formulas, or algorithms. 5. Use scientific calculators, graphing calculators, and/or computers to: guess and check; obtain more precision than by hand; investigate large data sets; and facilitate the exploration of graphical data. 6. Evaluate solutions and problem-solving processes for reasonableness, appropriateness, accuracy, alternative possibilities, and applications to other problem situations.
G: Express mathematical ideas orally and in writing using appropriate mathematical terminology and symbols; read, understand, interpret, and evaluate mathematical expressions of ideas and written presentations of mathematics.	1. Translate mathematics expressed in words into mathematical symbols; use words to express and explain mathematical symbols and relationships. 2. Redefine, explain, and paraphrase mathematical problems and concepts. 3. Formulate and express mathematical definitions and generalizations. 4. Discuss the mathematical solution to a problem including the process used to solve the problem, the appropriateness of the model, and the method of solution. 5. Understand written mathematics by asking clarifying and extending questions related to what has been read.
H: Formulate and test mathematical conjectures (e.g., make generalizations from observations); draw logical conclusions from given/known information; follow and judge the validity of mathematical arguments and proofs.	1. Make conjectures based upon investigation or observation. 2. Examine conjectures and find examples which support or are counter to the conjecture. 3. Prepare an argument in oral, written or symbolic form explaining the derivation of an algebraic or geometric fact. 4. Use models (e.g., geometric, algebraic, computer-generated, statistical), known facts, properties, and relationships to explain and validate mathematical reasoning across disciplines.

I: Recognize and use mathematical connections, including applications of mathematics to other disciplines.	1. Represent relationships from other disciplines in appropriate functional notation and interpret the functions in terms of the context situations. 2. Recognize and generate equivalent graphic, numerical, and symbolic representations of a given set of data. 3. Recognize and utilize connections among mathematical topics and procedures. 4. Apply appropriate mathematical concepts, operations, and strategies when learning, studying, or investigating topics in other disciplines. 5. Incorporate connections between mathematics and other disciplines into a written or oral project. 6. Work individually and/or in teams to apply mathematical techniques to situations outside a strictly mathematical context.
J: Understand the conceptual foundations of calculus and its relationship to other areas of mathematics and to other disciplines.	1. Show awareness of calculus as a branch of mathematics which deals with the general problems of: estimation by successive approximations; determining maxima, minima, and other sophisticated details of functions; and instantaneous rates of change. 2. Understand that calculus is a branch of mathematics used extensively in science and engineering.

** Note: The fundamental and unifying concepts of the sciences listed in Proficiencies A-D are organized under separate domains for purposes of clarity; however, university and secondary contributors to the development of PASS Proficiencies in Science endorse an integrated understanding and study of science consistent with the ways in which science is experienced and practiced.*

***A: Understand and apply the unifying concepts and investigative processes of the sciences.**

1. Understand and connect the sciences through unifying concepts, including, but not limited to:
   a. systems (e.g., ecological, physical, and thermodynamic).
   b. constancy, change, and equilibrium.
   c. conservation of energy and matter.
   d. homeostasis.
   e. complementary nature of structure and function.
   f. physical and life cycles (e.g., static and dynamic, such as chemical, thermal, population, and physical).
   g. model.
2. Understand and effectively use investigative processes across varied scientific contexts, including, but not limited to:
   a. observation.
   b. hypothesizing.
   c. classification.
   d. comparison.
   e. measurement.
   f. secondary research.
   g. controlled experimentation.

***B: Understand and apply fundamental principles, laws, and concepts of the physical sciences.**

1. Demonstrate conceptual understanding of physical science principles and their application across varied scientific contexts, including, but not limited to:
   a. atomic structures (e.g., fundamental particles, periodic table, and bonding),
   b. chemical and physical properties of matter (e.g., acids and bases, states of matter, thermal and electrical properties of matter).
   c. forms of energy (e.g., potential, kinetic, etc.); transformation of energy.
   d. chemical reactions (e.g., equilibrium and kinetics).
   e. forces, motions and momentum (e.g., Newton's laws, rate, and acceleration).
   f. interactions of energy and matter (e.g., waves, electron flow).

*C: Understand and apply fundamental principles and concepts of the life sciences.

1. Demonstrate conceptual understanding of life science principles and their application across varied scientific contexts, including, but not limited to:
   a. molecular and cellular processes of organisms,
   b. organization of living systems,
   c. behavior and interdependence among organisms; interactions of organisms with the environment (e.g., competition, ecological niche, symbiosis),
   d. evolution, inheritance, biodiversity.

*D: Understand and apply fundamental principles, laws, and concepts of earth and space sciences.

1. Demonstrate conceptual understanding of earth and space science principles and their application across varied scientific contexts, including, but not limited to:
   a. energy in the earth system,
   b. geochemical cycles,
   c. physical structure and properties of earth and the solar system.
   d. processes of change (e.g., geological, hydrological, atmospheric, astronomic),

E: Design experiments using principles of scientific inquiry. Collect and analyze data, communicate results, and critique experimental designs.

1. Design and conduct scientific investigations and experiments that:
   a. frame an area for inquiry and pose research questions or hypotheses based on observations of nature and existing data;
   b. investigate the questions or hypotheses through experimental design and data gathering strategies;
   c. utilize scientific knowledge, effective methodology, proper equipment, and safe practices in the implementation of the experimental design;
   d. demonstrate how the data are linked to the questions or hypotheses using graphs and/or mathematical analyses.
2. Recognize relationships (e.g., qualitative and quantitative) and interdependence among observations and data collected during an experiment.
3. Describe flaws or limitations in the question or hypothesis, the experimental design, and the method of analysis, regardless of the results.
4. Write or present results orally in a way that demonstrates the linkages among the questions or hypotheses, the method, the data, and the conclusions.
5. Formulate or revise scientific explanations and models, or defend scientific arguments using logic and evidence from scientific inquiry, investigations, and experiments.
6. Conduct investigations and experiments for a variety of reasons: exploration, discovery, confirmation of prior investigations, prediction of current theories, comparison of models and theories, determination of causal-functional relationships, etc.

F: Use technology for scientific research, including the use of computers for information searches, data collection, data analysis, and graphic display. Recognize the relationships between science and technology.

1. Use scientific instruments and technology with precision, and accuracy.
2. Collect data using a computer (within an experiment or by accessing an existing database).
3. Make appropriate choices regarding data to be analyzed and displayed, types of analyses and displays, organization of displays, scale, etc.
4. Check and verify computer-generated analyses and displays.
5. Explain the limitations of technologies used in the collection and analysis of data.

G: Recognize and state scientific problems and arguments, using reasoning, mathematics, writing, and speaking appropriate to the sciences.

1. Use technical writing, mathematics and graphical methods to represent and clarify scientific topics, relationships, processes, and problems.
2. Recognize a scientific problem by:
   a. differentiating between scientific and non-scientific problems,
   b. using graphical and/or mathematical methods to recognize relationships between physical quantities.
3. State a scientific problem using technical writing/speaking to make the scientific problem clear to a specified audience while remaining faithful to the scientific meaning.
4. Evaluate and defend scientific arguments, using data, scientific knowledge, reasoning, logic, and clear writing or speaking.

H: Read and critically evaluate the accuracy of scientific information and claims presented in the media. Analyze the implications of the information and claims presented for the individual and society.

1. Summarize science-oriented articles or presentations in the media, identifying the purpose, the audience, the main points, and the importance or significance.
2. Identify and evaluate claims made in scientific articles or media presentations.
3. Identify flawed reasoning, recognize bias, and point out unsubstantiated arguments.
4. Recognize the differences among observations, inferences, evidence, and opinions.
5. Analyze the implications of scientific information and claims presented in the media for individuals, public opinion, public policy, and society.
6. Apply the basic laws, principles, and conventions of science appropriately in the analysis of contemporary issues.

I: Understand the context in which scientific theories or concepts develop and the implications of scientific research for society.

1. Examine a major scientific theory, its concepts, its major contributors or proponents, and its critics.
2. Explain the historical, social, and scientific context in which the theory was developed.
3. Explain the ramifications of the theory to science and to other disciplines.
4. Identify and discuss the scientific, social, moral, ethical, and philosophical implications of current scientific issues and research.
5. Analyze and defend opposing views of a scientific issue or theory.

A: Know and use geographic information, concepts, and skills to understand and analyze historical, social, economic, political, cultural, and environmental issues.

1. Create, interpret, and use maps and other geographic representations and data sources to acquire, understand, represent and synthesize information and to convey spatial relationships.
2. Locate, map, and describe major physical and human geographic phenomena, including but not limited to major world and national entities, features, places, and phenomena.
3. Explain the relationships between global and regional geographic phenomena, the relationships between the physical and human characteristics of places, and the influences of geographic features on the physical and cultural development of cities, nations, and regions.
4. Explain the characteristics, distribution, and migration of human populations in terms of physical, cultural, and economic factors and conflicts.
5. Analyze the dynamic relationships between human and physical systems of the Earth, between human actions and the environment.
6. Apply geographic concepts (spatial organization, location, places and regions, physical and human systems, interaction between humans and environment) to analyze, explain, and respond to regional and world issues, considering historical, social, economic, political, cultural, and environmental causes and effects.

B: Exhibit knowledge of the chronological flow of human history; identify major themes of historical change in prehistoric through contemporary periods. Employ historical thinking and inquiry to understand events, issues, developments, relationships and perspectives of history, and to interpret current trends/issues.

1. Order a series of significant events in human history (e.g., major discoveries, events/causes constituting major economic depressions, changes in forms of transportation, agrarian/industrial economies, immigration/migration).
2. Analyze causal relationships in history and apply more than one perspective to show how these causal relationships might have different interpretations.
3. Identify, analyze, develop and defend particular thematic interpretations of historical change.
4. Utilize historical inquiry (research of primary and secondary sources), chronological thinking, historical comprehension, analysis and interpretation to understand and describe events, issues, developments, relationships and perspectives in world, national, local, and cultural histories.

C: Understand significant historical eras, concepts, people, events, and relationships in U.S. history. Employ historical thinking and inquiry to understand events, issues, developments, relationships and perspectives of history, and to interpret current trends/issues.

1. Exhibit knowledge and understanding of significant eras in American history, from pre-colonial beginnings to the contemporary United States.
2. Identify, describe, and analyze connections among significant historical periods and patterns of change, conflict, and complexity throughout U.S. history.
3. Apply key concepts such as time, chronology, causality, change, conflict, and complexity to explain and analyze patterns of historical change and continuity in American history.
4. Describe and assess ways that physical geography and human factors have influenced events in U.S. history.
5. Identify and describe the influences of various historical and contemporary cultures on individuals and society in the United States.
6. Analyze group and institutional influences on people, events, and elements of culture in both historical and contemporary settings in the U.S.
7. Describe correlations between technology and U.S. status as a world power.

D: Understand the principles, purposes, structures, and functions of government in the United States: its philosophical basis and historical evolution; the structure of power, authority, and governance; the relationship of the states to the federal government; the Constitution and Bill of Rights; the dynamics of conflicting rights and interests in the American political system; the role and responsibilities of citizenship; and patterns of democratic participation in American politics. Compare other forms of government and political systems to those found in the United States.

1. Identify and assess the influence of important sources of ideas incorporated into the Declaration of Independence, the U.S. Constitution, and the Bill of Rights; understand the relationship of these documents and their principles to government and political processes in the United States.
2. Analyze and explain the ideas and mechanisms that have developed throughout U.S. history to meet the needs of citizens, regulate territory, manage conflict, establish order, and balance competing conceptions of a just society.
3. Analyze historical and contemporary illustrations of the following basic principles of U.S. government: checks and balances, pluralism, federalism, representative versus direct democracy, individual rights and responsibilities, limited government, and the role of the courts.
4. Explain the rights, responsibilities, and methods of citizen participation in the U.S. democratic process (e.g., initiative and referendum, voting, political parties); analyze why citizens may or may not participate in the ways listed and the implications of low participation rates.
5. Describe sources of political power and their influences on U.S. governance.
6. Compare and discuss the relationships between other forms of government and political systems and those found in the United States.

E: Analyze the structure and functioning of various economic systems, their relationship to national and international political, social and geographic systems, and the conditions that influence the development of such systems.

1. Define, explain, and analyze economic systems in terms of scarcity and allocation of resources; production, distribution, and consumption of goods and services; supply and demand; competition; cost; land; labor; capital; and other economic concepts.
2. Compare major economic systems in terms of economic concepts, roles, and decisions; distinguish between domestic and global economic systems, and explain interactions between them.
3. Utilize relationships among various economic, political, social and geographic systems by, for example:
    a. comparing how values and beliefs (e.g., concepts of individualism vs. collectivism) influence economic decisions in different societies,
    b. applying economic concepts and reasoning when evaluating historical and contemporary social developments and issues,
    c. explaining how the scarcity of resources (i.e., human, capital, technological, and natural) requires political and economic decisions about how goods and services are produced and distributed,
    d. describing relationships among the various economic institutions that comprise economic systems (e.g., households, markets, business firms, banks, government agencies, labor unions, savings and investments, capital),
    e. applying knowledge of economic concepts in the analysis of a public issue and the creation of an economic plan for accomplishing a socially desirable outcome related to that issue.

F: Understand aspects of individual, group, and communal human behavior and the effects of culture and ethnic diversity within and among societies.

1. Identify, compare, and contrast various social science perspectives which explain human behavior (e.g., psychological, sociological, and anthropological).
2. Explain the concepts of "culture" and give examples of how culture and personality interact in shaping people and groups/society.
3. Describe the ways family, religion, gender, ethnicity, nationality, socioeconomic status, and other group and cultural influences contribute to the development of a sense of self.
4. Compare and evaluate the impact of stereotyping, conformity, acts of altruism, and other behaviors on individuals and groups.
5. Apply concepts such as role, status, and social class in describing the connections and interactions of individuals, groups, and institutions in society.
6. Describe and examine belief systems basic to specific traditions and laws in contemporary and historical societies/cultures.
7. Apply scientific principles of evidence to present a convincing argument explaining at least one aspect of human behavior.

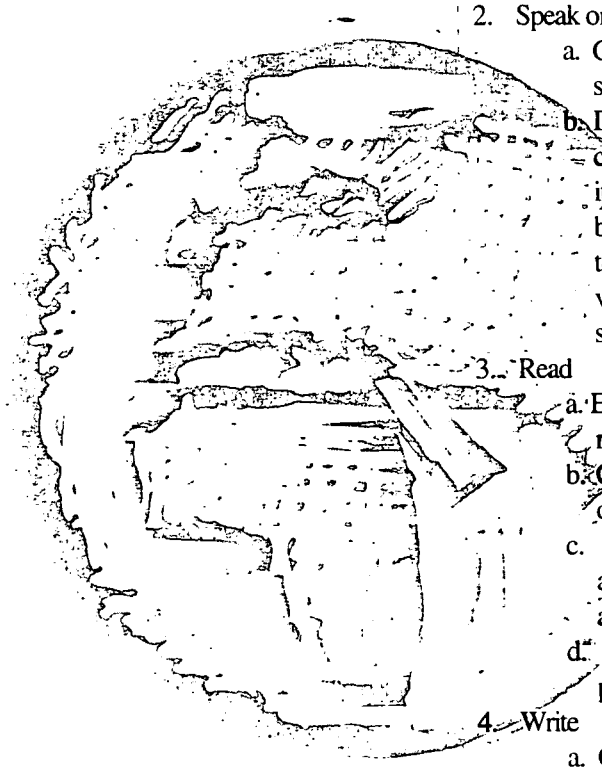
G: Analyze, explain, and pose responses to complex social issues, phenomena, and events at local, regional, national, and international levels. Use the varied perspectives of the social sciences, a balanced variety of data sources, communication skills, and technology in social science analysis.

1. Recognize and evaluate the various social science perspectives expressed in written, oral, and visual materials.
2. Research, analyze, and propose responses to a complex social issue:
    a. provide social, political, economic, scientific, and/or historical perspectives on the issue;
    b. locate, select, and use appropriate information to illustrate the issue or problem, possible solutions, and the potential effects of implementing those solutions;
    c. pose possible responses or solutions to the issue;
    d. communicate understanding of the issue and responses to it using a variety of representational modes.
3. Analyze a past or present event of global proportion and identify its social, political, cultural, and economic effects on the local, national, and international levels.
4. Describe and analyze a complex problem or a pervasive phenomenon (e.g., poverty, world war) from more than one social science perspective (e.g., historical, geographical, anthropological, economic, political, sociological, psychological) and identify its effects on the local, national, and international levels.
5. Identify and discuss literary and artistic responses to a complex societal issue.
6. Discuss the possible impacts of individual or group actions on public policy; explain the ethical implications of those actions.
7. Respond personally to societal issues by participating in and evaluating community service activities.
8. Research and present information on social science issues and events using effective communication skills and technology.

H: Use processes of social science inquiry and statistical methods to research, examine, analyze, and discuss social science topics and issues. Use varied data gathering techniques, including data base searches, review of primary source documents, observations, interviews, surveys, and analysis of quantitative and qualitative data.

1. Accurately interpret tables and graphs presenting complex empirical data that reflect a variety of social science perspectives; explain conclusions drawn from the data.
2. Read and interpret maps portraying data that reflect a variety of social science perspectives; explain conclusions made from the spatial data.
3. Locate and use criteria to determine whether information is factual or opinion; classify information according to those criteria.
4. Distinguish between factual information and expressions of opinion in primary sources and interviews.
5. Plan and conduct effective data searches and interviews.
6. Construct and administer a survey; collect and analyze statistical information to show trends and relationships.
7. Represent social science data in various graphical forms (i.e., maps, charts, tables, figures) to illuminate various social phenomena.
8. Examine a data sample and understand how data were derived.
9. Demonstrate and analyze critically how data and statistics can be used selectively to support predetermined views and sway opinions on contemporary social, economic, political, and cultural issues.
10. Recognize the distinctions between facts, supported inferences, and opinions in one's own discussions and writing about social science issues and events.

A: Communicate and interact in a second language.



1. Listen
   a. Extract basic key information from authentic sources such as paragraph-length explanations.
   b. Comprehend the details of everyday conversations on topics such as society or future plans.
   c. Recognize stylistic distinctions, such as those marked by intonation or vocabulary choice (e.g., "real nice" vs. "very nice").
2. Speak or sign
   a. Communicate simple information, feelings, and ideas using simple sentences.
   b. Do the following sorts of things with language in simple social contexts: Identify objects such as common household items, ask questions, make statements, make requests, combine and vary memorized words and phrases in simple sentences, interact in a socially appropriate manner, initiate conversation, and use language for one's own purposes in new situations.
3. Read
   a. Extract key information from written texts such as essays or news items.
   b. Comprehend the details of written texts such as simple letters or announcements.
   c. Make interpretations and inferences regarding the purposes and motivations of the writer using knowledge of the culture and society.
   d. Recognize stylistic differences between texts and why particular stylistic choices were made.
4. Write
   a. Communicate information, feelings, and ideas grounded in personal experience through written texts such as letters or short essays.
   b. Write in both narrative and expository styles.
   c. Produce writing that is sufficiently accurate for a native speaker to comprehend the writer's meaning.

B: Understand cultural contexts in which the language is used.

1. Understand Culture
   Use appropriate language that reflects understanding of fundamental social situations (e.g., formal and informal ways of addressing others).
2. Apply Cultural Understanding
   Obtain and apply cultural information and patterns expressed in authentic situations such as speeches, announcements, and ceremonies.
   a. Understand linguistic conventions (e.g., various forms of leave taking) and non-verbal behaviors (e.g., culture-specific hand gestures and facial expressions) that reflect more subtle cultural nuances.
   b. Produce linguistic and non-verbal expressions which reflect more subtle cultural nuances.

C: Communicate and comprehend the content of other disciplines using a second language.

1. Use a second language to engage in activities related to the content of other disciplines
   a. Engage in math-related activities such as estimating food and lodging expenses in the local currency, calculating distances in kilometers, or reading simple graphs in foreign language newspaper articles.
   b. Engage in science-related activities such as understanding and using the metric system for measuring temperature and distance and then using these to plan an outing.
   c. Engage in social science-related activities such as expressing in simple terms the concept of freedom of speech or identifying key social groupings in another society.
   d. Engage in humanities-related activities such as summarizing the plot of a film or identifying the cultural attainments of another culture.
   e. Engage in visual & performing arts-related activities such as briefly describing what is happening in a dramatic performance or identifying major artists in another culture.

A: Understand and analyze the ways in which language constructs, influences, and communicates meaning in various contexts, time periods, and cultures.

1. Analyze how patterns of language, structures, and purposes affect communication in various forms of discourse and in one's own writing/speaking.
2. Recognize differences and evolution in the use of language across various contexts, cultures, and historical periods.
3. Adapt one's own use of language appropriately to communicate in different contexts and content areas; consider and utilize a range of linguistic choices when writing and speaking.
4. Identify and critically evaluate language which reflects biases, stereotypes, persuasive techniques and propaganda from various sources, including mass media and one's own writing.
5. Use words, diction, grammar, syntax, and punctuation correctly and appropriately in a variety of communication contexts.
6. Analyze and evaluate the relationships between purpose, audience, form, organization, voice, diction, style, and use of conventions in various forms of discourse and in one's own writing/speaking.

B: Read and analyze texts of varying length and complexity including, but not limited to a broad selection of classical, contemporary, and multicultural literature. Read poetry, novels, short stories, essays, and drama, understanding the characteristics of each literary genre.

1. Read and respond to works of recognized literary merit from classical, contemporary, and multicultural domains.
2. Read poetry, novels, short stories, essays, and drama, interpreting and responding in ways appropriate for the particular genre and work.
3. Use evidence from texts to support interpretations, evaluations, and comparative analyses.
4. Recognize distinguishing characteristics of literary genres and explain the appropriateness of the genres to their subjects.
5. Write about texts in order to discover ideas, to clarify understanding, and to convey responses and insights.

C: Recognize and analyze the use of literary forms, elements, and devices in literature and in one's own writing.

1. Understand and discuss how the elements of literature (e.g., form, plot, characterization, setting, conflict, theme, style, point of view) unify and contribute to the effectiveness of literary texts.
2. Analyze and evaluate the use of rhetorical devices (e.g., diction, figurative language, voice, dialect, sound) and patterns (e.g., imagery, symbolism, ambiguity, irony, allusion) in literary texts.
3. Understand, use, develop, and write critical analyses of literature and the arts which focus upon elements of form, style, and language.
4. Employ literary concepts and terminology appropriately and correctly in the reading, interpretation, and analysis of literature.
5. Create works using literary genres, forms, elements, and devices.

D: Understand how historical, social, and literary contexts, biographical background, and thematic intentions influence literary expression.	1. Analyze the ways in which an author's/artist's life experiences and historical context contribute to a work and its themes. 2. Discuss/represent the ways in which literature and the arts reflect social/historical conditions and issues. 3. Recognize the influence of literary movements and other authors on an author's work. 4. Explore the treatment of particular themes in a variety of genres, cultures, and historical periods.
E: Recognize and analyze how literature reflects, shapes, and comments upon the assumptions, traditions, structures, and changes in societies and cultures.	1. Identify values, beliefs, and traditions reflected in literature and works of art created by people from various cultural backgrounds. 2. Interpret various treatments of social, cultural, political, and historical issues in literature and works of art. 3. Analyze how literature and the arts have affected and been affected by various cultures. 4. Compare and contrast works by artists, authors, historians, musicians, filmmakers, and photographers of diverse backgrounds. 5. Identify and analyze references to class and social status in literature and the arts. 6. Examine and analyze how authors and artists use literature/ the arts to promote social change and ideas. 7. Examine ways in which gender, culture, and other social perspectives influence one's reaction to texts, performances, and works of art, and how various works may reflect the influence of such perspectives and points of view.
F: Analyze, interpret, and critique texts, performances, and media, through both personal and critical responses.	1. Use varied and appropriate critical approaches, historical/cultural understandings, and personal experience in reading, analyzing, interpreting, and critiquing literary works. 2. Discuss how the organization, development, and expression of texts, performances, and media presentations contribute to their meaning. 3. Determine how writers' and artists' views and intentions shape and influence their work. 4. Use specific and defensible criteria to analyze, interpret, and evaluate texts, performances, and media; distinguish between personal and critical responses. 5. Use textual evidence to discover, develop, and support (or argue against) critical interpretations of literary works. 6. Create a project or performance using expressive technologies (e.g., drama, film, video, choral performance, publication, animation, cartoon, computer graphics) to present literature in a new or enhanced way; identify how this work is intended to affect an audience.

G: Understand and analyze literature's significance in one's own life.	1. Using specific works, explain how literature and the arts help individuals understand themselves and the world. 2. Explain how personal views, experiences, opinions, and emotions influence one's response to literature and the arts.
H: Understand and use the relationships between literature and other disciplines.	1. Apply knowledge gained from other disciplines to the interpretation of literature and the arts. 2. Explain how the study of literature influences one's understanding of other disciplines. 3. Illustrate how literature and the arts depict technology and industry in different times and places. 4. Describe and compare how literature, the arts, and history have depicted a scientific discovery, significant event, or cultural trend.

A: Understand the ways in which artists use elements, materials, technologies, artistic processes and organizational principles in similar and distinctive ways in the various art forms.	1. Communicate at a basic level in or about various disciplines of the arts (music, dance, theater, visual art, literary arts, or film/video), using or discussing the basic vocabularies, tools, techniques, and thinking of the particular discipline. 2. Recognize common or unifying elements and principles (e.g., unity and variety, repetition and contrast) in and among visual art works, performances, and architectural structures. 3. Defend a particular creation, object, or performance as a work of art, considering the choices of the artist/performer, its design qualities, audience responses, and aesthetic criteria.
B: Understand the role the arts play in society and the ways in which the arts empower people to create images, artifacts, performances, and structures which manifest their beliefs, knowledge, social relationships, values, and skills.	1. Interpret orally, in writing, or through other expressive media a historical or contemporary culture, considering: a. the nature of the culture, b. the role of the arts in the culture, c. how cultural values shape artistic expression, d. how artistic forms of expression shape and define cultural values, e. how the culture has evolved as a consequence of its forms of arts and communication, f. what modes of cultural expression are diminished or no longer exist, g. how a specific work or form of art has shaped further artistic or cultural development.
C: Interpret works of art from various historical periods, cultures and peoples, analyzing the context in which they were created, the characteristics of the works, and the range of possible interpretations.	1. Research, describe, critique, and compare one or more artworks in relation to its/their historical, cultural, social, biographical, intellectual or scientific contexts. 2. Communicate interpretations of works of art from various historical periods, cultures and peoples through writing, speaking, performance, or visual media. 3. Demonstrate an informed acquaintance with exemplary works of art and artists from a variety of cultures and historical periods.

D: Understand the significance and potential contribution of the arts to the quality of one's life.

1. Communicate orally, in writing, or through other expressive media:
   a. one's response to one of the arts, a specific work of art, or an artistic expression;
   b. the effect of a work of art on one's artistic development or the artistic development of another;
   c. the experiences resulting from teaching or learning one of the arts.
2. Express personal aesthetics, communicating one's conception of what is artistically valid or beautiful.

E: Exhibit skill and understanding in at least one form of the arts, defining and responding to artistic problems with insight, technical ability, and quality.

1. Define and respond to an artistic problem(s) with processes which exhibit imagination, insight, understanding, skill, and commitment to quality.
2. Create, compose, perform, or critique a work(s) of art as an individual or member of an artistic group including, but not limited to: performance in music, dance, drama, painting, sculpture, film, stage setting, choreography, poetry or other literary forms, conducting, and directing.
3. Present, exhibit, or perform an original work(s) in a public forum.
4. Reflect on the experience of creating and of participating in a public performance(s).

(Note: Criteria for proficient performance will be established separately for each of the disciplines of the arts).

F: Analyze and evaluate works of art and performances from functional, structural/formal, historical, and cultural perspectives, using defensible criteria and communicating effectively through writing, speaking, and expressive media.

1. Interpret and explain the intended purpose, function, message, mood, and/or audience response for a work of art.
2. Analyze, discuss, and evaluate, using defensible criteria and appropriate vocabularies:
   a. the elements/components/qualities of a specific artwork and how they interact to give the work its unique expression;
   b. the interaction of various art forms in a mixed-media work;
   c. cultural, historical, and/or critical perspectives on the work(s).
3. Communicate and support responses to a work of art through writing, oral presentation/interpretation, and/or technology/media.

Comments & Suggestions

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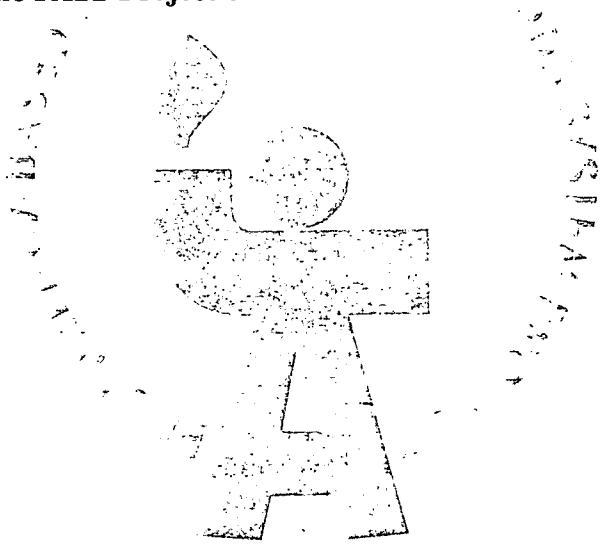

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