

COMMUNITY UNIT SCHOOL DISTRICT 200

Pre-Algebra - Course 2 Middle School Grade 7

1. Subject Expectation (State Goal 6) **Students will be able to demonstrate and apply an understanding of numbers and their operations, including meaning and relationships.**

Essential Learning 1 (Learning Standard A) (Learning Standard D)	Understand numbers, ways of representing numbers, relationships among numbers, and number systems
---	--

Critical Content	6.A.3	a. represent decimals in expanded form using powers of ten in standard and exponential form <ul style="list-style-type: none"> • 4.23 as $(4*1)+(2*0.1)+(3*0.01)$ and $(4*10^0)+(2*10^{-1})+(3*10^{-2})$
	6.A.3	b. express numbers larger than one using scientific notation
	6.D.3	c. differentiate between ratios and rates
	6.B.3a*	d. apply the understanding of a fraction as division to simplifying fractions
	6.B.3 *	e. use absolute value in computations <ul style="list-style-type: none"> • $7 + -2$ vs. $7 + -2$
	6.B.3b*	f. find the prime factorization of a number and express it in exponential form
	6.A.3	g. differentiate between an exact and an approximate value of a rational and an irrational number
	6.B.3a	h. choose an appropriate form of a rational number given a particular operation or situation

Essential Learning 2 (Learning Standard B)	Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships
---	--

Critical Content	6.A.3	a. convert between scientific notation and standard notation for numbers greater than one
	6.B.3a	b. convert fractions to terminating or repeating decimals
	6.B.3a	c. add, subtract, multiply, and divide fractions and mixed numbers (note: do division of fractions using reciprocals, not cross products)
	6.B.3a	d. use simplification (canceling) to multiply fractions <ul style="list-style-type: none"> • $x = = = x =$
	6.B.3a	e. add, subtract, and multiply decimals
	6.B.3a	f. interpret the quotient and remainder of a division problem
	6.B.3a	g. divide decimals by decimals
		h. add, subtract, multiply, and divide integers

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
 including = a mandatory concept
 *exceeds state standards as cited
 Board Approved 07-08-09

- 6.B.3a i. represent percents small than 1% and larger than 100% in fraction and decimal form
- 6.B.3b j. apply factors, multiples, GCF, or LCM in real life situations
 - hotdogs come in packages of 6 and buns come in packages of 8, what is the least number of each you will need so that each hotdog has a bun and there are no leftover hotdogs or buns?
- 6.B.3b k. use prime factorization to generate least common multiples and greatest common factors
- 6.B.3c l. identify square roots of perfect squares and approximate square roots of other numbers to the nearest whole number
- 6.B.3c m. apply number properties including commutative, associative, distributive, equality, identities, zero, and inverses and use them to compute with integers, fractions, and decimals
- 6.B.3c n. evaluate numerical expressions using order of operations, including exponents, the fraction bar, and brackets
- 6.C.3b o. recognize proportions as a special class of equations which may be solved using cross products (means-extremes)
- 6.C.3b p. use proportions to generate equivalent fractions by using means-extremes
 - $\frac{a}{b} = \frac{c}{d}$
 - $\frac{a}{b} = \frac{c}{x}$
 - $x = 7.2$
- 6.B.3c q. recognize perfect squares through 144
- 6.B.3c r. estimate percentage amounts using benchmark fractions
 - $\frac{3}{8}$ is approximately 50%
- 6.D3 s. use proportional reasoning to
 - solve problems using similar figures, discount, sales tax, percent, percent increase/decrease, scale drawings and other proportions
 - calculate unit rates
 - solve equations *such as* $\frac{2}{3} - \frac{x}{4} = 0$
- 6.D.3 t. use proportions to solve the three types of percent problems, and identify the percent, percentage, and rate *such as*
 - 25 is what percent of 40?
 - What is 82% of 150?
 - 70 is 35% of what number?
- 6.D.3 u. solve problems using percent equation *such as* discount sales tax
- 6.A.3 v. know equivalent percent, decimal and fraction forms (families of eighths, sixths as well as halves, thirds, fifths, tenths) to solve and work flexibly within problems
- 6.B.3a w. convert between fractions, decimals, and percents, and work flexibly with them to solve problems
 - tenths, halves, fourths, thirds, fifths

Essential Learning 3 (Learning Standard C)	Compute using a variety of methods and make reasonable estimates
---	---

- | | | |
|------------------|--------|---|
| Critical Content | 6.B.3c | a. demonstrate automatic recall of perfect squares through 225 |
| | 6.C.3b | b. round decimals to a given place value to the nearest hundredth |
| | 6.C.3b | c. apply estimating techniques <i>such as</i> rounding, compatible numbers, and clustering to add, subtract, multiply, and divide rational numbers |
| | 6.C.3b | d. use rounding and estimation to determine the reasonableness of an answer |
| | 6.C.3b | e. use rounding and estimation to make predictions <i>such as</i> <ul style="list-style-type: none"> • How much time should you allow? • How much money should you bring? • How much pizza should you order for a party? |
| | 6.C.3a | f. develop and use mental math strategies appropriate to seventh grade concepts |
| | 6.D.3 | g. calculate unit rates |

Essential Learning 4 *	Choose appropriate technology/tools
-------------------------------	--

- | | | |
|------------------|---|--|
| Critical Content | * | a. select appropriate methods and tools, according to the context, for computing <ul style="list-style-type: none"> • mental computation • estimation • calculators (scientific or graphic) • manipulatives and models such as base 10 blocks, counting chips, number lines, and graph paper • paper and pencil • protractor |
|------------------|---|--|

Essential Learning 5 *	Recognize the connections between number sense, other math strands, and other curricular areas
-------------------------------	---

- | | | |
|------------------|---------|---|
| Critical Content | 6.B.3c* | a. use a variable to represent a missing term in a proportion or equivalent fraction |
| | * | b. use experimental probability activities to apply fraction, decimal, and percent skills |

Essential Learning 6 *	Construct and communicate convincing arguments and proofs to solve problems
-------------------------------	--

- | | | |
|------------------|---|---|
| Critical Content | * | a. use the language of numbers and operations to express mathematical ideas precisely, both verbally and in writing |
| | * | b. make and test conjectures about mathematical properties and relationships and develop logical arguments to justify conclusions |
| | * | c. write a symbolic equation to solve a two- or three-step word problem |

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
including = a mandatory concept
*exceeds state standards as cited
Board Approved 07-08-09

- * d. write a word problem from a symbolic equation
- * e. write an extended response for a two or three step problem including
 - the answer
 - the process
 - the strategy(ies)
 - the explanation including how and why
- * f. demonstrate the accurate use of mathematical symbols
- * g. translate among and within representations *such as* concrete materials, spoken language, written language, pictures, diagrams and graphs, lists and tables

Essential Learning 7 * Use reading and writing strategies to comprehend math text

Critical Content

- * a. understand how the text structure of a book differs from reading expository and narrative text
 - format features within a text
 - identify heading to determine the ordinance hierarchy of ideas
 - discern where a section of text starts and stops using organizational visual cues
 - distinguish headings from boldfaced vocabulary words
 - identify features unusual to the specific text
 - skill pages
 - captions
 - review section
 - adjunct pages of information
 - charts
 - graphs
 - use the front and end matter of text
 - glossary
 - table of contents
- * b. develop and apply appropriate strategies *during* reading to understand math textbooks
 - monitoring for meaning--knowing when you know, knowing when you don't know
 - using and creating schema-making connections between and the known
 - building and activating background knowledge
 - asking questions--generating questions before, during, and after reading that lead you deeper into the text
 - determining importance--deciding what matters most, what is worth remembering
 - inferring--combining background knowledge with information from the text to predict, conclude, make judgments, and interpret
 - using sensory and emotional images--creating mental images to deepen and stretch meaning
 - synthesizing--creating an evolution of meaning by combining understanding with knowledge from other texts/sources
- * c. solve problems using reading comprehension strategies to analyze information using key words *such as* difference, increased, of and is to determine important information to select the necessary operations to solve the problem

Essential Learning 8	*	Build mathematical knowledge by using a variety of appropriate strategies to solve a problem
-----------------------------	----------	---

Critical Content

- * a. know the four phases in the process of problem solving including
 - understanding the problem
 - determine the conditions of the situation
 - comprehend the language and terms used
 - identify the desired goal and understand the constraints
 - form a representation
 - examine the assumptions
 - devising a plan of attack and selecting the appropriate problem solving strategy
 - organized list
 - guess and check
 - act out/use problem and show reasoning
 - justify an answer by using manipulatives
 - draw a picture
 - use/find a pattern
 - work backwards
 - use logical reasoning
 - make a table
 - carrying out the plan
 - work through the problem
 - monitor use of the strategy
 - change strategies as necessary
 - reviewing
 - reconsider the initial conditions, constraints, and goals to make sure the solution fits
 - judge the reasonableness of the answer
- * b. rely on metacognitive processes to solve a problem
 - activate prior knowledge about information in the problem
 - develop various ways to represent information
 - question effectiveness and reasonableness

**2. Subject Expectation
(State Goal 7)**

The student will be able to estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Essential Learning 1 (Learning Standard A)	Understand measurable attributes of objects and the units, systems, and process of measurement	
Critical Content	7.A.3a	a. recognize and analyze relationships among measurable attributes in rectangular prisms (length, area, surface area, volume)
	7.A.3b	b. convert between units in the customary system (including length, weight, and capacity) <ul style="list-style-type: none"> • convert 4 yards into inches 1 yard = 36 inches 1 x 4 = 36 x 4 4 yards = 144 inches • convert 17 quarts into gallons 1 gallon = 4 quarts 1 gallon/4 = 4 quart/4 ¼ gallon = 1 quart ¼ x 17 = 1 x 17 4 ¼ gallons = 17 quarts
	7.A.3b	c. relate two different units of measure as a rate, <i>such as</i> miles per hour
	7.A.3b	d. solve a multi-step conversion problem
	7.A.3b	e. convert within commonly used units in the metric system (including length, mass, and capacity)
	7.A.3b	f. convert parts of units within a measurement system, such as 1.25 hours = 1 hour 15 minutes or 1 foot 6 inches = 1.5 feet
	7.B.3	g. estimate length using the metric and customary systems
	7.B.3	h. estimate angle measures using benchmark angles (including straight, right, and 45 degree angles)
	*	i. explore and estimate area of irregular shapes using both metric and customary units
	*	j. explore and estimate volume of regular and irregular shapes using both metric and customary units
	7.A.3b	k. recognize and analyze relationships among measurable attributes <ul style="list-style-type: none"> • temperature in terms of degrees Fahrenheit and Celsius • time <ul style="list-style-type: none"> • estimate and calculate elapsed time • 24 hour clock (analog and digital)
	7.A.3b	i. recognize and apply appropriate benchmarks for an attribute <i>such as</i> the boiling point, freezing point, room temperature and body temperature
Essential Learning 2 (Learning Standard B) (Learning Standard C)	Apply appropriate techniques, tools and formulas to determine measurements	

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
 including = a mandatory concept
 *exceeds state standards as cited
 Board Approved 07-08-09

Critical Content	7.B.3	a.	select and apply appropriate units of measure based on size and dimension
	7.B.3	b.	draw and measure angles using a protractor
	7.C.3b	c.	apply formulas for perimeter and area of triangles and quadrilaterals
	7.C.3b	d.	develop and use formulas for area of trapezoid and area and circumference of a circle
	7.C.3b	e.	calculate surface area of prisms using nets <ul style="list-style-type: none"> • rectangular prisms • triangular prisms
	7.C.3b	f.	calculate volume of prisms <ul style="list-style-type: none"> • rectangular prisms • triangular prisms

Essential Learning 3	Recognize the connections between measurement, other math strands, and other curricular areas
-----------------------------	--

Critical Content	7.A.3b	a.	add and subtract mixed units of measure
	7.A.3b	b.	multiply mixed units of measure by a whole number
	7.C.3a	c.	construct a scale drawing for a given situation using graph paper
	9.C.3a	d.	understand the concept of the constant π as the ratio of the circumference to the diameter of a circle <i>such as</i> <ul style="list-style-type: none"> • measure the diameter and circumference of several circular objects (use string or measuring tape to measure circumference) then chart measurements using a calculator, divide each circumference by its diameter
	*	e.	explore and apply relationship between perimeter and area

Essential Learning 4	* Construct and communicate convincing arguments and proofs to solve problems
-----------------------------	--

Critical Content	*	a.	use the language of measurement to express mathematical ideas precisely, both verbally and in writing
	*	b.	develop logical arguments to justify conclusions about topics <i>such as</i> formulas for area, surface area, and volume
	*	c.	make and test conjectures about mathematical properties and relationships and develop logical arguments to justify conclusions <ul style="list-style-type: none"> • in multi-digit multiplication, lining up numbers and moving over numbers differs from lining up numbers in an addition problem • the concept of division as the inverse operation of multiplication
	*	d.	write a symbolic equation to solve a two or three step word problem
	*	e.	write a word problem from a symbolic equation
	*	f.	write an extended response for a two or three step problem including

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
including = a mandatory concept
*exceeds state standards as cited
Board Approved 07-08-09

- the answer
 - the process
 - the strategy(ies)
 - the explanation including how and why
- * g. demonstrate the accurate use of mathematical symbols
- * h. translate among and within representations *such as* concrete materials, spoken language, written language, pictures, diagrams and graphs, lists and tables
- * i. translate among and within representations *such as* concrete materials, spoken language, written language, pictures, diagrams and graphs, lists and tables

Essential Learning 5	*	Use reading and writing strategies to comprehend math text
-----------------------------	---	---

Critical Content * Same as Subject Expectation 1 Essential Learning 7

Essential Learning 6	*	Build mathematical knowledge by using a variety of appropriate strategies to solve a problem
-----------------------------	---	---

Critical Content * Same as Subject Expectation 1 Essential Learning 8

**3. Subject Expectation
(State Goal 8)**

The student will be able to use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

Essential Learning 1 (Learning Standard A)	Describe numerical relationships using variables and patterns
---	--

- | | | |
|------------------|---------|--|
| Critical Content | 8.A.3a | a. describe, extend, create, and make generalizations about geometric and numeric patterns including arithmetic sequences |
| | 8.A.3b | b. represent and analyze patterns and functions using words, tables, graphs, and symbolic rules |
| | 8.A.3b | c. translate written expressions that involve multiple operations to algebraic expressions <i>such as</i> <ul style="list-style-type: none"> the sum of twice a number and ten |
| | 8.A.3b | d. relate and compare different forms of representation for a relationship |
| | 8.A.3a | e. evaluate algebraic expressions using order of operations, including exponents and grouping symbols <ul style="list-style-type: none"> evaluate $5k + m^2 - (8 + n)$ if $k = 4$, $m = 3$, and $n = 5$ |
| | 8.A.3a | f. reinforce the use of properties such as commutative, associative, and distributive in evaluating expressions |
| | 8.A.3a | g. use distributive property to combine like terms |
| | 8.A.3a | h. introduce the properties of equality (addition, subtraction, multiplication, division), inverse, and identity in solving algebraic equations |
| 8.A.3a | 8.A.3b | i. check equations using substitutions |
| | 8.A.3b | j. demonstrate how to solve and check one- and two-step equations using whole numbers |
| | | k. check one- and two-step equations using substitution |
| | 8.B.4a* | l. translate sentences and word problems into algebraic equations and solve problems |
| | 8.A.3a | m. use t-tables to graph linear and non linear functions from equations |
| | * | n. use appropriate symbols for multiplication and division, eliminating raised dot for multiplication <ul style="list-style-type: none"> review: fraction bar |

Essential Learning 2 (Learning Standard B)	Interpret and describe numerical relationships using tables, graphs, and symbols
---	---

- | | | |
|------------------|-------|--|
| Critical Content | 8.B.3 | a. use t-tables to verbally and symbolically describe a pattern involving multiple operations <i>such as</i> |
|------------------|-------|--|

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
including = a mandatory concept
*exceeds state standards as cited
Board Approved 07-08-09

• Number of minutes	Cost
1	\$0.25
2	\$0.40
3	\$0.55
4	\$0.70
5	\$0.85
9	\$1.45
m	_____

- 8.B.3 b. graph and solve one-step inequalities on a number line
 c. graph and solve one-step inequalities

Essential Learning 3 (Learning Standard D)	Use mathematical models to represent and understand quantitative relationships and solve problems
---	--

- 8.D.3.b a. solve problems using formulas, proportions, and linear functions

Essential Learning 4 *	Use problem solving to analyze change in real life situations
-------------------------------	--

- Critical Content 8.C.3 a. write and use formulas to solve problems
 * b. investigate how a change in one variable relates to a change in a second variable-

Essential Learning 5 *	Choose appropriate technology/tools for algebraic representation
-------------------------------	---

- Critical Content 8.B.4a a. use manipulatives to solve linear equations
 8.B.3 b. use technology *such as* graphing calculators, to look at the relationships among tables, graphs and equations

Essential Learning 6 *	Recognize the connections between algebra, other math strands, and other curricular areas
-------------------------------	--

- Critical Content 8.D.3b a. use ration and proportion to solve problems
 * b. find, describe, extend, and create geometric patterns using tessellations

Essential Learning 7 *	Construct and communicate convincing arguments and proofs to solve problems
-------------------------------	--

- Critical Content * a. use the language of algebra to express mathematical ideas precisely, both verbally and in writing
 * b. differentiate between algebraic expressions and algebraic equations
 * c. make and test conjectures about mathematical properties and relationships and develop logical arguments to justify conclusions
 * d. write a symbolic equation to solve a two or three step word problem

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
 including = a mandatory concept
 *exceeds state standards as cited
 Board Approved 07-08-09

- * e. write a word problem from a symbolic equation
- * f. write an extended response for a two or three step problem including
 - the answer
 - the process
 - the strategy(ies)
 - the explanation including how and why
- * g. demonstrate the accurate use of mathematical symbols
- * h. translate among and within representations *such as* concrete materials, spoken language, written language, pictures, diagrams and graphs, lists and tables

Essential Learning 8	*	Use reading and writing strategies to comprehend math text
-----------------------------	---	---

Critical Content
* Same as Subject Expectation 1 Essential Learning 7

Essential Learning 9	*	Build mathematical knowledge by using a variety of appropriate strategies to solve a problem
-----------------------------	---	---

Critical Content
* Same as Subject Expectation 1 Essential Learning 8

**4. Subject Expectation
(State Goal 9)**

The student will use geometric methods to analyze, categorize, and draw conclusions about points, lines, planes and space.

Essential Learning 1 (Learning Standard A)	Demonstrate and apply geometric concepts involving points, lines, planes, and space
---	--

- | | | |
|------------------|--------|---|
| Critical Content | 9.A.3b | a. name coordinate and quadrants and graph points in the coordinate plane |
| | 9.A.3b | b. draw the reflection, translation, and rotation of figures using dot paper and coordinate graphs |
| | 9.A.3a | c. draw prisms and pyramids and identify them by their bases |
| | 9.A.3a | d. identify lines of symmetry in a figure and finish drawing a figure given its line(s) of symmetry |

Essential Learning 2 (Learning Standard B) (Learning Standard D)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
---	---

- | | | |
|------------------|-------|--|
| Critical Content | 9.B.3 | a. identify polygons based on their sides |
| | 9.B.3 | b. distinguish between regular and non-regular polygons by side and angle |
| | 9.B.3 | c. describe, classify, and compare triangles and quadrilaterals (including isosceles trapezoid), according to their side and angle properties) |
| | 9.B.3 | d. identify parallel or perpendicular lines in given 3-D shapes or situations |
| | 9.B.3 | e. define line, segment, ray, angle, parallel, and perpendicular |
| | 9.B.3 | f. determine the complement and/or supplement of a given angle |
| | 9.B.3 | g. apply knowledge of angles to investigate supplementary and complementary angles, vertical angles, and linear pairs |
| | 9.B.3 | h. identify congruent and similar figures and their corresponding parts |
| | 9.B.3 | i. define a circle and identify the center, radius, diameter, and circumference |
| | 9.D.3 | j. develop and use the Pythagorean Theorem |

Essential Learning 3 (Learning Standard C)	Use visualization, spatial reasoning, geometric modeling to solve problems
---	---

- | | | |
|------------------|--------|---|
| Critical Content | 9.C.3b | a. use the sum of angle measures to find a missing angle measure of a triangle or quadrilateral |
| | 9.C.3b | b. explore the relationship among the radius, diameter, circumference, and π |
| | 9.D.3 | c. explore the relationship between length and area, such as the effects on area after doubling the side length of a square |

- * d. explore the relationship between length and volume, such as the effects on volume after doubling the side length of a cube

Essential Learning 4	*	Apply transformations and use symmetry to analyze mathematical situations
-----------------------------	---	--

Critical Content 9.A.3b a. use translations or rotations to create a tessellating shape

Essential Learning 5	*	Recognize the connections between geometry, other math strands, and other curricular areas
-----------------------------	---	---

Critical Content 7.A.3b a. derive and apply formulas for area of trapezoids, and area and circumference of circles

Essential Learning 6	*	Choose appropriate technology/tools for geometric representations
-----------------------------	---	--

Critical Content 7.B.3 a. use protractors, rulers, graph paper, compass or appropriate software
 7.A.3a
 9.C.3b b. use manipulatives for investigating translations and creating tessellations
 9.C.3b c. use appropriate software to explore the relationship between diameter and area of circles

Essential Learning 7	*	Construct and communicate convincing arguments and proofs to solve problems
-----------------------------	---	--

Critical Content *

- a. use the language of geometry to express mathematical ideas precisely, both verbally and in writing
- * b. make and test conjectures about mathematical properties and relationships and develop logical arguments to justify conclusions
- * c. write a symbolic equation to solve a two or three step word problem
- * d. write a word problem from a symbolic equation
- * e. write an extended response for a two or three step problem including
 - the answer
 - the process
 - the strategy(ies)
 - the explanation including how and why
- * f. demonstrate the accurate use of mathematical symbols
- * g. translate among and within representations *such as* concrete materials, spoken language, written language, pictures, diagrams and graphs, lists and tables

Essential Learning 8	*	Use reading and writing strategies to comprehend math text
-----------------------------	---	---

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
 including = a mandatory concept
 *exceeds state standards as cited
 Board Approved 07-08-09

Critical Content * Same as Subject Expectation 1 Essential Learning 7

Essential Learning 9	*	Build mathematical knowledge by using a variety of appropriate strategies to solve a problem
-----------------------------	---	---

Critical Content * Same as Subject Expectation 1 Essential Learning 8

**5. Subject Expectation
(State Goal 10)**

The student will select, organize and analyze data using statistical methods; predict results; and interpret uncertainty-using concepts of probability.

Essential Learning 1 (Learning Standard A) (Learning Standard B)	Develop concepts of data collection and analysis
---	---

Critical Content	10.A.3a	a. create, read and interpret multiple line graphs, circle graphs, back to back stem and leaf plots, frequency tables, scatter plots and lines of best fit
	10.A.3a	b. determine an appropriate interval that could be used to display a given set of data
	10.A.3a 10.A.4a*	c. using given and/or collected data, construct multiple line graphs, circle graphs, single stem and leaf plots, frequency tables, and scatterplots
	10.A.4a*	d. using a scatterplot, identify positive, negative, or no correlation between the data
	10.A.4a*	e. using a scatterplot, draw an approximate line of best fit
	10.A.3a	f. choose an appropriate graph to represent a given set of data
	10.A.3b	g. explore how changes in data values affect the mean and median of a set of data
	10.A.3b	h. explain which measure of central tendency is most appropriate in a given context
	10.A.3a	i. analyze graphs of the same information that appear different due to differences in scale, interval, and data breaks, and determine which gives a misleading representation of the data
	10.B.3	j. formulate questions, devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies

Essential Learning 2 (Learning Standard C)	Determine, describe, and apply the probabilities of events
---	---

Critical Content	10.C.3a	a. compute probabilities for simple events using areas of geometric shapes
	10.C.3a	b. list the sample space for a compound event
	10.C.3a	c. compute probabilities for compound events using methods such as organized lists, tree diagrams, and the Fundamental Counting Principle
	10.C.3a	d. describe complementary events and their probabilities
	10.C.3a	e. explore replacement (independent) and non-replacement (dependent) probability through data collection experiments, such as picking from a bag of marbles
	*	f. differentiate between the theoretical probability and the experimental probability
	10.C.3b	g. use data to estimate the probability of future events

7th Grade Pre-Alg. Course 2 3-23-09
such as = an example used for clarification but not a mandatory concept
 including = a mandatory concept
 *exceeds state standards as cited
 Board Approved 07-08-09

- * h. understand that for an event, as the number trials increases, the experimental probability approaches the theoretical probability
- * i. determine the theoretical probability of independent, dependent, and mutually exclusive events using “and”, “or”, or “not”
- 10.C.3a j. determine the probabilities of complementary events

Essential Learning 3	*	Choose appropriate tools for data collection and representation
-----------------------------	---	--

- | | | |
|------------------|---|---|
| Critical Content | * | a. use a protractor to create a circle graph |
| | * | b. use a calculator to analyze data |
| | * | c. use graph paper to construct scatterplots |
| | * | d. use appropriate manipulatives such as spinners, and number cubes |
| | * | e. use technology, such as graphing calculators, to represent and/or analyze data |

Essential Learning 4	*	Recognize the connections between data collection and probability, other math strands, and other curricular areas
-----------------------------	---	--

- | | | |
|------------------|---|---|
| Critical Content | * | a. analyze and predict conclusions from graphical representations |
| | * | b. connect number scale 0-1 to fraction decimals and percents |

Essential Learning 5	*	Construct and communicate convincing arguments and proofs to solve problems
-----------------------------	---	--

- | | | |
|------------------|---|---|
| Critical Content | * | a. use the language of data collection and probability to express mathematical ideas precisely, both verbally and in writing |
| 10.B.3 | | b. make predictions based on theoretical probability |
| 10.A.3c | | c. discuss possible outcomes of experiments |
| 10.A.3c | | d. develop logical arguments to justify the reason for a prediction |
| | * | e. make and test conjectures about mathematical properties and relationships and develop logical arguments to justify conclusions |
| | * | f. write a symbolic equation to solve a two or three step word problem |
| | * | g. write a word problem from a symbolic equation |
| | * | h. write an extended response for a two or three step problem including <ul style="list-style-type: none"> • the answer • the process • the strategy(ies) • the explanation including how and why |
| | * | i. demonstrate the accurate use of mathematical symbols |

- * j. translate among and within representations *such as* concrete materials, spoken language, written language, pictures, diagrams and graphs, lists and tables

Essential Learning 6	*	Use reading and writing strategies to comprehend math text
-----------------------------	---	---

Critical Content * Same as Subject Expectation 1 Essential Learning 7

Essential Learning 7	*	Build mathematical knowledge by using a variety of appropriate strategies to solve a problem
-----------------------------	---	---

Critical Content * Same as Subject Expectation 1 Essential Learning 8