Charyl Stockwell Academy

Explorer Benchmarks and Grade Level Content Expectations

Benchmarks are in normal font and GLCES are in italics

Mathematics Curriculum with Focal Points

Number and Operations and Algebra: Developing an understanding of and fluency with division of whole numbers.

- Use algorithms to accomplish a multiplication and division task or to solve problems;
  - *write mathematical statement involving multiplication and division for given situations*
  - *multiply a multi-digit number by a two-digit number and divide fluently up to a four-digit number by a two-digit number*
- Multiply and divide efficiently and accurately in solving problems
  - *Mentally calculate simple products and quotients up to a four-digit number by a one digit number involving multiples of 10 or 100 or 1000*
  - *multiply a multi-digit number by a two-digit number and divide fluently up to a four-digit number by a two-digit number*
  - *Find the prime factorization of numbers between 1 and 50, express in exponential notation, and understand that every whole number can be expresses as a product of primes*

Number and Operations and Algebra Continued Instruction: *all Numbers and Operations and Algebra benchmarks and GLCEs are essential.*

Number and Operations: Developing an understanding of and fluency with addition and subtraction of fractions and decimals.

- Use manipulatives to model operations with whole numbers, decimals and fractions; develop their own methods of recording operations; and relate their models and recordings to standard symbolic expressions and algorithms
- Add and subtract decimals using manipulatives, written algorithms, and calculators

- Develop and apply the appropriate method of computation from among mental computation, estimation, paper-and-pencil, or use of a calculator for whole numbers, decimals and fractions.
- Apply their understanding of fractions to model and solve problems
    - *Understand that a fraction can be written as a sum of unit fractions, e.g. ¾=1/4 + 1/4 + ¼*
    - *Add and subtract fractions with like and unlike denominators (denominators being 12 or less and including 100)*
    - *Solve fraction problems involving sums and differences for fractions where one denominator is a multiple of the other*
    - *Multiply fractions by whole numbers, using repeated addition and area, array models*
    - *Find the product of two unit fractions with small denominators using area model*
    - *Divide a fraction by a whole number and a whole number by a fraction using simple unit fractions*
    - *Solve for the unknown in equations: ___ + x = ___*
    - *Solve word problems that involve finding sums and differences of fractions with unlike denominators using knowledge of equivalent fractions*

Numbers and Operations (fractions and decimals) Continued Instruction

- *Given an applied situation involving addition and subtraction of fractions, write mathematical statements describing the situation*
- *Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness; use examples involving money*

Geometry and Measurement and Algebra: Describing three-dimensional shapes and analyzing their properties, including volume and surface area.

- Use measurements of capacity to describe world and to solve practical problems
    - *Know and use common units of measurements in volume*
    - *Convert measurements of volume within a given system using easily manipulated numbers*
    - *Know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations*
    - *Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter*
    - *Solve applied problems about the volumes or rectangular prisms using multiplication and division and using the appropriate units*

- Recognize and name familiar shapes in three dimensions such as spheres and informally discuss the shape of a graph
  - *Recognize the Basic Elements of Geometric Objects by looking at familiar shapes and/or objects in the classroom*
    - *Identify parallel faces of rectangular prisms, in familiar shapes and in the classroom*
    - *Identify, describe, compare, and classify three-dimensional shapes (cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices)*
- Recognize, name, draw, build, and compare common three-dimensional shapes and describe their attributes: prism, sphere, pyramid, cone, and cylinder.
  - *Identify and count the faces, edges, and vertices of basic three-dimensional geometric solids including cubes, rectangular prisms, and pyramids; describe the shape of their faces*
  - *Represent front, top, and side views of solids built with cubes*
- Use the formula for the volume of a rectangular prism
- Draw and measure angles between 0 and 360 degrees
  - *Find unknown angles in problems involving angles on a straight line, angles surrounding a point and vertical angles*
  - *Know that angles on a straight line add up to 180 degrees and angles surrounding a point add up to 360 degrees, justify informally by "surrounding" a point with angles*
  - *Understand why the sum of the interior angles of a triangle is 180 degrees and the sum of the interior angles of a quadrilateral is 360 degrees, and use these properties to solve problems*
  - *Find unknown angles using the properties of: triangles, including rights, isosceles, and equilateral triangles; parallelograms, including rectangles and rhombuses; and trapezoids*
- Name a given point of a rectangular coordinate grid by an ordered pair
- Locate a place on the globe using latitude and longitude

Geometry, Measurement, and Algebra Continued Instruction

  - *Solve contextual problems about surface area*
  - *Give answers to a reasonable degree of precision in the context of a given problem*
  - *Build solids with unit cubes and state their volumes*
  - *Use filling (unit cubes or liquid), and counting or measuring to find the volume of a cube and rectangular prism*
- Build models of polyhedra
- Explore the situations in which figures are modeled and paths are traced using vertices connected by edges

Other:

Probability and Data Analysis:

- Collect data
- Organize data through using objects, tallies, charts, graphs
    - *Construct tables and bar graphs from given data*
    - *Construct line graphs from table of data; include axis labels and scale*
- Present data using appropriate representations and explain the meaning of the data
    - *Order a given set of data, find the median, and specify the range of values*
    - *Read scales on the axes and identify the maximum, minimum, and range of values in a bar graph*
    - *Given a set of data, find and interpret the mean (using the concept of fair share) and mode*
- Draw, explain, and justify conclusions based on data
    - *Read and interpret bar graphs in both horizontal and vertical forms*
    - *Read and interpret line graphs including distance-time graphs, and problems with two or three line graphs on same axes, comparing different data*
    - *Compare data represented in two bar graphs and read bar graphs showing two data sets*
- Conduct surveys, sampling, and experiments to solve problems and answer the questions of interest
    - *Solve problems using information or data presented in bar graphs, tables, line graphs*
    - *Solve multi-step problems involving means*
- Recognize, describe, and extend numerical and geometric patterns
- Represent and record patterns and relationships in a variety of ways including tables, charts, and pictures
- Recognize that change is often predictable, but variable, and that patterns emerge that help describe the change
- Use tables, charts, open sentences, and hands-on models to represent change and variability
- Explore change, and realize that changes are frequently interdependent

Probability and Data Analysis Continued Instruction

- Describe the shape of the graph using informal language
- Make and explain predictions based on data
- Make and test hypotheses

- Explore variability and change in mathematics in a variety of contexts, investigations, and problems

Probability

- Explain the difference between chance and certainty and give examples to illustrate their understanding
- Compare events, describe them as “more likely” or “less likely”, and use the language of fractions to describe simple probabilities
- Conduct experiments with concrete objects to explore probability concepts and develop an intuitive understanding of how changing the conditions of an experiment can affect the outcomes
- Conduct simple probability experiments with coins and spinners, record the outcomes, examine those outcomes to determine if they make sense, and search for explanations of the outcomes