



MATHEMATICS CURRICULUM
SCHOOL DISTRICT OF THREE LAKES

REVISED: June 2018

Mission Statement: Teaching Students to be Productive Citizens!

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Math Curriculum

Philosophy

The mission in Three Lakes is to teach students to be productive citizens. The mathematics program develops skills and knowledge of concepts necessary for decision making and problem solving in personal living, and also provides the background for a variety of educational and vocational options, including preparation for further study of mathematics. The program also provides an appreciation for the role of mathematics and how it relates to other disciplines. Students preparing for the future should think about their mathematics preparation. Virtually all post high school choices require mathematics. Whether students choose to enter the world of work right out of high school, attend a college or technical school, complete an apprenticeship, or seek other options, a solid mathematics background will positively affect their future. Today's competitive world economy calls for a well-trained and educated labor force. Students should prepare for the future now by including a well-planned mathematics curriculum in their high school education.

General Goals

1. Problem solving is the focus of mathematics in our district.
2. Students ought to have their facts memorized in the elementary grades.
3. Students ought to develop the ability to reach logical conclusions by the use of sound reasoning, and be able to justify these conclusions in oral and written form.
4. Students should have a working knowledge of the applications of arithmetic.
5. Our math program should take advantage of the power of technology at the appropriate grade levels.
6. Our program will prepare students for advanced work in mathematics.
7. Teachers of mathematics should use diverse instructional strategies, materials and resources, such as: audio/visual media, small group work, manipulatives, discovering patterns, cyclic review, situations that provide for inquiry, basic drill, field trips, etc..
8. Since students differ widely in maturation and intellectual development, the teacher should be sensitive to individual needs and adjust expectations and teaching strategies accordingly.
9. Through active learning and concrete experiences, students should be made aware of how their study of math applies to everyday living and careers.

10. All students will work toward achieving proficient or the advanced level on the state tests.

Evaluation Process

Our program will be evaluated each year by using professional observation, direct questioning, reviewing homework, and a combination of commercial, teacher-developed, and standardized tests.

Model Classroom

The teacher will:

- Involve students in interdisciplinary math units.
- Provide opportunities for students to practice with active involvement, remembering that when students learn by doing, they are much more likely to retain and use what they have learned.
- Teach and model sound reasoning, including estimation, steps in problem solving, and the strategies listed above.
- Teach and provide practice in good reading, listening, and test-taking skills.
- Understand student interest and appreciation of math and how it applies to everyday life and careers.
- Provide a variety of challenging problems and develop a wide range of strategies and critical thinking skills.
- Involve all students and help each student to succeed, thereby enhancing self-concept.
- Ask students to work as a group to explore, find patterns and solve problems.

4K Math Curriculum

Unit 1: Number Operations

Time Frame: Ongoing

Topics:

Number sense

Counting to 10

Identifies first and last

Counts one-to-one correspondence

Simple comparative language

Visual amount recognition

Concept of zero

Part/whole

Materials:

- Number line
- Unifix cubes
- Whiteboards
- Pencil/paper
- Manipulatives corresponding with weekly theme
- Geoboards
- Books
- SMART board

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Activity sheets
- Read alouds
- Peer tutoring
- Work groups
- Hands-on projects

Wisconsin Model Early Learning Standards Addressed:

B.EL.1

- Arranges sets of concrete objects in one-to-one correspondence
- Counts by ones to 10 or higher
- Counts concrete objects to 10 or higher
- Recognizes and describes the concept of zero (meaning there are none)

B.EL.2

- Begins to identify first and last in a series
- Begins to name “how many” are in a group of up to three (or more) objects without counting (e.g. recognizing two or three crayons in a box)
- Begins to compare the numbers of concrete objects using language (e.g. “same” or “equal”, “one more”, “more than”, “less than”)

Unit 2: Patterns

Time Frame: Ongoing

Topics:

Recognizes patterns

Predicts patterns

Reproduces patterns

Materials:

- Number line
- Unifix cubes
- Whiteboards
- Pencil/paper
- Manipulatives corresponding with weekly theme
- Geoboards
- Books
- SMART board

Activities:

- Videos
- Games
- Classroom Activities
- Board work

- Activity sheets
- Read alouds
- Peer tutoring
- Work groups
- Hands-on projects

Wisconsin Model Early Learning Standards Addressed:

A.EL.1

- Imitates pattern sounds and physical movements (e.g., clap, stomp, clap, stomp)

A.EL.2

- Begins to recognize patterns in their environment (e.g., day follows night, repeated phrases in story books, patterns in carpeting or clothing)
- Recognizes and reproduces simple patterns of concrete objects (e.g. a string of beads that are yellow, blue, blue, yellow, blue blue)

B.EL.4

- Recognizes and reproduces simple patterns of concrete objects (e.g. a string of beads that are yellow, blue, blue, yellow, blue blue)
- Begins to predict what comes next when patterns are extended
-

Unit 3: Geometry and Spatial Sense

Time Frame: Ongoing

Topics:

Recognizes shapes

Describes shapes

Names shapes

Use words that indicate where things are in space

Recognize orientation of shapes

Puts together puzzles

Materials:

- Number line
- Unifix cubes
- Puzzles

- Whiteboards
- Pencil/paper
- Manipulatives corresponding with weekly theme
- Geoboards
- Books
- SMART board

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Activity sheets
- Read alouds
- Peer tutoring
- Work groups
- Hands-on projects

Wisconsin Model of Early Learning Standards Addressed:

A.EL.2

-Puts together puzzles of increasing complexity

A.EL.3

-Begins to recognize when a shape's position or orientation has changed

-Puts together puzzles of increasing complexity

B.EL.3

- Begins to recognize, describe, and name shapes (e.g., circles, triangles, rectangles including squares)
- Begins to use words that indicate where things are in space (e.g., "beside," "inside," "behind," "above," "below")
- Begins to recognize when shape's position or orientation has changed

Unit 4: Measurement

Time Frame: Ongoing

Topics:

- Begins to make size comparisons between objects
- Begins to use tools to imitate measuring
- Uses language associated with time
- Orders objects by size

Materials:

- Number line
- Unifix cubes
- Puzzles
- Whiteboards
- Pencil/paper
- Manipulatives corresponding with weekly theme
- Geoboards
- Books
- SMART board

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Activity sheets
- Read alouds
- Peer tutoring
- Work groups
- Hands-on projects

Wisconsin Model of Early Learning Standards Addressed:

A.EL.2

-Begins to categorize time intervals and uses language associated with time in everyday situations (e.g. “in the morning”, “after snack”)

A.EL.3

-Begins to use tools to imitate measuring

B.EL.5

- Covers an area with shapes (e.g., tiles)
- Begins to make size comparisons between objects (e.g., taller than, smaller than)
- Begins to use tools to imitate measuring
- Begins to order two or three objects by size (serration) (e.g., largest to smallest)

Unit 5: Classification and Data Collection

Time Frame: Ongoing

Topics:

- Match objects that are alike
- Describe similarities and differences between objects
- Sort objects
- Create and use pictorial graphs
-

Materials:

- Number line
- Unifix cubes
- Puzzles
- Whiteboards
- Pencil/paper
- Manipulatives corresponding with weekly theme
- Geoboards
- Books
- SMART board

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Activity sheets
- Read alouds
- Peer tutoring
- Work groups
- Hands-on projects

Wisconsin Model of Early Learning Standards Addressed:

A.EL.1

- Matches objects that are alike
- Describes similarities and differences between objects
- Sorts objects into groups by an attribute and begins to explain how the grouping was done

B.EL.4

- Matches objects that are alike
- Describes similarities and differences between objects
- Sorts objects into groups by an attribute and begins to explain how the grouping was done

B.EL.6

- Participates in creating and using real and pictorial graphs

Kindergarten

Unit 1: Counting Skills/Numeral Formation/Number Sense

Time Frame: 50 Days

Topics:

Count 0-20

Reading and Writing 0-20
Equal To
Greater Than
Less Than
Compare Number 0-20
One More
Count to 100 by Ones and Tens
Problem Solving: Draw a Diagram

Materials:

My Math Textbook
My Math Workbook
Calendar
Virtual manipulatives online
Classroom manipulatives
Videos
Whiteboards/Markers
Shaving Cream

Activities:

Daily Calendar
Games
Videos
Classroom Activities
Hands on Partner Work
Math Centers

Common Core Standards Addressed:

CCSS.MATH.CONTENT.K.CC.A.1

Count to 100 by ones and by tens.

CCSS.MATH.CONTENT.K.CC.A.2

Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

CCSS.MATH.CONTENT.K.CC.A.3

Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

Count to tell the number of objects.

CCSS.MATH.CONTENT.K.CC.B.4

Understand the relationship between numbers and quantities; connect counting to cardinality.

CCSS.MATH.CONTENT.K.CC.B.4.A

When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

CCSS.MATH.CONTENT.K.CC.B.4.B

Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

CCSS.MATH.CONTENT.K.CC.B.4.C

Understand that each successive number name refers to a quantity that is one larger.

CCSS.MATH.CONTENT.K.CC.B.5

Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

Compare numbers.

CCSS.MATH.CONTENT.K.CC.C.6

Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.1

CCSS.MATH.CONTENT.K.CC.C.7

Compare two numbers between 1 and 10 presented as written numerals.

Unit 2: Addition

Time Frame: 45 Days

Topics:

Problem Solving: Act It Out

Addition Stories

Use Objects to Add

Use + Symbol

Use = Symbol

How Many in All?

Problem Solving: Write a Number Sentence

Add to Make 10

Fact Fluency to 5

Materials:

My Math Textbook
My Math Workbook
Calendar
Virtual manipulatives online
Classroom manipulatives
Videos
Whiteboards/Markers

Activities:

Daily Calendar
Games
Videos
Classroom Activities
Hands on Partner Work
Math Centers

Common Core Standards Addressed:CCSS.MATH.CONTENT.K.OA.A.1

Represent addition and subtraction with objects, fingers, mental images, drawings¹, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

CCSS.MATH.CONTENT.K.OA.A.2

Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

CCSS.MATH.CONTENT.K.OA.A.3

Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

CCSS.MATH.CONTENT.K.OA.A.4

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

CCSS.MATH.CONTENT.K.OA.A.5

Fluently add and subtract within 5.

Unit 3: Subtraction

Time Frame: 15 Days

Topics:

Subtraction Stories

Use objects to subtract

Using the - symbol

Using the = symbol

How Many Left?

Problem Solving: Write a Number Sentence

Subtract and Take Apart 10

Fact Fluency Within 5

Materials:

My Math Textbook

My Math Workbook

Calendar

Virtual manipulatives online

Classroom manipulatives

Videos

Activities:

Daily Calendar

Games

Videos

Classroom Activities

Hands on Partner Work

Math Centers

Common Core Standards Addressed:

CCSS.MATH.CONTENT.K.OA.A.1

Represent addition and subtraction with objects, fingers, mental images, drawings¹, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

CCSS.MATH.CONTENT.K.OA.A.2

Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

CCSS.MATH.CONTENT.K.OA.A.3

Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$)

and $5 = 4 + 1$).

CCSS.MATH.CONTENT.K.OA.A.4

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

CCSS.MATH.CONTENT.K.OA.A.5

Fluently add and subtract within 5.

Unit 4: Place Value/Base Ten Operations

Time Frame: 11 Days

Topics

Make Numbers to Twenty
Take Numbers Apart to Twenty
Problem Solving: Make a Table

Materials:

My Math Textbook
My Math Workbook
Calendar
Virtual manipulatives online
Classroom manipulatives
Videos
Ten Frames Workmat
2 Color Counters

Activities:

Daily Calendar
Games
Videos
Classroom Activities
Hands on Partner Work
Math Centers

Common Core Standard Addressed:

CCSS.MATH.CONTENT.K.NBT.A.1

Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones

Unit 5: Measurement and Data

Time Frame: 23 Days

Topics:

Compare Length
Compare Height
Compare Weight
Describe Length, Height, Weight
Compare Capacity
Problem Solving: Guess, Check and Revise
Alike and Different
Sort by Size
Sort by Shape
Sort by Count
Problem Solving: Use Logical Reasoning

Materials:

My Math Textbook
My Math Workbook
Calendar
Virtual manipulatives online
Classroom manipulatives
Videos
Ten Frames Workmat
2 Color Counters

Activities:

Daily Calendar
Games
Videos
Classroom Activities
Hands on Partner Work
Math Centers

Common Core Standards Addressed:

CCSS.MATH.CONTENT.K.MD.A.1

Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

CCSS.MATH.CONTENT.K.MD.A.2

Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the*

heights of two children and describe one child as taller/shorter.

Classify objects and count the number of objects in each category.
CCSS.MATH.CONTENT.K.MD.B.3

Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.1

Unit 6: Geometry

Time Frame: 35 Days

Topics:

Above and Below

Position (In Front Of, Behind, Next To, Beside)

Problem Solving: Act It Out

2D Shapes (Square, Rectangle, Circle, Triangle, Hexagon)

Shapes and Patterns

Shapes and Positions

Compose New Shapes

Problem Solving: Using Logical Reasoning

Model Shapes in the World

3D Shapes (sphere, cubes, cylinders, cones)

Compare Solid Shapes

Problem Solving: Act it Out

Model Solid Shapes in Our World

Materials:

My Math Textbook

My Math Workbook

Calendar

Virtual manipulatives online

Classroom manipulatives

Videos

Construction Paper

Toothpicks and Marshmallows

Attribute Blocks

White Boards

Pattern Blocks

Activities:

Daily Calendar

Games

Videos

Classroom Activities
Hands on Partner Work
Math Centers

Common Core Standards Addressed:

CCSS.MATH.CONTENT.K.G.A.1

Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.

CCSS.MATH.CONTENT.K.G.A.2

Correctly name shapes regardless of their orientations or overall size.

CCSS.MATH.CONTENT.K.G.A.3

Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

Analyze, compare, create, and compose shapes.

CCSS.MATH.CONTENT.K.G.B.4

Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

CCSS.MATH.CONTENT.K.G.B.5

Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

CCSS.MATH.CONTENT.K.G.B.6

Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

Supplemental Units Covered (NOT in Textbook)

Unit: Calendar Math

Time Frame: All Year Long

Topics:

Day, Month, Year

Counting to 100
Skip Counting
Counting Backwards from 20
Place Value
Graphing
Tally Marks
Weather
Coin Recognition
Time to the Hour

Materials:

Calendar Bulletin Board
Smartboard Calendar

1st Grade Math Curriculum

Unit 1: Addition Concepts (Chapter 1)

Time Frame: 4 Weeks

Topics:

Addition Stories
Model Addition
Addition Number Sentences
Add 0
Vertical Addition
Problem Solving Strategies: Write a Number Sentence
Ways to Make 4 and 5
Ways to Make 6 and 7
Ways to Make 8, 9, 10
Find Missing Parts of 10
True and False Statements
Fact Fluency

Materials:

- My Math Workbook
- Vocabulary Cards

- Videos
- Virtual manipulatives online
- Classroom Manipulatives - Connecting Cubes, Counters
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary Worksheets
- Hands-on Projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.OA.1

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.1.OA.B.3

Apply properties of operations as strategies to add and subtract.2 Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)

CCSS.MATH.CONTENT.1.OA.6

Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

CCSS.MATH.CONTENT.1.OA.7

Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.

CCSS.MATH.CONTENT.1.OA.8

Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.*

Unit 2: Subtraction Concepts

Time Frame: 4 Weeks

Topics:

Subtraction Stories

Model Subtraction

Subtraction Number Sentences

Subtract 0 and All

Vertical Subtraction

Problem Solving Strategy: Draw a Diagram

Compare Groups

Subtract from 4 and 5

Subtract from 6 and 7

Subtract from 8

Subtract from 9

Subtract from 10

Relate Addition and Subtraction

Fact Fluency

Materials:

- My Math Workbook
- Vocabulary Cards
- Videos
- Virtual Manipulatives Online
- Classroom Manipulatives - Connecting cubes, Counters, Flash Cards

- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.OA.1

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.1.OA.B.3

Apply properties of operations as strategies to add and subtract.2 Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)

CCSS.MATH.CONTENT.1.OA.4

Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.

CCSS.MATH.CONTENT.1.OA.6

Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 -$

8 = 4); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

Unit 3: Addition Strategies to 20

Time Frame: 3 Weeks

Topics:

Count on 1,2, or 3

Count on Using Pennies

Use a Number Line to Add

Use Doubles to Add

Use Near Doubles to Add

Problem-Solving Strategy: Act it Out

Make 10 to Add

Add in Any Order

Add Three Numbers

Fact Fluency

Materials:

- My Math Workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives -connecting cubes, counters, dominoes
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:CCSS.MATH.CONTENT.1.OA.1

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.1.OA.2

Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.1.OA.B.3

Apply properties of operations as strategies to add and subtract.2 Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)

CCSS.MATH.CONTENT.1.OA.B.5

Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

CCSS.MATH.CONTENT.1.OA.6

Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

Unit 4: Subtraction Strategies**Time Frame: 3 Weeks**

Topics:

Count Back 1,2,3

Use a Number Line to Subtract

Use Doubles to Subtract

Problem-Solving Strategy: Write a Number Sentence

Make 10 to Subtract

Use Related Facts to Add and Subtract

Fact Families

Missing Addends

Fact Fluency

Materials:

- My Math workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives -connecting cubes, counters, base-ten blocks
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.OA.1

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all

positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.1.OA.4

Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.

CCSS.MATH.CONTENT.1.OA.5

Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

CCSS.MATH.CONTENT.1.OA.6

Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

CCSS.MATH.CONTENT.1.OA.8

Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.*

Unit 5: Place Value

Time Frame: 4 Weeks

Topics:

Numbers 11 to 19

Tens

Count by Tens Using Dimes

Ten and Some More

Tens and Ones

Problem-Solving Strategy: Make a Table
Numbers to 100
Ten More, Ten Less
Count by Fives Using Nickels
Use Models to Compare Numbers
Use Symbols to Compare Numbers
Numbers to 120
Count to 120
Read and Write Numbers to 120

Materials:

- My Math workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives -connecting cubes, counters, base-ten blocks
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.NBT.1

Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

CCSS.MATH.CONTENT.1.NBT.2a

10 can be thought of as a bundle of ten ones — called a "ten."

CCSS.MATH.CONTENT.1.NBT.2b

The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

CCSS.MATH.CONTENT.1.NBT.2c

The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

CCSS.MATH.CONTENT.1.NBT.3

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

CCSS.MATH.CONTENT.1.NBT.5

Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

Unit 6: Two-Digit Addition and Subtraction

Time Frame: 3 Weeks

Topics:

Add Tens

Count on Tens and Ones

Add Tens and Ones

Problem-Solving Strategy: Guess Check, and Revise

Add Tens and Ones with Regrouping

Subtract Tens

Count Back by 10's

Relate Addition and Subtraction of Tens

Fact Fluency

Materials:

- My Math workbook

- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives -connecting cubes, counters, base 10 blocks, number line, hundred chart
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.NBTC.4

Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

CCSS.MATH.CONTENT.1.NBTC.6

Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Unit 7: Organize and Use Graphs

Time Frame: 2-3 Weeks

Topics:

Tally Charts

Problem-Solving Strategy: Make a Table

Make Picture Graphs

Read Picture Graphs

Make Bar Graphs

Read Bar Graphs

Materials:

- My Math workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives -connecting cubes, counters, base 10 blocks, number line, hundred chart, tally charts, bar graphs, color tiles
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.MD.C.4

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Unit 8: Measurement and Time

Time Frame: 3 Weeks

Topics:

Compare Lengths

Compare and Order Lengths

Nonstandard Units of Length

Problem-Solving Strategy: Guess, Check, and Revise

Time to the Hour: Analog

Time to the Hour: Digital

Time to the Half Hour: Analog

Time to the Half Hour: Digital

Time to the Hour and Half Hour

Materials:

- My Math workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives - connecting cubes, clocks
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.MD.1

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

CCSS.MATH.CONTENT.1.MD.2

Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

CCSS.MATH.CONTENT.1.MD.3

Tell and write time in hours and half-hours using analog and digital clocks.

Unit 9: Two-Dimensional Shapes and Equal Shares

Time Frame: 3 Weeks

Topics:

Squares and Rectangles

Triangles and Trapezoids

Circles

Compare Shapes

Composite Shapes

More Composite Shapes

Problem-Solving Shapes

Problem-Solving Strategy: Using Logical Reasoning

Equal Parts

Halves

Quarters and Fourths

Materials:

- My Math workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives -attribute blocks, geoboard, chart paper
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1G.A.1

Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

CCSS.MATH.CONTENT.1G.A.2

Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

CCSS.MATH.CONTENT.1G.A.3

Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*.

Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

Unit 10: Three-Dimensional Shapes

Time Frame: 2 Weeks

Topics:

Cubes and Prisms

Cones and Cylinders

Problem-Solving Strategy: Look for a Pattern

Combine Three-Dimensional Shapes

Materials:

- My Math workbook
- Vocabulary Cards
- Videos
- Virtual manipulatives online
- Classroom manipulatives - Geometric Solids
- My Math Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Calendar
- Board work
- Vocabulary worksheets
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.1.G.1

Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

CCSS.MATH.CONTENT.1.G.2

Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape

2nd Grade Math Curriculum

Unit 1: Addition

Time Frame: 2 weeks Chapter 1: Apply Addition Concepts

3 weeks Chapter 3: Add Two-Digit Numbers

3 weeks Chapter 6: Add Three-Digit Numbers

Some year long

Topics:

Addition Strategies

- Doubles
- Doubles +1
- Identity Property
- Commutative Property

Count on to add

Touch Math

Make a ten

Add three numbers

Regrouping with 2 and 3 digit numbers

Fact families

One and two step story problems

Memorize math facts to 18

Mental Math

- Add 1, 10, 100 to numbers within 1000

Problem Solving

Materials:

- My Math Chapter 1: Apply Addition concepts
- My Math Chapter 3: Add with regrouping 2 digit numbers
- My Math Chapter 6: Add with regrouping 3 digit numbers
- Rocket Math
- Brainpop Jr.
- Xtra math
- Counters
- Number Lines
- Unifix cubes
- Touch math poster/chart
- Read Aloud Books
- Work Mats
- Dry erase boards

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.OA.A.1

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.2.OA.B.2

Fluently add and subtract within 20 using mental strategies.² By end of Grade 2, know from memory all sums of two one-digit numbers.

CCSS.MATH.CONTENT.2.NBT.B.5

Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.2.NBT.B.6

Add up to four two-digit numbers using strategies based on place value and properties of operations.

CCSS.MATH.CONTENT.2.NBT.B.7

Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

CCSS.MATH.CONTENT.2.NBT.B.8

Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

CCSS.MATH.CONTENT.2.NBT.B.9

Explain why addition and subtraction strategies work, using place value and the properties of operations.

Unit 2: Subtraction

Time Frame: 2 weeks Chapter 1: Apply Subtraction Concepts

2 weeks Chapter 4: Subtract Two-Digit Numbers

3 weeks Chapter 7: Subtract Three-Digit Numbers

Some year long

Topics:

Subtraction Strategies

- Count back

- Subtract all
- Subtract 0
- Use Doubles to Subtract

Touch Math

Missing Addends

Regrouping 2 and 3 digit numbers

Subtract across zero

Check subtraction using addition

Fact families

One and two step story problems

Memorize math facts from 18

Mental Math

- Subtract 1, 10, 100 to numbers within 1000

Problem Solving

Materials:

- My Math Chapter 1: Apply Subtraction Concepts
- My Math Chapter 4: Subtract Two-Digit Numbers with Regrouping
- My Math Chapter 7: Subtract Three-Digit Numbers with Regrouping
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets
- Rocket Math
- Brainpop Jr.
- Xtra math
- Counters
- Number Lines
- Unifix cubes
- Touch math poster/chart
- Read Aloud Books
- Work Mats
- Dry erase boards

Activities:

- Poem
- Videos
- Games
- Classroom Activities
- Interactive Notebook

- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.OA.A.1

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.2.OA.B.2

Fluently add and subtract within 20 using mental strategies.² By end of Grade 2, know from memory all sums of two one-digit numbers.

CCSS.MATH.CONTENT.2.NBT.B.5

Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.2.NBT.B.7

Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

CCSS.MATH.CONTENT.2.NBT.B.8

Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

CCSS.MATH.CONTENT.2.NBT.B.9

Explain why addition and subtraction strategies work, using place value and the properties of operations.

Unit 3: Number Patterns/Counting Skills

Time Frame: 2 weeks Chapter 2: Number Patterns
1 day Chapter 5: Place Value to 1,000
Some year long

Topics:

Counting patterns/skip count

- 2s
- 5s
- 10s (17, 27, 37..)
- 100s

Even/Odd numbers

Problem Solving

Materials:

- My Math Chapter 2: Number Patterns
- My Math Chapter 5: Place Value to 1,000
- Counters
- Hundreds Chart
- Unifix cubes
- Read Aloud Books
- Work Mats

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.OA.A.1

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.2.OA.C.3

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

CCSS.MATH.CONTENT.2.OA.C.4

Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

CCSS.MATH.CONTENT.2.NBT.A.1

Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

CCSS.MATH.CONTENT.2.NBT.A.2

Count within 1000; skip-count by 5s, 10s, and 100s.

CCSS.MATH.CONTENT.2.NBT.A.3

Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

CCSS.MATH.CONTENT.2.NBT.B.5

Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.2.NBT.B.6

Add up to four two-digit numbers using strategies based on place value and properties of operations.

CCSS.MATH.CONTENT.2.NBT.B.7

Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

CCSS.MATH.CONTENT.2.NBT.B.8

Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

Unit 4: Multiplication

Time Frame: 3 days Chapter 2: Number Patterns

Topics:

Repeated addition
Rectangular arrays
Sums of equal numbers
Problem Solving

Materials:

- My Math Chapter 2: Number Patterns
- Counters
- Hundreds Chart
- Unifix cubes
- Read Aloud Books
- Work Mats

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages

- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CSS.MATH.CONTENT.2.OA.C.3

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

CCSS.MATH.CONTENT.2.OA.C.4

Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

CCSS.MATH.CONTENT.2.OA.C.4

Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Unit 5: Place Value

Time Frame: 3 weeks

Year long

Topics:

Place Value to 1000

Read and write numbers within a 1000

- Base ten
- Expanded form
- Number form
- Word form

Compare Numbers to 1000

Problem Solving

Materials:

- My Math Chapter 5: Place Value to 1,000
- Vocabulary
- Videos

- Virtual manipulatives online
- Base ten blocks
- Practice worksheets
- Dry erase boards

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom activities
- Interactive notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CSS.MATH.CONTENT.2.NBT.A.1

Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

CCSS.MATH.CONTENT.2.NBT.A.1.A

100 can be thought of as a bundle of ten tens — called a "hundred."

CCSS.MATH.CONTENT.2.NBT.A.1.B

The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

CCSS.MATH.CONTENT.2.NBT.A.3

Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

CCSS.MATH.CONTENT.2.NBT.A.4

Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

CCSS.MATH.CONTENT.2.NBT.B.5

Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.2.NBT.B.6

Add up to four two-digit numbers using strategies based on place value and properties of operations.

CCSS.MATH.CONTENT.2.NBT.B.8

Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

Unit 6: Money

Time Frame: 2 weeks

Topics:

Identify Pennies, Nickels, Dimes, Quarters names and worth
Count combinations to \$1
Word problems involving money
Count combinations to \$10
Problem Solving

Materials:

- My Math Chapter 8: Money
- Coins
- Read Aloud Books
- Work Mats

Activities:

- Poems
- Songs
- Videos
- Virtual manipulatives online
- Games

- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.MD.C.8

Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?

Unit 7: Data Analysis

Time Frame: 2 weeks

Topics:

Surveys

Represent and compare data using:

- Picture graphs
- Bar graphs
- Tally charts
- Line plots

Problem Solving

Materials:

- My Math Chapter 9: Data Analysis
- Graph paper
- Dice
- Read Aloud Books
- Work Mats

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.MD.D.9

Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

CCSS.MATH.CONTENT.2.MD.D.10

Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Unit 8: Time

Time Frame: 3 weeks

Topics:

Time

- Hour
- Half hour
- Quarter to/after
- Five minutes

AM and PM

Problem Solving

Materials:

- My Math Chapter 10: Time

- Clocks
- Read Aloud Books
- Work Mats

Activities:

- Songs
- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.MD.C.7

Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Unit 9: Measurement

Time Frame: 4 weeks

Topics:

Compare and measure standard units

Length

Weight

Capacity

m, cm, yd, ft, inch

Problem Solving

Materials:

- My Math Chapter 11: Customary and Metric Lengths
- Rulers
- Yardsticks

- Meter sticks
- Various objects to measure
- Read Aloud Books

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.MD.A.1

Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

CCSS.MATH.CONTENT.2.MD.A.2

Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

CCSS.MATH.CONTENT.2.MD.A.3

Estimate lengths using units of inches, feet, centimeters, and meters.

CCSS.MATH.CONTENT.2.MD.A.4

Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

CCSS.MATH.CONTENT.2.MD.B.5

Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.2.MD.B.6

Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

Unit 10: Fractions

Time Frame: 1 week

Topics:

Recognize, write name, & draw: fractions-

- Halves
- thirds
- fourths
- up to 12 parts

Making whole w/another fraction of same denominator

Problem Solving

Materials:

- My Math Chapter 12: Geometric Shapes and Equal Shares
- Fraction Circles
- Fraction Squares

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities
- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.G.A.1

Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.1 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

CCSS.MATH.CONTENT.2.G.A.2

Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

CCSS.MATH.CONTENT.2.G.A.3

Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

Unit 11: Geometry

Time Frame: 2 weeks

Topics:

Recognize:

- Triangles
- Quadrilaterals
- Pentagons
- Hexagons
- cubes

Draw shapes given the number of angles or equal faces

Problem Solving

Materials:

- My Math Chapter 12: Geometric Shapes and Equal Shares
- Everyday Objects
- Pattern Blocks
- Three Dimensional Objects
- Geometric Solids

Activities:

- Videos
- Virtual manipulatives online
- Games
- Classroom Activities

- Interactive Notebook pages
- Board work
- Vocabulary worksheets
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.2.G.A.1

Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.1 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

CCSS.MATH.CONTENT.2.G.A.2

Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

CCSS.MATH.CONTENT.2.G.A.3

Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

3rd Grade Math Curriculum

Unit 1: Place Value

Time Frame: 2 weeks

Topics:

Place value to thousands

Compare numbers

Order numbers

Round to nearest 10

Round to nearest 100

Different ways to write a number

Materials:

- My Math textbook
- My Math workbook
- Vocabulary flashcards
- Work mat 1
- Work math 2
- Manipulatives: Base-ten blocks, 0-5 number cube, Sets of 22 counters

Activities:

- Videos
- Games
- Classroom activities
- Note taking
- Board work
- Vocabulary flash cards
- Peer tutoring
- Work groups

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.NBT.1

Use place value understanding to round whole numbers to the nearest 10 or 100.

Unit 2: Addition

Time Frame: 3 weeks

Topics:

Addition properties

Patterns in the addition tables

Estimate sums

Use models to add

Add 3 digit numbers

Add 4 digit numbers

Adding more than 2 numbers

Fact fluency

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: connecting cubes, counters, 0-5 number cubes, base-ten blocks, 5-9 number cube
- Work mat 1
- Work mat 2
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary flash cards
- Peer tutoring
- Work groups

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.NBT.2

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.3.OA.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

Unit 3: Subtraction

Time Frame: 2 Weeks

Topics:

Mental subtraction

Estimate differences

Subtract with regrouping

Subtract 3 digit numbers

Subtract 4 digit numbers

Subtract across zeros

Fact fluency

Materials:

- My Math textbook
- My Math workbook
- Work mat 1
- Work mat 2
- Manipulatives: Base-ten blocks
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups

- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.NBT.2

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Unit 4: Multiplication

Time Frame: 11 Weeks

- Chapter 4: Understand Multiplication (10 days)
- Chapter 6: Multiplication and Division Patterns (3 weeks)
- Chapter 7: Multiplication and Division (3 weeks)
- Chapter 8: Apply Multiplication and Division (3 weeks)

Topics:

Multiplication as repeated addition

Arrays and multiplication

Multiplication and combinations

Patterns in the multiplication table

Multiply by 0-12

Distributive Property

Associative Property

Inverse operation

Take apart to multiply

Multiply three factors

Write Expressions

Fact fluency

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: counters, cubes, number lines, play money, base-ten blocks

- Work mat 2
- Grid paper
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.OA.1

Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7 .*

CCSS.MATH.CONTENT.3.OA.2

Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7 .*

CCSS.MATH.CONTENT.3.OA.3

Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

CCSS.MATH.CONTENT.3.OA.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

CCSS.MATH.CONTENT.3.OA.5

Apply properties of operations as strategies to multiply and divide.² *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can*

find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)

CCSS.MATH.CONTENT.3.OA.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

CCSS.MATH.CONTENT.3.OA.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

CCSS.MATH.CONTENT.3.NBT.3

Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

Unit 5: Division

Time Frame: 11 Weeks

- Chapter 5: Understand Division (2 weeks)
- Chapter 6: Multiplication and Division Patterns (3 weeks)
- Chapter 7: Multiplication and Division (3 weeks)
- Chapter 8: Apply Multiplication and Division (3 weeks)

Topics:

Division as equal sharing

Relate division and subtraction

Relate division and multiplication

Inverse operations

Divide by 0-12

Double as a known fact

Write Expressions

Fact fluency

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: counters, cubes, number lines, play money, base-ten blocks
- Work mat 2
- Grid paper
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:**CCSS.MATH.CONTENT.3.OA.2**

Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*

CCSS.MATH.CONTENT.3.OA.5

Apply properties of operations as strategies to multiply and divide.² *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

CCSS.MATH.CONTENT.3.OA.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Unit 6: Fractions

Time Frame: 2 Weeks

Topics:

Unit fractions

Part of a whole

Part of a set

Fractions on a number line

Equivalent fractions

Fractions as one whole

Compare fractions

Ordering fractions

Adding like fractions

Mixed numbers

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: fraction circles, fraction tiles, paper strips, counters, pattern blocks
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.NF.1

Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.

CCSS.MATH.CONTENT.3.NF.2b

Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

CCSS.MATH.CONTENT.3.NF.3c

Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.*

CCSS.MATH.CONTENT.3.NF.3d

Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Unit 7: Measurement

Time Frame: 2 weeks

Topics:

Estimate and measure capacity

Solve capacity problems

Estimate and measure mass

Solve mass problems

Measure to full inch

Measure to halves and fourths of an inch

Perimeter

Area

Area of rectangles

Area and the Distributive Property

Area of composite figures

Tell time to the minute

Time intervals

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: measuring cups, liter bottles, bucket balances, kg and g weights, fraction circles, analog clocks
- Base-10 blocks
- Work mat 2
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.MD.1

Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

CCSS.MATH.CONTENT.3.MD.2

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

CCSS.MATH.CONTENT.3.MD.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

CCSS.MATH.CONTENT.3.MD.5b

A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

CCSS.MATH.CONTENT.3.MD.7a

Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

CCSS.MATH.CONTENT.3.MD.7c

Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.

CCSS.MATH.CONTENT.3.MD.7d

Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

CCSS.MATH.CONTENT.3.MD.8

Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Unit 8: Represent and Interpret Data

Time Frame: 3 weeks

Topics:

Collect and record data

Draw scaled picture graphs

Draw scaled bar graphs

Relate bar graphs to scaled graphs

Draw and analyze line plots

Collect and display measurement data

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: connecting cubes, items less than 12 inches in length
- Inch ruler
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.MD.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

CCSS.MATH.CONTENT.3.MD.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Unit 9: Geometry

Time Frame: 3 weeks

Topics:

Angles

Polygons

Triangles

Quadrilaterals

Partition shapes

Materials:

- My Math textbook
- My Math workbook
- Manipulatives: base-ten blocks, pattern blocks, color tiles, counters
- Centimeter ruler
- Inch ruler
- Geoboards
- Grid paper
- Rubber bands
- White boards

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.G.1

Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

CCSS.MATH.CONTENT.3.G.2

Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.*

Unit 10: Problem Solving

Time Frame: Year long

Topics:

Use the four-step plan

Reasonable answers

Estimate or exact answer

Make a table

Use a model

Look for a pattern

Extra or missing information

Make an organized list

Logical reasoning

Work backward

Solve a simpler problem

Draw a diagram

Guess, check, and revise

Two-step word problems

Evaluate Expressions

Write Equations

Materials:

- My Math textbook
- My Math workbook
- White board
- Chart paper

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.3.NBT.1

Use place value understanding to round whole numbers to the nearest 10 or 100.

CCSS.MATH.CONTENT.3.NBT.2

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.3.OA.3

Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.¹

CCSS.MATH.CONTENT.3.OA.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

CCSS.MATH.CONTENT.3.OA.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or

properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

CCSS.MATH.CONTENT.3.OA.8

Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCSS.MATH.CONTENT.3.OA.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends*

CCSS.MATH.CONTENT.3.MD.1

Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

CCSS.MATH.CONTENT.3.MD.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

CCSS.MATH.CONTENT.3.MD.8

Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

CCSS.MATH.CONTENT.3.NF.1

Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.

CCSS.MATH.CONTENT.3.G.1

Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

4th Grade Math Curriculum

In 4th grade real world problem solving and fact practice are done daily.

Unit 1: Place Value (Chapter 1) (Chapter 10)

Time Frame: 2 Weeks

Topics:

Place Value to Millions

Read and Write Multi-Digit Numbers

Compare Numbers

Order Numbers

Use Place Value to Round

Place Value Through Tenths and Hundredths

Materials:

- McGraw Hill My Math Workbook
- Base-ten blocks
- Index cards w. 4-digit numbers from 1,000 - 6,000
- Play money
- Place-Value Charts
- Tenths/hundredths grid
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Vocabulary
- Word problems
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- End of unit assessment

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NBT.A.1

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.*

CCSS.MATH.CONTENT.4.NBT.A.2

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

CCSS.MATH.CONTENT.4.NBT.A.3

Use place value understanding to round multi-digit whole numbers to any place.

CCSS.MATH.CONTENT.4.NF.C.6

Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*

Unit 2: Addition (Chapter 2)

Time Frame: 1 week

Topics:

Addition properties and rules

Addition patterns

Mental addition

Estimating

Adding multi-digit numbers

Materials:

- McGraw-Hill My Math workbook
- Connecting cubes
- Base-ten blocks
- Place value charts
- Number cubes
- Cups and counters
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Vocabulary
- Word problems
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- Fact Practice
- Assessments

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.4.NBT.A.3

Use place value understanding to round multi-digit whole numbers to any place.

CCSS.MATH.CONTENT.4.OA.C.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

Unit 3: Subtraction (Chapter 2)

Time Frame: 1 week

Topics:

Subtraction rules

Subtraction Patterns

Mental subtraction

Estimation

Subtracting multi-digit numbers

Subtracting across zeros

Materials:

- McGraw-Hill My Math workbook
- Math picture books
- Connecting cubes
- Base-ten blocks
- Place value charts
- Number cubes
- Cups and counters
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Read Alouds
- Vocabulary
- Word problems
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- Fact Practice
- Assessments

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.4.NBT.A.3

Use place value understanding to round multi-digit whole numbers to any place.

CCSS.MATH.CONTENT.4.OA.C.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

Unit 4: Multiplication (Chapter 3, 4, 5)

Time Frame: 8 weeks

Topics:

Multiplication properties and rules

Regrouping

Factors and multiples

Relate multiplication to division

Use place value to multiply

Multiplication as comparison

Multiples of 10, 100, & 1,000

Round to estimate products

Use models to multiply

Multiply by two digit numbers

Multiply across zeros

Materials:

- McGraw Hill My Practice Workbook
- Math picture books
- Egg cartons
- Beans
- Cartons
- Sticky notes
- Colored crayons and pencils
- Number cubes
- Connecting cubes
- Base-ten blocks
- Grid paper
- Construction paper
- Masking tape
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Read Alouds
- Vocabulary
- Word problems (Real world problem solving)

- Board Work
- Modeling
- Independent practice
- Hands-on activities
- Fact practice
- Assessments

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NBT.B.5

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS.MATH.CONTENT.4.OA.A.1

Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

CCSS.MATH.CONTENT.4.OA.C.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

CCSS.MATH.CONTENT.4.OA.B.4

Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

CCSS.MATH.CONTENT.4.NBT.A.1

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.*

CCSS.MATH.CONTENT.4.NBT.A.3

Use place value understanding to round multi-digit whole numbers to any place.

Unit 5: Division (Chapters 3, 6, 7)

Time Frame: 2 weeks

Topics:

Relate division and subtraction

Division rules and properties

Divide multiples of 10, 100, & 1,000

Estimate quotients

Use place values to divide

Divide with remainders

Partial quotients

Division with a 4 digit number

Quotients with zeros

Materials:

- McGraw Hill My Practice Workbook
- Math picture books
- Base ten blocks grid paper
- Flash cards
- Counters
- Coins
- Classroom manipulatives

Activities:

- Videos
- Read Alouds
- Vocabulary
- Word problems (Real world problem solving)
- Board Work
- Modeling
- Independent practice
- Hands-on activities

- Fact practice
- Assessments

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NBT.B.6

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS.MATH.CONTENT.4.NBT.B.5

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS.MATH.CONTENT.4.NBT.A.1

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.*

CCSS.MATH.CONTENT.4.NBT.A.3

Use place value understanding to round multi-digit whole numbers to any place.

Unit 6: Fractions (Chapter 8, 9, 10)

Time Frame:

Topics:

Factors and Multiples

Prime and Composite Numbers

Equivalency

Simplest Form of Fractions

Compare and Order fractions

Identifying benchmark fractions

Mixed numbers

Improper fractions

Add/subtract fractions with like denominators

Add/subtract mixed numbers

Model and multiply fractions by whole #s

Materials:

- McGraw Hill My Math Workbook
- Picture books on fractions
- Set of colored cards
- Hundreds chart paper
- Colored pencils and crayons
- Fraction tiles
- Rulers
- Counters
- Fraction circles
- Coins
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Read aloud
- Vocabulary
- Word problems (Real world problem solving)
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- End of unit assessment

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.OA.B.4

Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

CCSS.MATH.CONTENT.4.NE.A.1

Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two

fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

CCSS.MATH.CONTENT.4.NF.A.2

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

CCSS.MATH.CONTENT.4.NF.B.3

Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.

CCSS.MATH.CONTENT.4.NF.B.3.A

Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

CCSS.MATH.CONTENT.4.NF.B.3.B

Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples:* $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$.

CCSS.MATH.CONTENT.4.NF.B.3.C

Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

CCSS.MATH.CONTENT.4.NF.B.3.D

Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

CCSS.MATH.CONTENT.4.NF.B.4

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

CCSS.MATH.CONTENT.4.NF.B.4.A

Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*

CCSS.MATH.CONTENT.4.NF.B.4.B

Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)*

Unit 7: Decimals (Chapter 10)

Time Frame: 2 weeks

Topics:

Place value

Tenths

Hundredths

Relating Decimals and fractions

Compare and order decimals

Adding Coins and Writing Decimal Amounts (**Money is covered within Decimal Unit**)

Materials:

- McGraw Hill My Math Workbook
- Picture books
- Fraction tiles
- Colored pencils and crayons
- Number lines
- Place value charts
- Play money
- Place-Value Charts
- Tenths/hundredths grid
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Read Aloud

- Vocabulary
- Word problems (Real world problem solving)
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- End of unit assessment

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NF.C.5

Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.² *For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.*

CCSS.MATH.CONTENT.4.NF.C.6

Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*

CCSS.MATH.CONTENT.4.NF.C.7

Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.

¹ Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

² Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.

Unit 8: Patterns (Chapter 7)

Time Frame: 2 Weeks

Topics:

Nonnumeric Patterns

Numeric Patterns

Sequences

Order of Operations

Equations with Multiple Operations

Materials:

- Function Machine
- Index Cards
- Counters
- Notebook Paper
- McGraw Hill My Math Workbook
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Vocabulary
- Word problems
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- End of unit assessment

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.OA.C.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

CCSS.MATH.CONTENT.4.OA.A.3

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Unit 9: Measurement (Chapter 11, 12, 13,)

Time Frame: 4 weeks

Topics:

Customary units of:

- Length
- Capacity
- Weight

Metric Units of

- Length
- Capacity
- Mass

Converting units of both customary and metric

Area

Perimeter

Line Plots to display data (**Data unit is taught within Measurement Unit**)

Frequency table

Convert units of time (**Time is taught within Measurement Unit**)

Materials:

- McGraw Hill My Math Workbook
- Picture books
- Measuring cups
- Rulers
- Scales
- Weights
- Miscellaneous measurement containers
- Stopwatches
- Colored pencils and markers or crayons
- Construction paper
- Base ten blocks
- Sticky notes
- Connecting cubes

Activities:

- Videos

- Read aloud
- Vocabulary
- Word problems
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- End of unit assessment

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.MD.A.1

Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*

CCSS.MATH.CONTENT.4.MD.A.2

Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

CCSS.MATH.CONTENT.4.MD.A.3

Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Represent and interpret data.

CCSS.MATH.CONTENT.4.MD.B.4

Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information

presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

Unit 10: Geometry (Chapter 14)

Time Frame: 2 weeks

Topics:

Points

Lines

Rays

Draw and Identify parallel & Perpendicular lines

Angles

- Model
- Classify
- Measure
- Draw
- Solve problems with angles

Triangles

Quadrilaterals

Symmetry

Materials:

- McGraw Hill My Math Workbook
- Protractors
- Paper
- Colored pencils and markers
- Tape
- Index cards
- Base ten blocks
- Number lines
- Rulers
- Miscellaneous classroom manipulatives

Activities:

- Videos
- Read aloud
- Vocabulary
- Word problems
- Board Work
- Modeling
- Independent practice
- Hands-on activities
- End of unit assessment

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.G.A.1

Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

CCSS.MATH.CONTENT.4.G.A.2

Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

CCSS.MATH.CONTENT.4.G.A.3

Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

CCSS.MATH.CONTENT.4.MD.C.5

Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

CCSS.MATH.CONTENT.4.MD.C.5.A

An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles.

CCSS.MATH.CONTENT.4.MD.C.5.B

An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

CCSS.MATH.CONTENT.4.MD.C.6

Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

CCSS.MATH.CONTENT.4.MD.C.7

Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Supplemental Unit: Problem Solving (All Chapters)

Time Frame: Throughout the School Year

Topics:

Using the four step plan
Drawing diagrams
Solving Multi-step
Comparing to Solve
Reasonableness of answers
Estimating
Creating a table or model
Looking for patterns
Working backwards
Guess/Check/Revise
Making a list

Materials:

- Paper
- Pencils
- Graph paper
- Classroom manipulatives

- Etc.. as needed

Activities:

- Videos
- Vocabulary
- Board Work
- Modeling
- Collaboration
- Independent practice
- Hands-on activities

Common Core Standards Addressed:

CCSS.MATH.CONTENT.4.NBT.A.2

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

CCSS.MATH.CONTENT.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.4.NBT.B.6

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS.MATH.CONTENT.4.OA.A.2

Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.¹

CCSS.MATH.CONTENT.4.OA.A.3

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCSS.MATH.CONTENT.4.OA.C.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

CCSS.MATH.CONTENT.4.NF.B.3.D

Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

CCSS.MATH.CONTENT.4.NF.C.5

Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.² *For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.*

CCSS.MATH.CONTENT.4.MD.A.2

Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Wisconsin Standards for Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

5th Grade Math Curriculum

Unit 1: Place Value (Chapter 1)

Time Frame: 1-2 Weeks

Topics:

Place Value Through the Millions

Compare and Order Whole Numbers Through Millions

Place Value Through Thousandths

Compare Decimals

Order Whole Numbers and Decimals

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets
- Moby Max

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations

Common Core Standards Addressed:**CCSS.MATH.CONTENT.5.NBT.1**

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.

CCSS.MATH.CONTENT.5.NBT.3

Read, write, and compare decimals to thousandths.

CCSS.MATH.CONTENT.5.NBT.4

Use place value understanding to round decimals to any place.

Unit 2: Multiplication (Chapter 2)**Time Frame: 2 Weeks****Topics:**

Prime Factorization

Powers and Exponents

Multiplication Patterns

Partial Products and Distributive Property

Estimate Products

Multiply by One-digit Numbers

Multiply by Two-digit numbers

*Multiply by Three-digit numbers

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives

- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.NBT.2

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10

CCSS.MATH.CONTENT.5.NBT.5

Fluently multiply multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.5.NBT.7

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Unit 3: Dividing (Chapter 3 & 4)

Time Frame: 4 Weeks

Topics:

Relate Division to Multiplication

Two-Digit Dividends

Estimate Quotients

Distributive and Partial Quotients

Divide Three and Four Digit Dividends

Quotients with Zeros

Interpret the Remainder

Divide by a Two-Digit Divisor

Divide Greater Numbers

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.NBT.6

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Unit 4: Decimals (Chapters 5 & 6)

Time Frame: 4-5 Weeks

Topics:

Rounding Decimals
Estimating Sums and Differences
Adding Decimals
Subtract Decimals
Multiply Decimals by Whole Number
Multiply Decimals by a Decimal
*Multiplying Large Decimals
Multiplying decimals by powers of ten
Estimating products and Quotients of decimals
Dividing decimals by decimals
Dividing decimals by whole numbers
Dividing decimals by powers of ten

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.NBT.4

Use place value understanding to round decimals to any place.

CCSS.MATH.CONTENT.5.NBT.5

Fluently multiply multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.5.NBT.7

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Unit 5: Expressions/Patterns/Algebra (Chapter 7)

Time Frame: 2 Weeks

Topics:

Graphing Patterns

Identifying Number Patterns

Multiplication Patterns

Division Patterns

Ordered Pairs

Order of Operations

Writing Numerical Expressions

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:CCSS.MATH.CONTENT.5.OA.3

Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

CCSS.MATH.CONTENT.5.OA.1

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

CCSS.MATH.CONTENT.5.OA.2

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

CCSS.MATH.CONTENT.5.G.1

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

CCSS.MATH.CONTENT.5.G.2

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

CCSS.MATH.CONTENT.5.NBT.2

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

CCSS.MATH.CONTENT.5.NBT.6

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Unit 6: Expressions/Patterns/Algebra (Chapter 7)

Time Frame: 2 Weeks

Topics:

Graphing Patterns

Identifying Number Patterns

Multiplication Patterns

Division Patterns

Ordered Pairs

Order of Operations

Writing Numerical Expressions

Materials:

- My Math workbook
- Vocabulary
- Videos

- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.OA.3

Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

CCSS.MATH.CONTENT.5.OA.1

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

CCSS.MATH.CONTENT.5.OA.2

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

CCSS.MATH.CONTENT.5.G.1

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

CCSS.MATH.CONTENT.5.G.2

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

CCSS.MATH.CONTENT.5.NBT.2

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

CCSS.MATH.CONTENT.5.NBT.6

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Unit 7: Fractions/Percentages (Chapter 8, 9, 10)

Time Frame: 8 Weeks

Topics:

Greatest Common Factor

Simplest Form

Least Common Multiple

Compare Fractions

Write Fraction As Decimal

*Convert Decimal to Percentage

*Convert Percentage to Fractions and Decimals

Irrational Fraction to Mixed Number

Round Fractions

Add and Subtract Like Fractions

Add and Subtract Unlike Fractions
Estimating Sums and Differences of Fractions
Add/subtract Mixed Numbers
Subtract Fractions with Renaming
Estimating Products
Multiplying Whole Number and Fraction
Multiplying Fractions
Multiplying Mixed Numbers
Place Fractions on Number Line
Divide Whole numbers by Fractions
Divide fractions by whole numbers
*Divide Fraction by a Fraction

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.NF.1

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

CCSS.MATH.CONTENT.5.NF.2

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

CCSS.MATH.CONTENT.5.NF.3

Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

CCSS.MATH.CONTENT.5.NF.4

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

CCSS.MATH.CONTENT.5.NF.5

Interpret multiplication as scaling (resizing)

CCSS.MATH.CONTENT.5.NF.6

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

CCSS.MATH.CONTENT.5.NF.7

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

Unit 8: Measurement/Data (Chapter 11)

Time Frame: 3 Weeks

Topics:

Measure with a Ruler $\frac{1}{4}$, $\frac{1}{2}$, and whole inch
Convert Customary Length (feet, inches, yards, mile)
Estimate and Measure Weight (ounces and pounds)
Convert Customary Weights
Display measurement on Line Plot
Estimate and Measure Capacity (mL and L)
Convert Capacity
Measure with Metric Ruler
Convert Metric Units (mm, cm, m, km)
Estimate and Measure Mass (mg, g, kg)
Convert Metric Capacity

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.MD.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

CCSS.MATH.CONTENT.5.MD.2

Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.

Unit 9: Geometry (Chapter 12)

Time Frame: 2 Weeks

Topics:

Identify Polygons (Regular 3-8 sided figures)

Measure Sides and Angles of Triangles

Classify Triangles

Measure Sides and Angles of Quadrilaterals

Classify Quadrilaterals

Identify 3D Figures (face, edge, vertex)

Volume of Prisms

Volume of Composite Figures

*Area and Perimeter

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online

- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.G.3

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

CCSS.MATH.CONTENT.5.G.4

Classify two-dimensional figures in a hierarchy based on properties.

CCSS.MATH.CONTENT.5.MD.5

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

Supplemental Unit: Problem Solving (Within Each Chapter)

Time Frame: Throughout the Year

Topics:

Four Step Model

Work Backwards

Look For Pattern

Guess, Check, and Revise

Determine Reasonable Answer

Draw Diagram

Use Logical Reasoning

Make a Model

Make a Table

Identify Extra/Missing Information

Solve a Simpler Problem

Estimate or Exact Answer

Materials:

- My Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

Activities:

- Videos
- Games
- Classroom Activities
- Board work
- Vocabulary flash cards
- Rotations
- Moby Max

Common Core Standards Addressed:

CCSS.MATH.CONTENT.5.NBT.4

Use place value understanding to round decimals to any place

CCSS.MATH.CONTENT.5.NBT.5

Fluently multiply multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.5.NBT.6

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS.MATH.CONTENT.5.NBT.7

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

CCSS.MATH.CONTENT.5.NF.1

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

CCSS.MATH.CONTENT.5.NF.4

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

CCSS.MATH.CONTENT.5.NF.6

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

CCSS.MATH.CONTENT.5.NF.7

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

CCSS.MATH.CONTENT.5.MD.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

CCSS.MATH.CONTENT.5.MD.3

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

CCSS.MATH.CONTENT.5.MD.4

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

CCSS.MATH.CONTENT.5.MD.5

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

***These topics are an extension of the My Math program, but not taught as an independent topic**

6th Grade Math Curriculum

Unit 1: Ratios and Proportional Relationships (Chapters 1 and 2)

Time Frame: 30 Days

Topics:

- Factors and Multiples
- Ratios
- Ratio Tables
- Graph Ratio Tables
- The Four-Step Plan
- Equivalent Ratios
- Ratio and Rate Problems
- Decimals and Fractions
- Percents and Fractions
- Percents and Decimals
- Percents Greater than 100%/Less Than 1%
- Compare and Order Fractions, Decimals, and Percents
- Estimate with Percents

Percent of a Number
Solve Percent Problems

Problem Solving Strategies:

Solve a Simpler Problem

Materials:

Glencoe Math Workbook
Glencoe Math Assessment Book
Textbook Resource Supplementals
Vocabulary Flashcards
Videos/Online Tutorials
Virtual Online Manipulatives
Concrete Hands-On Manipulatives
Problem Solving Packets
Inquiry Labs/Materials
Critical Thinking Activities and Puzzles
SMART Board
Chromebooks

Activities:

Skills Check
Direct Instruction with Note Taking
Vocabulary Building
Board Work
Small Whiteboard Work
SMART Board Activities
Games
Peer Tutoring
Individual Seatwork
Group Work
Videos/Online Tutorials
Math Labs
Problem Solving Labs
Math Projects
Resource Supplementals
Assessments
Fact Fluency Activities
Real World Math

Common Core Standards Addressed:

CCSS.MATH.CONTENT.6.RP.A.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

CCSS.MATH.CONTENT.6.RP.A.2

Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."¹*

CCSS.MATH.CONTENT.6.RP.A.3

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

CCSS.MATH.CONTENT.6.RP.A.3.A

Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

CCSS.MATH.CONTENT.6.RP.A.3.B

Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

CCSS.MATH.CONTENT.6.RP.A.3.C

Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.

CCSS.MATH.CONTENT.6.RP.A.3.D

Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

CCSS.MATH.CONTENT.6.NS.B.4

Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple

of a sum of two whole numbers with no common factor. *For example, express $36 + 8$ as $4(9 + 2)$.*

Unit 2: The Number System (Chapters 3, 4, and 5)

Time Frame: 44 Days

Topics:

- Add and Subtract Decimals
- Estimate Products
- Multiply Decimals by Whole Numbers
- Multiply Decimals by Decimals
- Multiply by Powers of 10
- Divide Multi-Digit Numbers
- Estimate Quotients
- Divide Decimals by Whole Numbers
- Divide Decimals by Decimals
- Estimate Products of Fractions
- Multiply Fractions and Whole Numbers
- Multiply Fractions
- Multiply Mixed Numbers
- Convert Measurement Units
- Divide Whole Numbers by Fractions
- Divide Fractions
- Divide Mixed Numbers
- Integers and Graphing
- Absolute Value
- Compare and Order Integers
- Terminating and Repeating Decimals
- Compare and Order Rational Numbers
- The Coordinate Plane
- Graph on the Coordinate Plane

Problem Solving Strategies:

- Look for a Pattern
- Draw a Diagram
- Work Backward

Materials:

- Glencoe Math Workbook
- Glencoe Math Assessment Book
- Textbook Resource Supplementals

Vocabulary Flashcards
Videos/Online Tutorials
Virtual Online Manipulatives
Concrete Hands-On Manipulatives
Problem Solving Packets
Inquiry Labs/Materials
Critical Thinking Activities and Puzzles
SMART Board
Chromebooks

Activities:

Skills Check
Direct Instruction with Note Taking
Vocabulary Building
Board Work
Small Whiteboard Work
SMART Board Activities
Games
Peer Tutoring
Individual Seatwork
Group Work
Videos/Online Tutorials
Math Labs
Problem Solving Labs
Math Projects
Resource Supplementals
Assessments
Fact Fluency Activities
Real World Math

Common Core Standards Addressed:

CCSS.MATH.CONTENT.6.NS.B.2

Fluently divide multi-digit numbers using the standard algorithm.

CCSS.MATH.CONTENT.6.NS.B.3

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

CCSS.MATH.CONTENT.6.NS.A.1

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the

problem. *For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?*

CCSS.MATH.CONTENT.6.RP.A.3

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

CCSS.MATH.CONTENT.6.RP.A.3.A

Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

CCSS.MATH.CONTENT.6.RP.A.3.B

Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

CCSS.MATH.CONTENT.6.RP.A.3.C

Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.

CCSS.MATH.CONTENT.6.RP.A.3.D

Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

CCSS.MATH.CONTENT.6.NS.C.5

Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

CCSS.MATH.CONTENT.6.NS.C.6

Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

CCSS.MATH.CONTENT.6.NS.C.6.A

Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.

CCSS.MATH.CONTENT.6.NS.C.6.B

Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

CCSS.MATH.CONTENT.6.NS.C.6.C

Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

CCSS.MATH.CONTENT.6.NS.C.7

Understand ordering and absolute value of rational numbers.

CCSS.MATH.CONTENT.6.NS.C.7.A

Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*

CCSS.MATH.CONTENT.6.NS.C.7.B

Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write $-3\text{ }^{\circ}\text{C} > -7\text{ }^{\circ}\text{C}$ to express the fact that $-3\text{ }^{\circ}\text{C}$ is warmer than $-7\text{ }^{\circ}\text{C}$.*

CCSS.MATH.CONTENT.6.NS.C.7.C

Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write $|-30| = 30$ to describe the size of the debt in dollars.*

CCSS.MATH.CONTENT.6.NS.C.7.D

Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.*

CCSS.MATH.CONTENT.6.NS.C.8

Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Unit 3: Expressions and Equations (Chapters 6, 7, and 8)

Time Frame: 42 Days

Topics:

- Powers and Exponents
- Numerical Expressions
- Algebra: Variables and Expressions
- Algebra: Write Expressions
- Algebra: Properties
- The Distributive Property
- Equivalent Expressions
- Equations
- Solve and Write Addition Equations
- Solve and Write Subtraction Equations
- Solve and Write Multiplication Equations
- Solve and Write Division Equations
- Function Tables
- Function Rules
- Functions and Equations
- Multiple Representations of Functions
- Inequalities
- Write and Graph Inequalities
- Solve One-Step Inequalities

Problem Solving Strategies:

- Act it Out
- Guess, Check, and Revise
- Make a Table

Materials:

Glencoe Math Workbook

Glencoe Math Assessment Book
Textbook Resource Supplementals
Vocabulary Flashcards
Videos/Online Tutorials
Virtual Online Manipulatives
Concrete Hands-On Manipulatives
Problem Solving Packets
Inquiry Labs/Materials
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Activities:

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Resource Supplementals
Assessments
Fact Fluency Activities
Real World Math

Common Core Standards Addressed:

[CCSS.MATH.CONTENT.6.EE.A.1](#)

Write and evaluate numerical expressions involving whole-number exponents.

[CCSS.MATH.CONTENT.6.EE.A.2](#)

Write, read, and evaluate expressions in which letters stand for numbers.

[CCSS.MATH.CONTENT.6.EE.A.2.A](#)

Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as $5 - y$.*

CCSS.MATH.CONTENT.6.EE.A.2.B

Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.*

CCSS.MATH.CONTENT.6.EE.A.2.C

Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.*

CCSS.MATH.CONTENT.6.EE.A.3

Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.*

CCSS.MATH.CONTENT.6.EE.A.4

Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions $y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.*

CCSS.MATH.CONTENT.6.EE.B.6

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

CCSS.MATH.CONTENT.6.EE.B.5

Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

CCSS.MATH.CONTENT.6.EE.B.7

Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.

CCSS.MATH.CONTENT.6.RP.A.3

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

CCSS.MATH.CONTENT.6.RP.A.3.A

Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

CCSS.MATH.CONTENT.6.RP.A.3.B

Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

CCSS.MATH.CONTENT.6.RP.A.3.C

Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

CCSS.MATH.CONTENT.6.RP.A.3.D

Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

CCSS.MATH.CONTENT.6.EE.A.2

Write, read, and evaluate expressions in which letters stand for numbers.

CCSS.MATH.CONTENT.6.EE.A.2.A

Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as $5 - y$.*

CCSS.MATH.CONTENT.6.EE.A.2.B

Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.*

CCSS.MATH.CONTENT.6.EE.A.2.C

Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.*

CCSS.MATH.CONTENT.6.EE.B.5

Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

CCSS.MATH.CONTENT.6.EE.B.6

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

CCSS.MATH.CONTENT.6.EE.B.8

Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

CCSS.MATH.CONTENT.6.EE.C.9

Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.

Unit 4: Geometry (Chapters 9 and 10)

Time Frame: 28 Days

Topics:

- Area of Parallelograms
- Area of Triangles
- Area of Trapezoids

Changes in Dimensions
Polygons on the Coordinate Plane
Area of Composite Figures
Volume of Rectangular Prisms
Volume of Triangular Prisms
Surface Area of Rectangular Prisms
Surface Area of Triangular Prisms
Surface Area of Pyramids

Problem Solving Strategies:

Draw a Diagram
Make a Model

Materials:

Glencoe Math Workbook
Glencoe Math Assessment Book
Textbook Resource Supplementals
Vocabulary Flashcards
Videos/Online Tutorials
Virtual Online Manipulatives
Concrete Hands-On Manipulatives
Problem Solving Packets
Inquiry Labs/Materials
Critical Thinking Activities and Puzzles
SMART Board
Chromebooks
Geometer's Sketchpad

Activities:

Skills Check
Direct Instruction with Note Taking
Vocabulary Building
Board Work
Small Whiteboard Work
SMART Board Activities
Games
Peer Tutoring
Individual Seatwork
Group Work
Videos/Online Tutorials
Math Labs
Problem Solving Labs

Math Projects
Resource Supplementals
Assessments
Fact Fluency Activities
Real World Math

Common Core Standards Addressed:

CCSS.MATH.CONTENT.6.G.A.1

Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.6.G.A.3

Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.6.NS.C.8

Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

CCSS.MATH.CONTENT.6.G.A.2

Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

CCSS.MATH.CONTENT.6.G.A.4

Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Unit 5: Statistics and Probability (Chapters 11 and 12)

Time Frame: 25 Days

Topics:

Mean
Median and Mode
Measures of Variation
Mean Absolute Deviation
Appropriate Measures
Line Plots
Histograms
Box Plots
Shape of Data Distribution
Interpret Line Graphs
Select an Appropriate Display

Problem Solving Strategies:

Use Logical Reasoning
Use a Graph

Materials:

Glencoe Math Workbook
Glencoe Math Assessment Book
Textbook Resource Supplementals
Vocabulary Flashcards
Videos/Online Tutorials
Virtual Online Manipulatives
Concrete Hands-On Manipulatives
Problem Solving Packets
Inquiry Labs/Materials
Critical Thinking Activities and Puzzles
SMART Board
Chromebooks

Activities:

Skills Check
Direct Instruction with Note Taking
Vocabulary Building
Board Work
Small Whiteboard Work
SMART Board Activities
Games
Peer Tutoring
Individual Seatwork
Group Work
Videos/Online Tutorials

Math Labs
Problem Solving Labs
Math Projects
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Assessments
Fact Fluency Activities
Real World Math

Common Core Standards Addressed:

CCSS.MATH.CONTENT.6.SP.A.1

Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*

CCSS.MATH.CONTENT.6.SP.A.3

Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

CCSS.MATH.CONTENT.6.SP.B.5

Summarize numerical data sets in relation to their context, such as by:

CCSS.MATH.CONTENT.6.SP.B.5.A

Reporting the number of observations.

CCSS.MATH.CONTENT.6.SP.B.5.B

Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

CCSS.MATH.CONTENT.6.SP.B.5.C

Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

CCSS.MATH.CONTENT.6.SP.B.5.D

Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

CCSS.MATH.CONTENT.6.SP.A.2

Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

CCSS.MATH.CONTENT.6.SP.B.4

Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

CCSS.MATH.CONTENT.6.SP.B.5

Summarize numerical data sets in relation to their context, such as by:

CCSS.MATH.CONTENT.6.SP.B.5.A

Reporting the number of observations.

CCSS.MATH.CONTENT.6.SP.B.5.B

Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

CCSS.MATH.CONTENT.6.SP.B.5.C

Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

CCSS.MATH.CONTENT.6.SP.B.5.D

Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

7th Grade Math Curriculum

Unit 1: Ratios and Proportional Relationships
Chapters 1 and 2

Time frame: 5 to 6 Weeks

Topics:

Rates

Complex fractions and unit rates

Convert unit rates
Proportional and nonproportional relationships
The four step plan
Graph proportional relationships
Solve proportional relationships
Constant rate of change
Slope
Direct variation
Percent of a number
Percent and estimation
The percent proportion
The percent equation
Percent of change
Sales tax, tips, and markup
Discount
Simple interest

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
- Virtual Manipulatives
- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical thinking activities
- Classroom manipulatives

Activites:

- videos
- activities
- games
- notetaking
- board work
- vocab worksheets
- online tools
- peer tutoring
- work groups

Common Core Standards Addressed:

CCSS.MATH.CONTENT.7.RP.A.1

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a*

person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.

CCSS.MATH.CONTENT.7.RP.A.2

Recognize and represent proportional relationships between quantities.

CCSS.MATH.CONTENT.7.RP.A.2.

Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

CCSS.MATH.CONTENT.7.RP.A.2.B

Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

CCSS.MATH.CONTENT.7.RP.A.2.C

Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.*

CCSS.MATH.CONTENT.7.RP.A.2.D

Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.

CCSS.MATH.CONTENT.7.RP.A.3

Use proportional relationships to solve multistep ratio and percent problems.

Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

CCSS.MATH.CONTENT.7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.1

CCSS.MATH.CONTENT.7.EE.A.2

Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."*

CCSS.MATH.CONTENT.7.EE.B.3

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Unit 2: The Number System

Chapters 3 and 4

Time Frame: 5 to 6 weeks

Topics:

Integers and absolute value
Add integers
Subtract integers
Distance on a number line
Looking for a pattern
Multiply integers
Divide integers
Terminating and repeating decimals
Compare and order rational numbers
Add and subtract on the number line
Add and subtract like fractions
Add and subtract unlike fractions
Add and subtract mixed numbers
Multiply fractions
Convert between systems
Divide fractions

Materials:

-Glencoe Math workbook
-Vocabulary
-Videos
-Virtual Manipulatives

- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical thinking activities
- Classroom manipulatives

Activites:

- videos
- activities
- games
- notetaking
- board work
- vocab worksheets
- online tools
- peer tutoring
- work groups

Common Core Standards addressed:

CCSS.MATH.CONTENT.7.NS.A.1

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

CCSS.MATH.CONTENT.7.NS.A.1.A

Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*

CCSS.MATH.CONTENT.7.NS.A.1.B

Understand $p + q$ as the number located a distance $|q|$ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

CCSS.MATH.CONTENT.7.NS.A.1.C

Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number

line is the absolute value of their difference, and apply this principle in real-world contexts.

CCSS.MATH.CONTENT.7.NS.A.1.D

Apply properties of operations as strategies to add and subtract rational numbers.

CCSS.MATH.CONTENT.7.NS.A.2

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

CCSS.MATH.CONTENT.7.NS.A.2.A

Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

CCSS.MATH.CONTENT.7.NS.A.2.B

Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.

CCSS.MATH.CONTENT.7.NS.A.2.C

Apply properties of operations as strategies to multiply and divide rational numbers.

CCSS.MATH.CONTENT.7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.

CCSS.MATH.CONTENT.7.EE.B.3

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation*

CCSS.MATH.CONTENT.7.NS.A.2.D

Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

CCSS.MATH.CONTENT.7.RP.A.3

Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Unit 3 Expressions and Equations

Chapters 5 and 6

Time frame: 5 to 6 weeks

Topics:

Algebraic expressions
Sequences
Properties of operations
The distributive property
Making a table
Simplify algebraic expressions
Add linear expressions
Subtract linear expressions
Factor linear expressions
Solve one step addition and subtractions equations
Multiplication equations with bar diagrams
Multiplication and division equations
Solve equations with rational coefficients
Solve two step equations
Solve inequalities by addition or subtraction
Solve inequalities by multiplication or division
Solve two step inequalities

Materials:

-Glencoe Math workbook
-Vocabulary
-Videos
-Virtual Manipulatives
-Practice worksheets

- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical thinking activities
- Classroom manipulatives

Activites:

- videos
- activities
- games
- notetaking
- board work
- vocab worksheets
- online tools
- peer tutoring
- work groups

Common Core Standards addressed:

CCSS.MATH.CONTENT.7.EE.A.1

Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

CCSS.MATH.CONTENT.7.EE.A.2

Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."*

CCSS.MATH.CONTENT.7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.

CCSS.MATH.CONTENT.7.EE.B.3

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

CCSS.MATH.CONTENT.7.EE.B.4

Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

CCSS.MATH.CONTENT.7.EE.B.4.A

Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*

CCSS.MATH.CONTENT.7.EE.B.4.B

Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.*

Unit 4 Geometry

Chapters 7 and 8

Time frame: 5 to 6 weeks

Topics:

Classify Angles

Complementary and supplementary angles

Create triangles

Draw triangles

Make a model

Scale drawings

Draw three dimensional figures

Cross sections

Circumference

Area of circles

Area of composite figures

Volume of prisms

Volume of pyramids

Nets of three dimensional figures

Surface area of prisms

Surface area of pyramids

Composite figures

Volume and surface area of composite figures

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
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- Practice worksheets
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- Inquiry Labs
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- Critical thinking activities
- Classroom manipulatives

Activites:

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- board work
- vocab worksheets
- online tools
- peer tutoring
- work groups

Common Core Standards addressed:

CCSS.MATH.CONTENT.7.G.A.1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

CCSS.MATH.CONTENT.7.G.A.2

Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

CCSS.MATH.CONTENT.7.G.A.3

Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

CCSS.MATH.CONTENT.7.G.B.4

Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

CCSS.MATH.CONTENT.7.G.B.5

Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

CCSS.MATH.CONTENT.7.G.B.6

Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Unit 5 Statistics and Probability

Chapters 9 and 10

Time frame: 5 to 6 weeks

Topics:

Probability of simple events
Relative frequency
Theoretical and experimental probability
Fair and unfair games
Probability of compound events
Fundamental counting principle
Permutations
Independent and dependent events
Making predictions
Unbiased and biased samples
Misleading graphs and statistics
Compare populations
Visual overlap of data distributions
Select an appropriate display

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
- Virtual Manipulatives
- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical thinking activities
- Classroom manipulatives

Activites:

- videos
- activities
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- vocab worksheets
- online tools
- peer tutoring
- work groups

Common Core Standards addressed:

CCSS.MATH.CONTENT.7.SP.A.1

Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

CCSS.MATH.CONTENT.7.SP.A.2

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

Draw informal comparative inferences about two populations.

CCSS.MATH.CONTENT.7.SP.B.3

Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*

CCSS.MATH.CONTENT.7.SP.B.4

Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Investigate chance processes and develop, use, and evaluate probability models.

CCSS.MATH.CONTENT.7.SP.C.5

Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2

indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

CCSS.MATH.CONTENT.7.SP.C.6

Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*

CCSS.MATH.CONTENT.7.SP.C.7

Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

CCSS.MATH.CONTENT.7.SP.C.7.A

Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*

CCSS.MATH.CONTENT.7.SP.C.7.B

Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*

CCSS.MATH.CONTENT.7.SP.C.8

Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

CCSS.MATH.CONTENT.7.SP.C.8.A

Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

CCSS.MATH.CONTENT.7.SP.C.8.B

Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday

language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

CCSS.MATH.CONTENT.7.SP.C.8.C

Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

8th Grade Math Curriculum

Unit 1: The Number System (Chapter 1)

Time Frame: 5 Weeks

Topics:

Rational Numbers

Powers and Exponents

Multiply and Divide Monomials

Powers of Monomials

Negative Exponents

Scientific Notation

Compute with Scientific Notation

Graphing Technology: Scientific Notation Using Technology

Roots

Roots of Non-Perfect Squares

Estimate Roots

Compare Real Numbers

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets

- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical Thinking Activities and Puzzles

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.8.NS.A.1

Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

CCSS.MATH.CONTENT.8.NS.A.2

Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

CCSS.MATH.CONTENT.8.EE.A.1

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

CCSS.MATH.CONTENT.8.EE.A.2

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

CCSS.MATH.CONTENT.8.EE.A.4

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Unit 2: Expressions and Equations (Chapters 2, 3)

Time Frame: 7-8 Weeks

Topics:

Solve Equations with Rational Coefficients

Solve Two-Step Equations

Solve Two-Step Equations

Write Two-Step Equations

Equations with Variables on Each Side

Solve Equations with Variables on Each Side

Solve Multi-Step Equations

Constant Rate of Change

Slope

Equations in $y=mx$ Form

Slope-Intercept Form

Slope Triangles

Graph a Line Using Intercepts

Write Linear Equations

Model Linear Behavior

Systems of Equations

Solve Systems of Equations by Graphing

Solve Systems of Equations Algebraically

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
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- Critical Thinking Activities and Puzzles

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- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.8.EE.C.7

Solve linear equations in one variable.

CCSS.MATH.CONTENT.8.EE.C.7.A

Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

CCSS.MATH.CONTENT.8.EE.C.7.B

Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

CCSS.MATH.CONTENT.8.EE.B.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

CCSS.MATH.CONTENT.8.EE.B.6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

CCSS.MATH.CONTENT.8.EE.C.8

Analyze and solve pairs of simultaneous linear equations.

CCSS.MATH.CONTENT.8.EE.C.8.A

Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

CCSS.MATH.CONTENT.8.EE.C.8.B

Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.*

CCSS.MATH.CONTENT.8.EE.C.8.C

Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

CCSS.MATH.CONTENT.8.F.A.2

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

CCSS.MATH.CONTENT.8.F.A.3

Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1,1)$, $(2,4)$ and $(3,9)$, which are not on a straight line.*

Use functions to model relationships between quantities.

CCSS.MATH.CONTENT.8.F.B.4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

CCSS.MATH.CONTENT.8.F.B.5

Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Unit 3: Functions (Chapter 4)

Time Frame: 5 Weeks

Topics:

Represent Relationships

Relations

Relations and Functions

Functions

Linear Functions

Compare Properties of Functions

Construct Functions

Linear and Nonlinear Functions

Quadratic Functions

Graphing Technology: Families of Nonlinear Functions

Qualitative Graphs

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
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- Classroom manipulatives
- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical Thinking Activities and Puzzles

Activities:

- Videos
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- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

Define, evaluate, and compare functions.

CCSS.MATH.CONTENT.8.F.A.1

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1

CCSS.MATH.CONTENT.8.F.A.2

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

CCSS.MATH.CONTENT.8.F.A.3

Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1, 1)$, $(2, 4)$ and $(3, 9)$, which are not on a straight line.*

Use functions to model relationships between quantities.

CCSS.MATH.CONTENT.8.F.B.4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

CCSS.MATH.CONTENT.8.F.B.5

Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Unit 4: Geometry

Time Frame: 20 Weeks (Chapters 5, 6, 7, 8)

Topics:

Lines

Geometric Proof

Triangles

Angles of Triangles

Polygons and Angles

Right Triangle Relationships

The Pythagorean Theorem

Proofs About the Pythagorean Theorem

Use the Pythagorean Theorem

Distance on the Coordinate Plane

Translations

Reflections

Rotational Symmetry

Rotations

Dilations

Composition of Transformations

Congruence and Transformations
Investigate Congruent Triangles
Congruence
Geometry Software
Similar Triangles
Similarity and Transformations
Properties of Similar Polygons
Similar Triangles and Indirect Measurement
Slope and Similar Triangles
Area and Perimeter of Similar Figures
Volume of Cylinders
Volume of Cones
Volume of Spheres
Surface Area of Cylinders
Surface Area of Cylinders
Nets of Cones
Surface Area of Cones
Changes in Scale
Changes in Dimensions

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
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- Classroom manipulatives
- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets

- Critical Thinking Activities and Puzzles

Activities:

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- Classroom Activities
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- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.8.G.A.5

Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

Understand and apply the Pythagorean Theorem.

CCSS.MATH.CONTENT.8.G.B.6

Explain a proof of the Pythagorean Theorem and its converse.

CCSS.MATH.CONTENT.8.G.B.7

Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

CCSS.MATH.CONTENT.8.G.B.8

Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

CCSS.MATH.CONTENT.8.EE.A.2

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

CCSS.MATH.CONTENT.8.G.A.1

Verify experimentally the properties of rotations, reflections, and translations:

CCSS.MATH.CONTENT.8.G.A.1.A

Lines are taken to lines, and line segments to line segments of the same length.

CCSS.MATH.CONTENT.8.G.A.1.B

Angles are taken to angles of the same measure.

CCSS.MATH.CONTENT.8.G.A.1.C

Parallel lines are taken to parallel lines.

CCSS.MATH.CONTENT.8.G.A.3

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

CCSS.MATH.CONTENT.8.G.A.1

Verify experimentally the properties of rotations, reflections, and translations:

CCSS.MATH.CONTENT.8.G.A.1.A

Lines are taken to lines, and line segments to line segments of the same length.

CCSS.MATH.CONTENT.8.G.A.1.B

Angles are taken to angles of the same measure.

CCSS.MATH.CONTENT.8.G.A.2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

CCSS.MATH.CONTENT.8.G.A.4

Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

CCSS.MATH.CONTENT.8.G.A.5

Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

CCSS.MATH.CONTENT.8.EE.B.6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

CCSS.MATH.CONTENT.8.G.C.9

Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Unit 5: Statistics and Probability (Chapter 9)

Time Frame: 4 Weeks

Topics:

Scatter Plots

Lines of Best Fit

Linear and Nonlinear Association

Two-Way Tables

Descriptive Statistics

Measures of Variation

Analyze Data Distributions

Materials:

- Glencoe Math workbook
- Vocabulary
- Videos
- Virtual manipulatives online
- Classroom manipulatives
- Practice worksheets
- Problem Solving Investigations
- Inquiry Labs
- 21st Century Career worksheets
- Critical Thinking Activities and Puzzles

Activities:

- Videos
- Games
- Classroom Activities
- Note taking
- Board work
- Vocabulary worksheets
- Peer tutoring
- Work groups
- Hands-on projects

Common Core Standards Addressed:

CCSS.MATH.CONTENT.8.SP.A.1

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

CCSS.MATH.CONTENT.8.SP.A.2

Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

CCSS.MATH.CONTENT.8.SP.A.3

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*

CCSS.MATH.CONTENT.8.SP.A.4

Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

Algebra 1A Curriculum

Unit 0: Preparing for Algebra

Time Frame: 3-4 weeks

Topics:

Real Numbers

Operations with Integers:

Add

Subtract

Multiply and Divide

Adding and Subtracting Rational Numbers

Multiply and Divide Rational Numbers

The Percent Proportion

Plan for Problem Solving

Materials:

- Textbook
- Online resources
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments

Common Core Standards Addressed:

7.EE.A.1 Apply properties of operations as strategies to add, subtract, and expand linear expressions with rational coefficients.

7.EE.B.3 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically.

A.SSE.1a, A.SSE.1b Interpret expressions that represent a quantity in terms of its content.

Unit 1: Expressions and Functions

Time Frame: 3-4 weeks

Topics:

Variables and Expressions

Order of Operations

Properties of Numbers

Distributive Property

Descriptive Modeling and Accuracy

Relations

Functions

Interpreting Graphs of Functions

Materials:

- Textbook
- Online resources
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments

Common Core Standards Addressed:

N.Q.2 Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 Choose a level of accuracy appropriate to the limitations on measurement when reporting quantities.

A.SSE.1a, A.SSE.1b Interpret expressions that represent a quantity in terms of its content.

F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range.

Unit 2: Linear Equations

Time Frame: 3-4 weeks

Topics:

Writing Equations

Solving One-Step Equations

Solving Multi-Step Equations

Solving Equations with the Variable on Each Side

Solving Equations Involving Absolute Value

Ratios and Proportions

Literal Equations and Dimensional Analysis

Materials:

- Textbook
- Online resources
- Textbook resource supplementals
- Videos
- Science Problem solving sets
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems.

A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution.

A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Unit 3: Linear and Nonlinear Functions

Time Frame: 4-5 weeks

Topics:

Graphing Linear Functions

Zeros of Linear Functions

Rate of Change and Slope

Slope-Intercept Form

Transformations of Linear Functions

Arithmetic Sequences as Linear Functions

Piecewise and Step Functions

Absolute Value Functions

Materials:

- Textbook
- Online resources
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Unit 4: Equations of Linear Functions

Time Frame: 5-6 weeks

Topics:

Writing Equations in Slope-Intercept Form

Writing Equations in Standard and Point-Slope Forms

Parallel and Perpendicular Lines

Scatter Plots and Lines of Fit

Correlation and Causation

Regression and Median-Fit Lines

Inverses of Linear Functions

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

F.BF.1 Write a function that describes a relationship between two quantities.

F.BF.4 Find inverse functions.

F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

S.ID.6 Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

S.ID.9 Distinguish between correlation and causation.

Unit 5: Linear Inequalities

Time Frame: 5-6 weeks

Topics:

Solving Inequalities by Addition and Subtraction
Solving Inequalities by Multiplication and Division
Solving Multi-Step Inequalities
Solving Compound Inequalities
Solving Inequalities Involving Absolute Value
Graphing Inequalities in Two Variables

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems.

A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.REI.12 Graph the solutions to a linear inequality in two variables as a half-plane, and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit 6: Systems of Linear Equations and Inequalities

Time Frame: 4-5 weeks

Topics:

Graphing Systems of Equations

Substitution

Elimination Using Addition and Subtraction

Elimination Using Multiplication

Applying Systems of Linear Equations

Systems of Inequalities

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Algebra 1B Curriculum

Unit 0: Review of Algebra 1A

Time Frame: 2 weeks

Topics:

Algebra Basics

Expressions and Functions

Linear Equations

Linear and Nonlinear Functions

Equations of Linear Functions

Linear Inequalities

Systems of Linear Equations and Inequalities

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

(all of those covered in Algebra 1A)

Unit 1: Exponents and Exponential Functions

Time Frame: 7 weeks

Topics:

Multiplication Properties of Exponents

Division Properties of Exponents
Rational Exponents
Radical Expressions
Exponential Functions
Transformations of Exponential Functions
Writing Exponential Functions
Transforming Exponential Expressions
Geometric Sequences as Exponential Functions
Recursive Formulas

Materials:

- Textbook
- Online resources and Graphing Tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input output pairs (include reading these from a table).

F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Unit 2: Polynomials

Time Frame: 3-4 weeks

Topics:

Adding and Subtracting Polynomials
Multiplying a Polynomial by a Monomial
Multiplying Polynomials
Special Products
Using the Distributive Property
Factoring Quadratic Trinomials
Factoring Special Products

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.SSE.2 Use the structure of an expression to identify ways to rewrite it.

A.APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add subtract, and multiply polynomials.

Unit 3: Quadratic Functions and Equations

Time Frame: 5-6 weeks

Topics:

Graphing Quadratic Functions

Transformations of Quadratic Functions

Solving Quadratic Equations by Factoring

Solving Quadratic Equations by Completing the Square

Solving Quadratic Equations by Using the Quadratic Formula

Solving Systems of Linear and Quadratic Equations

Analyzing Functions with Successive Differences

Combining Functions

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.

A.REI.4b Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula, and factoring.

F.IF.6 Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a given graph.

Unit 4: Geometry Introduction

Time Frame: 3 weeks

Topics:

Geometry basics and definitions

Measuring lines and angles

Lines and angle pairs

Triangles and quadrilaterals

Ratios and proportions

Similarity

Area and perimeter

Circles basics

Materials:

- Textbook
- Online resources
- Graphing tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task
- Authentic Assessment

Common Core Standards Addressed:

HSG.CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

HSG.SRT.A.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

Unit 5: Statistics

Time Frame: 2-3 weeks

Topics:

Measures of Center

Representing Data

Measures of Spread

Distributions of Data

Comparing Sets of Data

Summarizing Categorical Data

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S.ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S.ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Unit 6: Rational Equations and Functions

Time Frame: 6-7 weeks

Topics:

Model Inverse Variation

Graph Rational Functions

Divide Polynomials

Simplify Rational Expressions

Multiply and Divide Rational Expressions

Add and Subtract Rational Expressions

Solve Rational Equations

Materials:

- Other text resources
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

HSF.IF.C.7d (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

HSF.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.

Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

HSA.APR.D.6 Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less

than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.

HSA.APR.D.7 (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

HSA.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Algebra 1 Curriculum

Unit 0: Preparing for Algebra

Time Frame: 2 weeks

Topics:

Real Numbers

Operations with Integers:

Add

Subtract

Multiply and Divide

Adding and Subtracting Rational Numbers

Multiply and Divide Rational Numbers

The Percent Proportion

Plan for Problem Solving

Materials:

- Textbook
- Online resources
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work

- Problem solving sets
- Board and Group work
- Assessments

Common Core Standards Addressed:

7.EE.A.1 Apply properties of operations as strategies to add, subtract, and expand linear expressions with rational coefficients.

7.EE.B.3 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically.

A.SSE.1a, A.SSE.1b Interpret expressions that represent a quantity in terms of its content.

Unit 1: Expressions and Functions

Time Frame: 2-3 weeks

Topics:

Variables and Expressions

Order of Operations

Properties of Numbers

Distributive Property

Descriptive Modeling and Accuracy

Relations

Functions

Interpreting Graphs of Functions

Materials:

- Textbook
- Online resources
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work

- Assessments

Common Core Standards Addressed:

N.Q.2 Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 Choose a level of accuracy appropriate to the limitations on measurement when reporting quantities.

A.SSE.1a, A.SSE.1b Interpret expressions that represent a quantity in terms of its content.

F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range.

Unit 2: Linear Equations

Time Frame: 2-3 weeks

Topics:

Writing Equations

Solving One-Step Equations

Solving Multi-Step Equations

Solving Equations with the Variable on Each Side

Solving Equations Involving Absolute Value

Ratios and Proportions

Literal Equations and Dimensional Analysis

Materials:

- Textbook
- Online resources
- Textbook resource supplementals
- Videos
- Science Problem solving sets
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments

- Performance Task

Common Core Standards Addressed:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems.

A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution.

A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Unit 3: Linear and Nonlinear Functions

Time Frame: 3 weeks

Topics:

Graphing Linear Functions

Zeros of Linear Functions

Rate of Change and Slope

Slope-Intercept Form

Transformations of Linear Functions

Arithmetic Sequences as Linear Functions

Piecewise and Step Functions

Absolute Value Functions

Materials:

- Textbook
- Online resources
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work

- Assessments
- Performance Task

Common Core Standards Addressed:

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Unit 4: Equations of Linear Functions

Time Frame: 2-3 weeks

Topics:

Writing Equations in Slope-Intercept Form

Writing Equations in Standard and Point-Slope Forms

Parallel and Perpendicular Lines

Scatter Plots and Lines of Fit

Correlation and Causation

Regression and Median-Fit Lines

Inverses of Linear Functions

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work

- Assessments
- Performance Task

Common Core Standards Addressed:

F.BF.1 Write a function that describes a relationship between two quantities.

F.BF.4 Find inverse functions.

F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

S.ID.6 Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

S.ID.9 Distinguish between correlation and causation.

Unit 5: Linear Inequalities

Time Frame: 2-3 weeks

Topics:

Solving Inequalities by Addition and Subtraction

Solving Inequalities by Multiplication and Division

Solving Multi-Step Inequalities

Solving Compound Inequalities

Solving Inequalities Involving Absolute Value

Graphing Inequalities in Two Variables

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments

- Performance Task

Common Core Standards Addressed:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems.

A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.REI.12 Graph the solutions to a linear inequality in two variables as a half-plane, and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit 6: Systems of Linear Equations and Inequalities

Time Frame: 2 weeks

Topics:

Graphing Systems of Equations

Substitution

Elimination Using Addition and Subtraction

Elimination Using Multiplication

Applying Systems of Linear Equations

Systems of Inequalities

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Unit 7: Exponents and Exponential Functions

Time Frame: 3-4 weeks

Topics:

Multiplication Properties of Exponents

Division Properties of Exponents

Rational Exponents

Radical Expressions

Exponential Functions

Transformations of Exponential Functions

Writing Exponential Functions

Transforming Exponential Expressions

Geometric Sequences as Exponential Functions

Recursive Formulas

Materials:

- Textbook
- Online resources and Graphing Tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments

- Performance Task

Common Core Standards Addressed:

F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input output pairs (include reading these from a table).

F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.

N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Unit 8: Polynomials

Time Frame: 2 weeks

Topics:

Adding and Subtracting Polynomials

Multiplying a Polynomial by a Monomial

Multiplying Polynomials

Special Products

Using the Distributive Property

Factoring Quadratic Trinomials

Factoring Special Products

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets

- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

A.SSE.2 Use the structure of an expression to identify ways to rewrite it.

A.APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add subtract, and multiply polynomials.

Unit 9: Quadratic Functions and Equations

Time Frame: 3 weeks

Topics:

Graphing Quadratic Functions

Transformations of Quadratic Functions

Solving Quadratic Equations by Factoring

Solving Quadratic Equations by Completing the Square

Solving Quadratic Equations by Using the Quadratic Formula

Solving Systems of Linear and Quadratic Equations

Analyzing Functions with Successive Differences

Combining Functions

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work

- Assessments
- Performance Task

Common Core Standards Addressed:

F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.

A.REI.4b Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula, and factoring.

F.IF.6 Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a given graph.

Unit 10: Statistics

Time Frame: 2 weeks

Topics:

Measures of Center

Representing Data

Measures of Spread

Distributions of Data

Comparing Sets of Data

Summarizing Categorical Data

Materials:

- Textbook
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S.ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S.ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Unit 11: Rational Equations and Functions

Time Frame: 3 weeks

Topics:

Model Inverse Variation

Graph Rational Functions

Divide Polynomials

Simplify Rational Expressions

Multiply and Divide Rational Expressions

Add and Subtract Rational Expressions

Solve Rational Equations

Materials:

- Other text resources
- Online resources
- Graphing tools
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities/Outcomes:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

HSF.IF.C.7d (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

HSF.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

HSA.APR.D.6 Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.

HSA.APR.D.7 (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

HSA.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Geometry Curriculum

Unit 1: Tools of Geometry

Time Frame: 2-3 weeks

Topics:

Points, Lines, and Planes

Line Segments and Distance

Locating Points and Midpoints

Angle Measure

Angle Relationships

Two-Dimensional Figures

Transformations in the Plane

Three-Dimensional Figures

Two-Dimensional Representations of Three-Dimensional Figures

Precision and Accuracy

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

G.CO.2 Represent transformations in the plane using, for example, transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.

G.CO.12 Make formal geometric constructions with a variety of tools and methods.

Unit 2: Logical Arguments and Line Relationships

Time Frame: 2-3 weeks

Topics:

Conjectures and Counterexamples

Statements, Conditionals, and Biconditionals

Deductive Reasoning
Writing Proofs
Proving Segment Relationships
Parallel Lines and Transversals
Slope and Equations of Lines
Proving Lines Parallel
Perpendiculars and Distance

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.CO.9 Prove theorems about lines and angles.

G.CO.12 Make formal geometric constructions with a variety of tools and methods.

G.GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.

Unit 3: Rigid Transformations and Symmetry

Time Frame: 1-2 weeks

Topics:

Reflections
Translations

Rotations
Compositions of Transformations
Symmetry

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.CO.2 Represent transformations in the plane using, for example, transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.

G.CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

G.CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

Unit 4: Triangles and Congruence

Time Frame: 2-3 weeks

Topics:

Angles of Triangles
Congruent Triangles

Proving Triangles Congruent - SSS,SAS
Proving Triangles Congruent- ASA,AAS
Proving Right Triangles Congruent
Isosceles and Equilateral Triangles
Triangles and Coordinate Proof

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.CO.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

G.CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

G.SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Unit 5: Relationships in Triangles

Time Frame: 3 weeks

Topics:

Bisectors of Triangles
Medians and Altitudes of Triangles
Inequalities in One Triangle
Indirect Proof
The Triangle Inequality
Inequalities in Two Triangles

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.CO.10 Prove theorems about triangles.
G.CO.12 Make formal geometric constructions with a variety of tools and methods.
G.MG.3 Apply geometric methods to solve design problems.

Unit 6: Quadrilaterals

Time Frame: 2-3 weeks

Topics:

Angles of Polygons
Parallelograms
Tests for Parallelograms
Special Parallelograms: Rectangles, Rhombi, Squares

Trapezoids and Kites

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.CO.11 Prove theorems about parallelograms.

G.CO.12 Make formal geometric constructions with a variety of tools and methods.

G.GPE.4 Use coordinates to prove simple geometric theorems algebraically.

G.MG.3 Apply geometric methods to solve problems.

Unit 7: Similarity

Time Frame: 2 weeks

Topics:

Dilations

Similar Polygons

Similar Triangles: AA Similarity

Similar Triangles: SSS and SAS Similarity

Parallel Lines and Proportional Parts

Parts of Similar Triangles

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar.

G.SRT.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

G.SRT.4 Prove theorems about triangles.

G.SRT.5 Use congruence and similarity criteria for triangles to solve problems.

Unit 8: Right Triangles and Trigonometry

Time Frame: 3-4 weeks

Topics:

Radicals Review

Geometric Mean

The Pythagorean Theorem and Its Converse

Special Right Triangles

Trigonometry

Angles of Elevation and Depression

The Law of Sines

The Law of Cosines

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G.SRT.10 Prove the Laws of Sines and Cosines and use them to solve problems.

G.SRT.11 Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles.

Unit 9: Circles

Time Frame: 3-4 weeks

Topics:

Circles and Circumference

Measuring Angles and Arcs

Arcs and Chords

Inscribed Angles

Tangents

Secants, Tangents, and Angle Measures

Equations of Circles

Equations of Parabolas

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task

Common Core Standards Addressed:

G.C.2 Identify and describe relationships among inscribed angles, radii, and chords.

G.C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

G.GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

G.GPE.2 Derive the equation of a parabola given a focus and directrix.

Unit 10: Area

Time Frame: 3 weeks

Topics:

Areas of Parallelograms and Triangles

Areas of Trapezoids, Rhombi, and Kites

Areas of Circles and Sectors

Areas of Regular Polygons and Composite Figures

Area and Nonrigid Transformations

Surface Area

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task/Authentic Assessments

Common Core Standards Addressed:

G.GPE.7 Use coordinates to prove simple geometric theorems algebraically. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.

G.MG.1 Use geometric shapes, their measures, and their properties to describe objects.

G.MG.3 Apply geometric methods to solve design problems.

Unit 11: Extending Volume

Time Frame: 2-3 weeks

Topics:

Cross Sections and Solids of Revolution

Volumes of Prisms and Cylinders

Volumes of Pyramids and Cones

Spheres

Spherical Geometry

Volume and Nonrigid Transformations

Applying Measurements

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task/Authentic Assessments

Common Core Standards Addressed:

G.GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.

G.GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

G.GMD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

G.MG.2 Apply concepts of density based on area and volume in modeling situations.

Unit 12: Probability

Time Frame: 2-3 weeks

Topics:

Representing Sample Spaces

Probability and Counting

Probability with Permutations and Combinations

Geometric Probability

Probability and the Multiplication Rule

Probability and the Addition Rule

Conditional Probability

Two-Way Frequency Tables

Materials:

- Textbook
- Online resources
- Graphing/Drawing Tools / Geometer's Sketchpad
- White boards/charts
- Textbook resource supplementals
- Videos
- Problem solving investigations

Activities:

- Written work
- Problem solving sets
- Board and Group work
- Assessments
- Performance Task/Authentic Assessments

Common Core Standards Addressed:

S.CP.1 Describe events as subsets of a sample space using characteristics of the outcomes, or as unions, intersections, or complements of other events.

S.CP.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

S.CP.9 Use permutations and combinations to compute probabilities of compound events and solve problems.

Algebra 2 Curriculum

Unit 1: Linear Equations

Time Frame: 19 days

Topics:

Solving Linear Equations
Solving Linear Inequalities
Algebra Lab Interval and Set Builder Notation
Rate of Change and Slope
Writing Linear Equations
Graphing Linear Inequalities
Graphing Technology Lab Intersections of Graphs
Solving Systems of Equations
Solving Systems of Linear Inequalities by Graphing
Graphing Technology Lab Systems of Linear Inequalities
Optimization with Linear Programming
Solving Systems of Equations in Three Variables

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems.

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

Unit 2: Linear Relations and Functions

Time Frame: 13 days

Topics:

Functions and Continuity
Linearity and Symmetry
Extrema and End Behavior
Sketching Graphs of Functions
Graphing Special Functions
Transformations of Functions
Solving Equations by Graphing

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Unit 3: Quadratic Functions

Time Frame: 16 days

Topics:

Graphing Quadratic Functions

Graphing Technology Lab: Modeling Real World Data

Solving Quadratic Equations by Graphing

Graphing Technology Lab: Solving Quadratic Equations by Graphing

Solving Quadratic Equations by Factoring

Complex Numbers

Solving Quadratic Equations by Completing the Square

Graphing Technology Lab: Solving Quadratic Equations

The Quadratic Formula and the Discriminant

Quadratic Inequalities

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals

- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

N.CN.7 Solve quadratic equations with real coefficients that have complex solutions.

Unit 4: Polynomials and Polynomial Functions

Time Frame: 20 days

Topics:

Operations with Polynomials

Algebra Lab: Dimensional Analysis

Powers of Binomials

Dividing Polynomials

Graphing Technology Lab: Dividing Polynomials

Graphing Technology: Power Functions

Graphing Polynomial Functions

Analyzing Graphs of Polynomial Functions

Graphing Technology Lab: Modeling Data Using Polynomial Functions

Graphing Technology Lab: Solving Polynomial Equations by Graphing

Solving Polynomial Equations

Proving Polynomial Identities

The Remainder and Factor Theorems

Roots and Zeros

Graphing Technology Lab: Analyzing Polynomial Functions

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

A.APR.6 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

F.IF.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

Unit 5: Inverses and Radical Functions

Time Frame: 15 days

Topics:

Operations with Functions

Composition of Functions

Inverse Functions and Relations

Graphing Technology Lab: Inverse Functions and Relations

Graphing Square Root Functions

Graphing Cube Root Functions

Graphing Technology Lab: Graphing nth Root Functions

Solving Radical Equations

Graphing Technology Lab: Solving Radical Equations

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

F.IF.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions

Unit 6: Exponential and Logarithmic Functions

Time Frame: 19 days

Topics:

Graphing Exponential Functions

Graphing Technology Lab: Solving Exponential Equations and Inequalities

Solving Exponential Equations and Inequalities

Geometric Sequences and Series

Logarithms and Logarithmic Functions

Modeling Data

Properties of Logarithms

Common Logarithms

Natural Logarithms

Solving Logarithmic Equations and Inequalities

Solving Exponential Equations and Inequalities

Using Logarithms to Solve Exponential Problems

Graphing Technology Lab: Cooling

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking

- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems.

F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F.IF.8b Use the properties of exponents to interpret expressions for exponential functions.

F.LE.4 For exponential models, express as a logarithm the solution to $abct = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.

Unit 7: Rational Functions

Time Frame: 16 days

Topics:

Multiplying and Dividing Rational Expressions

Adding and Subtracting Rational Expressions

Graphing Reciprocal Functions

Graphing Rational Functions

Graphing Technology Lab: Graphing Rational Functions

Variation Functions

Solving Rational Equations and Inequalities

Graphing Technology Lab: Solving Rational Equations and Inequalities

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad

- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

A.APR.7 Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.REI.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Unit 8: Statistics and Probability

Time Frame: 14 days

Topics:

Random Sampling

Using Statistical Experiments

Population Parameters

Distributions of Data

Evaluating Published Data

Normal Distributions

Using Probability to Make Decisions

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

S.IC.4 Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

S.IC.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S.MD.6 Use probabilities to make fair decisions.

S.MD.7 Analyze decisions and strategies using probability concepts.

Unit 9: Trigonometric Functions (if time allows)

Time Frame: 15 days

Topics:

Spreadsheet Lab: Investigating Special Right Triangles
Trigonometric Functions in Right Triangles
Geometry Lab: Regular Polygons
Angles and Angle Measure
Geometry Lab: Areas of Parallelograms
Trigonometric Functions of General Angles
Circular and Periodic Functions
Graphing Trigonometric Functions
Graphing Technology Lab: Trigonometric Graphs
Translations of Trigonometric Graphs

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

F.BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.

F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F.TF.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

Unit 10: Trigonometric Identities and Equations (if time allows)

Time Frame: 12 days

Topics:

Trigonometric Identities

Verifying Trigonometric Identities

Sum and Difference Identities

Double-Angle and Half-Angle Identities

Graphing Technology Lab: Solving Trigonometric Equations

Solving Trigonometric Equations

Materials:

- Glencoe Algebra 2 Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment

- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

F.TF.8 Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.

Pre-Calculus and Trigonometry Curriculum

Unit 1: Functions from a calculus Perspective

Time Frame: 15 days

Topics:

Functions

Analyzing Graphs of Functions and Relations

Continuity, End Behavior and Limits

Extrema and Average Rates of Change

Parent Functions and Transformations

Graphing Technology Lab: Nonlinear Inequalities

Function Operations and Composition of Functions

Inverse Relations and Functions

Graphing Technology Lab: Graphing Inverses Using Parametric Equations

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks

- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Building Functions F-BF

1. Build a function that models a relationship between two quantities.
 - c. (+) Compose functions.
4. Find inverse functions.
 - b. (+) Verify by composition that one function is the inverse of another.
 - c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.
 - d. (+) Produce an invertible function from a non-invertible function by restricting the Domain.

Unit 2: Power, Polynomial and Rational Functions

Time Frame: 17 days

Topics:

Power and Radical Functions

Graphing Technology Lab: Behavior of Graphs

Polynomial Functions

Graphing Technology Lab: Hidden Behavior of Graphs

The Remainder and Factor Theorems

Zeros of Polynomial Functions

Rational Functions

Nonlinear Inequalities

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Interpreting Functions F-IF

7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★
 - d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

Unit 3: Exponential and Logarithmic Functions

Time Frame: 17 days

Topics:

Exponential Functions

Graphing Technology Lab: Financial Literacy: Exponential Functions

Logarithmic Functions
Properties of Logarithms
Exponential and Logarithmic Equations
Graphing Technology Lab: Solving Exponential and Logarithmic Inequalities
Modeling with Nonlinear Regression

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Building Functions F-BF

5. (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.

Unit 4: Trigonometric Functions

Time Frame: 19 days

Topics:

Right Triangle Trigonometry

Degrees and Radians

Trigonometric Functions on the Unit Circle

Graphing Technology Lab: Graphing the Sine Function Parametrically

Graphing Sine and Cosine Functions

Graphing Technology Lab: Sums and Differences of Sinusoids

Graphing Other Trigonometric Functions

Inverse Trigonometric Functions

The Law of Sines and the Law of Cosines

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Trigonometric Functions F-TF

3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x , where x is any real number.
4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
6. (+) Understand that restricting a trigonometric function to a domain on which it is always

increasing or always decreasing allows its inverse to be constructed.

7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context. ★

Unit 5: Trigonometric Identities and Equations

Time Frame: 16 days

Topics:

Trigonometric Identities

Verifying Trigonometric Identities

Solving Trigonometric Identities

Graphing Technology Lab: Solving Trigonometric Inequalities

Sum and Difference Identities

Graphing Technology Lab: Reduction Identities

Multiple-Angle and Product-to-Sum Identities

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:
Trigonometric Functions F-TF

9. (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.

Unit 6: Systems of Equations and Matrices

Time Frame: 15 days

Topics:

Multivariable Linear Systems and Row Operations

Matrix Multiplication, Inverses and Determinants

Graphing Technology Lab: Determinants and Areas of Polygons

Linear Systems using Inverses and Cramer's Rule

Graphing Technology Lab: Matrices and Cryptography

Partial Fractions

Linear Optimization

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects

- Real World Examples

Common Core Standards Addressed:

Vector and Matrix Quantities N-VM

6. (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.
7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
8. (+) Add, subtract, and multiply matrices of appropriate dimensions.
9. (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.
10. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.
12. (+) Work with 2×2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.

Reasoning with Equations and Inequalities A-REI

8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.
9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).

Unit 7: Conic Sections and Parametric Equations

Time Frame: 16 days

Topics:

Parabolas

Ellipses and Circles

Hyperbolas

Rotations of Conic Sections

Graphing Technology Lab: Systems of Nonlinear Equations and Inequalities
Parametric Equations
Graphing Technology Lab: Modeling with Parametric Equations

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Expressing Geometric Properties with Equations G-GPE

3. (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.

Geometric Measurement and Dimension G-GMD

2. (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.

Unit 8: Vectors

Time Frame: 15 days

Topics:

Introduction to Vectors

Vectors in the Coordinate Plane

Dot Products and Vector Projections

Vectors in Three Dimensional Space

Graphing Technology Lab: Vector Transformations with Matrices

Dot and Cross Products of Vectors in Space

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Vector and Matrix Quantities N-VM

Represent and model with vector quantities.

1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., \mathbf{v} , $|\mathbf{v}|$, $\|\mathbf{v}\|$, v).

2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.

3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.

Perform operations on vectors.

4. (+) Add and subtract vectors.

a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.

b. Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.

c. Understand vector subtraction $v - w$ as $v + (-w)$, where $-w$ is the additive inverse of w , with the same magnitude as w and pointing in the opposite direction.

Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.

5. (+) Multiply a vector by a scalar.

a. Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.

b. Compute the magnitude of a scalar multiple $c v$ using $\|c v\| = |c| \|v\|$. Compute the direction of $c v$ knowing that when $|c| \|v\| \neq 0$, the direction of $c v$ is either along v (for $c > 0$) or against v (for $c < 0$).

11. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of Vectors.

Unit 9: Polar Coordinates and Complex Numbers

Time Frame: 15 days

Topics:

Polar Coordinates

Graphing Technology Lab: Investigate Graphs of Polar Equations

Graphs of Polar Equations

Polar and Rectangular Forms of Equations

Polar Forms of Conic Sections

Complex Numbers and De Moivre's Theorem

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

The Complex Number System N-CN

3. (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers. Represent complex numbers and their operations on the complex plane.

4. (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.

5. (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation.

6. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.

Unit 10: Sequences and Series (if time allows)

Time Frame: 17 days

Topics:

Sequences, Series and Sigma Notation

Arithmetic Sequences and Series

Geometric Sequences and Series

Graphing Technology Lab: Continued Fractions

Mathematical Induction

The Binomial Theorem

Functions as Infinite Series

Spreadsheet Lab: Detecting Patterns in Data

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks

- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

N/A

Unit 11: Inferential Statistics (if time allows)

Time Frame: 19 days

Topics:

Descriptive Statistics
Probability Distributions
The Normal Distribution
Graphing Technology Lab: Transforming Skewed Data
The Central Limit Theorem
Confidence Intervals
Hypothesis Testing
Correlation and Linear Regression
Graphing Technology Lab: Median-Fit Lines

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work

- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

Using Probability to Make Decisions S-MD

Calculate expected values and use them to solve problems

1. (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
2. (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
3. (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value.
4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value.

Use probability to evaluate outcomes of decisions

5. (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
 - a. Find the expected payoff for a game of chance.
 - b. Evaluate and compare strategies on the basis of expected values.

Unit 12: Limits and Derivatives (if time allows)

Time Frame: 17 days

Topics:

Estimating Limits Graphically

Evaluating Limits Algebraically

Graphing Technology Lab: The Slope of a Curve

Tangent Lines and Velocity

Derivatives

Area Under a Curve and Integration

The Fundamental Theorem of Calculus

Materials:

- Glencoe Pre-Calculus Textbook (online or print formats)
- Geometer's Sketchpad
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Common Core Standards Addressed:

N/A

Calculus Curriculum

Unit P: Preparing For Calculus

Time Frame: 10 days

Topics:

Functions and Their Graphs

Library of Functions; Mathematical Modeling

Operations on Functions; Graphing Techniques

Inverse Functions

Exponential and Logarithmic Functions

Trigonometric Functions

Inverse Trigonometric Functions

Sequences; Summation Notation; the Binomial Theorem

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

***Common Core Standards have already been met by the time a student reaches calculus. The Common Core is designed for secondary education, Calculus is considered a post-secondary course.**

Unit 1: Limits and Continuity

Time Frame: 12 days

Topics:

Limits of Functions Using Numerical and Graphing Techniques

Limits of Functions Using Properties of Limits

Continuity

Limits and Continuity of Trigonometric, Exponential and Logarithmic Functions

Infinite Limits and Limits at Infinity

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Unit 2: The Derivative

Time Frame: 13 days

Topics:

Rates of Change and the Derivative

The Derivative as a Function

The Derivative of a Polynomial Function and $y = e^x$

Differentiating the Product and Quotient of Two Functions

Higher Order Derivatives

The Derivative of Trigonometric Functions

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Unit 3: More About Derivatives

Time Frame: 14 days

Topics:

The Chain Rule

Implicit Differentiation

Derivatives of the Inverse Trigonometric Functions

Derivatives of Logarithmic Functions

Differentials: Linear Approximations and Newton's Method

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides

- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Unit 4: Applications of the Derivative

Time Frame: 33 days

Topics:

Related Rates

Maximum and Minimum Values; Critical Numbers

The Mean Value Theorem

Local Extrema and Concavity

Indeterminate Forms and L'Hopital's Rule

Using Calculus to Graph Functions

Optimization

Antiderivatives; Differential Equations

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Unit 5: The Integral

Time Frame: 34 days

Topics:

Area

The Definite Integral

The Fundamental Theorem of Calculus

Properties of the Definite Integral

The Indefinite Integral; Substitution Method

Uninhibited and Inhibited Growth Models

Separable First-Order Differential Equations

Slope Fields

Euler's Method

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Unit 6: Applications of the Integral

Time Frame: 18 days

Topics:

Area Between Graphs

Volume of a Solid of Revolution; Disks and Washers

Volume of a Solid of Revolution; Cylindrical Shells

Volume of a Solid; Slicing

Materials:

- Calculus 2E Sullivan & Miranda Textbook
- TI-84 Graphing Calculators
- Chromebooks
- Textbook Resource Supplementals
- Online Resources

Activities:

- Direct instruction with note taking
- Video Solution Guides
- Group Work
- Board Work
- Performance Tasks
- Assessment
- Labs/Projects
- Real World Examples

Applied Math Curriculum

Unit 1: Basic Math Review**Time Frame: 5 Weeks****Topics:**

- Addition/Subtraction

- Multiplication/division
- Negative numbers
- Fractions
- Decimals

Materials:

Khan Academy (www.khanacademy.org)

Activities:

Videos

Practice Problems

Common Core Standards Addressed:

CCSS MATH CONTENT 4.OA.A.3

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCSS MATH CONTENT 3.OA.A.2

Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

CCSS MATH CONTENT 6.NS.B.2

Fluently divide multi-digit numbers using the standard algorithm.

CCSS MATH CONTENT 6.NS.B.3

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

CCSS MATH CONTENT 4.NBT.B.6

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS MATH CONTENT 6.NS.A.1

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

CCSS MATH CONTENT 3.OA.A.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

CCSS MATH CONTENT 3.OA.C.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

CCSS MATH CONTENT 4.NBT.B.5

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS MATH CONTENT 7.NS.A.1c

Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

CCSS MATH CONTENT 6.NS.A.1

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

Unit 2: Algebra Basics**Timeline:**

8 weeks

Topics

- Exponents
- Order of Operations
- Square Roots
- Expressions with multiple variables
- Interpreting linear expressions
- Relationships between quantities in equations and graphs
- Match equations to coordinates on a line
- Independent vs dependent variables
- Linear equations
- Solving Equations
- Inequalities

Materials:

Khan Academy (www.khanacademy.org)

Activities:

Videos

Practice Problems

Common Core Standards Addressed:

CCSS MATH CONTENT 6.EE.A.1

Write and evaluate numerical expressions involving whole-number exponents.

CCSS MATH CONTENT 6.EE.A.2c

Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

CCSS MATH CONTENT HSN-RN-A.2

Rewrite expressions involving radicals and rational exponents using the properties of exponents.

CCSS MATH CONTENT 8.EE.A.2

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

CCSS MATH CONTENT 7.EE.A.2

Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.

CCSS MATH CONTENT 6.EE.C.9

Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

CCSS MATH CONTENT 8.EE.C.7b

Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

CCSS MATH CONTENT HSA-REI.B.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

CCSS MATH CONTENT 6.EE.B.8

Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams

CCSS MATH CONTENT 8.F.B.4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

CCSS MATH CONTENT HSF-1F.C.7a

Graph linear and quadratic functions and show intercepts, maxima, and minima.

CCSS MATH CONTENT HSF-LE.A.2

Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

CCSS MATH CONTENT 8.F.A.3

Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

CCSS MATH CONTENT 8.F.A.1

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

CCSS MATH CONTENT HSF-IF.A.1

Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.

CCSS MATH CONTENT HSF-IF-A.2

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

UNIT 3 - Lure of the Labyrinth

Timeline

6 weeks

Topics

- Ratios and proportions
- Expressions and equations
- Number and operations - fractions
- Functions
- The Number System

Materials:

Lure of the Labyrinth (www.labyrinth.thinkport.org)

Activities:

Use math to solve puzzles and advance through game

Common Core Standards Addressed:

CCSS MATH CONTENT 7.RP.2

Recognize and represent proportional relationships between quantities.

CCSS MATH CONTENT 7.RP.2a

Decide whether two quantities are in a proportional relationship

CCSS MATH CONTENT 6.EE.2

Write, read, and evaluate expressions in which letters stand for numbers.

CCSS MATH CONTENT 6.EE.3

Apply the properties of operations to generate equivalent expressions.

CCSS MATH CONTENT 6.EE.6

Use variables to represent numbers and write expressions when solving a real world problem, understanding that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set.

CCSS MATH CONTENT F.BF.1

Write a function that describes a relationship between two quantities.

CCSS MATH CONTENT 8.F.1

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

CCSS MATH CONTENT 7.NS.1

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, and represent addition and subtraction on a horizontal or vertical number line diagram.

Unit 4: Probability and Statistics

Timeline:

9 weeks

Topics:

- Probability
- Compound probability
- Statistics
- Statistics sampling
- Exploring phenomena with probability

Materials:

CK-12 (www.ck12.org)

Activities:

CK-12 flexbooks and lessons

Common Core Standards Addressed:

CCSS MATH CONTENT S.CP.2

Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

CCSS MATH CONTENT S.CP.1

Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or”, “and”, “not”).

CCSS MATH CONTENT S.CP.3

Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

CCSS MATH CONTENT S.CP.4

Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

CCSS MATH CONTENT S.CP.5

Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

CCSS MATH CONTENT S.CP.9

Use permutations and combinations to compute probabilities of compound events and solve problems.

CCSS MATH CONTENT S.CP.6

Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.

CCSS MATH CONTENT S.ID.4

Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

CCSS MATH CONTENT S.ID.5

Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

CCSS MATH CONTENT S.ID.6

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

CCSS MATH CONTENT S.ID.7

Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

CCSS MATH CONTENT S.ID.9

Distinguish between correlation and causation.

CCSS MATH CONTENT S.ID.8

Compute (using technology) and interpret the correlation coefficient of a linear fit.

CCSS MATH CONTENT N.Q.2

Define appropriate quantities for the purpose of descriptive modeling.

CCSS MATH CONTENT S.IC.6

Evaluate reports based on data.

CCSS MATH CONTENT N.Q.3

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Unit 5 Triangles and Trigonometry

Timeline:

5 weeks

Topics:

- Pythagorean Theorem
- Pythagorean Triples
- Distance Formula
- Special Triangles
- Right triangle trigonometry
- Calculator Trig functions
- SEC CSC COT
- Angles of elevation and depression
- Sine and cosine laws
- Using triangles and bearings

Materials:

CK-12 (www.ck12.org)

Activities:

CK-12 flexbooks and lessons

Common Core Standards Addressed:

CCSS MATH CONTENT G.8

Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

CCSS MATH CONTENT G.SRT.8

Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

CCSS MATH CONTENT G.SRT.C.06

Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

CCSS MATH CONTENT F.TF.7

Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

CCSS MATH CONTENT G.SRT.D.11

Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

CCSS MATH CONTENT N.VN.2

Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.

CCSS MATH CONTENT G.SRT.D.10

Prove the Laws of Sines and Cosines and use them to solve problems.