Curriculum Map: Riverview Second Grade Math

Course: Math Grade 2

Grade(s): Second Grade

Course Description:

In second grade the content focuses on procedures, concepts, and applications in four critical areas

1. understanding of base-10 notation
2. building fluency with addition and subtraction
3. using standard units of measure
4. describing and analyzing shapes

These concepts emphasize problem solving, multiple representations, reasoning, mathematical modeling, tool use, communication, and other ways of making sense of mathematics.

Course Student Learning Outcomes:

Numbers and Operations

The learner will use place-value concepts to represent amounts of tens and ones and to compare three digit numbers.
The learner will use place-value concepts to read, write, and skip count to 1000.
The learner will use place-value understanding and properties of operations to add and subtract within 1000.

Algebraic Concepts

The learner will present and solve problems involving addition and subtraction within 100.
The learner will use mental strategies to add and subtract within 20.
The learner will work with equal groups of objects to gain foundations for multiplication.

Geometry

The learner will analyze and draw two- and three-dimensional shapes having specified attributes.
The learner will use the understanding of fractions to partition shapes into halves, quarters, and thirds.

Measurement, Data, and Probability

The learner will measure and estimate lengths in standard units using appropriate tools.

The learner will tell and write time to the nearest five minutes using both analog and digital clocks.
The learner will solve problems and make change using coins and paper currency with appropriate symbols.

The learner will represent and interpret data using line plots, picture graphs, and bar graphs.
The learner will extend the concepts of addition and subtraction to problems involving length.

Course Essential Questions:

1. Mathematical relationships among numbers can be represented, compared, and communicated.

How is mathematics used to quantify, compare, represent, and model numbers?
How can mathematics support effective communication?
How are relationships represented mathematically?
What does it mean to estimate or analyze numerical quantities?
What makes a tool and/or strategy appropriate for a given task?
How can recognizing repetition or regularity assist in solving problems more efficiently?

2. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.

How is mathematics used to quantify, compare, represent, and model numbers?
How can mathematics support effective communication?
How are relationships represented mathematically?
What does it mean to estimate or analyze numerical quantities?
What makes a tool and/or strategy appropriate for a given task?
How can recognizing repetition or regularity assist in solving problems more efficiently?

3. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.

How is mathematics used to quantify, compare, represent, and model numbers?
How can mathematics support effective communication?
How are relationships represented mathematically?
What does it mean to estimate or analyze numerical quantities?
What makes a tool and/or strategy appropriate for a given task?
How can recognizing repetition or regularity assist in solving problems more efficiently?

4. Patterns exhibit relationships that can be extended, described, and generalized.

How is mathematics used to quantify, compare, represent, and model numbers?
How can mathematics support effective communication?
How are relationships represented mathematically?
How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?
How can recognizing repetition or regularity assist in solving problems more efficiently?
How can patterns be used to describe relationships in mathematical situations?

5. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization.

How can recognizing repetition or regularity assist in solving problems more efficiently?
How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?

How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?
How can geometric properties and theories be used to describe, model, and analyze situations?
How can patterns be used to describe relationships in mathematical situations?

6. Measurement attributes can be quantified, and estimated using customary and non-customary units of measure.

What does it mean to estimate or analyze numerical quantities?
When is it is appropriate to estimate versus calculate?
What makes a tool and/or strategy appropriate for a given task?
Why does "what" we measure influence "how" we measure?
In what ways are the mathematical attributes of objects or processes measured, calculated and/or interpreted?
How precise do measurements and calculations need to be?

7. Mathematical concepts and functions can be modeled through multiple representations and analyzed to raise and answer questions.

What does it mean to estimate or analyze numerical quantities?
What makes a tool and/or strategy appropriate for a given task?
Why does "what" we measure influence "how" we measure?
How can data be organized and represented to provide insight into the relationship between quantities?
How does the type of data influence the choice of display?
How can probability and data analysis be used to make predictions?

8. Data can be modeled and used to make inferences.

What does it mean to estimate or analyze numerical quantities?
What makes a tool and/or strategy appropriate for a given task?
Why does "what" we measure influence "how" we measure?
How can data be organized and represented to provide insight into the relationship between quantities?
How does the type of data influence the choice of display?
How can probability and data analysis be used to make predictions?

Course Big Ideas:

1. Mathematical relationships among numbers can be represented, compared, and communicated.

2. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.

3. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.

4. Patterns exhibit relationships that can be extended, described, and generalized. Data can be modeled and used to make inferences.

5. Geometric relationships can be described, analyzed, and classified based on spatial

reasoning and/or visualization.

6. Measurement attributes can be quantified and estimated using customary and non-customary units of measure.

7. Mathematical concepts and functions can be modeled through multiple representations and analyzed to raise and answer questions.

8. Data can be modeled and used to make inferences.

1. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.
2. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.
3. Data can be modeled and used to make inferences.
4. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization.
5. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.
6. Mathematical relationships among numbers can be represented, compared, and communicated.
7. Measurement attributes can be quantified and estimated using customary and non-customary units of measure.
8. Patterns exhibit relationships that can be extended, described, and genera

Course Long Term Transfer Goals:

Students will be able to independently use their learning to:

1. Make sense of and persevere in solving complex and novel mathematical problems.

2. Use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.

3. Communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.

4. Apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.

5. Make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies.

Students will be able to independently use their learning to:

1. Make sense of and persevere in solving complex and novel mathematical problems.
2. Use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.
3. Communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.
4. Apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.
5. Make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies.

Students will be able to independently use their learning to:

1. Make sense of and persevere in solving complex and novel mathematical problems.
2. Use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.
3. Communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.
4. Apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.
5. Make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies.

Unit:

STANDARDS

STATE: PA Core Standards (2014)

CC.2.1.2.B.1 (Advanced)	Use place-value concepts to represent amounts of tens and ones and to compare three digit numbers.
CC.2.1.2.B.2 (Advanced)	Use place-value concepts to read, write, and skip count to 1000.
CC.2.1.2.B.3 (Advanced)	Use place-value understanding and properties of operations to add and subtract within 1000.

CC.2.2.2.A.1 (Advanced)	Represent and solve problems involving addition and subtraction within 100.
CC.2.2.2.A.2 (Advanced)	Use mental strategies to add and subtract within 20.
CC.2.2.2.A.3 (Advanced)	Work with equal groups of objects to gain foundations for multiplication.
CC.2.3.2.A.1 (Advanced)	Analyze and draw two- and three-dimensional shapes having specified attributes.
CC.2.3.2.A.2 (Advanced)	Use the understanding of fractions to partition shapes into halves, quarters, and thirds.
CC.2.4.2.A.1 (Advanced)	Measure and estimate lengths in standard units using appropriate tools.
CC.2.4.2.A.2 (Advanced)	Tell and write time to the nearest five minutes using both analog and digital clocks.
CC.2.4.2.A.3 (Advanced)	Solve problems and make change using coins and paper currency with appropriate symbols.
CC.2.4.2.A.4 (Advanced)	Represent and interpret data using line plots, picture graphs, and bar graphs.
CC.2.4.2.A.6 (Advanced)	Extend the concepts of addition and subtraction to problems involving length.