

# DRAFT

## FEDERAL WAY SCHOOL DISTRICT Mathematics Expectations: Sixth Grade

### CONTENT STRANDS

#### **1. The student understands and applies the concepts and procedures of mathematics.**

##### **1.1 Number Sense**

- 1.1.1 uses pictures and symbols to demonstrate understanding of fractions and decimals
- 1.1.2 compares and orders fractions, (denominators of 2, 3, 4, 8, 10, 16, 100), decimals to .001, mixed numbers, and common percents (75%, 50%, 25%)
- 1.1.3 expresses fractions in lowest terms
- 1.1.4 uses concepts of prime and composite numbers
- 1.1.5 uses objects, pictures, and symbols to create and solve equivalent ratios and proportions
- 1.1.6 uses visual and physical models for all operations on fractions and decimals
- 1.1.7 adds, subtracts, multiplies, and divides whole numbers, decimals, fractions, and mixed numbers
- 1.1.8 uses visual and physical models to demonstrate the meaning of division of simple fractions and decimals
- 1.1.9 uses mental arithmetic, paper and pencil, calculator, or computer as appropriate for a given situation involving whole numbers and fractions
- 1.1.10 identifies situations involving whole numbers and fractions in which estimation is sufficient and computation is not required
- 1.1.11 uses estimation prior to actual computation with whole numbers and fractions to determine reasonableness of results

##### **1.2 Measurement**

- 1.2.1 applies procedures for determining area of a triangle, circumference of a circle, and volume of a rectangular solid
- 1.2.2 measures a variety of rates (e.g., heartbeat, breath per minute)
- 1.2.3 uses estimation to obtain reasonable approximation of area
- 1.2.4 describes appropriate situations for using standard and nonstandard units of measure
- 1.2.5 demonstrates the relationship among units within the metric and U.S. system
- 1.2.6 selects appropriate measurement tool for a given situation and explains how the selection and use of a particular tool affects precision and accuracy

##### **1.3 Geometric Sense**

- 1.3.1 constructs geometric shapes given their properties (e.g., draws a quadrilateral with opposite sides parallel)
- 1.3.2 creates simple scale drawings of plane figures (e.g., doubles the dimensions of a simple polygon)
- 1.3.3 identifies and draws multiple lines of symmetry
- 1.3.4 builds and records similar and congruent figures
- 1.3.5 constructs geometric figures using a variety of tools
- 1.3.6 describes the location of points on a coordinate grid using ordered pairs including negative numbers
- 1.3.7 identifies and draws simple transformations including translations (slides), reflections (flips), and rotations (turns)

##### **1.4 Probability and Statistics**

- 1.4.1 uses and describes strategies for determining that the probability of an event is a ratio between 0 and 1
- 1.4.2 displays the sample space of a probability experiment by making a table or using a diagram
- 1.4.3 chooses appropriate strategy for collecting random samples of a representative population
- 1.4.4 organizes and displays data using multiple line graphs and circle graphs; determines which form is most appropriate
- 1.4.5 calculates and demonstrates the appropriate use of mean, median, mode, and range to make inferences and draw conclusions
- 1.4.6 makes predictions, conducts experiments, and compares results with predictions
- 1.4.7 makes inferences and notes trends based on data collected from experiments, multiple line graphs, or circle graphs

##### **1.5 Algebraic Sense**

- 1.5.1 creates, analyzes and extends number patterns that involve a combination of one or two operations
- 1.5.2 represents and describes patterns using tables and graphs; supplies missing elements of patterns
- 1.5.3 identifies the correct equation for a given situation
- 1.5.4 sets up and solves one-step single variable equations in a context

# DRAFT

## FEDERAL WAY SCHOOL DISTRICT Mathematics Expectations: Sixth Grade

### PROCESS STRANDS

#### **2. The student uses mathematics to define and solve problems.**

##### **2.1 Investigates Situations**

2.1.1 solves challenging problems that require perseverance

2.1.2 solves problems involving integration of topics, such as probability, statistics, geometry and number sense

2.1.3 develops and uses a variety of strategies and combination of strategies (e.g. guess-check-revise, work backwards, solve a simple problem and generalize, write an equation, organized list, use proportional reasoning)

##### **2.2 Formulates Questions and Defines the Problem**

2.2.1 defines problems and identifies irrelevant information in problem situations

2.2.2 clarifies the problem and identifies the question being asked

2.2.3 distinguishes between relevant and irrelevant information

##### **2.3 Constructs Solutions**

2.3.1 uses technology (e.g. graphing calculators, spreadsheets) to find and analyze data or represent information

2.3.2 solves problems involving multiple steps

#### **3. The student uses mathematical reasoning.**

##### **3.1 Analyzes Information**

3.1.1 validates thinking and mathematical ideas using patterns, relationships, and counter-examples

##### **3.2 Predicts Results**

3.2.1 develops conjectures based on analysis of new problem situations (e.g. in context of learning divisibility rules, formulates a rule for divisibility by 6 and develops arguments to support the rule)

3.2.2 generates and organizes data to test a conjecture

##### **3.3 Draws Conclusions and Verifies Results**

3.3.1 supports arguments and justifies results using inductive reasoning

3.3.2 organizes and clarifies mathematical information by reflecting, writing, and discussing

3.3.3 reflects on and evaluates procedures and results through writing and discussion

#### **4. The student communicates knowledge and understanding in both everyday and mathematical language.**

##### **4.1 Gathers Information**

4.1.1 formulates questions and develops a plan for collecting and communicating relevant data

4.1.2 uses diagrams, oral narratives, symbolic representations, and written logs to clearly and effectively express ideas

4.1.3 uses available technology to browse, select, and retrieve information

##### **4.2 Organizes and Interprets Information**

4.2.1 organizes and clarifies mathematical information by reflecting and discussing (e.g. during class discussion about probability, presents oral justification for inferences made from experimental data)

##### **4.3 Represents and Shares Information**

4.3.1 uses both everyday and mathematical language appropriate to the audience

#### **5. The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.**

##### **5.1 Relates Concepts and Procedures within Mathematics**

5.1.1 connects conceptual and procedural understandings among different mathematical content areas (e.g. applies ratios and proportions to indirect measurement tasks)

5.1.2 relates and uses different mathematical models and representations for the same situation

##### **5.2 Relates Mathematics to Other Disciplines**

5.2.1 identifies mathematical patterns and relationships in other disciplines (e.g. shows the relationship between coordinate grids and maps)

5.2.2 uses mathematical thinking and modeling in other disciplines

5.2.3 understands the contributions to mathematics by different cultures

##### **5.3 Relates Mathematics to Real Life Situations**

5.3.1 recognizes the use of mathematics outside the classroom and within several occupational/career areas (e.g. banking, engineering)