LCB File No. T047-99

ADOPTED TEMPORARY REGULATION OF THE STATE BOARD OF EDUCATION/STATE BOARD FOR OCCUPATIONAL EDUCATION

(Effective June 4, 1999)

Explanation: Matter in ***italics*** is new; matter in brackets ~~[-]~~ is material to be omitted.

ENGLISH LANGUAGE ARTS

Statutory Authority: 385.080

Chapter 389 of NAC is hereby amended by deleting specific regulations effective July 1, 1999 as follows:

The following Reading and Language regulations are hereby repealed effective July 1, 1999:

NAC 389.200, NAC 389.205, NAC 389.245, NAC 389.250, NAC 389.295, NAC 389.300, NAC 389.345, NAC 389.350, NAC 389.456, NAC 389.458, NAC 389.460, NAC 389.462, and NAC 389.463.

TEXT OF REPEALED SECTIONS

[389.200 Reading. The courses in reading offered in public kindergartens must include instruction designed to teach the pupil to:

1. Perceive similarities and differences in letters and words.

2. Identify some capital and small letters of the alphabet.

3. Interpret pictures, paying attention to the details.

4. Describe the action taking place in a picture.

5. Distinguish between the sounds of the letters of the alphabet.

6. Appreciate literature by exposing him to a variety of reading materials.**]**

[389.205 Language. The courses in language offered in public kindergartens must include instruction designed to teach the pupil to:

1. Listen without interrupting.

2. Listen to a story and retell it in the same sequence.

3. Match and recall rhyming words.

4. Follow in sequence simple directions which include two or three steps.

5. Identify and name common objects and pictures.

6. Communicate his thoughts and needs in complete sentences.

7. Recognize and name basic colors, shapes and sizes.

8. Recall familiar nursery rhymes, poems, finger puppetry and short stories.

9. Know terms related to location and position such as "inside," "outside," "beside," "between," "before," "after," "over," "under," "on," "in," "in front of," "in back of," "first," "middle" and "last."

10. Dictate simple sentences to describe objects and illustrations.

11. Orally share his experiences.

12. Create and tell original stories from his own experience.

13. Hold a crayon and pencil correctly.

14. Trace, copy and draw basic shapes.

15. Demonstrate the letter strokes of top to bottom and left to right.

16. Write his first name with appropriate capital and small letters.]

[389.245 Reading. The courses in reading offered in public elementary schools must include instruction designed to teach the pupil by completion of the third grade to:

1. Distinguish all letters and commonly used punctuation marks.

2. Use a basic vocabulary and understand frequently used words.

3. Identify:

(a) Beginning and ending consonants, consonantal blends and consonantal digraphs;

(b) Digraphs, dipthongs, vowels, long and short vowel sounds and schwas;

(c) Irregular sounds and silent letters;

(d) Plurals, verb endings, compound words, contractions, possessive nouns, syllables, roots of words and common prefixes and suffixes;

(e) Homonyms, synonyms and antonyms; and

(f) Pronouns and the nouns to which they refer.

4. Use:

(a) Contextual clues to derive the meaning of words; and

(b) Phonics to pronounce new words.

5. Explain:

(a) The meaning of a word or sentence; and

(b) The main idea and details of a paragraph or short written passage.

6. Arrange ideas and events in their proper sequence.

7. Distinguish cause and effect, real and unreal, and fact and opinion.

8. Predict results and draw conclusions from written material.

9. Identify character traits and interpret the mood and feeling of a written passage.

10. Read orally with proper projection, enunciation, expression, phrasing and fluency.

11. Read without guidance.

12. Identify different types of literature and forms of writing.

13. Listen to, comprehend, react to and retell narrated passages.

14. Identify rhyming words.**]**

[389.250 Language. The courses in language offered in public elementary schools must include instruction designed to teach the pupil by completion of the third grade to:

1. Obtain information by listening to and following oral directions.

2. Use all of his senses to be aware of the details of his experiences.

3. Enjoy and appreciate literature which is read to him.

4. Relate, dramatize and discuss situations.

5. Express his experiences by:

(a) Identifying, selecting and classifying information;

(b) Making inferences;

(c) Distinguishing fact from opinion; and

(d) Using simple logic.

6. Write a paragraph with a topic sentence and related sentences correctly using:

(a) All closing punctuation;

(b) Abbreviations;

(c) Capital letters;

(d) Commas when writing dates, addresses and letters; and

(e) Apostrophes for contractions and the possessive form of words.

7. Write a report based on a personal experience or interest.

8. Write a letter to a friend and address the envelope correctly.

9. Print legibly and begin to use cursive handwriting.

10. Proofread and edit.

11. Use basic spelling patterns.

12. Use a library, including the ability to:

(a) Locate the fiction, nonfiction, reference and periodical collections;

(b) Use the Dewey decimal system to locate different categories of books;

(c) Check out materials properly; and

(d) Handle books in the appropriate manner.

13. Gain knowledge from pictures and films.

14. Skim material to find a word, name, date or other detail.

15. Read material to find the main idea and supporting details.

16. Use a table of contents and glossary.

17. Find the date a book was published.

18. Use a dictionary to find words and alphabetize words to the third letter.

19. Interpret graphs, charts, time lines and simple maps.

20. Manage his time efficiently.**]**

[389.295 Reading. The courses in reading offered in public elementary schools must include instruction designed to teach the pupil by completion of the sixth grade to:

1. Identify:

(a) Irregular plurals;

(b) Endings for verbs;

(c) Contractions;

(d) Forms of words which denote possession;

(e) Syllables and determine the syllables on which the accent should be placed;

(f) Prefixes, suffixes, roots of words and comparative endings;

(g) Homonyms, synonyms and antonyms;

(h) Figurative language;

(i) Words with multiple meanings; and

(j) Pronouns and the nouns to which they refer.

2. Use contextual clues to derive the meaning of words.

3. Explain:

(a) The meaning of a sentence; and

(b) The main idea and details of a paragraph or short written passage.

4. Arrange ideas and events in their proper sequence.

5. Identify and distinguish between cause and effect, real and unreal, and fact and opinion.

6. Predict results and draw conclusions.

7. Identify a character's traits and feelings and interpret the mood of a written passage.

8. Identify the setting of a story.

9. Make analogies.

10. Summarize information.

11. Identify different:

(a) Types of literature such as poems, short stories and novels.

(b) Forms of writing such as fiction, nonfiction, narration and description.

12. Read orally with proper projection, enunciation, expression and phrasing.

13. Read without guidance.

14. Adjust his rate of reading for different effects.

15. Follow and restate oral directions.

16. Take notes of and summarize information presented orally.**]**

[389.300 Language. The courses in language offered in public elementary schools must include instruction designed to teach the pupil by completion of the sixth grade to:

1. Obtain information by listening to and following oral directions.

2. Listen and respond to literature which is read to him.

3. Speak effectively to a group of people.

4. Understand that each idea can be expressed in a variety of grammatically correct sentences and that he must choose the sentence that will suit his purpose.

5. Write a composition with correct grammar and spelling and well developed paragraphs including introductory and concluding paragraphs.

6. Use correctly:

(a) Closing punctuation;

(b) Commas, quotation marks, apostrophes and hyphens;

(c) Capital letters; and

(d) The different parts of speech.

7. Proofread and edit.

8. Use the appropriate form and style for different types of correspondence.

9. Write an original report by using reference materials, taking notes and outlining his material.

10. Write a narrative story and a descriptive story.

11. Write poetry in different forms.

12. Write fluently and legibly in cursive handwriting and printing.

13. Take dictation of sentences.

14. Evaluate how he is influenced by the various materials he reads.

15. Use a library, including the ability to:

(a) Arrange books in their correct order according to the Dewey decimal system;

(b) Locate and use indexes, atlases, almanacs, newspapers and other reference materials;

(c) Locate and use the guide to children's magazines;

(d) Select the related materials on a given topic;

(e) Select the appropriate index for a given purpose;

(f) Use the card catalog to find the call number assigned to a specific book;

(g) Understand the information contained on the cards showing the manner in which material is cataloged in the Library of Congress; and

(h) Use a thesaurus.

16. Write a simple outline.

17. Compile a simple bibliography.

18. Take notes.

19. Determine his objectives before reading specific material.

20. Adjust his reading rate to the matter being read.

21. Use the index, appendix and bibliography in a book.

22. Use a dictionary to:

(a) Select the meaning of a word which applies to a specific use; and

(b) Determine the correct pronunciation of a word.

23. Use the guide words on the pages of a dictionary.

24. Alphabetize words using all of the letters in the words.

25. Use graphs, charts and globes.

26. Manage his time efficiently during independent study.

27. Take an examination efficiently, pacing himself and judiciously attempting and omitting questions.

28. Know of career opportunities in language.**]**

[389.345 Reading. The courses in reading offered in public elementary schools must include instruction designed to teach the pupil by completion of the eighth grade to:

1. Demonstrate his ability to listen, speak, read and write by identifying and correctly using:

(a) Homonyms, synonyms and antonyms;

(b) Words with multiple meanings;

(c) Figurative language; and

(d) Prefixes and suffixes.

2. Demonstrate his literal, inferential, creative and critical comprehension by:

(a) Using contextual clues to derive the meaning of words;

(b) Identifying pronouns and the nouns to which they refer.

(c) Identifying and explaining:

(1) The meaning of a sentence;

(2) The main idea and details of a paragraph or short passage;

(3) The sentence which sets forth the topic of a paragraph;

(4) The theme of a selection;

(5) Important details;

(6) The author's purpose;

(7) The mood of a paragraph or passage;

(8) The setting of a story;

(9) The character traits and feelings expressed in a story; and

(10) Different types of literature and different forms of writing;

(d) Arranging ideas and events in their proper sequence;

(e) Identifying and distinguishing between cause and effect, and fact and opinion;

(f) Predicting results and drawing conclusions;

(g) Using analogies; and

(h) Summarizing information.

3. Improve his ability to read by concentrating on his projection, enunciation, expression and phrasing.**]**

[389.350 Language. The courses in language offered in public elementary schools must include instruction designed to teach the pupil by completion of the eighth grade to:

1. Practice good listening habits.

2. Listen to poetry and stories for his appreciation and enjoyment.

3. Follow directions.

4. Receive, remember and use information he hears.

5. Listen critically to identify the speaker's purpose.

6. Speak in a clear and audible voice.

7. Use stress, pitch, intonation and body language effectively.

8. Express his personal views.

9. Make an oral presentation to his class at school.

10. Choose appropriate language to address a specific audience.

11. Practice all aspects of the writing process including preparation, writing, editing, revising, rewriting and sharing.

12. Write essays, notes, summaries, poems, letters, stories, reports, scripts and journals.

13. Write for a variety of audiences including himself, his classmates, community and teacher and realize that his approach should vary as his audience varies.

14. Write for a wide range of purposes such as to inform, persuade, express himself, explore and clarify.

15. Use the mechanics, spelling and standard form of edited American English in his writing.

16. Respond constructively to other students' writing during the various stages of the writing process.

17. Continue to increase his vocabulary.

18. Write sentences that vary in length and structure.

19. Write legibly.

20. Plan an academic program in language.

21. Locate reference materials related to specific subjects using such works as Current Biography, Reader's Guide to Periodical Literature and the World Almanac.

22. Select suitable sources for information on a living person, quick summaries of fact, short factual articles and the identification of poetry and quotations.

23. Use cross references in the card catalog.

24. Use general reference works and those related to specific subjects.

25. Identify the sections of a newspaper including the classified advertisements, editorials and political cartoons.

26. Paraphrase or summarize information.

27. Use bibliographies to aid in locating information.

28. Skim to get an overview of material.

29. Write a bibliography using a specified style.

30. Organize to show sequence.

31. Outline information by topic or sentence.

32. Identify the sentence which sets forth the topic of the paragraph.

33. Take notes using a specified procedure.

34. Understand his own bias.

35. Make charts and graphs to convey information.

36. Set goals and priorities and follow a schedule for the efficient management of the time he spends outside of school.

37. Adjust his thinking, writing and editing according to the type of examination he is taking.

38. Meet the standards, such as adequate performance in the laboratory and effective participation in the classroom, by which his educational performance is assessed.

39. Identify males and females who have contributed to the field of language.

40. Know of career opportunities in language.**]**

[389.456 English in all grades. A course of study in English in all grades of high school must include instruction which is designed to teach the pupil to do the following:

1. Participate appropriately in dialogues and in conversations in small and large groups.

2. Identify, summarize and understand the main and subordinate ideas in discussions, lectures and written reports.

3. Recognize that oral and written language may be structured differently, aimed at different audiences and conveyed by different points of view.

4. Evaluate the intention and message of speakers and writers, including an attempt to manipulate the language in order to deceive the listener or reader.

5. Give and follow directions in speaking and writing.

6. Recognize writing as a process that involves a number of elements, including:

(a) Collecting information;

(b) Formulating ideas and determining their relationships;

(c) Drafting and arranging sentences and paragraphs in an appropriate order and building transitions between them; and

(d) Evaluating, revising and editing what has been written.

7. Write for a variety of audiences, including:

(a) The writer;

(b) Classmates;

(c) The teacher; and

(d) The community.

8. Write for a wide range of purposes, including:

(a) To inform;

(b) To persuade;

(c) To express one's self;

(d) To explore ideas;

(e) To clarify thinking;

(f) To organize ideas; and

(g) To increase fluency in writing.

9. Write in many forms.

10. Develop a personal style of writing.

11. Demonstrate an understanding of American English including spelling, handwriting, punctuation, capitalization and grammar.

12. Recognize that writing is a way to develop personally by recording experiences, thoughts and feelings and communicating with others.

13. Recognize that reading is a pleasurable activity and a means of acquiring knowledge.

14. Read a wide variety of materials, including periodicals.

15. Determine the meanings of words through the context in which they are used and by using a dictionary.

16. Adjust the rate of reading according to the pupil's purpose and the difficulty of the material.

17. Examine literature as a mirror of human experience, motives, conflicts and values which helps the pupil more fully to understand personal experiences and the range and depth of the human experience.

18. Recognize values and universal themes in literature.

19. Read selections from the works of authors from various countries.

20. Read and understand the major types of literature.

21. Identify the various components of major types of literature.

22. Identify and understand literary terms and figurative language.

23. Construct logical sequences, draw conclusions and defend ideas.

24. Use the advanced skills of application, analysis, synthesis and evaluation of information.

25. Locate information using resources such as interviews, computers and readers for microfiche.

26. Use tools for research, including the card catalog, the Reader's Guide to Periodical Literature, bibliographies, indexes, atlases, dictionaries, books, magazines and newspapers.

27. Recognize and use the different parts of a book.**]**

[389.458 English in ninth grade. In addition to the instruction required for all grades in high school, a course of study in English in the ninth grade must include instruction designed to teach the pupil to do the following:

1. Adopt words and strategies to inform and converse.

2. Examine various kinds of communications, including intonation and body language, that accompany speaking.

3. Examine the messages and effects of mass communications.

4. Identify relationships such as time, space, cause and effect, and comparison and contrast.

5. Distinguish fact from opinion in speaking and writing.

6. Distinguish denotative from connotative meaning in speaking and writing.

7. Predict results based on given information.

8. Make judgments based on criteria that can be supported and explained.

389.460 English in tenth grade. In addition to the instruction required for all grades in high school, a course of study in English in the tenth grade must include instruction designed to teach the pupil to do the following:

1. Organize, develop and present topics and arguments convincingly before a group, using appropriate intonation and body language.

2. Distinguish between abstract and concrete ideas in speaking and writing.

3. Evaluate the messages and effects of mass communications.

4. Distinguish between subjective and objective viewpoints in speaking and writing.

5. Recognize analogy, metaphor and symbols in written and oral material.**]**

[389.462 English in eleventh and twelfth grades. Except as otherwise provided in NAC 389.463, in addition to the instruction required for all grades in high school, a course of study in English in the eleventh and twelfth grades must include instruction designed to teach the pupil to do the following:

1. Adapt words and strategies to persuade an audience or a reader.

2. Participate appropriately in discussions and interviews.

3. Recognize the relationship of literature to the social conditions in which it was produced.

4. Evaluate literature critically, recognizing the author's purpose and the means used to accomplish it.

5. Distinguish and use deductive and inductive reasoning.

6. Detect fallacies in reasoning.**]**

[389.463 Business English. In lieu of the course of study in English for the 11th or 12th grade established pursuant to NAC 389.462, a pupil may elect to enroll in business English. A course in business English must include instruction designed to teach the pupil to do the following:

1. Apply the basic structure of English including grammar, usage and style.

2. Apply the principles of style that business writers and speakers follow in order to ensure that their audience will be able to interpret messages quickly and accurately.

3. Apply the principles of grammar and usage that have practical application in writing and speaking for a business purpose.

4. Apply the style of punctuation, capitalization, usage of numbers and abbreviations required in business writing.

5. Apply principles and techniques of writing various types of business letters, memoranda and informal business reports.

6. Use the proper spelling, pronunciation, meaning, syllabication and choice of words frequently used by business speakers and writers.

7. Use business proofreading and editing techniques and procedures.

8. Gather resource material and compose business correspondence.

9. Examine the business network of communication systems.

10. Practice business study skills including critical listening, taking of notes, communication interpretation and reading comprehension.

11. Evaluate and use business-related literature.

12. Maintain and reinforce language arts skills and strategies learned in English courses.

13. Adapt words and strategies for the purpose of persuading.

14. Participate appropriately in panel discussions and interviews.

15. Distinguish and use deductive and inductive reasoning strategies.

16. Detect fallacies in reasoning.

17. Locate designated information using tools such as interviews, computers, data banks and microfiche readers.

18. Use research tools such as a card catalog, The Readers' Guide to Periodical Literature, bibliographies, indexes, atlases, dictionaries, books, magazines and newspapers.]

MATHEMATICS

Statutory Authority: 385.080

Chapter 389 of NAC is hereby amended by adding the provisions as follows with an effective date of July 1, 1999:

389.465 Mathematics: Generally.

1. A local school district shall ensure that pupils, by the completion of the twelfth grade, are able to comply with the ~~[objectives of the core curriculum]~~ ***content and performance standards required*** for mathematics listed in NAC 389~~[.467]~~. In carrying out this requirement, the district shall:

(a) Develop ~~[minimum objectives for two]~~ courses which must encompass all of the ~~[requirements for the core curriculum]~~ ***content and performance standards required for mathematics by the completion of the twelfth grade***; and

(b) ~~[Institute any number of classes in mathematics to cover the minimum objectives for the respective course]~~ ***Make available to each pupil enrolling in high school a listing of the courses that encompass all of the content and performance standards required for mathematics by the completion of the twelfth grade.***

2. A class must be designated as including the objectives of either course developed pursuant to subsection 1. A district shall notify the department of education of each class being offered and which course it falls under.

3. A district may develop a third course which builds and expands upon the objectives of the courses developed and instituted pursuant to subsection 1.

4. A pupil may receive a maximum of one credit in mathematics under each course.

~~5.]~~ ***2.*** A pupil who ~~[begins a program in high school]~~ ***enrolls in specific*** mathematics ~~[with the]~~ courses listed under NAC 389.468 to 389.484, inclusive, shall ~~[also meet the objectives listed in the core curriculum. The courses developed pursuant to subsection 1 must be designed to allow pupils to study both the objectives of the core curriculum and the objectives of the specific courses listed under NAC 389.468 to 389.484, inclusive]~~ ***be notified in writing by the school district at the time of enrollment that:***

(a) The objectives of the specific courses may include additional mathematics standards above those required to be completed by the end of grade 12; and

(b) The specific courses are not designed to ensure that all content and performance standards required to be completed by the end of grade 12 will be covered through completion

of a specific course or courses unless included in the listing of courses identified under Subsection 1.

~~[6. If an integrated curriculum encompasses the objectives of the specific courses listed under NAC 389.468 to 389.484, inclusive, the requirements of all the courses must be met within the integrated curriculum.]~~

The following Mathematics regulations are hereby repealed effective July 1, 1999:

NAC 389.292, NAC 389.310, NAC 389.360, NAC 389.400, and NAC 389.467.

TEXT OF REPEALED SECTIONS

[389.292 Mathematics. The courses in mathematics offered in public elementary schools must include instruction designed to teach the pupil, by the completion of the fourth grade, to do the following:

1. For the areas of solving problems and logic:

(a) Use the process of solving a problem to investigate and understand the content of mathematics.

(b) Formulate a problem from a situation in everyday life regarding mathematics.

(c) Develop and apply strategies to solve a wide variety of mathematical problems.

(d) Verify and interpret the results of a solution to a problem.

(e) Solve a problem by using a calculator, a computer or other technology and know when it is appropriate to use such technology.

(f) Demonstrate confidence in the practical use of mathematics.

(g) Demonstrate persistence when working independently or with others to solve a problem.

2. For the area of communication:

(a) Use reading, writing and other learning skills to develop an understanding of mathematics.

(b) Relate language used in everyday life to mathematical language and symbols.

(c) Relate physical materials, pictures and diagrams to mathematical ideas.

(d) Describe different methods of thinking to clarify mathematical ideas and mathematical situations.

(e) Discuss options for solving problems.

(f) Use a computer or other technological resources to present results in proper form.

3. For the areas of reasoning and mathematical connections:

(a) Use models, known facts, properties and relationships to explain his thinking.

(b) Use patterns and relationships to interpret mathematical situations.

(c) Construct criteria for sorting and organizing materials or data.

(d) Justify and defend answers to problems and any methods used to reach those answers.

(e) Use different physical materials, visualizations and descriptions to represent the same mathematical concept.

(f) Describe connections between activities that he is physically participating in and mathematical procedures and situations related thereto.

(g) Investigate different situations that are related to the same mathematical concepts.

(h) Recognize that mathematical topics are interrelated.

(i) Use previously learned mathematical ideas to understand new mathematical ideas.

(j) Use mathematics in other areas of curriculum and in his daily life.

4. For the area of the development of the concept of numbers:

(a) As it relates to understanding numbers:

(1) Understand the meanings of numbers from a variety of personal experiences by using physical materials.

(2) Understand the system of numeration by relating counting, grouping and the different concepts of place values.

(3) Develop an understanding of the relationships between numbers.

(4) Interpret the different uses for numbers that are encountered in everyday life.

(b) As it relates to making estimates:

(1) Develop strategies for making estimates.

(2) Recognize when making an estimate is appropriate.

(3) Determine the reasonableness of the results of making estimates.

(4) Apply strategies for estimation when working with quantities, measurement or computation and when solving a problem.

(c) As it relates to concepts and operations of whole numbers:

(1) Understand the meaning of the operations of addition, subtraction, multiplication and division by creating and discussing a wide variety of situations in which problems arise.

(2) Relate informal language, visualizations and concrete models to mathematical language and symbolism.

(3) Recognize that a wide variety of structures of problems can be represented by a single operation of addition, subtraction, multiplication or division.

(4) Describe relationships between the operations of addition, subtraction, multiplication and division.

(5) Develop an understanding of the relationships between numbers and the operations of numbers.

(6) Use models and strategies to develop a reasonable proficiency in the basic facts for addition and subtraction of whole numbers and for addition and subtraction of algorithms.

(7) Use calculators and computers in the appropriate computational situations.

(8) Use and describe a variety of techniques for mental computation and estimation.

(9) Select and use techniques for estimation and computation that are appropriate for a specific problem.

(10) Determine the reasonableness of results.

(d) As it relates to common fractions and decimal fractions:

(1) Create and describe common fractions and decimal fractions, including mixed numbers, by using physical materials.

(2) Develop an understanding of the relationship between numbers or common fractions and decimal fractions.

(3) Investigate relationships between common fractions by using physical materials.

(4) Investigate relationships between decimal fractions by using physical materials.

(5) Investigate relationships between common fractions and decimal fractions, including equivalent fractions, by using physical materials.

(6) Investigate the operations of addition, subtraction, multiplication and division on common fractions and decimal fractions by using physical materials.

(7) Create and solve problems involving the meaning of common fractions and decimal fractions by using physical materials.

5. For the areas of geometry and measurement:

(a) Recognize and describe geometry in everyday life.

(b) Describe, model, draw and sort shapes.

(c) Investigate and predict the results of combining, subdividing and changing shapes.

(d) Develop a sense of his surroundings and the objects contained in those surroundings.

(e) Relate geometric ideas to ideas relating to numbers and measurements.

(f) Describe the relative position and location of objects in space.

(g) Describe different figures and objects in terms of length, capacity, weight, area and volume.

(h) Describe the attributes of an object in terms of length, capacity, weight, area, volume, time, temperature and angle.

(i) Estimate and measure objects by using nonstandard units.

(j) Estimate and measure objects by using half units in customary measurement used in the United States and whole units in metric measurement.

(k) Make and use measurements to solve specific problems and situations in everyday life.

6. For the areas of probability and statistics:

(a) Investigate the concept of chance.

(b) Describe an example of probability in everyday life.

(c) Collect, organize and describe data by using different methods.

(d) Construct, read and interpret displays of data.

(e) Create and solve a problem that requires the collection and interpretation of data.

7. For the areas of patterns and relationships:

(a) Recognize, describe, extend and create a wide variety of patterns.

(b) Represent and describe mathematical relationships.

(c) Investigate the use of open sentences and variables to describe relationships by using physical materials.**]**

[389.310 Mathematics. The courses in mathematics offered in public elementary schools must include instruction designed to teach the pupil, by the completion of the sixth grade, to do the following:

1. For the areas of solving problems and logic:

(a) Use an approach for solving a problem to investigate and understand mathematics.

(b) Formulate a problem from situations within and outside the field of mathematics.

(c) Develop and apply different strategies to solve problems with emphasis on problems that require multiple steps or problems that are not routine.

(d) Verify and interpret the results of a problem.

(e) Apply general strategies to specific problem situations that reflect experiences in everyday life.

2. For the area of communication:

(a) Express mathematical situations by using oral, written, concrete, pictorial and graphical methods.

(b) Use reading, writing and other learning skills to interpret and evaluate mathematical ideas.

(c) Use a computer and other technological resources to present results in proper form.

3. For the areas of reasoning and mathematical connections:

(a) Recognize and draw a valid conclusion from specific information.

(b) Make and support a mathematical conjecture.

(c) Construct a system for classifying and organizing materials or data.

(d) Investigate a problem and describe conclusions made by using graphical, numerical, physical, algebraic and verbal mathematical models or representations.

(e) Investigate the connections between mathematical topics, mathematics and other disciplines.

(f) Use a previously learned mathematical idea to further his understanding of other mathematical ideas or problems.

(g) Apply mathematical thinking to solve problems that arise in other disciplines.

4. For the area of understanding numbers:

(a) As it relates to the relationship of numbers:

(1) Investigate, develop and use numbers in a variety of equivalent forms in everyday life and situations relating to mathematical problems.

(2) Develop an understanding of whole numbers, fractions and decimals.

(3) Investigate relationships among fractions, decimals and percentages by using physical materials and by making the appropriate symbolic connections.

(4) Represent numerical relationships in one-dimensional and two-dimensional graphs.

(b) As it relates to making estimates and computations:

(1) Estimate and compute with whole numbers, fractions and decimals.

(2) Develop, analyze and explain procedures for computation and techniques for making estimates by using objects and by making the appropriate symbolic connections.

(3) Select the proper method of computation for a specific situation, such as the use of estimation, the use of paper and pencil, the use of calculators and mental computation.

(4) Make estimates and computations to solve problems.

(5) Use estimation to check the reasonableness of results.

(c) As it relates to systems and theories of numbers:

(1) Investigate the need for numbers other than whole numbers.

(2) Compare whole numbers, fractions and decimals.

(3) Expand the use of adding, subtracting, multiplying and dividing whole numbers to fractions and decimals.

(4) Understand how the basic operations of arithmetic are related.

(5) Develop concepts of theories of numbers and make the appropriate connections to situations in everyday life and mathematical problems.

5. For the areas of geometry and measurement:

(a) Identify, describe, compare and classify geometric figures.

(b) Construct geometric figures with emphasis on developing a sense of his surroundings and the objects in those surroundings.

(c) Investigate simple transformations of geometric figures.

(d) Develop and solve problems by using geometric models.

(e) Relate his knowledge of geometry in describing the physical world.

(f) Investigate geometric properties and geometric relationships as they relate to two-dimensional objects and three-dimensional objects.

(g) Compare geometric shapes by using measurements.

(h) Describe and compare the structure and use of systems of measurement.

(i) Select the proper units and tools to determine measurements to the appropriate degree of accuracy in a specific situation.

(j) Estimate, make and use measurements to describe and compare the physical world.

(k) Investigate activities related to solving problems to develop the concepts of perimeter, area, volume, weight, mass, capacity and the measurement of an angle.

6. For the areas of probability and statistics:

(a) Investigate the variety of uses of probability in everyday life.

(b) Investigate situations in everyday life by experimenting with various models to determine probabilities.

(c) Use results of experiments to represent or predict events.

(d) Discover the power of using a model of probability by comparing experimental results with mathematical expectations.

(e) Systematically collect, organize and describe data.

(f) Construct, read and interpret tables, charts and graphs.

(g) Analyze and extend patterns of graphs.

7. For the areas of patterns and functions:

(a) Describe, extend, analyze and create a wide variety of patterns.

(b) Describe and depict relationships by using tables, graphs and rules.

(c) Investigate functional relationships to explain how a change in one quantity results in a change in another.

(d) Use patterns and functions to depict and solve problems.

8. For the area of algebra:

(a) Investigate the concepts of a variable, an expression and an equation.

(b) Develop situations and patterns of numbers with tables, graphs, and equations and investigate the relationships of these representations.

(c) Analyze tables and graphs to identify properties and relationships.

(d) Experiment with solutions to linear equations by using concrete, informal and formal methods.**]**

[389.360 Mathematics. The courses in mathematics offered in public elementary schools must include instruction designed to teach the pupil, by the completion of the eighth grade, to do the following:

1. For the areas of solving problems and logic:

(a) Apply the appropriate strategy to solve a problem that requires multiple steps or a problem that is not routine.

(b) Prepare, explain and validate arguments to support solutions to a problem and determine the reasonableness of those solutions.

(c) Apply general strategies to problem situations that reflect experiences in everyday life.

2. For the area of communication:

(a) Express situations by using oral, written, concrete, pictorial, graphical and algebraic methods.

(b) Use reading, writing and other learning skills to interpret and evaluate mathematical ideas.

(c) Use computers and other technological resources to present results in proper form.

3. For the areas of reasoning and mathematical connections:

(a) Make and support mathematical conjectures from specific information.

(b) Judge and support the validity of mathematical conjectures.

(c) Develop a system for classifying and organizing material or data.

(d) Describe connections between activities involving physical models and any symbolic representations of those activities.

(e) Analyze connections between mathematical topics.

(f) Apply mathematical thinking and modeling to solve problems that arise in other disciplines.

4. For the area of understanding numbers:

(a) As it relates to the relationship of numbers:

(1) Develop an understanding of whole numbers, common decimals, common fractions, integers and rational numbers.

(2) Investigate relationships among common fractions, decimal fractions and percentages by using physical materials.

(b) As it relates to making estimates and computations:

(1) Perform addition, subtraction, multiplication and division with whole numbers, integers, common fractions and decimal fractions.

(2) Make reasonable estimations for mathematical problems occurring in everyday life.

(3) Solve problems through different skills, including the use of calculators, computers, paper and pencil and mental computation.

5. For the areas of systems and theories of numbers:

(a) Describe the necessity of using different systems of numbers, including common fractions, decimal fractions and integers.

(b) Use the concepts of theories of numbers in everyday life and in situations involving mathematical problems.

(c) Develop an informal understanding of mathematical ideas, including the role of definitions in providing the pupil with a basis of knowledge.

6. For the areas of geometry and measurement:

(a) Identify, describe, compare and classify geometric figures.

(b) Create, represent and visualize various geometric figures with emphasis on developing a sense of his surroundings and the objects in those surroundings.

(c) Investigate geometric properties and relationships as they relate to two-dimensional objects and three-dimensional objects.

(d) Recognize transformations of geometric figures.

(e) Investigate similarity and congruence in geometric figures.

(f) Apply geometric models to solve problems in everyday life.

(g) Select appropriate units and tools for measuring objects to a specified degree of accuracy.

(h) Estimate the size of an object in the physical world by using both the customary units of measurement used in the United States and the metric units of measurement.

(i) Use measurement to describe and compare objects in the physical world.

(j) Solve problems by using both the metric system of measurement and the customary system of measurement used in the United States.

(k) Develop a procedure to solve a problem that requires measurement.

(l) Understand the concept of rates.

7. For the areas of probability and statistics:

(a) Devise and carry out experiments to determine probabilities.

(b) Predict outcomes that are based on experimental and theoretical probabilities.

(c) Investigate the different uses for probability in everyday life.

(d) Generate and organize data and construct and interpret tables, charts and graphs by using such data.

(e) Analyze and extend patterns of graphs.

(f) Apply key statistical terms to the data found in tables, charts and graphs.

8. For the areas of patterns and functions:

(a) Describe, extend, analyze and create a wide variety of patterns.

(b) Find a pattern in a specific example.

(c) Use patterns and functions to depict and solve problems and explain how a change in one quantity results in a change in another.

(d) Investigate patterns, tables of data and graphs to formulate a conjecture.

9. For the area of algebra:

(a) Demonstrate an understanding of algebraic expressions or terms and formulas by using graphical, concrete or pictorial representations.

(b) Present and solve simple linear equations by using concrete and informal methods.

(c) Communicate mathematically by using and differentiating between word phrases, concrete models, pictorial models, graphical models and algebraic models.**]**

[389.400 Mathematics. A course of study in mathematics must include instruction designed to teach the pupil by the completion of the eighth grade to do the following:

1. Understand place value in the structure of the decimal system.

2. Add, subtract, multiply and divide with increased efficiency and accuracy.

3. Understand rational numbers.

4. Understand real number.

5. Apply the properties of real numbers to algorithms for subsets of the system of real numbers.

6. Multiply and divide with numbers expressed in exponential notation.

7. Use the properties of inverse operations to solve simple equations.

8. Demonstrate an understanding of the theory of sets.

9. Recognize common geometrical figures and the relationships among them.

10. Apply geometric concepts and constructions to solve a problem.

11. Apply the concepts of measurement to practical problems.

12. Use both English and metric systems of measurement to solve problems in length, area and volume.

13. Extend the use of mathematical tools, other than the basic operations, such as proportions and statistical analysis.

14. Use a variety of formulas in practical situations.

15. Apply other mathematical skills to practical situations.

16. Explore opportunities for employment in the field of mathematics.**]**

[389.467 Mathematics: Core curriculum. The objectives of the core curriculum for mathematics are to teach a pupil, by the completion of the twelfth grade to do the following:

1. For the areas of solving problems and logic, define, formulate and solve problems by applying the strategies and processes of mathematical modeling to problems in everyday life that are relevant to the pupil's experiences.

2. For the area of communication:

(a) Express, at a level which is consistent with the content of a specific course, mathematical ideas orally and in writing, including concrete, pictorial, graphical and algebraic methods.

(b) Read and understand, at a level which is consistent with the content of the specific course, written presentations of mathematics.

(c) Formulate a mathematical definition and describe a generalization discovered through an investigation.

(d) Use computers and other technological resources to present results in proper form.

3. For the areas of reasoning and mathematical connections:

(a) Make and test conjectures relating to numerical patterns and geometric patterns.

(b) Construct a simple valid argument and judge the validity of an argument.

(c) Connect concrete models to their equivalent symbolic representations.

(d) Analyze connections between mathematical topics.

(e) Recognize that there may be different methods available to solve a problem.

(f) Solve a problem that requires the integration of mathematical topics.

(g) Identify and use the connections between mathematics and other disciplines.

4. For the area of geometry:

(a) Represent the relationship between two sets of data on a coordinate system.

(b) Classify figures in terms of congruence and similarity.

(c) Describe and classify characteristics of two- dimensional figures and three-dimensional objects.

(d) Represent and solve a problem by using a geometric model.

(e) Solve problems by using both the metric system of measurement and the customary system of measurement used in the United States.

(f) Solve a problem by using relationships between triangles.

5. For the areas of probability and statistics:

(a) Estimate probabilities and odds by using simulations.

(b) Design an experiment to represent and solve a problem involving uncertainty.

(c) Construct charts, tables and graphs that summarize data from situations encountered in everyday life and draw inferences from those charts, tables and graphs.

(d) Recognize sampling and its role in statistical claims.

(e) Design a statistical experiment to study a problem, conduct the experiment, and interpret and communicate the results.

(f) Analyze how changes in data affect the mean, median and mode.

6. For the area of algebra:

(a) Express a situation that involves variable quantities with mathematical symbols, equations and inequalities.

(b) Interpret expressions, equations and inequalities by using tables and graphs.

(c) Solve simple equations and inequalities at the appropriate level.

(d) Determine the reasonableness of results of problems regarding algebra.

7. For the area of precalculus:

(a) Express problems by using directed graphs and matrices.

(b) Present problem situations by using sequences involving recurrence relations.

(c) Investigate limits informally by examining infinite series and sequences.

(d) Interpret and determine maximum and minimum points from a graph representing a specific application.

8. For the area of functions:

(a) Analyze sequences to formulate generalizations.

(b) Describe and interpret a situation from everyday life that is depicted on a graph.**]**

SCIENCE

Statutory Authority: 385.080

Chapter 389 of NAC is hereby amended by adding the provisions effective July 1, 1999 as follows:

389.491 Science*: Generally* ~~[**in all grades.** A course of study in science in all grades of high school must include instruction designed to teach the pupil to:~~

~~1. Evaluate quantitative information using the scientific method.~~

~~2. Develop and enhance skills in observation, communication, classification, inference and prediction.~~

~~3. Use critical and creative thinking in solving scientific problems.~~

~~4. Demonstrate confidence and excitement in learning science through relevant experiences, innovative instruction, discrepant events and activities in which pupils are required to participate.~~

~~5. Develop a positive feeling for science through an understanding of the history of science, opportunities for careers in science and the relationship of science to daily living.~~

~~6. Explore the relationship between science and technology and the effects of that relationship on society and the environment.~~

~~7. Explore the relationships between science and other courses of study.~~

~~8. Recognize that science is an ongoing process, rather than merely a body of knowledge.]~~

1. A local school district shall ensure that pupils, by the completion of the twelfth grade, are able to comply with the content and performance standards for science listed in NAC 389. In carrying out this requirement, the district shall:

(a) Develop courses which must encompass all of the content and performance standards required for science by the completion of the twelfth grade; and

(b) Make available to each pupil enrolling in high school a listing of the courses that encompass all of the content and performance standards required for science by the completion of the twelfth grade.

2. A pupil who ***enrolls in specific*** science courses listed under NAC 389.492 to 389.498, inclusive, shall ***be notified in writing by the school district at the time of enrollment that:***

(a) The objectives of the specific courses may include additional science standards above those required to be completed by the end of grade 12; and

(b) The specific courses are not designed to ensure that all content and performance standards required to be completed by the end of grade 12 will be covered through completion of a specific course or courses unless included in the listing of courses identified under Subsection 1.

The following Science regulations are hereby repealed effective July 1, 1999:

NAC 389.265, NAC 389.315, NAC 389.365, NAC 389.405, NAC 389.410, NAC 389.415, and NAC 389.4985.

TEXT OF REPEALED SECTIONS

[389.265 Science. The courses in science offered in public schools must include instruction designed to teach the pupil by completion of the third grade to:

1. Use skills related to the scientific method of study, including observation, communication, classification, inference and prediction.

2. Demonstrate curiosity in the study of science, individually and as a member of a group, using a variety of materials.

3. Show respect for the natural world.

4. Understand the value of science in daily living.

5. Understand that there are many forms of living things.

6. Identify the resources that are needed for living things to grow.

7. Recognize how the environment affects living things.

8. Describe how living things change.

9. Understand that all living things have a life cycle.

10. Understand that all things are composed of matter.

11. Identify various forms of energy.

12. Explain how energy is used in doing work.

13. Observe and explain changes in the earth.

14. Identify predictable patterns in the universe.

15. Value the principles of conservation of natural resources and of preservation of the environment and understand how those principles directly affect human life.

16. Demonstrate an awareness of the interrelationship among and the integration of science, technology, society and the environment.**]**

[389.315 Science. The courses in science offered in public elementary schools must include instruction designed to teach the pupil by completion of the sixth grade to:

1. Use each step of the scientific method of study.

2. Use written, oral and pictorial methods of communication.

3. Measure length, mass and volume using the metric and English (standard) systems.

4. Demonstrate the ability to think critically.

5. Use a variety of scientific tools.

6. Show an interest in science through the meaningful application of scientific concepts.

7. Demonstrate respect for the environment through the pupil's attitude and actions.

8. Express confidence in the use of scientific concepts, individually and as a member of a group.

9. Use and care for scientific equipment, including microscopes, computers and other scientific tools.

10. Understand the cyclical and systemic nature of the world.

11. Recognize the sequential nature of natural processes.

12. Delineate and classify groups of things having similar characteristics.

13. Understand that the natural environment is constantly changing.

14. Recognize that interactions of matter and energy determine the nature of the environment.

15. Understand that natural phenomena are limited by the nature of matter and energy.

16. Recognize the broad range of occupations and professions that require scientific knowledge.

17. Demonstrate an awareness of the historical impact of persons who have contributed to modern advances in technology.

18. Recognize how science is related to the community and society.

19. Understand the interrelationship of science with other educational disciplines, including languages, music, art, mathematics and social studies.

20. Understand the importance of science in all aspects of life and its significance to every person, regardless of race, sex or level of ability.

21. Explain how technology and human activities have affected the environment and the future of life on earth.**]**

[389.365 Science. The courses in science offered in public elementary schools must include instruction designed to teach the pupil by completion of the eighth grade to:

1. Recognize problems in the study of science.

2. Formulate questions related to the study of science.

3. Collect and analyze data related to the solution of scientific problems.

4. Draw conclusions based on scientific data.

5. Use diagrams and appropriate oral and written forms of communication to report the results obtained from solving a scientific problem.

6. Demonstrate an open mind in the study of science.

7. Make judgments or withhold judgment based on available evidence.

8. Show a willingness to change judgments as new evidence becomes available.

9. Demonstrate curiosity and persistence in the solution of scientific problems.

10. Show an interest in pursuing science as a lifelong endeavor.

11. Recognize the misuse and limitations of science.

12. Demonstrate a sense of responsibility for the environment.

13. Recognize the contributions of science and technology to daily living.

14. Recognize the obligation of each person to have a basic understanding of the principles of science.

15. Demonstrate the ability to solve problems in cooperation with other persons.

16. Recognize that science can aid in understanding local, state, national and international problems and issues.

17. Exhibit the ability to assess, evaluate and make responsible decisions concerning the solution of local, state, national and international problems and issues.

18. Understand the opportunities for involvement in the community and employment in fields relating to science, technology and the environment.

19. Recognize that mathematics is used to communicate scientific principles and understand that mathematics is a necessary component of scientific knowledge.

20. Recognize technology as the application of science and understand that technology is a necessary component of scientific knowledge.

21. Understand that natural phenomena have many similarities and differences.

22. Understand that the natural environment is constantly changing.

23. Understand that rules of cause and effect make it possible to explain change.

24. Explain how the interaction of matter and energy determines the nature of the environment.

25. Recognize that the universe is comprised of systems within systems.

26. Understand that natural phenomena are limited by the nature of matter and energy.**]**

[389.405 Life science. A course of study in life science in the seventh or eighth grade must include instruction designed to teach the pupil to do the following:

1. Recognize and demonstrate a knowledge of the functions and cycles of life.

2. Organize and classify living organisms and understand general principles of taxonomy.

3. Identify the structure of cells and the function of tissues, organisms and higher levels of organization.

4. Understand photosynthesis and respiration.

5. Observe and differentiate between the anatomy of plants and animals.

6. Understand basic principles of genetics.

7. Understand environmental concepts and their relationship to the continuing existence of life.

8. Recognize, interpret or distinguish theories of the origin and development of life.]

[389.410 Earth science. A course of study in the seventh or eighth grade on earth science must include instruction designed to teach the pupil to do the following:

1. Demonstrate knowledge of the relationship between the boundaries of plates, zones of earthquakes and volcanic activity.

2. Explain the topography of the floor of the ocean, the sources of natural resources and the factors that influence physical cycles, such as water and climate.

3. Demonstrate a knowledge of global and local patterns of weather and related phenomena.

4. Describe the technological events leading to travel in space.

5. Understand the solar system and its place in the universe.

6. Use the principles of classification to identify common types of rock.

7. Describe the methods by which sedimentary, igneous and metamorphic rocks are formed.

8. Explain the forces that build up and wear down formations of the earth.

9. Demonstrate an awareness of the importance of mining to the history and economy of Nevada.

10. Demonstrate a general awareness of geologic history.

11. Distinguish between renewable and nonrenewable resources.

12. Demonstrate skill in reading and interpreting maps.

13. Develop an understanding of the chemical nature of matter.]

[389.415 Physical science. A course of study in physical science in the seventh or eighth grade must include instruction designed to teach the pupil to do the following:

1. Differentiate among the characteristics of matter.

2. Demonstrate a knowledge of the structure of matter.

3. Recognize patterns in the periodic chart of elements.

4. Define and distinguish the various forms of energy.

5. Describe how energy may be transformed from one form to another.

6. Recognize the scientific principles and the technological applications of motion, force, work and power.

7. Demonstrate a knowledge of the basic characteristics and technological applications of motion, electromagnetism and molecular energy.**]**

[389.4985 General science. A course of study in general science must allow the pupil, as appropriate to the course, to do the following upon completion of the course:

1. Demonstrate critical thinking and reasoning skills.

2. Identify the relationship between matter and energy.

3. Analyze the characteristics of the processes responsible for diversity and change in the universe.

4. Demonstrate an understanding of how to use mathematics as a method of communicating scientific results and to quantify and interpret data collected.

5. Explain the relationship among sciences and their use in various professions and industries and in everyday life.

6. Recognize the interdependence between organisms and their environment.

7. Understand the relationship between human activity and the environment.

8. Demonstrate an understanding of the structure and interdependence of living systems.

9. Demonstrate an understanding of metabolic processes.

10. Demonstrate an understanding of the forces and phenomena which affect the earth.

11. Explain the relationship between the structure and properties of matter.

12. Demonstrate an understanding of the transformation of energy and the laws of motion.**]**

INDIVIDUAL MATHEMATICS COURSES
RECOMMENDED TO REMAIN IN HIGH SCHOOL COURSE OF STUDY
NAC 389.468 TO NAC 389.484

NAC 389.468 Prealgebra. A course of study in prealgebra must include instruction designed to teach the pupil to do the following:

1. Demonstrate strategies for solving problems, including the use of sets, Venn diagrams, sketching diagrams, and techniques of estimation.

2. Solve and graph equations and inequalities of the first degree.

3. Demonstrate an understanding of exponents.

4. Evaluate algebraic expressions and algebraic formulas by using the correct order of operations.

5. Perform basic monomial operations.

6. Add and subtract polynomials.

7. Formulate and solve problems in everyday life by using ratio, proportion and percentages.

8. Formulate and solve problems in everyday life by using the basic techniques of algebra.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.470 Algebra I. A course of study in Algebra I must include instruction designed to teach the pupil to do the following:

1. Formulate and solve problems in everyday life by using the basic techniques of algebra.

2. Solve and graph linear equations and linear inequalities.

3. Perform algebraic operations with polynomials.

4. Solve quadratic equations by algebraic methods.

5. Depict and represent problems or phenomena in everyday life by using algebra.

6. Depict and represent problems in everyday life by using matrices.

7. Solve linear equations by using algebraic methods.

8. Solve problems by using the basic laws of exponents and radicals.

9. Justify the logic of algebraic procedures by using field properties.

10. Formulate predictions based on collections of data points.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.472 Geometry. A course of study in geometry must include instruction designed to teach the pupil to do the following:

1. Investigate and compare the different geometric systems to develop an understanding of an axiomatic system.

2. Compare and contrast properties of geometric figures on a plane.

3. Investigate and draw three-dimensional objects.

4. Create and validate formulas for two-dimensional figures and three-dimensional objects.

5. Construct proofs for mathematical assertions, including indirect proofs and paragraph proofs.

6. Analyze and solve problems by using inductive reasoning and deductive reasoning.

7. Construct figures to discover and validate mathematical assertions.

8. Apply coordinate geometry to validate properties of geometric figures.

9. Investigate and solve problems by using relationships of the right triangle.

10. Formulate and solve problems in everyday life by using geometric models.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.474 Algebra II. A course of study in Algebra II must include instruction designed to teach the pupil to do the following:

1. Analyze the effect of changing parameters on graphs of functions.

2. Formulate and solve problems in everyday life by using matrices.

3. Investigate transformations on different classes of algebraic functions by using technology.

4. Solve linear and quadratic equations and inequalities by using algebraic methods and apply these skills to solving problems in everyday life.

5. Solve systems of equations and inequalities and apply these skills to solving problems in everyday life.

6. Solve algebraic problems by using absolute value, exponential functions and logarithmic functions.

7. Prove algebraic assertions by using field properties.

8. Organize data to aid in the interpretation of data and to make predictions on the basis of such data.

9. Represent and solve problems by using linear programming and difference equations.

10. Develop the complex system of numbers.

11. Investigate series and sequences.

12. Investigate different principles of counting and their use in probability.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.476 Trigonometry. A course of study in trigonometry must include instruction designed to teach the pupil to do the following:

1. Solve problems in everyday life by using transformations, coordinates and vectors.

2. Validate mathematical assertions by using techniques of trigonometry.

3. Demonstrate how phenomena occur in everyday life by using trigonometric and circular functions.

4. Investigate the connections between trigonometric functions, polar coordinates, series and complex numbers.

5. Investigate transformations on trigonometric functions by using technology.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.478 Analytic geometry. A course of study in analytic geometry must include instruction designed to teach the pupil to do the following:

1. Demonstrate an understanding of coordinate geometry.

2. Recognize the equations of conic sections in both polar and rectangular forms.

3. Recognize the three-dimensional conic sections generated by the revolution of a locus of points.

4. Use and sketch the graphs of the polynomial functions and the rational functions.

5. Demonstrate the translation and rotation of axes in a two-dimensional system.

6. Demonstrate an understanding of the operation on a vector and the properties of vectors.

7. Write vectors and parametric equations to solve problems.

8. Demonstrate the translation and rotation of axes in a three-dimensional system.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.480 Precalculus. A course of study in precalculus must include instruction designed to teach the pupil to do the following:

1. Analyze the graphs of polynomial, rational, radical and transcendental functions by using technology.

2. Determine the maximum and minimum points of a graph and interpret the results in situations involving problems in everyday life.

3. Investigate limits by examining infinite sequences and series and areas under curves.

4. Investigate different techniques available to solve problems in everyday life.

5. Solve problems in everyday life by using complex numbers and vectors.

6. Investigate the relationship between vectors and complex numbers.

7. Investigate and describe functions and their inverses by using techniques to sketch curves.

8. Investigate and describe the general properties and behavior of classes of functions.

9. Validate mathematical assertions by using mathematical induction.

10. Solve problems in everyday life by applying the techniques of elementary probability and statistics.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.482 Calculus. A course of study in calculus must include instruction designed to teach the pupil to do the following:

1. Interpret limits geometrically and evaluate them.

2. Differentiate between continuous functions and noncontinuous functions.

3. Analyze domains of functions.

4. Differentiate rational, transcendental and implicitly defined functions.

5. Investigate the upper and lower sums of a function by using technology.

6. Analyze the graphs of functions by using technology.

7. Integrate elementary functions.

8. Solve problems in everyday life by using the techniques of calculus.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 4-1-92)

NAC 389.484 Probability and statistics. A course of study in probability and statistics must include instruction designed to teach the pupil to do the following:

1. Analyze the effects of transformations of data on measures of central tendency and variability.

2. Design a statistical experiment to study a problem occurring in everyday life, interpret and communicate the outcomes, and test the hypothesis by using the appropriate statistics.

3. Analyze sets of data assumed to be distributed normally by using the properties of a normal curve.

4. Demonstrate an understanding of notations for combinations and permutations.

5. Apply the concept of a random variable to generate and interpret probability distributions including binomial, uniform, normal and chi square.

6. Solve problems in everyday life by using the techniques of statistical analysis.
7. Solve problems in everyday life by using conditional probability.

8. Formulate and solve problems in the physical world by using techniques in statistical analysis.

INDIVIDUAL SCIENCE COURSES
RECOMMENDED TO REMAIN IN HIGH SCHOOL COURSE OF STUDY
NAC 389.492 TO NAC 389.498

NAC 389.492 Life science. In addition to the course of study in science required for all grades of high school, a course of study in life science must include instruction designed to teach the pupil to do the following, as appropriate to the specific course in life science:

1. Demonstrate the active use of critical thinking and logical reasoning.

2. Identify relationships between matter and energy.

3. Analyze the characteristics and organization of the processes that cause diversity and change in the universe.

4. Recognize the interdependence of organisms and their environment.

5. Understand that mathematics is used to communicate scientific principles.

6. Use mathematics in collecting and interpreting scientific data.

7. Explain the relationship among scientific disciplines and their relationship to choosing a career, industry and daily living.

8. Understand environmental concepts as they relate to life science.

9. Demonstrate an understanding of the continuity and development of life forms.

10. Demonstrate an understanding of the structure and interdependence of living systems.

11. Demonstrate an understanding of metabolic processes.

(Added to NAC by Bd. of Education, eff. 12-16-82; A 5-4-87; 3-27-92)

NAC 389.494 Earth science. In addition to the course of study in science required for all grades of high school, a course of study in earth science must include instruction designed to teach the pupil to do the following, as appropriate to the specific course in earth science:

1. Demonstrate the active use of critical thinking and logical reasoning.

2. Identify relationships between matter and energy.

3. Analyze the characteristics and organization of the processes that cause diversity and change in the universe.

4. Recognize the interdependence of organisms and their environment.

5. Understand that mathematics is used to communicate scientific principles.

6. Use mathematics in collecting and interpreting scientific data.

7. Explain the relationship among scientific disciplines and their relationship to choosing a career, industry and daily living.

8. Understand environmental concepts as they relate to earth science.

9. Demonstrate an understanding of geology, oceanography, meteorology and other phenomena related to earth science.

10. Demonstrate an understanding of the solar system and the universe.
(Added to NAC by Bd. of Education, eff. 5-4-87; A 3-27-92)

NAC 389.496 Physical science. In addition to the course of study in science required for all grades of high school, a course of study in physical science must include instruction designed to teach the pupil to do the following, as appropriate to the specific course in physical science:

1. Demonstrate the active use of critical thinking and logical reasoning.

2. Identify relationships between matter and energy.

3. Analyze the characteristics and organization of the processes that cause diversity and change in the universe.

4. Recognize the interdependence of organisms and their environment.

5. Understand that mathematics is used to communicate scientific principles.

6. Use mathematics to quantify science and in collecting and interpreting scientific data.

7. Explain the relationship among scientific disciplines and their relationship to choosing a career, industry and daily living.

8. Understand environmental concepts as they relate to physical science.

9. Explain the relationship between the structure and properties of matter.

10. Demonstrate an understanding of the transformation of energy, the forces of nature, motion and the relationship of cause and effect in those contexts.

(Added to NAC by Bd. of Education, eff. 5-4-87; A 3-27-92)

NAC 389.498 Environmental science. In addition to the course of study in science required for all grades of high school, a course of study in environmental science must include instruction designed to teach the pupil to do the following:

1. Demonstrate the active use of critical thinking and logical reasoning.

2. Identify relationships between matter and energy.

3. Analyze the characteristics and organization of the processes that cause diversity and change in the universe.

4. Recognize the interdependence of organisms and their environment.

5. Understand that mathematics is used to communicate scientific principles.

6. Use mathematics to quantify science in collecting and interpreting scientific data.

7. Explain the relationship among scientific disciplines and their relationship to choosing a career, industry and daily living.

8. Understand environmental concepts as they relate to human activities.

9. Demonstrate an understanding of the interrelationship among components of the biosphere.

10. Demonstrate an understanding of succession.

11. Demonstrate an understanding of the effect of technology on the environment.

12. Demonstrate an understanding of the environmental effects of change in the biosphere.

DEPARTMENT OF EDUCATION

ADOPTED TEMPORARY REGULATION OF THE STATE BOARD OF EDUCATION/STATE BOARD FOR OCCUPATIONAL EDUCATION

LEGISLATIVE REVIEW OF ADOPTED REGULATIONS AS REQUIRED BY ADMINISTRATIVE PROCEDURES ACT, NRS 233B.066
NAC 389, Courses of Study in Reading, Language, English, Mathematics and Science

IMPACT STATEMENT

The following statement is submitted for adopted amendments to Nevada Administrative Code (NAC) 389, Courses of Study in Reading, Language, English, Mathematics and Science:

1. A description of how public comment was solicited, a summary of public response, and explanation how other interested persons may obtain a copy of the summary.

Notice of Workshop to Solicit Comments on Proposed Regulations was sent to approximately one-hundred fifty individuals and educational organizations. One workshop was held May 21, 1999. There were no comments from the public.

The Notice of Intent to Act Upon a Regulation for public hearing on the proposed revisions to NAC 389 was sent to approximately one-hundred fifty individuals and educational organizations. One public hearing was conducted on May 22, 1999, to provide the opportunity for comments by affected parties and the public. There were no comments from the public.

2. The Number of Persons Who:

a) Attended Each Hearing:	Workshop: 10	First Hearing: 10	Second Hearing: n/a
b) Testified at Each Hearing;	Workshop: 0	First Hearing: 1	Second Hearing: n/a **and,**
c) Submitted Written Statements	Workshop: 0	First Hearing: 0	Second Hearing: n/a

No written comments were submitted.

A copy of any written comments may be obtained by calling LaDonna Byrd, Board Secretary, at the Department of Education (775) 687-9225, or by writing to the Department of Education, 700 East Fifth Street, Carson City, Nevada 89701-5096.

3. A description of how comment was solicited from affected businesses, a summary of the response and an explanation how other interested parties may obtain a copy of the summary.

Comment was solicited through the workshop notice and public hearing notices of April 19, 1999.

At the public hearing, comment from interested parties were as follows: James Morrison, Ph.D., The Thinking Network, spoke regarding an alternative method for presenting curriculum.

A copy of the summary and/or minutes of the public hearing may be obtained by calling LaDonna Byrd, Board Secretary, at the Department of Education (775) 687-9225, or by writing to the Department of Education at 700 East Fifth Street, Carson City, Nevada 89701-5096.

4. If the regulation was adopted with or without change to any part of the proposed regulation, a summary of the reasons for adopting.

The temporary regulation was adopted by the Nevada State Board of Education at the public hearing held May 22, 1999, without revision to the proposed language.

5. The estimated economic effect of the adopted regulation on the business which it is to regulate and on the public. These must be stated separately, and each case must include:

There is no economic effect on the business which is regulated. There is no estimated economic effect on the public, either adversely or beneficially, nor immediate or long term.

6. The estimated cost to the agency for enforcement of the adopted regulation.

There is no additional cost to the agency for enforcement of this regulation.

7. A description of any regulations of other state or government agencies which the proposed regulation overlaps or duplicates and a statement explaining why the duplication or overlapping is necessary. If the regulation overlaps or duplicates a federal regulation, the name of the regulating federal agency.

No other state or government agency regulations will be overlapped or duplicated by the above noted regulations. There is no duplication or overlap of federal regulations.

8. If the regulation includes provisions which are more stringent than a federal regulation which regulates the same activity, a summary of such provisions.

There are none.

9. If the regulation provides a new fee or increases an existing fee, the total annual amount the agency expects to collect and the manner in which the money will be used.

This regulation does not provide or involve a new fee.