

CHAPTER 3501
DEPARTMENT OF EDUCATION
STATEWIDE RIGOROUS CORE
ACADEMIC STANDARDS

ACADEMIC STANDARDS IN LANGUAGE ARTS		3501 0575	GRADE 3 STANDARDS
3501 0505	KINDERGARTEN STANDARDS	3501 0580	GRADE 4 STANDARDS
3501 0510	GRADE 1 STANDARDS	3501 0585	GRADE 5 STANDARDS
3501 0515	GRADE 2 STANDARDS	3501 0590	GRADE 6 STANDARDS
3501 0520	GRADE 3 STANDARDS	3501 0595	GRADE 7 STANDARDS
3501 0525	GRADE 4 STANDARDS	3501 0600	GRADE 8 STANDARDS
3501 0530	GRADE 5 STANDARDS	3501 0605	GRADES 9 THROUGH 11 STANDARDS
3501 0535	GRADE 6 STANDARDS	3501 0610	GRADES 11 AND 12 STANDARDS FOR ELECTIVE COURSES
3501 0540	GRADE 7 STANDARDS		
3501 0545	GRADE 8 STANDARDS		
3501 0550	GRADES 9 THROUGH 12 STANDARDS		
ACADEMIC STANDARDS IN MATHEMATICS			ACADEMIC STANDARDS IN THE ARTS
3501 0560	KINDERGARTEN STANDARDS	3501 0620	KINDERGARTEN THROUGH GRADE 3 STANDARDS
3501 0565	GRADE 1 STANDARDS	3501 0625	GRADES 4 AND 5 STANDARDS
3501 0570	GRADE 2 STANDARDS	3501 0630	GRADES 6 THROUGH 8 STANDARDS
		3501 0635	GRADES 9 THROUGH 12 STANDARDS

ACADEMIC STANDARDS IN LANGUAGE ARTS

3501.0505 KINDERGARTEN STANDARDS.

Subpart 1 **Reading and literature.** The student will listen to and begin to read and understand grade-appropriate English language text

A. Word recognition, analysis, and fluency. The student will understand and apply knowledge of the sounds of the English language (phonemic awareness) and of the sound-symbol relationship (phonics)

B Vocabulary expansion The student will use a variety of strategies to develop and expand reading, listening, and speaking vocabularies.

C Comprehension The student will listen to and understand the meaning of text

D Literature The student will read or listen to a variety of texts

Subp 2 **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes

A. Types of writing Writing is addressed in subpart 1, item A

B Elements of composition Standards under this heading may be locally determined

C. Spelling, grammar, and usage The student will begin to recognize correct spelling and punctuation

D. Research Standards under this heading may be locally determined.

E Handwriting and word processing The student will form letters and numbers

Subp 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media

A Speaking and listening The student will communicate effectively through listening and speaking.

B Viewing The student will become familiar with the structure of printed material.

Statutory Authority: *MS s 120B 021*

History: 28 SR 699

MINNESOTA RULES 2004

3501.0510 GRADE 1 STANDARDS.

Subpart 1 **Reading and literature.** The student will read and understand grade-appropriate English language text.

A Word recognition, analysis, and fluency The student will understand and apply knowledge of the sounds of the English language (phonemic awareness), the sound-symbol relationship (phonics), and word recognition strategies to read grade-level materials with accuracy and emerging fluency

B. Vocabulary expansion The student will use a variety of strategies to develop and expand reading, listening, and speaking vocabularies

C Comprehension The student will actively engage in the reading process and use a variety of comprehension strategies to understand the meaning of texts that have been read or listened to

D Literature The student will actively engage in the reading process and read, understand, respond to, and appreciate a wide variety of fiction, poetic, and nonfiction texts

Subp 2 **Writing.** The student will write clearly and coherently to communicate effectively for a variety of audiences and purposes

A Types of writing The student will compose various pieces of writing.

B. Elements of composition The student will demonstrate emerging knowledge of a writing process with attention to organization, topic, and quality of ideas

C Spelling, grammar, and usage The student will demonstrate emerging knowledge of punctuation, spelling, and capitalization.

D. Research The student will locate and use information in reference materials

E Handwriting and word processing. The student will improve the student's handwriting

Subp 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening The student will communicate effectively through listening and speaking

B Viewing The student will become familiar with the structure of printed material.

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0515 GRADE 2 STANDARDS.

Subpart 1 **Reading and literature.** The student will read and understand grade-appropriate English language text

A. Word recognition, analysis, and fluency The student will understand and apply knowledge of the sounds of the English language (phonemic awareness), the sound-symbol relationship (phonics), and word recognition strategies to read grade-level materials with accuracy and fluency

B Vocabulary expansion The student will use a variety of strategies to expand reading, listening, and speaking vocabularies

C Comprehension The student will actively engage in the reading process and use a variety of comprehension strategies to understand the meaning of texts that have been read.

D Literature. The student will actively engage in the reading process and read, understand, respond to, and appreciate a wide variety of fiction, poetic, and nonfiction texts

MINNESOTA RULES 2004

3501.0515 STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS

60

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes, demonstrating an emerging knowledge and application of skills.

A. Types of writing The student will compose narrative and informational pieces of writing.

B. Elements of composition The student will demonstrate increased emerging knowledge in a writing process, with attention to organization, focus, and quality of ideas.

C. Spelling, grammar, and usage The student will apply standard English conventions when writing.

D. Research The student will locate and use information in reference materials

E. Handwriting and word processing. The student will begin to write legibly

Subp. 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media

A. Speaking and listening The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Viewing. The student will become familiar with the structure of printed material

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0520 GRADE 3 STANDARDS.

Subpart 1 **Word recognition, analysis, and fluency.** The student will read and understand grade-appropriate English language text

A. Word recognition, analysis, and fluency. The student will apply word recognition strategies to decode unfamiliar multisyllabic words and will read grade-appropriate text with accuracy and fluency

B. Vocabulary expansion The student will use a variety of strategies to expand reading, listening, and speaking vocabularies

C. Comprehension The student will understand the meaning of texts using a variety of comprehension strategies and will demonstrate literal, interpretive, and evaluative comprehension

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts

Subp. 2 **Writing.** The student will write clearly and coherently to communicate effectively for a variety of audiences and purposes

A. Types of writing The student will compose various pieces of writing.

B. Elements of composition The student will engage in a writing process, with attention to organization, focus, and quality of ideas.

C. Spelling, grammar, and usage The student will apply standard English conventions when writing.

D. Research The student will locate and use information in reference materials

E. Handwriting and word processing The student will write legibly

Subp. 3. **Speaking, listening, and viewing.**

A. Speaking and listening The student will demonstrate understanding and communicate effectively through listening and speaking.

MINNESOTA RULES 2004

B Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0525 GRADE 4 STANDARDS.

Subpart 1 **Reading and literature.** The student will read and understand grade-appropriate English language text.

A Word recognition, analysis, and fluency. The student will decode unfamiliar words using phonetic and structural analysis and will read with fluency and expression.

B Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies

C. Comprehension. The student will understand the meaning of texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension

D. Literature The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes

A. Types of writing. The student will compose various pieces of writing

B. Elements of composition. The student will engage in writing, with attention to organization, focus, and quality of ideas.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research The student will locate and use information in reference materials

E. Handwriting and word processing. The student will write legibly and use a keyboard

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media

A. Speaking and listening The student will demonstrate understanding and communicate effectively through listening and speaking

B. Media literacy The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0530 GRADE 5 STANDARDS.

Subpart 1 **Reading and literature.** The student will read and understand grade-appropriate English language text

A Word recognition, analysis, and fluency The student will decode unfamiliar words using phonetic and structural analysis and will read with fluency and expression

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension The student will understand the meaning of texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension

D **Literature** The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts

Subp 2 **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes

A **Types of writing.** The student will compose various pieces of writing.

B **Elements of composition** The student will engage in a writing process, with attention to organization, focus, quality of ideas, audience, and a purpose.

C **Spelling, grammar, and usage.** The student will apply standard English conventions when writing

D. **Research** The student will locate and use information in reference materials.

E. **Handwriting and word processing.** The student will write legibly and demonstrate effective keyboarding skills

Subp 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A **Speaking and listening** The student will demonstrate understanding and communicate effectively through listening and speaking.

B **Media literacy.** The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0535 GRADE 6 STANDARDS.

Subpart 1 **Reading and literature.** Students will read and understand grade-appropriate English language text

A **Word recognition, analysis, and fluency.** The student will read with accuracy and fluency

B **Vocabulary expansion** The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. **Comprehension.** The student will understand the meaning of informational, expository, or persuasive texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D **Literature** The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts

Subp 2 **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes

A. **Types of writing** The student will create informative, expressive, and persuasive writing

B **Elements of composition** The student will engage in a writing process, with attention to organization, focus, quality of ideas, and a purpose

C **Spelling, grammar, and usage** The student will apply standard English conventions when writing

D. **Research** The student will locate and use information in reference materials

E. **Handwriting and word processing.** The student will write legibly and demonstrate effective keyboarding skills

Subp 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

MINNESOTA RULES 2004

63

STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS 3501.0545

A Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking

B Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas

Statutory Authority: *MS s 120B.021*

History: 28 SR 699

3501.0540 GRADE 7 STANDARDS.

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A Word recognition, analysis, and fluency The student will read with accuracy and fluency

B Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C Comprehension The student will understand the meaning of texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension

D. Literature The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp 2 **Writing.** The student will write clearly and coherently for a variety of audiences and purposes

A Types of writing. The student will create informative, expressive, and persuasive writing.

B. Elements of composition The student will engage in a writing process, with attention to context, organization, focus, quality of ideas, and a purpose

C Spelling, grammar, and usage The student will apply standard English conventions when writing

D Research The student will locate and use information in reference materials

E Handwriting and word processing The student will write legibly and demonstrate effective keyboarding skills

Subp. 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media

A Speaking and listening The student will demonstrate understanding and communicate effectively through listening and speaking

B Media literacy The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

Statutory Authority: *MS s 120B.021*

History: 28 SR 699

3501.0545 GRADE 8 STANDARDS.

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A Word recognition, analysis, and fluency Standards under this heading may be locally determined and based on the individual needs of the student

B Vocabulary expansion The student will use a variety of strategies to expand reading, listening, and speaking vocabularies

MINNESOTA RULES 2004

3501.0545 STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS

64

C **Comprehension** The student will understand the meaning of texts using a variety of strategies and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D **Literature.** The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp 2 **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes

A. **Types of writing.** The student will create informative, expressive, and persuasive writing

B. **Elements of composition** The student will engage in a writing process with attention to context, organization, focus, quality of ideas, and a purpose

C **Spelling, grammar, and usage.** The student will apply standard English conventions when writing.

D. **Research** The student will locate and use information in reference materials.

E **Handwriting and word processing** The student will write legibly and demonstrate effective keyboarding skills

Subp 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences, and actively listen to, view, and evaluate oral communication and media

A **Speaking and listening** The student will demonstrate understanding and communicate effectively through listening and speaking.

B **Media literacy** The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0550 GRADES 9 THROUGH 12 STANDARDS.

Subpart 1 **Reading and literature.** The student will read and understand grade-appropriate English language text

A **Word recognition, analysis, and fluency** Standards under this heading may be locally determined

B **Vocabulary expansion** The student will apply a variety of strategies to expand vocabulary

C **Comprehension.** The student will understand the meaning of informational, expository, or persuasive texts, using a variety of strategies and will demonstrate literal, interpretive, inferential, and evaluative comprehension

D **Literature** The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts

Subp. 2. **Writing.** The student will write clearly and coherently for a variety of audiences and purposes.

A **Type of writing** The student will write in narrative, expository, descriptive, persuasive, and critical modes.

B. **Elements of composition.** The student will engage in a writing process with attention to audience, organization, focus, quality of ideas, and a purpose.

C **Spelling, grammar, and usage.** The student will apply standard English conventions when writing.

D **Research** The student will locate and use information in reference materials

MINNESOTA RULES 2004

65

STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS 3501.0565

E Handwriting and word processing Standards under this heading may be locally determined

Subp 3 **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B Media literacy The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

Statutory Authority: *MS s 120B 021*

History: 28 SR 699

ACADEMIC STANDARDS IN MATHEMATICS

3501.0560 KINDERGARTEN STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5

Subp. 2 **Number sense, computation, and operations.**

A Number sense The student will represent quantities using whole numbers and understand relationships among whole numbers

B Computation and operation. The student will add and subtract whole numbers up to six in real-world and mathematical problems

Subp 3 **Patterns, functions, and algebra.**

A Patterns and functions The student will sort, classify, and compare objects based on their attributes. The student will understand simple repeating patterns.

B. Algebra, algebraic thinking Standards under this heading may be locally determined

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics The student will depict data with objects and pictures

B. Probability. Standards under this heading may be locally determined.

Subp. 5. **Spatial sense, geometry, and measurement.**

A Spatial sense. The student will understand the meanings of terms used to describe location and placement of objects

B. Geometry The student will sort two- and three-dimensional shapes

C. Measurement The student will understand terms and comparative language used in various measurement situations, identify tools to measure time, and identify coins

Statutory Authority: *MS s 120B 021*

History: 28 SR 699

3501.0565 GRADE 1 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5

Subp 2 **Number sense, computation, and operations.**

A. Number sense The student will understand place value, ways of representing whole numbers, and relationships among whole numbers. The student will understand the concept of one-half.

B Computation and operation. The student will add and subtract one-digit whole numbers in real-world and mathematical problems.

Subp 3 **Patterns, functions, and algebra.**

MINNESOTA RULES 2004

3501.0565 STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS

66

A Patterns and functions. The student will sort, classify, and compare objects based on their attributes. The student will understand repeating patterns.

B Algebra, algebraic thinking. Standards under this heading may be locally determined.

Subp. 4 **Data analysis, statistics, and probability.**

A Data and statistics. The student will gather and record data in real-world and mathematical problems.

B Probability. Standards under this heading may be locally determined.

Subp. 5 **Spatial sense, geometry, and measurement.**

A Spatial sense. The student will explore the concept of symmetry in real-world situations.

B Geometry. The student will use attributes of two- and three-dimensional shapes to identify them and distinguish between them.

C Measurement. The student will measure length, time, and money using appropriate tools or units to solve real-world and mathematical problems.

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0570 GRADE 2 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2 **Number sense, computation, and operations.**

A Number sense. The student will understand place value, ways of representing whole numbers, and relationships among whole numbers. The student will understand the concept of unit fractions.

B Computation and operation. The student will compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems.

Subp. 3. **Patterns, functions, and algebra.**

A Patterns and functions. The student will understand repeating, growing, and shrinking patterns.

B Algebra, algebraic thinking. The student will understand basic properties of addition and subtraction.

Subp. 4 **Data analysis, statistics, and probability.**

A. Data and statistics. The student will collect and represent data in real-world and mathematical problems.

B Probability. Standards under this heading may be locally determined.

Subp. 5 **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand the concept of symmetry and apply it to simple drawings.

B. Geometry. The student will use attributes of two- and three-dimensional shapes to identify them and distinguish between them.

C Measurement. The student will measure length, time, temperature, and money using appropriate tools and units to solve real-world and mathematical problems.

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0575 GRADE 3 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

MINNESOTA RULES 2004

Subp 2 **Number sense, computation, and operations.**

A. Number sense The student will represent whole numbers in various ways to quantify information and to solve real-world and mathematical problems. The student will understand the concepts of decimals and common fractions.

B. Computation and operation The student will compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems. The student will understand addition and subtraction and how they relate to one another. The student will understand the concepts of multiplication and division.

Subp 3 **Patterns, functions, and algebra.**

A. Patterns and functions The student will understand and describe patterns in numbers and shapes.

B. Algebra, algebraic thinking The student will add and subtract whole numbers in the correct order to solve real-world and mathematical problems.

Subp 4 **Data analysis, statistics, and probability.**

A. Data and statistics The student will represent and interpret data in real-world and mathematical problems.

B. Probability The student will explore the basic concept of probability.

Subp 5 **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand the concept of reflection symmetry as applied to geometric shapes. The student will understand how representations of shapes are affected by various motions.

B. Geometry The student will classify shapes by specified attributes. The student will identify simple shapes within complex shapes.

C. Measurement. The student will measure and calculate length, time, weight, temperature, and money using appropriate tools and units to solve real-world and mathematical problems.

Statutory Authority: *MS s 120B 021*

History: 28 SR 699

3501.0580 GRADE 4 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp 2. **Number sense, computation, and operations.**

A. Number sense The student will represent whole numbers in various ways to quantify information and to solve real-world and mathematical problems. The student will understand the concepts of fractions and decimals.

B. Computation and operation The student will compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems. The student will understand the meanings of arithmetic operations and how they relate to one another.

Subp 3. **Patterns, functions, and algebra.**

A. Patterns and functions The student will understand and describe patterns in tables and graphs.

B. Algebra, algebraic thinking The student will apply arithmetic operations in the correct order to compute with whole numbers in real-world and mathematical problems.

Subp 4. **Data analysis, statistics, and probability.**

A. Data and statistics The student will represent and interpret data in real-world and mathematical problems.

B. Probability The student will model simple probabilities by displaying the outcomes for real-world and mathematical problems.

Subp 5 Spatial sense, geometry, and measurement.

A Spatial sense. The student will understand spatial relationships and describe them using language such as congruent, similar, parallel, and perpendicular.

B Geometry. The student will use attributes of two- and three-dimensional shapes to identify them and distinguish between them

C Measurement. The student will measure and calculate length and area using appropriate tools and units to solve real-world and mathematical problems. The student will make change with money

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0585 GRADE 5 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5

Subp 2. Number sense, computation, and operations.

A Number sense. The student will represent fractions, decimals, and whole numbers in a variety of ways, to quantify information and to solve real-world and mathematical problems. The student will understand the concept of negative numbers

B. Computation and operation. The student will compute fluently and make reasonable estimates with fractions, decimals, and whole numbers, in real-world and mathematical problems. The student will understand the meanings of arithmetic operations and how they relate to one another

Subp 3 Patterns, functions, and algebra.

A Patterns and functions. The student will understand and describe patterns in numbers, shapes, tables, and graphs.

B Algebra, algebraic thinking. The student will represent mathematical relationships using equations

Subp 4 Data analysis, statistics, and probability.

A Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends

B. Probability. The student will model simple probabilities by displaying the outcomes for real-world and mathematical problems

Subp 5 Spatial sense, geometry, and measurement.

A Spatial sense. The student will understand the concepts of reflection and rotation symmetry as applied to two-dimensional shapes

B. Geometry. The student will sort, classify, compare, and describe two- and three-dimensional objects

C. Measurement. The student will measure and calculate length, area, and capacity using appropriate tools and units to solve real-world and mathematical problems

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0590 GRADE 6 STANDARDS.

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp 2. Number sense, computation, and operations.

A Number sense. The student will use positive and negative rational numbers, represented in a variety of ways, to quantify information, and to solve real-world and mathematical problems

B Computation and operation. The student will compute fluently and make reasonable estimates with positive and negative rational numbers in real-world and mathematical problems. The student will understand the meanings of arithmetic

MINNESOTA RULES 2004

69

STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS 3501.0595

operations, and factorization, and how they relate to one another. The student will appropriately use calculators and other technologies to solve problems.

Subp. 3 **Patterns, functions, and algebra.**

A. Patterns and functions. The student will demonstrate understanding of the rectangular coordinate system.

B. Algebra, algebraic thinking. The student will apply arithmetic operations in the correct order to simplify and evaluate numeric expressions in real-world and mathematical problems.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends.

B. Probability. The student will calculate and express probabilities numerically, and apply probability concepts to solve real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will recognize the relationship between different representations of two- and three-dimensional shapes. The student will understand the effects of various transformations.

B. Geometry. The student will identify a variety of simple geometric figures by name, calculate various quantities associated with them, and use appropriate tools to draw them.

C. Measurement. The student will make calculations of time, length, area, and volume within standard measuring systems, using good judgment in choice of units.

Statutory Authority: *MS s 120B 021.*

History: 28 SR 699

3501.0595 GRADE 7 STANDARDS.

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2. to 5.

Subp. 2 **Number sense, computation, and operations:**

A. Number sense. The student will use positive and negative rational numbers, represented in a variety of ways, to quantify information, and to solve real-world and mathematical problems.

B. Computation and operation. The student will compute fluently and make reasonable estimates with rational numbers in real-world and mathematical problems. The student will understand the meanings of the basic operations, including the use of integer exponents and square roots, and how the operations relate to one another. The student will appropriately use calculators and other technologies to solve problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will demonstrate an understanding of rate of change graphically and numerically.

B. Algebra, algebraic thinking. The student will apply arithmetic operations in the correct order to generate equivalent algebraic expressions and to solve simple formulas in real-world and mathematical problems.

Subp. 4 **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends.

B. Probability. The student will calculate and express probabilities numerically and apply probability concepts to solve real-world and mathematical problems.

Subp. 5 **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will recognize the relationship between different representations of two- and three-dimensional shapes. The student will understand the effects of various transformations.

MINNESOTA RULES 2004

3501.0595 STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS

70

B Geometry. The student will use basic geometric principles and proportional reasoning to solve real-world and mathematical problems

C Measurement. The student will make calculations of time, length, area, and volume within standard measuring systems using good judgment in choice of units

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0600 GRADE 8 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5

Subp 2 **Number sense, computation, and operations.**

A Number sense The student will use rational and irrational numbers, represented in a variety of ways, to quantify information and to solve real-world and mathematical problems

B Computation and operation The student will compute fluently and make reasonable estimates with rational and irrational numbers in real-world and mathematical problems The student will understand the meanings of the basic operations, including the use of integer exponents and n^{th} roots, and how the operations relate to one another The student will appropriately use calculators and other technologies to solve problems

Subp 3 **Patterns, functions, and algebra.**

A Patterns and functions. The student will understand and describe progressions The student will use graphs and tables to solve real-world and mathematical problems.

B. Algebra, algebraic thinking The student will use algebraic operations to generate equivalent expressions, and use proportional reasoning to solve real-world and mathematical problems The student will demonstrate the ability to manipulate an equation by applying arithmetic operations to both sides to maintain equivalence

Subp. 4. **Data analysis, statistics, and probability.**

A Data and statistics The student will represent data and use various measures associated with data to draw conclusions and identify trends

B Probability The student will calculate and express probabilities numerically and apply probability concepts to solve real-world and mathematical problems

Subp. 5. **Spatial sense, geometry, and measurement.**

A Spatial sense. The student will recognize the relationship between different representations of two- and three-dimensional shapes The student will understand the effects of various transformations

B Geometry The student will use basic geometric principles and proportional reasoning to solve real-world and mathematical problems

C Measurement The student will make calculations of time, length, area, and volume within and between standard measuring systems using good judgment in choice of units.

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0605 GRADES 9 THROUGH 11 STANDARDS.

Subpart 1 **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5

Subp 2 **Number sense, computation, and operations.**

A. Number sense The student will use real numbers, represented in a variety of ways, to quantify information and to solve real-world and mathematical problems

MINNESOTA RULES 2004

71

STATEWIDE RIGOROUS CORE ACADEMIC STANDARDS 3501.0620

B Computation and operation The student will appropriately use calculators and other technologies to solve algebraic, geometric, probabilistic, and statistical problems.

Subp. 3 **Patterns, functions, and algebra.**

A Patterns and functions The student will represent and analyze real-world and mathematical problems using numeric, graphic, and symbolic methods for a variety of functions.

B Algebra, algebraic thinking. The student will solve simple equations and inequalities numerically, graphically, and symbolically The student will use recursion to model and solve real-world and mathematical problems.

Subp 4 **Data analysis, statistics, and probability.**

A Data and statistics The student will represent data and use various measures associated with data to draw conclusions and identify trends The student will understand the effects of display distortion and measurement error on the interpretation of data

B. Probability. The student will use appropriate counting procedures, calculate probabilities in various ways and apply theoretical probability concepts to solve real-world and mathematical problems.

Subp 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will use models to represent and understand two- and three-dimensional shapes and how various motions affect them The student will recognize the relationship between different representations of the same shape.

B Geometry The student will apply basic theorems of plane geometry, right triangle trigonometry, coordinate geometry, and a variety of visualization tools to solve real-world and mathematical problems

C. Measurement. The student will use the interconnectedness of geometry, algebra, and measurement to explore real-world and mathematical problems

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

3501.0610 GRADES 11 AND 12 STANDARDS FOR ELECTIVE COURSES.

Subpart 1 **Statistics.** The student will use tables of the normal distribution and properties of that distribution to make judgments about populations based on random samples from these populations

Subp 2 **Algebra.** The student will demonstrate facility with a wide range of algebraic operations and use the relationship between coordinate geometry and algebraic equations to solve real-world and mathematical problems

Subp 3 **Trigonometry and geometry.** The student will understand the properties of the standard trigonometric functions and apply them to real-world and mathematical problems, especially geometrical problems The student will develop increased mastery of geometric proof methodology

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

ACADEMIC STANDARDS IN THE ARTS

3501.0620 KINDERGARTEN THROUGH GRADE 3 STANDARDS.

The student will understand and use artistic processes to create, perform, and interpret art works in at least two of the three arts areas required to be offered by a school from the following dance, music, theater, and visual arts

Statutory Authority: *MS s 120B 021*

History: *28 SR 699*

MINNESOTA RULES 2004

3501.0625 GRADES 4 AND 5 STANDARDS.

The student will understand and use artistic processes to create, perform, and interpret art works in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts

Statutory Authority: *MS s 120B 021*

History: 28 SR 699

3501.0630 GRADES 6 THROUGH 8 STANDARDS.

Subpart 1. **Artistic interpretation.** The student will understand and use artistic processes to analyze and interpret a variety of works in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts

Subp. 2 **Artistic creativity and performance.** The student will understand and use artistic processes to create and perform in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts.

Statutory Authority: *MS s 120B 021*

History: 28 SR 699

3501.0635 GRADES 9 THROUGH 12 STANDARDS.

Subpart 1. **Analysis and interpretation.** The student will understand and apply artistic processes to analyze, interpret, and evaluate art works in at least one of the three arts areas required to be offered by a school from the following: dance, media arts, music, theater, and visual arts

Subp. 2 **Creation and performance.** The student will understand and use artistic processes to create original or perform existing works of art in at least one of the three arts areas required to be offered by a school from the following: dance, media arts, music, theater, and visual arts. As an elective, the student may understand and use artistic processes to create original or perform existing works of art in another art form or creative writing

Statutory Authority: *MS s 120B 021*

History: 28 SR 699