

1.1 **Department of Education**

1.2 **Adopted Permanent Rules Relating to Academic Standards for Mathematics**

1.3 The rules proposed by notice published at State Register, Volume 32, Number 51, pages
1.4 2206-2208, June 16, 2008 (32 SR 2206), are adopted as follows:

1.5 **3501.0700 KINDERGARTEN STANDARDS.**

1.6 Subpart 1. **Number and operation.**

1.7 A. The student will understand the relationship between quantities and whole
1.8 numbers up to 31.

1.9 B. The student will use objects and pictures to represent situations involving
1.10 combining and separating.

1.11 Subp. 2. **Algebra.** The student will recognize, create, complete, and extend patterns.

1.12 Subp. 3. **Geometry and measurement.**

1.13 A. The student will recognize and sort basic two- and three-dimensional shapes
1.14 and use them to model real-world objects.

1.15 B. The student will compare and order objects according to location and
1.16 measurable attributes.

1.17 **3501.0705 GRADE 1 STANDARDS.**

1.18 Subpart 1. **Number and operation.**

1.19 A. The student will count, compare, and represent whole numbers up to 120,
1.20 with an emphasis on groups of tens and ones.

1.21 B. The student will use a variety of models and strategies to solve addition and
1.22 subtraction problem& in real-world and mathematical contexts.

1.23 Subp. 2. **Algebra.**

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2.1 A. The student will recognize and create patterns and use rules to describe
2.2 patterns.

2.3 B. The student will use number sentences involving addition and subtraction
2.4 basic facts to represent and solve real-world and mathematical problems. The student will
2.5 create real-world situations corresponding to number sentences.

2.6 **Subp. 3. Geometry and measurement.**

2.7 A. The student will describe characteristics of basic shapes. The student will use
2.8 basic shapes to compose and decompose other objects in various contexts.

2.9 B. The student will use basic concepts of measurement in real-world and
2.10 mathematical situations involving length, time, and money.

2.11 **3501.0710 GRADE 2 STANDARDS.**

2.12 **Subpart 1. Number and operation.**

2.13 A. The student will compare and represent whole numbers up to 1,000 with
2.14 an emphasis on place value and equality.

2.15 B. The student will demonstrate mastery of addition and subtraction basic
2.16 facts. The student will add and subtract one- and two-digit numbers in real-world and
2.17 mathematical problems.

2.18 **Subp. 2. Algebra.**

2.19 A. The student will recognize, create, describe, and use patterns and rules to
2.20 solve real-world and mathematical problems.

2.21 B. The student will use number sentences involving addition, subtraction, and
2.22 unknowns to represent and solve real-world and mathematical problems. The student will
2.23 create real-world situations corresponding to number sentences.

2.24 **Subp. 3. Geometry and measurement.**

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3.1 A. The student will identify, describe, and compare basic shapes according to
3.2 their geometric attributes.

3.3 B. The student will understand length as a measurable attribute. The student

3.4 will use tools to measure length.

3.5 C. The student will use time and money in real-world and mathematical
3.6 situations.

3.7 **3501.0715 GRADE 3 STANDARDS.**

3.8 **Subpart I. Number and operation.**

3.9 A. The student will compare and represent whole numbers up to 100,000 with
3.10 an emphasis on place value and equality.

3.11 B. The student will add and subtract multidigit whole numbers. The student will
3.12 represent multiplication and division in various ways. The student will solve real-world
3.13 and mathematical problems using arithmetic.

3.14 C. The student will understand meanings and uses of fractions in real-world and
3.15 mathematical situations.

3.16 **Subp. 2. Algebra.**

3.17 A. The student will use single-operation input-output rules to represent patterns
3.18 and relationships, and to solve real-world and mathematical problems.

3.19 B. The student will use number sentences involving multiplication and division
3.20 basic facts and unknowns to represent and solve real-world and mathematical problems.
3.21 The student will create real-world situations corresponding to number sentences.

3.22 **Subp. 3. Geometry and measurement.**

3.23 A. The student will use geometric attributes to describe and create shapes in
3.24 various contexts.

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4.1 B. The student will understand perimeter as a measurable attribute of real-world
4.2 and mathematical objects. The student will use various tools to measure distances.

4.3 C. The student will use time, money, and temperature to solve real-world and
4.4 mathematical problems.

4.5 Subp. 4. **Data analysis.** The student will collect, organize, display, and interpret
4.6 data. The student will use labels and a variety of scales and units in displays.

4.7 **3501.0720 GRADE 4 STANDARDS.**

4.8 Subpart 1. **Number and operation.**

4.9 A. The student will demonstrate mastery of multiplication and division basic
4.10 facts. The student will multiply multidigit numbers and solve real-world and mathematical
4.11 problems using arithmetic.

4.12 B. The student will represent and compare fractions and decimals in real-world
4.13 and mathematical situations. The student will use place value to understand how decimals
4.14 represent quantities.

4.15 Subp. 2. **Algebra.**

4.16 A. The student will use input-output rules, tables, and charts to represent patterns
4.17 and relationships and to solve real-world and mathematical problems.

4.18 B. The student will use number sentences involving multiplication, division, and
4.19 unknowns to represent and solve real-world and mathematical problems. The student will
4.20 create real-world situations corresponding to number sentences.

4.21 Subp. 3. **Geometry and measurement.**

4.22 A. The student will name, describe, classify, and sketch polygons.

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5.1 B. The student will understand angle and area as measurable attributes of
5.2 real-world and mathematical objects. The student will use various tools to measure angles
5.3 and areas.

5.4 C. The student will use translations, reflections, and rotations to establish
5.5 congruency and understand symmetries.

5.6 Subp. 4. **Data analysis.** The student will collect, organize, display, and interpret
5.7 data, including data collected over a period of time and data represented by fractions
5.8 and decimals.

5.9 **3501.0725 GRADE 5 STANDARDS.**

5.10 Subpart 1. **Number and operation.**

5.11 A. The student will divide multidigit numbers. The student will solve real-world
5.12 and mathematical problems using arithmetic.

5.13 B. The student will read, write, represent, and compare fractions and decimals.
5.14 The student will recognize and write equivalent fractions, and convert between fractions
5.15 and decimals. The student will use fractions and decimals in real-world and mathematical
5.16 situations.

5.17 C. The student will add and subtract fractions, mixed numbers, and decimals to
5.18 solve real-world and mathematical problems.

5.19 Subp. 2. **Algebra.**

5.20 A. The student will recognize and represent patterns of change. The student will
5.21 use patterns, tables, graphs, and rules to solve real-world and mathematical problems.

5.22 B. The student will use properties of arithmetic to generate equivalent numerical
5.23 expressions and evaluate expressions involving whole numbers.

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6.1 C. The student will understand and interpret equations and inequalities involving
6.2 variables and whole numbers, and use them to represent and solve real-world and
6.3 mathematical problems.

6.4 Subp. 3. **Geometry and measurement.**

6.5 A. The student will describe, classify, and draw representations of
6.6 three-dimensional figures.

6.7 B. The student will determine the area of triangles and quadrilaterals. The
6.8 student will determine the surface area and volume of rectangular prisms in various
6.9 contexts.

6.10 Subp. 4. **Data analysis.** The student will display and interpret data. The student

6.11 will determine mean, median, and range.

6.12 **3501.0730 GRADE 6 STANDARDS.**

6.13 **Subpart 1. Number and operation.**

6.14 A. The student will read, write, represent, and compare positive rational
6.15 numbers expressed as fractions, decimals, percents, and ratios. The student will write
6.16 positive integers as products of factors. The student will use these representations in
6.17 real-world and mathematical situations.

6.18 B. The student will understand the concept of ratio and its relationship to
6.19 fractions and to the multiplication and division of whole numbers. The student will use
6.20 ratios to solve real-world and mathematical problems.

6.21 C. The student will multiply and divide decimals, fractions, and mixed numbers.
6.22 The student will solve real-world and mathematical problems using arithmetic with
6.23 positive rational numbers.

6.24 **Subp. 2. Algebra.**

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7.1 A. The student will recognize and represent relationships between varying
7.2 quantities. The student will translate from one representation to another. The student will
7.3 use patterns, tables, graphs, and rules to solve real-world and mathematical problems.

7.4 B. The student will use properties of arithmetic to generate equivalent numerical
7.5 expressions and evaluate expressions involving positive rational numbers.

7.6 C. The student will understand and interpret equations and inequalities involving
7.7 variables and positive rational numbers. The student will use equations and inequalities
7.8 to represent real-world and mathematical problems. The student will use the idea of
7.9 maintaining equality to solve equations. The student will interpret solutions in the original
7.10 context.

7.11 **Subp. 3. Geometry and measurement.**

7.12 A. The student will calculate perimeter, area, surface area, and volume of two-

7.13 and three-dimensional figures to solve real-world and mathematical problems.

7.14 B. The student will understand and use relationships between angles in
7.15 geometric figures.

7.16 C. The student will choose appropriate units of measurement and use ratios to
7.17 convert within measurement systems to solve real-world and mathematical problems.

7.18 Subp. 4. **Data analysis and probability.** The student will use probabilities to solve
7.19 real-world and mathematical problems. The student will represent probabilities using
7.20 fractions, decimals, and percents.

7.21 **3501.0735 GRADE 7 STANDARDS.**

7.22 Subpart 1. **Number and operation.**

7.23 A. The student will apply, read, write, represent, and compare positive and
7.24 negative rational numbers, expressed as integers, fractions, and decimals.

8.1 B. The student will calculate with positive and negative rational numbers, and

8.2 rational numbers with whole number exponents, to solve real-world and mathematical

8.3 problems.

8.4 Subp. 2. **Algebra.**

8.5 A. The student will understand the concept of proportionality in real-world and

8.6 mathematical situations, and distinguish between proportional and other relationships.

8.7 B. The student will recognize proportional relationships in real-world and

8.8 mathematical situations. The student will represent these and other relationships with

8.9 tables, verbal descriptions, symbols, and graphs. The student will solve problems

8.10 involving proportional relationships and explain results in the original context.

8.11 C. The student will apply understanding of order of operations and algebraic

8.12 properties to generate equivalent numerical and algebraic expressions containing positive

8.13 and negative rational numbers and grouping symbols. The student will evaluate such

8.14 expressions.

8.15 D. The student will represent real-world and mathematical situations using

8.16 equations with variables. The student will solve equations symbolically, using the

8.17 properties of equality. The student will also solve equations graphically and numerically.

8.18 The student will interpret solutions in the original context.

8.19 **Subp. 3. Geometry and measurement.**

8.20 A. The student will use reasoning with proportions and ratios to determine

8.21 measurements, justify formulas, and solve real-world and mathematical problems

8.22 involving circles and related geometric figures.

8.23 B. The student will analyze the effect of change of scale, translations, and

8.24 reflections on the attributes of two-dimensional figures.

8.25 **Subp. 4. Data analysis and probability.**

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