

Preparing Students for College through Participation in UIL Academics

The Texas Higher Education Coordinating Board reported, "The U.S. Department of Labor estimates that 90 percent of 21st-century skilled workforce jobs will require some form of post-secondary education." The board stated, "if America is to remain competitive in tomorrow's global workforce, our students must first be able to successfully complete the first year of college without the need for remedial or developmental education." That is why Texas must graduate more college-ready high school students.

Recently, the state accepted the challenge by recognizing the need to dramatically increase the levels of expectation and achievement for its students and adopted across-the-board College Readiness Standards (CRS) in the critical areas of English/language arts, social sciences, mathematics and science. Once implemented, the CRS will allow for better core curriculum alignment between public and higher education. Ultimately, the goal is to create an easier transition for students between high school and college or the workforce.

Likewise, the University Interscholastic League Academic Program is designed to promote the kind of intellectual environment and critical thinking that prepares students for college, the workforce and a changing and complex future. It offers the most comprehensive scholastic competition in the nation, providing 23 high school and 19 elementary and junior high contests. Each year, more than a half million students participate in UIL academic events. These activities help students develop a strong foundation of knowledge and scholastic skills, including intellectual agility and adaptability.

Participation in UIL Academic Competition readies students for college with –

Enhanced Student Achievement:

- ✓ integration of neurological functions which aid learning and performance in a variety of subject areas,
- ✓ access to a variety of human insights which promote the use of higher order thinking skills,
- ✓ enrichment of the learning environment,
- ✓ development of a positive emotional response to learning, and
- ✓ motivation of the learner and improvement of a student's overall academic performance.

Practical Training for a Changing and Complex Future:

- ✓ Preparation for College – Competition develops higher-level thinking, organization of thoughts and information, and effective communication with others.
- ✓ Training for Careers – Numerous studies indicate that students who have been involved in extracurricular events have higher job success.
- ✓ Life Skills – Participation in extracurricular events builds a strong foundation for life-long learning and the development of social skills.
- ✓ Confidence – Involvement in academic contests builds poise and assurance, as well as the ability to handle stressful conditions.
- ✓ Fun – Competition allows students to interact with others, establish lasting friendships, and enjoy the thrill of learning.

College Scholarship Opportunities:

- ✓ The Texas Interscholastic League Foundation has given over \$22 million from 1954 to 2008 to more than 16,000 students who have competed in the **UIL Academic State Meet**.
- ✓ The TILF has over \$6 million in endowed funds and receives direct scholarship grants each year of more than \$800,000 from foundations, individuals and corporate sponsors throughout the state.
- ✓ During a typical academic year, TILF will disburse more than \$1 million to more than 600 students attending colleges and universities throughout Texas. While not all eligible applicants can be awarded a scholarship at this time, the TILF board continues to pursue additional funding.
- ✓ Participation in UIL academic competition enhances both college entrance and scholarship applications by graduating high school seniors.

I. Writing

A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose.

1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience.
2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.
3. Evaluate relevance, quality, sufficiency, and depth of preliminary ideas and information, organize material generated, and formulate thesis.
4. Recognize the importance of revision as the key to effective writing. Each draft should refine key ideas and organize them more logically and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose.
5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate.

A variety of texts are composed in the following UIL contests: Ready Writing, Debate, Editorial Writing, Feature Writing, News Writing, Current Issues and Events, Social Studies and Literary Criticism. Contestants read extensively, research and apply knowledge that is relevant to the topic and purpose. Contest writers must synthesize information to devise a thesis, supported in a logical and organized manner, and revise effectively to achieve their purpose. Judges use rubrics to evaluate writings based on the effective approach to purpose and audience and to evaluate use of language and style.

II. Reading

A. Locate explicit textual information and draw complex inferences, analyze, and evaluate the information within and across texts of varying lengths.

1. Use effective reading strategies to determine a written work's purpose and intended audience.
2. Use text features and graphics to form an overview of informational texts and to determine where to locate information.
3. Identify explicit and implicit textual information including main ideas and author's purpose.
4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions.
5. Analyze the presentation of information and the strength and quality of evidence used by the author, and judge the coherence and logic of the presentation and the credibility of an argument.

6. Analyze imagery in literary texts.
7. Evaluate the use of both literal and figurative language to inform and shape the perceptions of readers.
8. Compare and analyze how generic features are used across texts.
9. Identify and analyze the audience, purpose, and message of an informational or persuasive text.
10. Identify and analyze how an author's use of language appeals to the senses, creates imagery, and suggests mood.
11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme.

Contestants must read, research, synthesize and evaluate information in the following contests: Debate, Informative and Persuasive Speaking, Prose and Poetry Interpretation, Editorial Writing, Feature Writing, News Writing, Headline Writing, Current Issues and Events, Social Studies, Literary Criticism and One-Act Play. Participation in the contests requires students to analyze literature for purpose, main idea and intent, and interpret charts, graphs and reference guides for research and information compilation. Using logic and reasoning, student competitors scrutinize facts and opinions and evaluate evidence for quality and credibility. Contestants must understand the value, use and influence of imagery, determining literal and symbolic meaning. Examining standard attributes and unique approaches used in texts, contestants dissect informative and persuasive messages. Competitors compare and contrast different manuscripts and materials, looking for mood, the appeal to the senses and use of propaganda.

- B. Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.
1. Identify new words and concepts acquired through study of their relationships to other words and concepts.
 2. Apply knowledge of roots and affixes to infer the meanings of new words.
 3. Use reference guides to confirm the meanings of new words or concepts.

Contestants must expand their vocabulary usage in such contests as Spelling and Vocabulary, Debate, Informative and Persuasive Speaking, Prose and Poetry Interpretation, Editorial Writing, Feature Writing, News Writing, Headline Writing, Current Issues and Events, Social Studies, Literary Criticism and One-Act Play. When reading, researching and writing, contestants distinguish new vocabulary and concepts, analyze meanings through roots and affixes and use a wide variety of reference guidebooks.

C. Describe, analyze, and evaluate information within and across literary and other texts from a variety of cultures and historical periods.

1. Read a wide variety of texts from American, European, and world literatures.
2. Analyze themes, structures, and elements of myths, traditional narratives, and classical and contemporary literature.
3. Analyze works of literature for what they suggest about the historical period and cultural contexts in which they were written.
4. Analyze and compare the use of language in literary works from a variety of world cultures.

Contests such as Debate, Informative and Persuasive Speaking, Prose and Poetry Interpretation, Editorial Writing, Feature Writing, News Writing, Headline Writing, Current Issues and Events, Social Studies, Literary Criticism and One-Act Play require students to scrutinize and appraise various types of literature, examining cultural and historic influences. Students must read various geographic, classical and modern genres to examine and evaluate the premise, style and structure. By changing the topics and literary categories each year, UIL exposes students to a wide variety of subjects and authors.

D. Explain how literary and other texts evoke personal experience and reveal character in particular historical circumstances.

1. Describe insights gained about oneself, others, or the world from reading specific texts.

The Literary Criticism, Social Studies, Prose and Poetry Interpretation and One-Act Play contests involve an examination of emotional response to literature, based on personal experience and environmental issues. Students develop insights into characters' actions and historical and cultural influences.

III. Speaking

A. Understand the elements of communication both in informal group discussions and formal presentations (e.g., accuracy, relevance, rhetorical features, and organization of information).

1. Understand how style and content of spoken language varies in different contexts and influences the listener's understanding.
2. Adjust presentation (delivery, vocabulary, length) to particular audiences and purposes.

Debate, Informative and Persuasive Speaking, and Prose and Poetry Interpretation contestants use a variety of rhetorical approaches,

organizational techniques, vocabulary and delivery methods to adapt to the audience.

- B. Develop effective speaking styles for both group and one-on-one situations.
 - 1. Participate actively and effectively in one-on-one oral communication situations.
 - 2. Participate actively and effectively in group discussions.
 - 3. Plan and deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning.

In Debate, Informative and Persuasive Speaking, and Prose and Poetry Interpretation, students must understand and use appropriate speaking styles in a variety of settings. Speakers must prepare effective presentations and adjust their styles for large and small group settings. Students prepare for events by discussing and practicing in one-on-one and group situations.

IV. Listening

- A. Apply listening skills as an individual and as a member of a group in a variety of settings (e.g., lectures, discussions, conversations, team projects, presentations, interviews).
 - 1. Analyze and evaluate the effectiveness of a public presentation.
 - 2. Interpret a speaker's message; identify the position taken and the evidence in support of that position.
 - 3. Use a variety of strategies to enhance listening comprehension (e.g., focus attention on message, monitor message for clarity and understanding, provide verbal and nonverbal feedback, note cues such as change of pace or particular words that indicate a new point is about to be made, select and organize key information).

In Debate and Informative and Persuasive Speaking, competitors must become effective listeners by focusing and monitoring for clarity, taking effective notes, asking essential questions and accurately interpreting the speaker's message.

- B. Listen effectively in informal and formal situations.
 - 1. Listen critically and respond appropriately to presentations.
 - 2. Listen actively and effectively in one-on-one communication situations.
 - 3. Listen actively and effectively in group discussions.

Preparation for all UIL academic contests affords students opportunities to work in on-on-one and small groups settings with fellow competitors and their academic coaches to discuss and study the subject matter.

V. Research

A. Formulate topic and questions.

1. Formulate research questions.
2. Explore a research topic.
3. Refine research topic and devise a timeline for completing work.

In such contests as Debate, Informative and Persuasive Speaking, Current Issues and Events and Social Studies, students extensively research a topic or topics to prepare evidence, appropriate timelines and probing questions.

B. Select information from a variety of sources.

1. Gather relevant sources.
2. Evaluate the validity and reliability of sources.
3. Synthesize and organize information effectively.
4. Use source material ethically.

Debate, Informative and Persuasive Speaking, Current Events and Issues and Social Studies contestants study print, media and other informational resources, analyzing content for credibility and validity. Students select and organize materials for proper usage.

C. Produce and design a document.

1. Design and present an effective product.
2. Use source material ethically.

Debate, Informative and Persuasive Speaking, Journalism, Current Events and Issues and Social Studies contestants appropriately and effectively use their research to produce texts or presentations.

I. Numeric Reasoning

A. Number representation

1. Compare real numbers.
2. Define and give examples of complex numbers.

B. Number operations

1. Perform computations with real and complex numbers.

C. Number sense and number concepts

1. Use estimation to check for errors and reasonableness of solutions.

In Science, Number Sense, Mathematics and Calculator Applications contests, students must understand and use real and complex numbers when estimating and reasoning to reach solutions. They use addition, subtraction, multiplication, division, roots, powers, exponentiation, logarithms, trigonometric functions and other calculations.

II. Algebraic Reasoning

A. Expressions and equations

1. Explain and differentiate between expressions and equations using words such as solve, evaluate, and simplify.

Number Sense, Math, Calculator and Science tests require competitors to evaluate, simplify and/or solve expressions and equations, iterative solutions for transcendental equations, differential and integral calculus, elementary statistics and matrix algebra.

B. Manipulating expressions

1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to combine, transform, and evaluate expressions (e.g., polynomials, radicals, rational expressions).

Contestants understand and use algebraic structures and relationships to alter and assess mathematical expressions.

C. Solving equations, inequalities, and systems of equations

1. Recognize and use algebraic (field) properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.
2. Explain the difference between the solution set of an equation and the solution set of an inequality.

D. Representations, equations and relationships.

1. Interpret multiple representations of equations and relationships.
2. Translate among multiple representations of equations and relationships.

Not only must math and physics contestants be able to recognize inequality, analyze relationships and solve equations, but also they must do so on a timed test which requires quick and critical thinking.

III. Geometric Reasoning

A. Figures and their properties

1. Identify and represent the features of plane and space figures.
2. Make, test, and use conjectures about one-, two-, and three-dimensional figures and their properties.
3. Recognize and apply right triangle relationships including basic trigonometry.

B. Transformations and symmetry

1. Identify and apply transformations to figures.
2. Identify the symmetries of a plane figure.
3. Use congruence transformations and dilations to investigate congruence, similarity, and symmetries of plane figures.

C. Connections between geometry and other mathematical content strands

1. Make connections between geometry and algebra.
2. Make connections between geometry, statistics, and probability.
3. Make connections between geometry and measurement.

D. Logic and reasoning in geometry

1. Make and validate geometric conjectures.
2. Understand that Euclidean geometry is an axiomatic system.

The UIL math contest events require students to understand and use basic trigonometry, work with three-dimensional figures and deal with the identification and conversion of figures, such as plane and space figures. Competitors investigate congruence, similarity and symmetries, as well as connecting geometry to measurements, algebra and other mathematical elements. Using logic and reasoning, students complete geometric speculation and formulate solutions based on axiomatic methods.

IV. Measurement Reasoning

A. Measurement involving physical and natural attributes

1. Select or use the appropriate type of unit for the attribute being measured.

B. Systems of measurement

1. Convert from one measurement system to another.
2. Convert within a single measurement

C. Measurement involving geometry and algebra

1. Find the perimeter and area of two-dimensional figures.
2. Determine the surface area and volume of three-dimensional figures.
3. Determine indirect measurements of figures using scale drawings, similar figures, Pythagorean Theorem, and basic trigonometry

D. Measurement involving statistics and probability

1. Compute and use measures of center and spread to describe data.
2. Apply probabilistic measures to practical situations to make an informed decision.

Using systems of measurement involving statistics and probability, competitors solve problems based on data and situational analysis. When computing perimeters, surface areas and volumes, students convert measurements to reach solutions to geometric and algebraic problems.

V. Probabilistic Reasoning

A. Counting principles

1. Determine the nature and the number

B. Computation and interpretation of probabilities

1. Compute and interpret the probability of an event and its complement.
2. Compute and interpret the probability of conditional and compound events.

Students who compete in the UIL math events draw conclusions about the likelihood of potential events and the underlying mechanics of complex systems.

VI. Statistical Reasoning

A. Data collection

1. Plan a study.

B. Describe data

1. Determine types of data.
2. Select and apply appropriate visual representations of data.
3. Compute and describe summary statistics of data.
4. Describe patterns and departure from patterns in a set of data.

- C. Read, analyze, interpret, and draw conclusions from data
 - 1. Make predictions and draw inferences using summary statistics.
 - 2. Analyze data sets using graphs and summary statistics.
 - 3. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software.
 - 4. Recognize reliability of statistical results.

Acquiring the concepts and skills in this competency empowers UIL math competitors to select and use appropriate methods to analyze data and to develop and evaluate inferences and predictions based on data.

VII. Functions

- A. Recognition and representation of functions
 - 1. Recognize whether a relation is a function.
 - 2. Recognize and distinguish between different types of functions.
- B. Analysis of functions
 - 1. Understand and analyze features of a function.
 - 2. Algebraically construct and analyze new functions.
- C. Model real world situations with functions
 - 1. Apply known function models.
 - 2. Develop a function to model a situation.

Competitors must be able to identify and use functions that are widely used in numerical computation in engineering and the physical sciences, including many formulas and numerical tables of values for most of the functions.

VIII. Problem Solving and Reasoning

- A. Mathematical problem solving
 - 1. Analyze given information.
 - 2. Formulate a plan or strategy.
 - 3. Determine a solution.
 - 4. Justify the solution.
 - 5. Evaluate the problem solving process.
- B. Logical reasoning
 - 1. Develop and evaluate convincing arguments.
 - 2. Use various types of reasoning.
- C. Real world problem solving
 - 1. Formulate a solution to a real world situation based on the solution to a

- mathematical problem.
2. Use a function to model a real-world situation.
 3. Evaluate the problem solving process.

UIL events develop students' abilities to solve a wide variety of complex mathematics problems: doing word problems, creating patterns, interpreting figures, developing geometric constructions, proving theorems, etc.

IX. Communication and Representation

A. Language, terms, and symbols of mathematics

1. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem.
2. Use mathematical language to represent and communicate the mathematical concepts in a problem.
3. Use mathematics as a language for reasoning, problem solving, making connections, and generalizing.

B. Interpretation of mathematical work

1. Model and interpret mathematical ideas and concepts using multiple representations.
2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context.

C. Presentation and representation of mathematical work

1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words.
2. Create and use representations to organize, record, and communicate mathematical ideas.
3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

UIL competitors develop mathematical literacy and learn to interpret ideas and concepts. They use multiple representations (such as diagrams) to move fluently between symbolic, graphical, and numerical forms of mathematics concepts.

X. Connections

A. Connections among the strands of mathematics

1. Connect and use multiple strands of mathematics in situations and problems.
2. Connect mathematics to the study of other disciplines.

B. Connections of mathematics to nature, real-world situations, and everyday life

1. Use multiple representations to demonstrate links between mathematical and real-world situations.
2. Understand and use appropriate mathematical models in the natural, physical, and social sciences.
3. Know and understand the use of mathematics in a variety of careers and professions.

Students who compete in the UIL math and accounting events develop the conceptual understanding, procedural fluency, strategic competence and adaptive reasoning necessary to make mathematical connections.

Texas University Interscholastic League

College Readiness Standards: Science

- I. Nature of Science: Scientific Ways of Learning and Thinking
 - A. Cognitive skills in science
 - 1. Utilize skepticism, logic, and professional ethics in science.
 - 2. Use creativity and insight to recognize and describe patterns in natural phenomena.
 - 3. Formulate appropriate questions to test understanding of natural phenomena.
 - 4. Rely on reproducible observations of empirical evidence when constructing, analyzing, and evaluating explanations of natural events and processes.
 - B. Scientific inquiry
 - 1. Design and conduct scientific investigations in which hypotheses are formulated and tested.
 - C. Collaborative and safe working practices
 - 1. Collaborate on joint projects.
 - 2. Understand and apply safe procedures in the laboratory and field, including chemical, electrical, and fire safety and safe handling of live or preserved organisms.
 - 3. Demonstrate skill in the safe use of a wide variety of apparatuses, equipment, techniques, and procedures.
 - D. Current scientific technology
 - 1. Demonstrate literacy in computer use.
 - 2. Use computer models and applications.
 - 3. Demonstrate appropriate use of a wide variety of apparatuses, equipment, techniques, and procedures for collecting quantitative and qualitative data.
 - E. Effective communication of scientific information
 - 1. Use several modes of expression to describe or characterize natural patterns and phenomena. These modes of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic.
 - 2. Use essential vocabulary of the discipline being studied.

The UIL Science contest, consisting of Biology, Chemistry and Physics sections, challenges high school students to do a wide range of reading in the areas of science, to gain an understanding of the significance of experiments rather than to recall obscure details, to be alert to new

discoveries and information in the areas of science, to gain an understanding of the basic principles as well as knowledge of the history and philosophy of science, and to foster a sense of enthusiasm about science and how it affects our daily lives. Competitors must understand about observations, empirical evidence and the formulation of hypotheses. During preparation for the contests, students collaborate on projects and use technology to collect data, employ appropriate scientific notation and vocabulary, recognize and describe patterns and demonstrate knowledge of natural events and processes.

II. Foundation Skills: Scientific Applications of Mathematics

A. Basic mathematics conventions

1. Understand the real number system and its properties.
2. Use exponents and scientific notation.
3. Understand ratios, proportions, percentages, and decimal fractions, and translate from any form to any other.
4. Use proportional reasoning to solve problems.
5. Simplify algebraic expressions.
6. Estimate results to evaluate whether a calculated result is reasonable.
7. Use calculators, spreadsheets, computers, etc., in data analysis.

B. Mathematics as a symbolic language

1. Carry out formal operations using standard algebraic symbols and formulae.
2. Represent natural events, processes, and relationships with algebraic expressions and algorithms.

C. Understand relationships among geometry, algebra, and trigonometry

1. Understand simple vectors, vector notations, and vector diagrams, and carry out simple calculations involving vectors.
2. Understand that a curve drawn on a defined set of axes is fully equivalent to a set of algebraic equations.
3. Understand basic trigonometric principles, including definitions of terms such as sine, cosine, tangent, cotangent, and their relationship to triangles.
4. Understand basic geometric principles.

D. Scientific problem solving

1. Use dimensional analysis in problem solving.

E. Scientific application of probability and statistics

1. Understand descriptive statistics.

F. Scientific measurement

1. Select and use appropriate Standard International (SI) units and prefixes

- to express measurements for real-world problems.
2. Use appropriate significant digits.
 3. Understand and use logarithmic notation (base 10).

The UIL Science contest, as well as the Mathematics, Number Sense, and Calculator competitions, requires students to understand and use basic math applications. Students must answer problems involving ratios, percentages, algebraic equations and geometric principles. Additionally, contestants employ probability and statistics to draw conclusions about the likelihood of potential events and the underlying mechanics of complex systems. They also recognize the appropriate techniques, tools, and formulas to determine measurements and outcomes.

III. Foundation Skills: Scientific Applications of Communication

A. Scientific writing

1. Use correct applications of writing practices in scientific communication.

B. Scientific reading

1. Read technical and scientific articles to gain understanding of interpretations, apparatuses, techniques or procedures, and data.
2. Set up apparatuses, carry out procedures, and collect specified data from a given set of appropriate instructions.
3. Recognize scientific and technical vocabulary in the field of study and use this vocabulary to enhance clarity of communication.
4. List, use and give examples of specific strategies before, during, and after reading to improve comprehension.

C. Presentation of scientific/technical information

1. Prepare and present scientific/technical information in appropriate formats for various audiences.

D. Research skills/information literacy

1. Use search engines, databases, and other digital electronic tools effectively to locate information.
2. Evaluate quality, accuracy, completeness, reliability, and currency of information from any source.

To prepare for UIL Science competition, students must read scientific journals and understand technical vocabulary used in articles, textbooks and on tests. They use various instruments and technology to research and widen their comprehension of information so that they can formulate hypotheses and determine outcomes. In the contests students use graphing calculators or scientific calculators with the

following formulas: +, −, ×, ÷, %, √, 10^x, log x, e^x, ln x, y^x, sin, sin⁻¹, cos, cos⁻¹, tan, tan⁻¹ with scientific notation and degree/radian capability. Because the test is timed, students must be extremely proficient with the use of the calculators.

IV. Science, Technology, and Society

A. Interactions between innovations and science

1. Recognize how scientific discoveries are connected to technological innovations.

B. Social ethics

1. Understand how scientific research and technology have an impact on ethical and legal practices.
2. Understand how commonly held ethical beliefs impact scientific research.

C. History of science

1. Understand the historical development of major theories in science.
2. Recognize the role of people in important contributions to scientific knowledge.

The UIL Science contest helps encourage student appreciation for accurate and ethical scientific research, the historical advancement of scientific study and important theories and contributions to the field.

V. Cross-Disciplinary Themes

A. Matter/states of matter

1. Know modern theories of atomic structure.
2. Understand the typical states of matter (solid, liquid, gas) and phase changes among these.

B. Energy (thermodynamics, kinetic, potential, and energy transfers)

1. Understand the Laws of Thermodynamics.
2. Know the processes of energy transfer.

C. Change over time/equilibrium

1. Recognize patterns of change.

D. Classification

1. Understand that scientists categorize things according to similarities and differences.

E. Measurements and models

1. Use models to make predictions.
2. Use scale to relate models and structures.

3. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.

When answering questions or solving problems in the disciplines of biology, chemistry and physics, contestants must work with measurement, classification, models, shifting patterns and other topics in order to recognize, analyze and evaluate conditions. The students work with complicated questions relating to matter, atomic structure, energy, thermodynamics and other subjects.

VI. Biology

A. Structure and function of cells

1. Know that although all cells share basic features, cells differentiate to carry out specialized functions.
2. Explain in your own words how cells can be categorized into two major types: prokaryotic and eukaryotic, and describe major features that distinguish one from the other.
3. Describe the structure and function of major subcellular organelles.
4. Describe the major features of mitosis and relate this process to growth and asexual reproduction.
5. Understand the process of cytokinesis in plant and animal cells and how this process is related to growth.
6. Know the structure of membranes and how this relates to permeability.

B. Biochemistry

1. Understand the major categories of biological molecules: lipids, carbohydrates, proteins, and nucleic acids.
2. Describe the structure and function of enzymes.
3. Describe the major features and chemical events of photosynthesis.
4. Describe the major features and chemical events of cellular respiration.
5. Know how organisms respond to presence or absence of oxygen, including mechanisms of fermentation.
6. Understand coupled reaction processes and describe the role of ATP in energy coupling and transfer.

C. Evolution and populations

1. Know multiple categories of evidence for evolutionary change and how this evidence is used to infer evolutionary relationships among organisms.
2. Recognize variations in population sizes, including extinction, and describe mechanisms and conditions that produce these variations.

D. Molecular genetics and heredity

1. Understand Mendel's laws of inheritance.
2. Know modifications to Mendel's laws.

3. Understand the molecular structures and the functions of nucleic acids.
4. Understand simple principles of population genetics and describe characteristics of a Hardy-Weinberg population.
5. Describe the major features of meiosis and relate this process to Mendel's Laws of Inheritance.

E. Classification and taxonomy

1. Know ways in which living things can be classified based on each organism's internal and external structure, development, and relatedness of DNA sequences.

F. Systems and homeostasis

1. Know that organisms possess various structures and processes (feedback loops) that maintain steady internal conditions.
2. Describe, compare, and contrast structures and processes that allow gas exchange, nutrient uptake and processing, waste excretion, nervous and hormonal regulation, and reproduction in plants, animals, and fungi; give examples of each.

G. Ecology

1. Identify Earth's major biomes, giving their locations, typical climate conditions, and characteristic organisms present in each.
2. Know patterns of energy flow and material cycling in Earth's ecosystems.
3. Understand typical forms of organismal behavior.
4. Know the process of succession.

The Biology portion of the UIL Science contest focuses on life, living organisms and how they interact with each other and their environment. Questions are divided into the areas of Botany and Zoology. Competitors comprehend and analyze the structure, function, growth, origin, evolution, and distribution of living things. They must be able to classify and describe organisms and their functions and understand about such things as different species, cell theory, genetics, homeostasis and ecological conditions and shifts.

VII. Chemistry

A. Matter and its properties

1. Know that physical and chemical properties can be used to describe and classify matter.
2. Recognize and classify pure substances (elements, compounds) and mixtures.

B. Atomic structure

1. Summarize the development of atomic theory. Understand that models

of the atom are used to help us understand the properties of elements and compounds.

C. Periodic table

1. Know the organization of the periodic table.
2. Recognize the trends in physical and chemical properties as one moves across a period or vertically through a group.

D. Chemical bonding

1. Characterize ionic bonds, metallic bonds, and covalent bonds. Describe the properties of metals and ionic and covalent compounds.

E. Chemical reactions

1. Classify chemical reactions by type. Describe the evidence that a chemical reaction has occurred.
2. Describe the properties of acids and bases, and identify the products of a neutralization reaction.
3. Understand oxidation-reduction
4. Understand chemical equilibrium.
5. Understand energy changes in chemical reactions.
6. Understand chemical kinetics.

F. Chemical nomenclature

1. Know formulas for ionic compounds.
2. Know formulas for molecular compounds.

G. The mole and stoichiometry

1. Understand the mole concept.
2. Understand molar relationships in reactions, stoichiometric calculations, and percent yield.

H. Thermochemistry

1. Understand the Law of Conservation of Energy and processes of heat transfer.
2. Understand energy changes and chemical reactions.

I. Properties and behavior of gases, liquids, and solids

1. Understand the behavior of matter in its various states: solid, liquid, gas.
2. Understand properties of solutions.
3. Understand principles of ideal gas behavior and kinetic molecular theory.
4. Apply the concept of partial pressures in a mixture of gases.
5. Know properties of liquids and solids.
6. Understand the effect of vapor pressure on changes in state; explain heating curves and phase diagrams.

7. Describe intermolecular forces.

J. Basic structure and function of biological molecules: proteins, carbohydrates, lipids, nucleic acids

1. Understand the major categories of biological molecules: proteins, carbohydrates, lipids, and nucleic acids.

K. Nuclear chemistry

1. Understand radioactive decay.

The purpose of the UIL Chemistry section of the Science contest is to focus on the composition, structure and properties of matter, as well as the changes it undergoes during chemical reactions. Competitors answer complex questions about various atoms, molecules, crystals and other aggregates of matter whether in isolation or combination. Students must understand the concepts of energy and entropy in relation to the spontaneity of the chemical process and answer questions on a timed test.

VIII. Physics

A. Matter

1. Demonstrate familiarity with length scales from sub-atomic particles through macroscopic objects.
2. Understand states of matter and their characteristics.
3. Understand the concepts of mass and inertia.
4. Understand the concept of density.
5. Understand the concepts of gravitational force and weight.

B. Vectors

1. Understand how vectors are used to represent physical quantities.
2. Demonstrate knowledge of vector mathematics using a graphical representation.
3. Demonstrate knowledge of vector mathematics using a numerical representation.

C. Forces and Motion

1. Understand the fundamental concepts of kinematics.
2. Understand forces and Newton's Laws.
3. Understand the concept of momentum.

D. Mechanical Energy

1. Understand potential and kinetic energy.
2. Understand conservation of energy.
3. Understand the relationship of work and mechanical energy.

E. Rotating systems

1. Understand rotational kinematics.
2. Understand the concept of torque.
3. Apply the concept of static equilibrium.
4. Understand angular momentum.

F. Fluids

1. Understand pressure in a fluid and its applications.
2. Understand Pascal's Principle.
3. Understand buoyancy.
4. Understand Bernoulli's principle.

G. Oscillations and waves

1. Understand basic oscillatory motion and simple harmonic motion.
2. Understand the difference between transverse and longitudinal waves.
3. Understand wave terminology: wavelength, period, frequency, amplitude.
4. Understand the properties and behavior of sound waves.

H. Thermodynamics

1. Understand the gain and loss of heat energy in matter.
2. Understand the basic laws of thermodynamics.

I. Electromagnetism

1. Discuss electric charge and electric force.
2. Gain qualitative and quantitative understandings of voltage, current, and resistance.
3. Understand Ohm's Law.
4. Apply the concept of power to electricity.
5. Discuss basic DC circuits that include voltage sources and combinations of resistors.
6. Discuss basic DC circuits that include voltage sources and combinations of capacitors.
7. Understand magnetic fields and their relationship to electricity.
8. Relate electricity and magnetism to everyday life.

J. Optics

1. Know the electromagnetic spectrum.
2. Understand the wave/particle duality of light.
3. Understand concepts of geometric optics.

The Physics portion of the Science test promotes student understanding of such basic concepts as energy, force, mass and

charge. Competitors analyze nature to understand how the universe behaves. In some years, the physics portion of the test has included two or three questions revolving around a central theme on the modern revolution of physics. Some of questions involved famous physicists who contributed to the revolution as well as a conceptual and/or calculational problem on a modern physics topic. In 2008-2009, the goal is to have students investigate the researchers and areas of research at universities in Texas. Specifically, the test will focus on the theoretical physics program at The University of Texas at Austin. A single question will be included about a current or past UT theoretical physicist and couple of questions about a conceptual and/or calculational problem based on research interests (written at a level as found in an introductory physics textbook).

IX. Earth and Space Sciences

A. Earth systems

1. Know the major features and characteristics of atmosphere, geosphere, hydrosphere, and biosphere.
2. Understand relationships and interactions among atmosphere, geosphere, hydrosphere, and biosphere.
3. Possess a scientific understanding of the history of Earth's systems.
4. Utilize the tools scientists use to study and understand the Earth's systems.

B. Sun, Earth, and moon system

1. Understand interactions among the sun, Earth, and moon.
2. Possess a scientific understanding of the formation of the Earth and moon.

C. Solar system

1. Describe the structure and motions of the solar system and its components.
2. Possess a scientific understanding of the formation of the solar system.

D. Origin and structure of the universe

1. Understand scientific theories for the formation of the universe.
2. Know the current scientific descriptions of the components of the universe.

E. Plate tectonics

1. Describe the evidence that supports the current theory of plate tectonics.
2. Identify the major tectonic plates.
3. Describe the motions and interactions

of tectonic plates.

4. Describe the rock cycle and its products.

F. Energy transfer within and among systems

1. Matter and energy in the Earth system.

2. Give examples of effects of energy transfer within and among systems.

The UIL Academic program concentrates on earth and space science through the middle school or junior high contests, specifically Science I & II, designed for grades 7-8.

X. Environmental Science

A. Earth systems

1. Recognize the Earth's systems.

2. Know the major features of the geosphere and the factors that modify them.

3. Know the major features of the atmosphere.

4. Know the major features of the hydrosphere.

5. Be familiar with Earth's major biomes.

6. Describe the Earth's major biogeochemical cycles.

B. Energy

1. Understand energy transformations.

2. Know the various sources of energy for humans and other biological systems.

C. Populations

1. Recognize variations in population sizes, including human population and extinction, and describe mechanisms and conditions that produce these variations.

D. Economics and politics

1. Name and describe major environmental policies and legislation.

2. Understand the types, uses and regulations of the various natural resources.

E. Human practices and their impacts

1. Describe the different uses for land (land management).

2. Understand the use and consequences of pest management.

3. Know the different methods used to increase food production.

4. Understand land and water usage and management practices.

5. Understand how human practices affect air, water, and soil quality.

Both the Physics portion of the UIL Science contest and the Calculator

Application competition include questions about the application of physical principles to the measurement and analysis of environmental factors. A diversity of phenomena is explored, ranging from the dynamics and composition of the atmosphere and oceans, to the examination of pollutant gases. Another feature is to analyze and measure pollutant distribution.

I. Interrelated Disciplines and Skills

A. Spatial analysis of physical and cultural processes that shape the human experience

1. Use the tools and concepts of geography appropriately and accurately.
2. Analyze the interaction between human communities and the environment.
3. Analyze how physical and cultural processes have shaped human communities over time.
4. Evaluate the causes and effects of human migration patterns over time.
5. Analyze how various cultural regions have changed over time.
6. Analyze the relationship between geography and the development of human communities.

In contests such as Debate, Informative and Persuasive Speaking, Current Events and Issues and Social Studies, students analyze historical, cultural and geographic influences on the environment, events, and societies. They examine the human experience, public and private interaction and cultural conflict for the causes and effects on the United States and the world.

B. Periodization and chronological reasoning

1. Examine how and why historians divide the past into eras.
2. Identify and evaluate sources and patterns of change and continuity across time and place.
3. Analyze causes and effects of major political, economic, and social changes in U.S. and world history.

The Debate, Informative and Persuasive Speaking, Current Events and Issues and Social Studies contests require students to examine the causes and effects of important historical eras and current events so that they can produce presentations or texts.

C. Change and continuity of political ideologies, constitutions, and political behavior

1. Evaluate different governmental systems and functions.
2. Evaluate changes in the functions and structures of government across time.
3. Explain and analyze the importance of civic engagement.

By enlightening students and making them aware of the influence of

government on the lives of U.S. and international populations, UIL contests promote civic engagement and critical thinking.

D. Change and continuity of economic systems and processes

1. Identify and evaluate the strengths and weaknesses of different economic systems.
2. Analyze the basic functions and structures of international economics.

UIL contests such as Accounting, Debate, Informative and Persuasive Speaking, Current Events and Issues and Social Studies compel students to understand and analyze financial and economic processes and structures to determine the benefits and flaws.

E. Change and continuity of social groups, civic organizations, institutions, and their interaction

1. Identify different social groups (e.g., clubs, religious organizations) and examine how they form and how and why they sustain themselves.
2. Define the concept of socialization and analyze the role socialization plays in human development and behavior.
3. Analyze how social institutions (e.g., marriage, family, churches, schools) function and meet the needs of society.
4. Identify and evaluate the sources and consequences of social conflict.

Students competing in Debate, Informative and Persuasive Speaking, Current Events and Issues and Social Studies investigate social interaction, societal development and the institutions of civilizations for the purpose of answering questions, giving speeches and writing essays about the causes of conflict and the effects of clashes and war.

F. Problem-solving and decision-making skills

1. Use a variety of research and analytical tools to explore questions or issues thoroughly and fairly.
2. Analyze ethical issues in historical, cultural, and social contexts.

UIL contests advance problem-solving and decision-making opportunities by engaging students in critical-thinking activities in order to research, analyze, synthesize and evaluate ideas and events.

II. Diverse Human Perspectives and Experiences

A. Multicultural societies

1. Define a "multicultural society" and consider both the positive and negative qualities of multiculturalism.
2. Evaluate the experiences and contributions of diverse groups to

multicultural societies.

Contestants examine multicultural experiences by assessing the struggles of integration and the contributions of various groups. Through speaking, discussing, answering questions and writing their thoughts, the students consider important multicultural junctures.

B. Factors that influence personal and group identities, (e.g., race, ethnicity, gender, nationality, institutional affiliations, socioeconomic status)

1. Explain and evaluate the concepts of race, ethnicity, and nationalism.
2. Explain and evaluate the concept of gender.
3. Analyze diverse religious concepts, structures, and institutions around the world.
4. Evaluate how major philosophical and intellectual concepts influence human behavior or identity.
5. Explain the concepts of socioeconomic status and stratification.
6. Analyze how individual and group identities are established and change over time.

By competing in events that include topics about nationalism, group identities and changing societies, students must understand, interpret and probe difficult theories and historical episodes which encompassed individual and group conflict, assimilation and influence.

III. Interdependence of Global Communities

A. Spatial understanding of global, regional, national, and local communities

1. Distinguish spatial patterns of human communities that exist between or within contemporary political boundaries.
2. Connect regional or local developments to global ones.
3. Analyze how and why diverse communities interact and become dependent on each other.

Preparation for Debate, Informative and Persuasive Speaking, Current Events and Issues and Social Studies contests encourages students to comprehend the principles behind United States and world communities so that the students can communicate their ideas on topics about political interaction and interdependence.

B. Global Analysis

1. Apply social studies methodologies to compare societies and cultures.

When preparing for the contests, participants use traditional social studies processes to investigate global communities.

IV. Analysis, Synthesis and Evaluation of Information

A. Critical examination of texts, images, and other sources of information

1. Identify and analyze the main idea(s) and point(s) of view in sources.
2. Situate an informational source in its appropriate contexts (contemporary, historical, cultural).
3. Evaluate sources from multiple perspectives.
4. Understand the differences between a primary and secondary source and use each appropriately to conduct research and construct arguments.
5. Read narrative texts critically.
6. Read research data critically.

Using critical reading techniques and traditional research strategies, contestants discover and select information appropriate for answering questions or incorporating evidence into spoken or written presentations.

B. Research and methods

1. Use established research methodologies.
2. Explain how historians and other social scientists develop new and competing views of past phenomena.
3. Gather, organize and display the results of data and research.
4. Identify and collect sources.

Contestants explore important reference materials, texts and mediums to discern important ideas by applying a variety of traditional and technological research approaches.

C. Critical listening

1. Understand/interpret presentations (e.g., speeches, lectures, less formal presentations) critically.

Contest preparation with coaches and fellow competitors requires students to listen critically. Additionally, the UIL speech contests encourage students to listen for important ideas, logical assumptions or flaws, and quality of support.

D. Reaching conclusions

1. Construct a thesis that is supported by evidence.
2. Recognize and evaluate counter-arguments.

Speeches presented in Debate and Informative and Persuasive Speaking and writings in Editorial Writing, Ready Writing, Debate, Current Issues and Events, Social Studies and Literary Criticism consist of a thesis and supporting evidence and arguments.

V. Effective Communication

A. Clear and coherent oral and written communication

1. Use appropriate oral communication techniques depending on the context or nature of the interaction.
2. Use conventions of standard written English.

The UIL speech contests, consisting of Debate, Informative and Persuasive Speaking and Prose and Poetry Interpretation, train students to excel at public speaking. Writing contests (Ready Writing, Debate, Current Issues and Events, Social Studies and Literary Criticism) teach students effective writing skills.

B. Academic integrity

1. Attribute ideas and information to source materials and authors.

UIL contests stipulate that proper source and documentation methodology be followed by students.

Texas University Interscholastic League

College Readiness Standards: Cross Discipline

I. Key Cognitive Skills

A. Intellectual curiosity

1. Engage in scholarly inquiry and dialogue.
2. Accept constructive criticism and revise personal views when valid evidence warrants.

All UIL contests promote scholarly study, research, discussion and critical review of techniques and viewpoints.

B. Reasoning

1. Consider arguments and conclusions of self and others.
2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.
3. Gather evidence to support arguments, findings, or lines of reasoning.
4. Support or modify claims based on the results of an inquiry.

Debate, Informative and Persuasive Speaking, Journalism, Current Issues and Events, Social Studies and Ready Writing contests encompass opportunities to use clarity in reasoning and logic by having students gather evidence, formulate arguments and establish conclusions.

C. Problem solving

1. Analyze a situation to identify a problem to be solved.
2. Develop and apply multiple strategies to solving a problem.
3. Collect evidence and data systematically and directly relate to solving a problem.

All UIL contests help develop problem-solving skills by having students gather evidence, apply a variety of math strategies and/or use logic as a tool for drawing conclusions about arguments.

D. Academic behaviors

1. Self-monitor learning needs and seek assistance when needed.
2. Use study habits necessary to manage academic pursuits and requirements.
3. Strive for accuracy and precision.
4. Persevere to complete and master tasks.

UIL contestants must conduct effective and extensive studies, be thorough in their pursuits and excel at the task before them.

E. Work habits

1. Work independently.
2. Work collaboratively.

As students prepare for competition, they must possess an independent, intellectual curiosity and work collectively with their coaches and fellow participants.

F. Academic integrity

1. Attribute ideas and information to source materials and people.
2. Evaluate sources for quality of content, validity, credibility, and relevance.
3. Include the ideas of others and the complexities of the debate, issue, or problem.
4. Understand and adhere to ethical codes of conduct.

Learning how to document sources correctly, evaluating the credibility of evidence and observing ethical conventions are staples of UIL contests, especially speaking and writing events.

II. Foundational Skills

A. Reading across the curriculum

1. Use effective pre-reading strategies.
2. Use a variety of strategies to understand the meanings of new words.
3. Identify the intended purpose and audience of the text.
4. Identify the key information and supporting details.
5. Analyze textual information critically.
6. Annotate, summarize, paraphrase, and outline texts when appropriate.
7. Adapt reading strategies according to structure of texts.
8. Connect reading to historical and current events and personal interest.

Contestants must read, research, synthesize and evaluate information in speech, literary, business, social studies, science and math contests. Students analyze literature for purpose, main idea and intent and interpret charts, graphs and reference guides for research and information compilation. They use logic and reasoning, scrutinize facts and opinions and evaluate evidence for quality and credibility. Examining historical and current influences on texts, contestants must understand purpose, structure and rhetorical techniques. They must also outline, summarize and evaluate messages.

B. Writing across the curriculum

1. Write clearly and coherently using standard writing conventions.

2. Write in a variety of forms for various audiences and purposes.
3. Compose and revise drafts.

Students compose a variety of texts in the following UIL contests: Ready Writing, Debate, Editorial Writing, Feature Writing, News Writing, Current Issues and Events, Social Studies and Literary Criticism. Contestants study and apply knowledge that is relevant to the topic and purpose. Contest writers must synthesize information to devise a thesis, supported in a logical and organized manner, and revise effectively to achieve their purpose. Judges use rubrics to evaluate the effective approach to purpose and audience and to assess the use of language and style.

C. Research across the curriculum

1. Understand which topics or questions are to be investigated.
2. Explore a research topic.
3. Refine research topic based on preliminary research and devise a timeline for completing work.
4. Evaluate the validity and reliability of sources.
5. Synthesize and organize information effectively.
6. Design and present an effective product.
7. Integrate source material.
8. Present final product.

In such contests as Debate, Ready Writing, Informative and Persuasive Speaking, Current Issues and Events and Social Studies, students research topics and study printed texts and other informational resources, analyzing content for credibility and validity. Students select and organize materials to prepare an edited product.

D. Use of data

1. Identify patterns or departures from patterns among data.
2. Use statistical and probabilistic skills necessary for planning an investigation, and collecting, analyzing, and interpreting data.
3. Present analyzed data and communicate findings in a variety of formats.

In all UIL contests, data collected through reading, research and scientific exploration is used to answer questions, draw conclusions, make presentations and draft writings. Students must interpret data for patterns and validity so it can be used in multiple formats.

E. Technology

1. Use technology to gather information.

2. Use technology to organize, manage, and analyze information.
3. Use technology to communicate and display findings in a clear and coherent manner.
4. Use technology appropriately.

Competitors in all events, especially such contests as Computer Science, Computer Applications and Calculator Applications, use technology to gather, manage, analyze and manipulate information. One Act Play performers conduct Internet searches for information on dramatic periods for set design and costuming purposes. Debaters, Informative and Persuasive Speakers, Social Studies contestants and Current Issues and Events competitors are examples of students who research extensively on the Internet. Technology use is important to help students problem solve, research, evaluate information and produce products.

Appendix