

Washington West Supervisory Union

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K-8 Mathematics Curriculum

Washington West Supervisory Union

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Adopted

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This curriculum guide is grounded in extensive, thoughtful, and purposeful conversations among educators from all of the WWSU schools. The work was completed during the 2009-2010 school year, but reflects work done during the past several years. Over the past several years there has been an extensive focus on mathematics and this document provides the most synthesized and focused representation of that work. This document reflects the non-negotiable, guaranteed viable curriculum that will form the basis for assessments and the prioritization of content within our extensive mathematics programs at our schools.

As the mathematics committee began work on this WWSU Power Standards document, the following assumptions, important concepts and germane definitions influenced our work.

Not all **Grade Level Expectations** (GEs) and **Standards** are created equal!

Not all concepts introduced at a grade level are meant to be solid, secure, mastered and fluently executed by students. **Understanding develops over time.**

- We need a local curriculum document so as to clarify our priorities for instruction.
- Our curriculum document needs to be a brief, straightforward, easy to read document to guide standards based instruction

A Word (or two) about Power Standards:

What are Power Standards?

- Standards and indicators that are critical for student success. A carefully selected subset of the complete list of standards that students need for success.
- A subset of the complete list of standards for each grade or subject area and represent the "safety net" curriculum.
- The standards that each teacher needs to make sure that every student learns prior to leaving the current grade.

Why Power Standards?

- Power standards do not relieve teachers of the responsibility for teaching all standards and indicators, but rather identify which standards are of the utmost priority for student success and which ones can be given less emphasis
- In the absence of Power Standards, teachers will select their own or "run out of time" when the school year ends before they are finished teaching the program for a given grade level

Qualities of Power Standards

- **Endurance:** *Knowledge and skills to which this standard relates will be built upon and have relevance throughout their educational experiences*
- **Leverage:** *Knowledge and skills to which this standard relates will be applicable within other content areas and will have many connections to learning*
- **Readiness for the next level of learning:** *Necessary entry point for a student to enter the next grade - these critical indicators are considered "**non-negotiables**" and student supports and **interventions** must be developed if necessary to assure that students achieve these most foundational proficiencies.*

Thanks to the following teachers who served as members of the WWSU Mathematics Curriculum Development Team. Their efforts to create a valuable document for this critical work was remarkable. Teachers and students will benefit as a result of their many contributions.

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2009-2010 Washington West Mathematics Curriculum Committee			
K-2 Team	3-4 Team	5-6 Team	7-8 Team
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Note: Throughout the document the use of text styles has been used to differentiate between content. Items listed in bold are the most essential content, and represent each of the three criteria for being considered a "Power Standard". These items **must** be mastered through regular classroom instruction or through additional lessons in an instructional intervention program. Items listed in italics are still considered important but do not meet the third criteria of "Power Standards" as a *necessary entry point for a student to enter the next grade*. These items are essential learning, and students should have adequate opportunity to reach a solid understanding however.

Grade: Kindergarten

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Oral fluency with counting sequences (forward and backward) and skip counting from zero to support object counting**
- **Use efficient methods of counting collections of objects (counts 1:1)**
- **Compare numbers within the first decade**
- **Order numbers within and over a decade in and out of counting sequence**
- **Use models to solve addition and subtraction problems in which one adds to or takes from**
- **Proficient with addition facts to 5**

Grade: Kindergarten

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- *Recognize, name and describe 2-D shapes in more than one form (e.g. size or orientation)*
- *Sort and classify objects by one attribute.*
- *Use measurable attributes such as weight or length to solve problems by comparing and ordering objects*
- *Measure length in non-standard units*

Grade: Kindergarten

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- *Identify, create and extend a variety of patterns (sound, color, shapes, movements, numbers, letters, etc...)*

Grade: Kindergarten

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- Interpret data from tallies and graphs

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- No indicators

Grade: 1st

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Oral fluency with counting sequences (forward and backward) and skip counting on and off decade to support object counting**
- **Use efficient methods of counting collections of objects (counting from 1)**
- **Compare numbers within a decade and to benchmark numbers**
- **Order numbers across decades in and out of counting sequence**
- **Solve addition and subtraction problems in which one puts together and takes apart**
- **Proficient with addition and subtraction facts to 10**

Grade: 1st

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- *Sort and classify 2-D geometric figures by two or more attributes*
- *Compose and decompose shapes in a variety of ways*
- *Identify polygons and describe characteristics*
- *Use measurable attributes such as weight or length to solve problems by comparing and ordering objects*
- *Measure length with standard and non standard tools*

Grade: 1st

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- *Identify, create and extend a variety of patterns (sound, color, shapes, movements, numbers, letters, etc...)*
- *Show equivalence in between two expressions by solving one-step equations ($4+1=5$; $2+3=5$)*

Grade: 1st

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- Represent and interpret data from tallies, charts, tables and graphs (more, less, equally likely)

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- No indicators

Grade: 2nd

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Oral fluency with counting sequences (forward and backward) and skip counting off decade beyond 100 to support object counting**
- **Use efficient methods of counting collections of objects (counts on)**
- **Compare numbers across decades and to benchmark numbers**
- **Order numbers using place value across decades in and out of sequence**
- **Use visual representation addition and subtraction and the relationship between them**
- **Proficient with addition and subtraction facts to 20**

Grade: 2nd

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Identify 2-D shapes and compose and decompose shapes in a variety of ways**
- *Identify 3-D shapes and their attributes*
- **Measure and use length and weight with standard tools to solve problems**
- *Make conversions within systems when solving problems*
- *Solve problems involving conceptual understanding of perimeter and area*

Grade: 2nd

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- *Use number patterns to solve and extend problems.*
- *Solve addition and subtraction problems by finding the missing value in an open sentence.*

Grade: 2nd

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- **Create, interpret and analyze data from graphs, charts, tables and line plots** (*more, less, equally likely*) (*example: How many more/less dogs are there than cats? Which pets had four or more votes?*)

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- *Identify the number of combinations using counting techniques (tree diagram, organized list, table) (using addition and subtraction)*

Grade: 3rd

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Proficient with addition and subtraction of whole numbers including basic facts**
- *Use place value to compare and order whole numbers*
- *Solve and create word problems that are based on common underlying structures**
- *Use inverse relationship between addition and subtraction*
- **Use visual representation of multiplication and division to solve problems**
- **Use the commutative, associative, and distributive properties of addition and multiplication**
- **Use models to demonstrate part to whole relationship and equivalence with fractions**
- *Compare and order fractions with like denominators*
- *Use decimal notation identify tenths and hundredths in the context of money*
- **Proficient with multiplication facts for 2, 3, 4, 5, 10**

Grade: 3rd

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Describe, analyze, compare and classify two-dimensional shapes by number of sides and angles to define a given shape**
- *Compose and decompose 2D shapes*
- *Demonstrate an understanding of congruence through the transformation of shapes*
- *Identify, compare, and describe three-dimensional shapes by the shape of the base and the number of faces.*
- **Form an understanding of perimeter/area as measurable attributes and develop strategies to find them**
- **Measure and use units of measure to solve problems (see benchmarks)**
- *Make conversions to solve problems*

Grade: 3rd

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- **Describe, create, and extend patterns**
- *Describe in words the rules applied in a relationship between numbers (What's the rule?)*
- **Evaluate the missing variable in the context of a problem involving with one operation (addition, subtraction, multiplication)**
- **Show equivalence between two expressions**

Grade: 3rd

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- **Construct and interpret representations (bar graphs) to solve problems (additively- how many less and multiplicatively- twice as much as)**
- **Analyze data (mode) and make predictions.**

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- *Use counting techniques to solve combination problems (additively and multiplicatively)*
- *Use experimental probability to describe the likelihood or chance of an event*
- *Determine the likelihood of the occurrence of an event*

Grade: 4th

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Proficient with multiplication of whole numbers including basic facts**
- **Use visual models to show understanding of composition and decomposition of whole numbers with multiplication**
- *Use place value to compare and order numbers including decimals to the 100ths*
- *Solve and create word problems that are based on common underlying structures**
- **Understand division as repeated subtraction, the inverse of multiplication, and interpret remainder**
- **Use the commutative, associative, and distributive properties of multiplication and/or division**
- **Identify and represent fractions and decimals, and compare like forms (fraction to fraction or decimal to decimal) on a number line**
- **Proficient with multiplication facts for 6, 7, 8, 9**

Grade: 4th

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Describe, analyze, compare and classify two-dimensional shapes by number of sides and angles to define a given shape**
- *Compose and decompose 2D shapes*
- *Demonstrate an understanding of congruence, similarity and symmetry*
- *Identify, compare, and describe three-dimensional shapes by the shape of the base and the number of faces, edges, and vertices*
- **Use efficient strategies for finding perimeter/area of regular and irregular shapes**
- **Measure and use units of measure to solve problems (see benchmarks)**
- *Make conversions within systems to solve problems*

Grade: 4th

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- **Describe, create, and extend patterns in all operations**
- **Describe in words the rules applied in a relationship between numbers to find the next case in growing and repeating patterns**
- *Identify, describe, and compare situations that represent constant rates of change.*
- **Evaluate the missing variable in the context of a problem involving any operation**
- **Show equivalence between two expressions using whole numbers (including the use of parentheses)**

Grade: 4th

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- **Construct (line plots) and interpret (pictographs, circle graphs) representations to solve problems (additively- more than 7 votes and multiplicatively- half as many)**
- **Analyze data (mode and median) and make predictions.**

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- ***Use counting techniques to solve combination problems (multiplicatively)***
- **Use experimental probability, record the outcomes, and describe the likelihood of an event as a value from 0 to 1**
- **Determine the theoretical probability (likelihood) of an event and express the result as part to whole.**

Grade 5th

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Proficient with understanding of and procedural fluency of division of whole numbers including basic facts and interpret remainder**
- **Use benchmark numbers to compare and order integers, fractions, decimals, and common percents within like forms**
- **Proficient with understanding and procedural fluency of addition and subtraction of fractions (like and unlike denominators) and decimals**
- *Use number properties (factor, multiple, prime, composite, rules of divisibility and remainder) and apply order of operations to solve problems*

Grade: 5th

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Describe and analyze properties of two and three dimensional shapes**
- **Solve problems involving area and perimeter of rectangles and right triangles and find volume of rectangular prisms**
- **Describe proportional effect on linear dimension of polygons when scaling up or down**
- *Make conversions within systems to solve problems*

Grade: 5th

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- *Find a pattern and write a rule*
- *Write and evaluate algebraic expressions with two operations (eg $2x+7$)*

Grade: 5th

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- *Collect, construct and analyze data in tables, bar graphs and line plots*
- *Analyze and interpret line graphs*
- *Use a list, table or line plot to determine the mean of a set of data*

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- *Create a sample space to determine all possible outcomes in a one step situation*
- *Recognize the difference between experimental and theoretical probability of a particular outcome*
- *Express the probability of an event as a fraction*

Grade 6th

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Proficient with understanding and procedural fluency with all four operations involving fractions (like and unlike), decimals, and integers (addition and subtraction only)**
- **Compare and order rational numbers**
- **Find equivalence between fractions, decimals and percent**
- **Solve problems by comparing rates and ratios**
- *Use number properties (multiple, LCM, factor, GCF) to solve problems*

Grade: 6th

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Find area of all triangles and all quadrilaterals**
- **Solve problems involving volume of rectangular prisms**
- **Describe proportional effect on angle of polygons and circles (radius to diameter, and diameter to circumference) when scaling up or down**
- *Make conversions within systems to solve problems*
- *Use Cartesian coordinates to solve problems*

Grade: 6th

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- *Generalize linear relationships in words or symbols*
- *Write and evaluate algebraic expressions with two or more operations*
- *Use the concept of equality to find the unknown in simple, linear equations (eg $2x+x+7=5x+1$)*
- *Identify a constant rate of change for tables and graphs*

Grade: 6th

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- *Collect, construct and analyze data in circle and stem and leaf plots*

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- Use counting techniques to solve problems involving combinations or simple permutations
- Determine the probability for an event in which the sample space may or may not contain equally likely outcomes

Grade 7th

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Proficient with understanding and procedural fluency with all operations involving positive and negative rational numbers**
- **Apply multiplicative relationship within or between ratios**
- *Distinguish between and solve proportional and non-proportional problems*
- **Solve problems involving percent, ratio, and rate**
- *Use number properties (inverse, distributive, exponents, powers of ten, scientific notation, square roots) to solve problems*

Grade: 7th

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Develop and justify formulas for finding surface area and volumes of prisms and cylinders**
- **Use appropriate 2D and 3D shapes to solve problems involving surface areas, areas and circumferences of circles, and volumes of prisms and cylinders**
- **Use scale factor to describe how corresponding areas are related**
- **Use concept of similarity to solve problems**
- *Make conversions within systems to solve problems*

Grade: 7th

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- **Develop an understanding of the relationship between a table, coordinate graph, and equation for linear and nonlinear functions**
- **Distinguish between constant and varying rates of change**
- **Describe how change in the value of one variable relates to change in the value of a second variable**

Grade: 7th

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- Analyze data using scatter plots, tables and bar graphs
- Analyze the effect of changes in measure of central tendencies, outliers, and variations

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- Calculate theoretical probability with or without equally likely outcomes and express as a fraction, decimal or percent

Grade 8th

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

- **Proficient with understanding and procedural fluency with cross products**
- **Compare and order irrational numbers and complex fractions**
- **Solve problems involving rational numbers with respect to percent (describing change)**
- *Use number properties to solve problems*

Grade: 8th

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: 7.7 Geometry and Measurement

- **Solve multistep problems involving distance, angles and analysis of figures in two and three dimensional space**
- **Apply the Pythagorean theorem to find distances between points in the Cartesian coordinate plan to measure lengths and analyze polygons and polyhedra**
- *Make conversions within systems to solve problems*

Grade: 8th

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: 7.8 Patterns, Equations, and Inequalities

- **Distinguish between linear and nonlinear functions in coordinate graphs, tables, equations, and problem situations**
- **Solve for variables in the $y=mx+b$ form**
- **Graph $y=mx+b$ using slope and y-intercept**

Grade: 8th

Power Standard #4: Students represent, interpret, predict and solve problems using data

Content Area: 7.9 Data, Probability and Statistics

- Interpret Box-and-Whisker plots and quartile values
- Estimate the line of best fit to analyze situations in scatter plots

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

Content Area: 7.9 Data, Probability and Statistics

- Find permutations
- Determine the possible outcomes by sample space or *fundamental counting principle*

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

K	1	2	3	4
<ul style="list-style-type: none">• Oral fluency with counting sequences (forward and backward) and skip counting from zero to support object counting• Use efficient methods of counting collections of objects (counts 1:1)• Compare numbers within the first decade• Order numbers within and over a decade in and out of counting sequence• Use models to solve addition and subtraction problems in which one adds to or takes from• Proficient with addition facts to 5	<ul style="list-style-type: none">• Oral fluency with counting sequences (forward and backward) and skip counting on and off decade to support object counting• Use efficient methods of counting collections of objects (counting from 1)• Compare numbers within a decade and to benchmark numbers• Order numbers across decades in and out of counting sequence• Solve addition and subtraction problems in which one puts together and takes apart• Proficient with addition and subtraction facts to 10	<ul style="list-style-type: none">• Oral fluency with counting sequences (forward and backward) and skip counting off decade beyond 100 to support object counting• Use efficient methods of counting collections of objects (counts on)• Compare numbers across decades and to benchmark numbers• Order numbers using place value across decades in and out of sequence• Use visual representation addition and subtraction and the relationship between them• Proficient with addition and subtraction facts to 20	<ul style="list-style-type: none">• Proficient with addition and subtraction of whole numbers including basic facts• <i>Use place value to compare and order whole numbers</i>• <i>Solve and create word problems that are based on common underlying structures*</i>• <i>Use inverse relationship between addition and subtraction</i>• Use visual representation of multiplication and division to solve problems• Use the commutative, associative, and distributive properties of addition and multiplication• Use models to demonstrate part to whole relationship and equivalence with fractions• <i>Compare and order fractions with like denominators</i>	<ul style="list-style-type: none">• Proficient with multiplication of whole numbers including basic facts• Use visual models to show understanding of composition and decomposition of whole numbers with multiplication• <i>Use place value to compare and order numbers including decimals to the 100ths</i>• <i>Solve and create word problems that are based on common underlying structures*</i>• Understand division as repeated subtraction, the inverse of multiplication, and interpret remainder• Use the commutative, associative, and distributive properties of multiplication and/or division• Identify and represent fractions and decimals, and compare like forms (fraction to fraction)

Power Standard #1: Students understand relative magnitude of number and apply properties and operations of numbers

Content Area: 7.6 Number and Operations

5

- Proficient with understanding of and procedural fluency of division of whole numbers including basic facts and interpret remainder
- Use benchmark numbers to compare and order integers, fractions, decimals, and common percents within like forms
- Proficient with understanding and procedural fluency of addition and subtraction of fractions (like and unlike denominators) and decimals
- Use number properties (factor, multiple, prime, composite, rules of divisibility and remainder) and apply order of operations to solve problems

6

- Proficient with understanding and procedural fluency with all four operations involving fractions (like and unlike), decimals, and integers (addition and subtraction only)
- Compare and order rational numbers
- Find equivalence between fractions, decimals and percent
- Solve problems by comparing rates and ratios
- Use number properties (multiple, LCM, factor, GCF) to solve problems

7

- Proficient with understanding and procedural fluency with all operations involving positive and negative rational numbers
- Apply multiplicative relationship within or between ratios
- Distinguish between and solve proportional and non-proportional problems
- Solve problems involving percent, ratio, and rate
- Use number properties (inverse, distributive, exponents, powers of ten, scientific notation, square roots) to solve problems

8

- Proficient with understanding and procedural fluency with cross products
- Compare and order irrational numbers and complex fractions
- Solve problems involving rational numbers with respect to percent (describing change)
- Use number properties to solve problems

- Use decimal notation identify tenths and hundredths in context of money
- Proficient with multiplication facts for 2, 3, 4, 5, 10

- or decimal to decimal) on a number line
- Proficient with multiplication facts for 6, 7, 8, 9

WWSU Math Power Standards

Power Standard #2: Students know and apply the attributes of geometric figures and know and use units of measure

Content Area: Geometry and Measurement (7.7)

K	1	2	3	4
<ul style="list-style-type: none">• Recognize, name and describe 2-D shapes in more than one form (e.g. size or orientation)• Sort and classify objects by one attribute.• Use measurable attributes such as weight or length to solve problems by comparing and ordering objects• Measure length in non-standard units	<ul style="list-style-type: none">• Sort and classify 2-D geometric figures by two or more attributes• Compose and decompose shapes in a variety of ways• Identify polygons and describe characteristics• Use measurable attributes such as weight or length to solve problems by comparing and ordering objects• Measure length with standard and non standard tools	<ul style="list-style-type: none">• Identify 2-D shapes and compose and decompose shapes in a variety of ways• Identify 3-D shapes and their attributes• Measure and use length and weight with standard tools to solve problems• Make conversions within systems when solving problems• Solve problems involving conceptual understanding of perimeter and area	<ul style="list-style-type: none">• Describe, analyze, compare and classify two-dimensional shapes by number of sides and angles to define a given shape• Compose and decompose 2D shapes• Demonstrate an understanding of congruence through the transformation of shapes• Identify, compare, and describe three-dimensional shapes by the shape of the base and the number of faces.• Form an understanding of perimeter/area as measurable attributes and develop strategies to find them• Measure and use units of measure to solve problems (see benchmarks)• Make conversions within systems to solve problems	<ul style="list-style-type: none">• Describe, analyze, compare and classify two-dimensional shapes by number of sides and angles to define a given shape• Compose and decompose 2D shapes• Demonstrate an understanding of congruence, similarity and symmetry• Identify, compare, and describe three-dimensional shapes by the shape of the base and the number of faces, edges, and vertices• Use efficient strategies for finding perimeter/area of regular and irregular shapes• Measure and use units of measure to solve problems (see benchmarks)• Make conversions within systems to solve problems

WWSU Math Power Standards

5

- Describe and analyze properties of two and three dimensional shapes
- Solve problems involving area and perimeter of rectangles and right triangles and find volume of rectangular prisms
- Describe proportional effect on linear dimension of polygons when scaling up or down
- *Make conversions within systems to solve problems*

6

- Find area of all triangles and all quadrilaterals
- Solve problems involving volume of rectangular prisms
- Describe proportional effect on angle of polygons and circles (radius to diameter, and diameter to circumference) when scaling up or down
- *Make conversions within systems to solve problems*
- *Use Cartesian coordinates to solve problems*

7

- Develop and justify formulas for finding surface area and volumes of prisms and cylinders
- Use appropriate 2D and 3D shapes to solve problems involving surface areas, areas and circumferences of circles, and volumes of prisms and cylinders
- Use scale factor to describe how corresponding areas are related
- Use concept of similarity to solve problems
- *Make conversions within systems to solve problems*

8

- Solve multistep problems involving distance, angles and analysis of figures in two and three dimensional space
- Apply the Pythagorean theorem to find distances between points in the Cartesian coordinate plan to measure lengths and analyze polygons and polyhedra
- *Make conversions within systems to solve problems*

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: Patterns, Equations, and Inequalities (7.8)

Kindergarten

- Identify, create and extend a variety of patterns (sound, color, shapes, movements, numbers, letters, etc...)

1

- Identify, create and extend a variety of patterns (sound, color, shapes, movements, numbers, letters, etc...)
- Show equivalence in between two expressions by solving one-step equations ($4+1=5$; $2+3=5$)

2

- Use number patterns to solve and extend problems.
- Solve addition and subtraction problems by finding the missing value in an open sentence.

3

- Describe, create, and extend patterns
- Describe in words the rules applied in a relationship between numbers (What's the rule?)
- Evaluate the missing variable in the context of a problem involving with one operation (addition, subtraction, multiplication)
- Show equivalence between two expressions

4

- Describe, create, and extend patterns in all operations
- Describe in words the rules applied in a relationship between numbers to find the next case in growing and repeating patterns
- Identify, describe, and compare situations that represent constant rates of change.
- Evaluate the missing variable in the context of a problem involving any operation
- Show equivalence between two expressions using whole numbers (including the use of parentheses)

WWSU Math Power Standards

Power Standard #3: Students identify and extend patterns to express relationships between and among variables, and solve equations and inequalities

Content Area: Patterns, Equations, and Inequalities (7.8)

5

- *find a pattern and write a rule*
- *write and evaluate algebraic expressions with two operations (eg $2x+7$)*

6

- *generalize linear relationships in words or symbols*
- *write and evaluate algebraic expressions with two or more operations*
- *use the concept of equality to find the unknown in simple, linear equations (eg $2x+x+7=5x+1$)*
- *identify a constant rate of change for tables and graphs*

7

- **Develop an understanding of the relationship between a table, coordinate graph, and equation for linear and nonlinear functions**
- **Distinguish between constant and varying rates of change**
- **Describe how change in the value of one variable relates to change in the value of a second variable**

8

- **Distinguish between linear and nonlinear functions in coordinate graphs, tables, equations, and problem situations**
- **Solve for variables in the $y=mx+b$ form**
- **Graph $y=mx+b$ using slope and y-intercept**

Power Standard #4: Students represent, interpret, predict and solve problems using data

(Data, Probability and Statistics (7.9))

- | | | | | |
|---|--|--|--|--|
| <p>K</p> <ul style="list-style-type: none">Interpret data from tallies and graphs | <p>1</p> <ul style="list-style-type: none">Represent and interpret data from tallies, charts, tables and graphs (<i>more, less, equally likely</i>) | <p>2</p> <ul style="list-style-type: none">Create, interpret and analyze data from graphs, charts, tables and line plots (<i>more, less, equally likely</i>) (<i>example: How many more/less dogs are there than cats? Which pets had four or more votes?</i>) | <p>3</p> <ul style="list-style-type: none">Construct and interpret representations (bar graphs) to solve problems (additively- how many less and multiplicatively- twice as much as)Analyze data (mode) and make predictions. | <p>4</p> <ul style="list-style-type: none">Construct (line plots) and interpret (pictographs, circle graphs) representations to solve problems (additively- more than 7 votes and multiplicatively- half as many)Analyze data (mode and median) and make predictions. |
| <p>5</p> <ul style="list-style-type: none"><i>collect, construct and analyze data in tables, bar graphs and line plots</i><i>analyze and interpret line graphs</i><i>use a list, table or line plot to determine the mean of a set of data</i> | <p>6</p> <ul style="list-style-type: none"><i>collect, construct and analyze data in circle and stem and leaf plots</i> | <p>7</p> <ul style="list-style-type: none">Analyze data using scatter plots, tables and bar graphsAnalyze the effect of changes in measure of central tendencies, outliers, and variations | <p>8</p> <ul style="list-style-type: none">Interpret Box-and-Whisker plots and quartile valuesEstimate the line of best fit to analyze situations in scatter plots | |

WWSU Math Power Standards

Power Standard #5: Students find and use theoretical and experimental probability to solve problems

(Data, Probability and Statistics 7.9)

- | K | 1 | 2 | 3 | 4 |
|--|---|--|--|--|
| <ul style="list-style-type: none">• No indicators | <ul style="list-style-type: none">• No indicators | <ul style="list-style-type: none">• Identify the number of combinations using counting techniques (tree diagram, organized list, table) (using addition and subtraction) | <ul style="list-style-type: none">• Use counting techniques to solve combination problems (additively and multiplicatively)• Use experimental probability to describe the likelihood or chance of an event• Determine the likelihood of the occurrence of an event | <ul style="list-style-type: none">• Use counting techniques to solve combination problems (multiplicatively)• Use experimental probability, record the outcomes, and describe the likelihood of an event as a value from 0 to 1• Determine the theoretical probability (likelihood) of an event and express the result as part to whole. |
| 5 | 6 | 7 | 8 | |
| <ul style="list-style-type: none">• create a sample space to determine all possible outcomes in a one step situation• recognize the difference between experimental and theoretical probability of a particular outcome• express the probability of an event as a fraction | <ul style="list-style-type: none">• Use counting techniques to solve problems involving combinations or simple permutations• Determine the probability for an event in which the sample space may or may not contain equally likely outcomes | <ul style="list-style-type: none">• Calculate theoretical probability with or without equally likely outcomes and express as a fraction, decimal or percent | <ul style="list-style-type: none">• Find permutations• Determine the possible outcomes by sample space or fundamental counting principle | |