# LCB File No. R038-00

# PROPOSED REGULATION OF THE STATE BOARD OF EDUCATION

## STATE BOARD FOR OCCUPATIONAL EDUCATION

The Council to Establish Academic Standards for Public Schools will hold a Workshop to Solicit Comments on March 8, 2000, and the State Board of Education will hold a one-time only public hearing on March 18, 2000/

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

Authority: 385.080 and 389.110.

**Section 1.** Chapter 389 of NAC is hereby amended by adding thereto the provisions set forth as sections 2 to 6, inclusive, of this regulation to read as follows:

**Section 2.** ***By the end of the third grade, pupils must know and be able to do everything required in the previous grades for courses in computer and technology education offered in public elementary schools. Instruction in the third grade in computer and technology education must be designed so that pupils meet the following performance standards by the completion of third grade:***

***1. For the area of problem solving, to develop the ability to solve problems, a pupil will utilize problem-solving processes through the use of resources to reach a desired outcome as demonstrated by the pupil's ability to:***

***(a) Contribute to the definition of the problem;***
***(b) Recognize problem solving models;***
***(c) Discuss the steps (e.g., problem, plan, solution, evaluation) of a design/problem-solving model; and***
***(d) Identify effective and ineffective designs.***

***2. For the area of productivity tools, a pupil must be able to use appropriate productivity tools including but not limited to word processing, spreadsheet, database, multimedia and telecommunications as demonstrated by the pupil's ability to:***

***(a) Locate and use letters, numbers, and special keys on a keyboard using the left and right hand as appropriate;***
***(b) Type and edit an existing document;***
***(c) Search a database to locate specific information;***

*(d) Utilize a pre-designed spreadsheet to enter simple labels, values and formulas. Grade appropriate formulas would be three cell (e.g.2+2=4);*
*(e) Use multimedia software;*
*(f) Explain the purpose of a multimedia presentation;*
*(g) Create and save files on various storage media;*
*(h) Identify the differences between a network and a stand- alone computer system; and*
*(i) Identify a variety of electronic communication devices.*

*3. For the area of research tools, a pupil must be able to use various technology tools to research information and evaluate its accuracy and appropriateness in order to solve problems and make decisions as demonstrated by the pupil's ability to:*

*(a) Contribute an idea for topic or definition of problem;*
*(b) Contribute one appropriate keyword to the group and enter the keyword to conduct an electronic search;*
*(c) Works within a group to successfully select research materials;*
*(d) Identify an organizational tool and place information within the format;*
*(e) Participate in sharing his portion of the research; and*
*(f) Summarize the class research process and is able to discuss the results.*

*4. For the area of tools and processes, a pupil must be able to identify, apply concepts, and manage various tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions as demonstrated by the pupil's ability to:*

*(a) Identify tools and resources as used in computers and technology;*
*(b) Regularly select and manipulate tools for tasks in computer and technology areas;*
*(c) Demonstrate the importance of safety while working with computers and technology; and*
*(d) Regularly resolve difficulties using tools or devices, with guided practice.*

*5. For the area of systems, a pupil must be able to recognize that systems are made up of individual components and that each component affects the operation of the system and its relationship with other systems as demonstrated by the pupil's ability to:*

*(a) List the parts of an open and closed loop system;*
*(b) Given a system, explain how the parts of a system work together to achieve the desired outcome; and*
*(c) List and group technological systems. (i.e. construction, communications, energy, power, transportation, biotechnology, and manufacturing)*

*6. For the area related to implications on society, a pupil will be able to evaluate the impact and ethical implication on individuals, society and the environment as demonstrated by the pupil's ability to:*

*(a) Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide;*
*(b) Explain computer piracy and its implications;*

***(c) Use proper etiquette when using electronic communications;***
***(d) List changes around the school and in the community as a result of technology;***
***(e) With teacher help, list several careers that exist today that were not in existence when the student was born; and***
***(f) Explain how physical environments are changed by human activity through technology.***

***Section 3. By the end of the fifth grade, pupils must know and be able to do everything required in the previous grades for courses in computer and technology education offered in public elementary schools. Instruction in the fifth grade in computer and technology education must be designed so that pupils meet the following performance standards by the completion of fifth grade:***

***1. For the area of problem solving, to develop the ability to solve problems, a pupil will utilize problem-solving processes through the use of resources to reach a desired outcome as demonstrated by the pupil's ability to:***

***(a) Given various process models, explain a design/problem-solving model;***
***(b) Effectively use the steps (e.g., problem, plan, solution, evaluation) of a design/problem-solving model; and***
***(c) Explain effective and ineffective designs.***

***2. For the area of productivity tools, a pupil must be able to use appropriate productivity tools including but not limited to word processing, spreadsheet, database, multimedia and telecommunications as demonstrated by the pupil's ability to:***

*(a)* ***Demonstrate and use correct finger placement for basic keyboarding skills;***
*(b)* ***Use basic formatting techniques such as font selection, size and color;***
*(c)* ***Use tools such as spell-check to edit a composed document;***
*(d)* ***Include a graphic in a document;***
*(e)* ***Print a document;***
*(f)* ***Create a database using predefined fields (Fields and formulas are listed for entry in a database and spreadsheet.);***
*(g)* ***Enter data for multiple records;***
*(h)* ***Print reports based on sort and query; (A search for certain criteria in a specified field.);***
*(i)* ***Construct a guided spreadsheet;***
*(j)* ***Create a multimedia document or presentation using text, graphics and/or sound to organize and present an idea;***
*(k)* ***Describe and use the file management software of a computer;***
*(l)* ***Explain the differences between data files, program files, and operating system files;***
*(m)* ***Describe access privileges and demonstrate the process where possible;***
*(n)* ***Identify a LAN.***
*(o)* ***Explain the uses of electronic communication device; and***
*(p)* ***Define distance learning, telecommuting and teleconferencing.***

***3. For the area of research tools, a pupil must be able to use various technology tools to research information and evaluate its accuracy and appropriateness in order to solve problems and make decisions as demonstrated by the pupil's ability to:***

*(a)* ***With teacher or media specialist direction, individually select a research topic or define a problem giving a possible outcome and listing available technology tools to be used;***
*(b)* ***With teacher or media specialist direction, generate a list of keywords to conduct an electronic search;***
*(c)* ***With teacher or media specialist help, explore hyperlinks to select and evaluate information useful to the research of a topic or problem;***
*(d)* ***Identify an organizational tool and place information within the format working in a group;***
*(e)* ***Demonstrate an understanding of intellectual property and identify source and content of information collected;***
*(f)* ***Collaboratively list sources used; and***
*(g)* ***With teacher or media specialist assistance, summarize the research process and evaluate its outcome.***

***4. For the area of tools and processes, a pupil must be able to identify, apply concepts, and manage various tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions as demonstrated by the pupil's ability to:***

*(a)* ***List technological resources (e.g., people, information, materials, machines, energy, effort, capital, and time);***
*(b)* ***Demonstrate the use of tools and materials to design/develop products/projects;***
*(c)* ***Select and demonstrate the safe use of tools; and***
*(d)* ***Identify situations where incorrect, inoperable, or inappropriate tools are being used and cooperatively take appropriate actions.***

***5. For the area of systems, a pupil must be able to recognize that systems are made up of individual components and that each component affects the operation of the system and its relationship with other systems as demonstrated by the pupil's ability to:***

*(a)* ***List the parts of open, closed, simple, complex, micro and macro systems;***
*(b)* ***Cooperatively identify resources necessary to operate a system to achieve a desired outcome; and***
*(c)* ***Given a multitude of systems, sort according to type and level (e.g. open / closed / macro / micro / simple / complex).***

***6. For the area related to implications on society, a pupil will be able to evaluate the impact and ethical implication on individuals, society and the environment as demonstrated by the pupil's ability to:***

*(a)* ***Explain how a given object was developed to meet a human need or want;***
*(b)* ***Communicate the positive or negative environmental outcomes of technology;***

*(c) Given a career, compare and contrast the technological developments within that career; and*
*(d) Discuss changes in information technologies and the effect these changes have on the workplace and society.*

***Section 4. By the end of the eighth grade, pupils must know and be able to do everything required in the previous grades for courses in computer and technology education offered in public schools. Instruction in the eighth grade in computer and technology education must be designed so that pupils meet the following performance standards by the completion of eighth grade:***

***1. For the area of problem solving, to develop the ability to solve problems, a pupil will utilize problem-solving processes through the use of resources to reach a desired outcome as demonstrated by the pupil's ability to:***

*(a) Describe more than one design/problem-solving method;*
*(b) Select an appropriate design/problem-solving method; and*
*(c) Generate a desired outcome using a problem-solving method.*

***2. For the area of productivity tools, a pupil must be able to use appropriate productivity tools including but not limited to word processing, spreadsheet, database, multimedia and telecommunications as demonstrated by the pupil's ability to:***

*(a) Demonstrate proficiency and accuracy in keyboarding skills;*
*(b) Type, edit and print a document;*
*(c) Use advanced formatting techniques such as margins, line spacing and tabs;*
*(d) Import graphics with appropriate placement;*
*(e) Search and Replace text;*
*(f) Create a database, define fields and enter data for multiple records;*
*(g) Print reports based on sort and query;*
*(h) Develop a spreadsheet including labels, values, formulas and functions;*
*(i) Create a chart that visually represents data;*
*(j) Print a spreadsheet showing the formulas;*
*(k) Create a multi-page, multimedia presentation using text, graphics and sound to effectively communicate a concept;*
*(l) Organize files on a computer disk, hard drive, server, or other storage device;*
*(m) Explain how a LAN, Intranet and Internet operates versus a stand-alone system;*
*(n) Use an available electronic communication device (e-mail, fax, telephone, and two-way radios); and*
*(o) Explain the advantages of connectivity to share information and resources.*

***3. For the area of research tools, a pupil must be able to use various technology tools to research information and evaluate its accuracy and appropriateness in order to solve problems and make decisions as demonstrated by the pupil's ability to:***

*(a) With teacher and or media specialist assistance, select a research topic or develop a statement of a problem and identify its elements, scope, and expected outcomes;*
*(b) Independently generate a list of keywords to conduct a search using electronic-based sources;*
*(c) Use hyperlinks to explore search possibilities when collecting information;*
*(d) Place information within an organizational format;*
*(e) Demonstrate an understanding of intellectual property by citing sources of copyrighted materials in papers, projects and multimedia presentations;*
*(f) Analyze selected information for reliability authenticity and timeliness;*
*(g) Contribute to generating a standard bibliography working within a group; and*
*(h) Independently list the steps of the process and judge the outcome of the research.*

***4. For the area of tools and processes, a pupil must be able to identify, apply concepts, and manage various tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions as demonstrated by the pupil's ability to:***

*(a) List the tools and resources needed to solve a problem in a computer and technology area;*
*(b) Demonstrate the proper use of tools, instrumentation, equipment, materials, and processes while fabricating models, designs, simulations and prototypes;*
*(c) Given a situation, describe or define the correct use of tools, processes, and materials in diverse computers and technology applications; and*
*(d) Correctly operate and perform appropriate maintenance on technology tools.*

***5. For the area of systems, a pupil must be able to recognize that systems are made up of individual components and that each component affects the operation of the system and its relationship with other systems as demonstrated by the pupil's ability to:***

*(a) List resources necessary to achieve a desired outcome;*
*(b) Describe how one system's output could be input for another system;*
*(c) Given the systems in the areas of technology, cooperatively determine how they are controlled to achieve a desired outcome; and*
*(d) Select and use an appropriate system to achieve a given outcome.*

***6. For the area related to implications on society, a pupil will be able to evaluate the impact and ethical implication on individuals, society and the environment as demonstrated by the pupil's ability to:***

*(a) Practice legal and ethical behaviors when using information and technology, and discuss consequences of misuse;*
*(b) Compare how technology is affecting society and the environment;*
*(c) Discuss the impact of technology on career options; and*
*(d) Demonstrate that people control technologies and are responsible for their effects.*

***Section 5. By the end of the 12th grade, pupils must know and be able to do everything required in the previous grades for courses in computer and technology education offered in***

***public schools. Instruction in computer and technology education must be designed so that pupils meet the following performance standards by the completion of 12th grade:***

***1. For the area of problem solving, to develop the ability to solve problems, a pupil will utilize problem-solving processes through the use of resources to reach a desired outcome as demonstrated by the pupil's ability to:***

*(a)* ***Compare and contrast a variety of problem-solving approaches;***
*(b)* ***When given a problem, effectively design a problem-solving method; and***
*(c)* ***Create, with technical accuracy, designs/models to a problem in one of the four areas of technology.***

***2. For the area of productivity tools, a pupil must be able to use appropriate productivity tools including but not limited to word processing, spreadsheet, database, multimedia and telecommunications as demonstrated by the pupil's ability to:***

*(a)* ***Type a correctly formatted multi-page word processing document. Formatting to include, headers, footers, pagination, line spacing and margin settings;***
*(b)* ***Utilize appropriate tools such as spell check and thesaurus;***
*(c)* ***Create a database, define fields and enter data for multiple records;***
*(d)* ***Print reports based on sort and query;***
*(e)* ***Interpret report based on data;***
*(f)* ***Develop a spreadsheet including labels, values, formulas and functions;***
*(g)* ***Create and print a chart to visually represent data from a spreadsheet;***
*(h)* ***Print a spreadsheet showing the formulas;***
*(i)* ***Analyze the significance of the data in a spreadsheet;***
*(j)* ***Create and present a multi-page, multimedia presentations using three of the following, animation, digital video or linking using three of the following: text, graphics and sound.***
*(k)* ***Identify the intended message of a multimedia presentation;***
*(l)* ***Organize files on a computer disk, hard drive, server or other storage devices;***
*(m)* ***Compare and contrast a LAN, WAN, Intranet and the Internet;***
*(n)* ***Compare and analyze the appropriate uses of a variety of electronic communications; and***
*(o)* ***Locate and evaluate sources of distance learning, telecommuting and teleconferencing.***

***3. For the area of research tools, a pupil must be able to use various technology tools to research information and evaluate its accuracy and appropriateness in order to solve problems and make decisions as demonstrated by the pupil's ability to:***

*(a)* ***State a research topic/problem, list elements, limits, and expected outcomes;***
*(b)* ***Independently generate a list of keywords for a research topic/problem with qualifying modifiers to narrow the search of electronic-based sources;***
*(c)* ***Using a variety of search strategies, use hyperlinks to select information;***
*(d)* ***Select an organizational tool and accurately place collected information within the format to aid in making a decision;***
*(e)* ***Differentiate between the various types of information and makes selections of reliable, authentic and timely sources;***

*(f)* ***Create a standard bibliography or work cited page; and***
*(g)* ***Complete rubric for evaluation of the results and its outcome.***

***4. For the area of tools and processes, a pupil must be able to identify, apply concepts, and manage various tools and resources to evaluate their accuracy and appropriateness in solving problems and making decisions as demonstrated by the pupil's ability to:***

*(a)* ***Conduct research in a computer or technology area and explain how new tools, materials and processes are necessary to maintain and improve high productivity and quality;***
*(b)* ***Use tools, with minimal direction, to produce solutions in a computer or technology area;***
*(c)* ***Select the correct tool and process; and***
*(d)* ***Under supervision can correct non-functioning technology systems.***

***5. For the area of systems, a pupil must be able to recognize that systems are made up of individual components and that each component affects the operation of the system and its relationship with other systems as demonstrated by the pupil's ability to:***

*(a)* ***Explain the evolution of a given system or process;***
*(b)* ***Design a model of a system to produce a desired outcome; and***
*(c)* ***Given a system, identify possible ways to improve the product, productivity, and/or management.***

***6. For the area related to implications on society, a pupil will be able to evaluate the impact and ethical implication on individuals, society and the environment as demonstrated by the pupil's ability to:***

*(a)* ***Compare and contrast the impacts of new products and services on the quality of life;***
*(b)* ***Given a technology, determine possible outcomes and their acceptability;***
*(c)* ***Develop a career plan;***
*(d)* ***Discuss the advantages and disadvantages of widespread use of and reliance on technology in the workplace and in society as a whole.***

**Section 6.** NAC 389.290, NAC 389.340, NAC 389.390, NAC 389.500, NAC 389.502, and NAC 389.504 are hereby repealed.

## TEXT OF REPEALED SECTIONS

**NAC 389.290 Computers and other related technology.**

1. The courses in computers offered in public elementary schools must include instruction designed to teach the pupil by completion of the third grade to:

(a) Use a computer and other related technology in areas in which they are appropriate.
(b) Use computer terminology correctly.
(c) Locate numbers, letters and commonly used special keys on a keyboard.
(d) Load and run a program.
(e) Recognize that the computer and other related technology are tools for work and play.

(f) Describe how computers and other related technology are used in the community.

2. Each pupil must create at least two computer-generated products before the completion of the third grade.

**NAC 389.340 Computers and other related technology.**

1. The courses in computers offered in public elementary schools must include instruction designed to teach the pupil by completion of the sixth grade to:

(a) Use a computer and other related technology in areas in which they are appropriate.

(b) Use computer terminology correctly.

(c) Develop skills concerning the use of a keyboard.

(d) Operate computer hardware.

(e) Use a computer program and other related technology to solve problems.

(f) Develop word-processing skills.

(g) Identify the ways in which a computer and other related technology may be used.

2. The courses in computers offered in public elementary schools must also examine:

(a) The computer skills and other related technology required in various occupations.

(b) The ethical responsibilities of a person who uses a computer or other related technology.

3. Each pupil must create at least two computer-generated products before the completion of the sixth grade which demonstrate his ability to communicate through the use of a computer.

**NAC 389.390 Computers and other related technology.** The courses in computers offered in public elementary schools must include instruction designed to teach the pupil by completion of the eighth grade to:

1. Use a computer and other related technology in areas in which they are appropriate.

2. Operate computer hardware, peripherals and other related devices.

3. Develop his skills concerning the use of a keyboard.

4. Use computers and other related technology to collect and analyze information and solve problems.

5. Compose, edit and print text using a word-processing program.

6. Describe the major historical developments in computing.

7. Identify how a computer and other related technology are used in a variety of occupations.

8. Use data-base, spreadsheet and word-processing programs for various tasks.

9. Understand the misuses of computers and other related technology and the consequences of such misuses, including, without limitation, computer viruses, copyright laws and criminal laws related to the unauthorized access to a computer system.

**NAC 389.500 Computer literacy.** A course of study in computer literacy must:

1. Identify potential career opportunities using computer skills and describe the skills required for such careers.

2. Demonstrate the ways in which computer software, hardware and peripherals may be used to meet personal needs.

3. Explain the ways in which the use of a computer may lead to the invasion of the privacy of a person.

4. Explain the relevant issues related to copyright laws, security of data and ethics in the use of information.

5. Explore recent historical developments of the computer and understand their implications for the future.

6. Require pupils to:

(a) Demonstrate an understanding of concepts related to word processing, data bases, speadsheets, telecommunications, multimedia presentations, graphics and desktop publishing.

(b) Create, edit, store and print text using a word-processing program.

**NAC 389.502 Application of computers.** A course of study in the application of computers must include instruction designed to teach the pupil to do the following:

1. Create, store and retrieve personal files by using a data-base program.

2. Create, manipulate and make projections by using a spreadsheet program.

3. Create, edit, develop a format, store, retrieve and print text using a word-processing program.

4. Access a commercial data base or a simulated data base using telecommunications.

5. Demonstrate an understanding of applications of desktop publishing and multimedia presentations and the operation of a simple computer system.

**NAC 389.504 Science of computers.** A course of study in the science of computers must include instruction designed to teach the pupil to do the following:

1. Demonstrate knowledge of methods of problem solving through algorithm development.

2. Recognize the proper techniques of designing, documenting and correcting errors, deficiencies or other problems with a program.

3. Use the proper syntax and semantics of high-level programming language.

4. Use basic aspects of string processing, recursion, internal search and sort methods, and simple data procedures.

5. Demonstrate an understanding of the architecture of a simple computer system.

6. Operate a simple computer system.