

## Math GLE's - Grade 4

### Strand 1: Number and Operations

1. Understanding numbers, ways of representing numbers, relationships among numbers and number systems
  - A. Read, write and compare numbers: **MA 5 1.10 DOK 1**
    - \*Read, write, and compare whole numbers less than 100,000
  - B. Represent and use rational numbers: **MA 5 1.10 DOK 2**
    - Use models benchmarks (0,  $\frac{1}{2}$  and 1) and equivalent forms to judge the size of fractions
  - C. Compose and Decompose Numbers: **MA 1 1.6 DOK 2**
    - Recognize equivalent representations for the same number and generate them by decomposing and composing numbers.
  - D. Classify and describe numeric relationships: **MA 5 1.10 DOK 2**
    - 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 **MA 1 1.10 DOK 2**
    - 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: **MA 1 1.10 DOK 2**
    - Describe the effects of multiplying and dividing whole numbers as well as the relationship between the two operations
  - C. Apply properties of operations:  
\*none

D. Apply operations on real and complex numbers: None

3. Compute fluently and make reasonable estimates

A. Describe or represent mental strategies: MA 1 3.2 DOK 2

- 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: MA 1 1.6 DOK 1

- Demonstrate fluency with basic number relationships (12 x 12) of multiplication and related division facts

C. Compute problems: MA 1 3.2 DOK 2

- \*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: MA 1 3.2 DOK 3

- \*Estimate and justify the products of whole numbers

E. Use proportional reasoning: None

## Strand 2: Algebraic Relationships

### 1. Understand patterns, relations and functions

#### A. Recognize and extend patterns: MA 4 1.6 DOK 2

- Describe geometric and numeric patterns

#### B. Create and analyze patterns: MA 4 1.6 DOK 3

- Analyze patterns using words, tables and graphs

#### C. Classify objects and representations: None

#### D. Identify and compare functions: None

#### E. Describe the effects of parameter changes: None

### 2. Represent and analyze mathematical situations and structures using algebraic symbols

#### A. Represent mathematical situations MA 4 1.10 DOK 2

- \* using all operations, represent a mathematical situation as an expression or number sentence

#### B. Describe and use mathematical manipulation: MA 4 3.2 DOK 2

- \* use the commutative, distributive and associative properties of addition and multiplication for multidigit numbers

#### C. Utilize equivalent forms: None

#### D. Utilize systems: None

### 3. Use mathematical models to represent and understand quantitative relationships

#### A. Use mathematical models MA 4 1.6 DOK 2

- model problem situations, using representations such as graphs, tables or number sentences

### 4. Analyze change in various contexts

#### A. Analyze change: MA 4 1.6 DOK 2

- Describe mathematical relationships in terms of constant rates of change

## Strand 3: 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: **MA 2 1.10 DOK 2**
    - \* 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)
  - B. Apply geometric relationships: None
  - C. Compose and decompose shapes: **MA 2 1.6 DOK 2**
    - 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: **MA 2 3.3 DOK 2**
    - 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: **MA 2 3.6 DOK 3**
    - Predict the results of sliding/translating, flipping/reflecting and turning/rotating around a center point of a polygon
  - B. Use transformations on functions: None
  - C. Use symmetry: **MA 2 1.10 DOK 2**
    - Create a figure with multiple lines of symmetry and identify the lines of symmetry
4. Use visualizations, spatial reasoning and geometric modeling to solve problems
  - A. Recognize and draw three dimensional representations: **MA 2 3.3 DOK 1**
    - Given the picture of a prism, identify the shapes of the faces
  - B. Draw and use visual models: None

## Strand 4: Measurement

1. Understand measurable attributes of objects and the units, systems and processes of measurement.

A. Determine unit of measurement: **MA 2 3.1 DOK 3**

- Identify and justify the unit of linear measure including perimeter and (customary metric)

B. Identify equivalent measures: **MA 2 1.6 DOK 1**

- Identify equivalent linear measures within a system of measurement

C. Tell and use units of time: **MA 2 1.10 DOK 1**

- Tell time to the nearest minute

D. Count and compute money: **MA 1 1.10 DOK 2**

- 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 standard or non standard measurement: **MA 2 1.6 DOK 2**

- select and use benchmarks to estimate measurements (linear, capacity, weight)

B. Use angle measurement: **MA 2 1.6 DOK 2**

- Select and use benchmarks to estimate measurements of 0-, 45- acute, 90- right, greater than 90 obtuse degree angles

C. Apply geometric measurements: **MA 2 1.10 DOK 3**

- \* Determine and justify areas of polygons and non-polygonal regions imposed on a rectangular grid

D. Analyze precision: None

E. Use relationships within a measurement system: None

## Strand 5: 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: **MA 3 1.2 DOK 2**

- Collect data using observations, surveys, and experiments

B. Classify and organize data: None

C. Represent and interpret data: **MA 3 1.8 DOK 2**

- 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: **MA 3 1.6 DOK 2**

- Describe important features of a data set

B. Compare data representations: None

C. Represent data algebraically: None

3. Develop and evaluate inferences and predictions that are based on data.

A. Develop and evaluate inferences: **MA 3 3.5 DOK 3**

- Given a set of data, propose and justify conclusions that are based on the data

B. Analyze basic statistical techniques: None

4. Understand and apply basic concepts of probability

A. Apply basic concepts of probability: None

B. Use and describe compound events: None