Grade 4 math GLEs

**Number and Operations**
* means assess locally

1. Understand numbers, ways of representing numbers, relationships among numbers and number systems
   A. Read, write and compare numbers
      read, write and compare and whole numbers less than 100,000
   B. Represent and use rational numbers
      *use models, benchmarks (0, 1/2 and 1) and equivalent forms to judge the size of fractions
   C. Compose and decompose numbers
      recognize equivalent representations for the same number and generate them by decomposing and composing numbers
   D. Classify and describe numeric relationships
      classify and describe numbers by their characteristics, including odd, even, multiples and factors

2. Understand meanings of operations and how they relate to one another
   A. Represent operations
      *represent and recognize multiplication and related division using various models, including equal intervals on the number line, equal size groups, distributive property, etc.
   B. Describe effects of operations
      describe the effects of multiplying and dividing whole numbers as well as the relationship between the two operations

3. Compute fluently and make reasonable estimates
   A. Describe or represent mental strategies
      *represent a mental strategy used to compute a given multiplication problem (up to 2-digit by 2-digit multiple of)
   B. Develop and demonstrate fluency
      demonstrate fluency with basic number relationships (12 X 12) of multiplication and related division facts
   C. Compute problems
      apply and describe the strategy used to compute a given multiplication of 2-digit by 2-digit numbers and related division facts
   D. Estimate and justify solutions
      estimate and justify products of whole numbers

**Grade 4: Algebraic Relationships**

1. Understand patterns, relations and functions
   A. Recognize and extend patterns
      describe geometric and numeric patterns
   B. Create and analyze patterns
      analyze patterns using words, tables and graphs

2. Represent and analyze mathematical situations and structures using algebraic symbols
   A. Represent mathematical situations
      using all operations, represent a mathematical situation as an expression or number sentence
   B. Describe and use mathematical manipulation
      use the commutative, distributive and associative properties of addition and multiplication for multidigit numbers

3. Use mathematical models to represent and understand quantitative relationships
   A. Use mathematical models
      *model problem situations, using representations such as graphs, tables or number sentences

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4. Analyze change in various contexts
   A. Analyze change
   *describe mathematical relationships in terms of constant rates of change.

   **Grade 4: Geometric and Spatial Relationships**

   1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
   A. Describe and use geometric relationships
   name and identify properties of 1-, 2- and 3-dimensional shapes and describe the attributes of 2- and 3-dimensional shapes using appropriate geometric vocabulary (rectangular prism, cylinder, pyramid, sphere, cone, parallelism, perpendicularity)
   C. compose shapes
   *describe the results of subdividing, combining and transforming shapes

   2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems
   A. Use coordinate systems
   *describe movement using common language and geometric vocabulary (forward, back, left, right, north, south, east, west)

   3. Apply transformations and use symmetry to analyze mathematical situations
   A. Use transformations on objects
   predict the results of sliding/ translating, flipping/ reflecting or turning/ rotating around the center point of a polygon
   C. Use symmetry
   create a figure with multiple lines of symmetry and identify the lines of symmetry

   4. Use visualization, spatial reasoning and geometric modeling to solve problems
   A. Recognize and draw three-dimensional representations
   *given the picture of a prism, identify the shapes of the faces

   **Grade 4: Measurement**

   1. Understand measurable attributes of objects and the units, systems and processes of measurement
   A. Determine unit of measurement
   *identify and justify the unit of linear measure including perimeter and (customary metric)
   B. Identify equivalent measures
   identify equivalent linear measures within a system of measurement
   C. Tell and use units of time
   tell time to the nearest minute
   D. Count and compute money
   determine change from $10.00 and add and subtract money values to $10.00

   2. Apply appropriate techniques, tools and formulas to determine measurements
   A. Use angle measurement
   *select and use benchmarks to estimate measurements of 0-, 45- (acute), 90- (right) greater than 90 (obtuse) degree angles
   B. Use standard or non-standard measurement
   *select and use benchmarks to estimate measurements (linear, capacity, weight)
   C. Apply geometric measurements
   determine and justify areas of polygons and non-polygonal regions imposed on a rectangular grid
Grade 4: Data and Probability

1. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them
   A. Formulate questions
collect data using observations, surveys and experiments
   C. Represent and interpret data
create tables or graphs to represent categorical and numerical data (including line plots)

2. Select and use appropriate statistical methods to analyze data
   A. Describe and analyze data
   *describe important features of the data set

3. Develop and evaluate inferences and predictions that are based on data
   A. Develop and evaluate inferences
   *given a set of data, propose and justify conclusions that are based on the data

4. Understand and apply basic concepts of probability