INTRODUCTION TO MATHEMATICS LEARNING RESOURCES
GEORGIA DEPARTMENT OF EDUCATION
TEACHING & LEARNING - CURRICULUM & INSTRUCTION
OFFICE OF MATHEMATICS

The Georgia Department of Education Mathematics Team has curated resources aligned to the Georgia Standards of Excellence for Mathematics and Georgia Frameworks Units presented in the state curriculum frameworks. Each unit for each grade level includes at least 10 specific resources that students can use during the time of isolation due to the public health emergency involving the COVID-19 pandemic. These resources are aligned directly to the Georgia Standards of Excellence and provide a supplement for any remote instruction provided by the classroom teacher. When engaging learners in remote learning, it is important to remember to engage students in activities that continue to promote hands-on, conceptual learning and limit the learners' screen time as much as possible. Therefore, this curated repository of resources includes both web-based resources and hands-on, kinesthetic activities. This resource is designed for mathematics educators and homeschool teaching professionals supporting learners in their continued learning. This is not designed to be an exhaustive list of materials for students to use to thoroughly master all standards in each unit. These are just quick, convenient resources for students to use to refine their mathematics skills and reasoning while learning remotely.

In order to effectively utilize this resource package, please use the following guidance:

1. Review each activity, task, website, and game to capture key details before assigning it to students.
2. Integrate the activities into your learning management system, communication platform, or on a weekly calendar or choice board for learners to easily access.
3. Give students the activities in manageable segments, alternating between digital and hands-on to regulate screen time.
4. Review the additional resources at the very end of the spreadsheet (after high school).
5. Let learners have fun learning math. Enjoy!

Introduction

Kindergarten
1st Grade
2nd Grade
3rd Grade
4th Grade
5th Grade

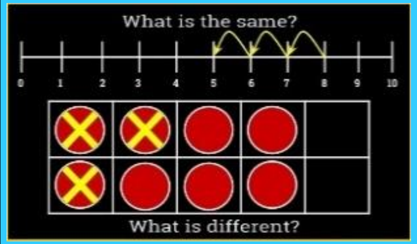
6th Grade
7th Grade
8th Grade

Coordinate Algebra
Algebra I
Analytic Geometry
Geometry
Algebra II - Advanced Algebra
Precalculus
Calculus-Based HS Courses
All Other HS Courses

Additional Teacher Resources

GSE Kindergarten Mathematics Curriculum Map

Grade Level Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Counting With Friends	**Comparing Numbers**	**Sophisticated Shapes**	**Measuring and Analyzing Data**	**Investigating Addition and Subtraction**	**Further Investigation of Addition and Subtraction**	**Show What We Know** ***(Free Math Apps for all Units)***
Web-based Resources						
Open Middle: Caterpillar Counting	More, Same, Less Virtual dot cards	Geoboard Museum Virtual Geoboard	Crystals Rule - Measuring with Non-Standard Units	Open Middle: Decomposing Numbers Less Than or Equal to Ten	Open Middle: Adding and Subtracting within Ten	PBS Learning Media
What the heck is a rekenrek? Virtual Rekenrek	Desmos Activity: Teen Numbers Card Sort (Sign up for a free account to use this activity)	Compose Shapes using the Patch Tool from NCTM	Bridge Builder - PBS Kids	Adding And Subtracting on a Ten Frame (NCTM)	How Many Ways to Get to 10? 12 Ways to Get to 11, by Eve Merriam (read aloud)	Greg Tang Math Games
Desmos Activity: Counting and Number Lines (Sign up for a free account to use this activity)	Riddle Me This? Virtual Ten Frames	Pattern Block Pictures Virtual Pattern Shapes	Sorting by Size - Practice	Adding And Subtracting on a 5 Frame (NCTM)	Ten Flashing Fireflies Ten Flashing Fireflies (read aloud)	The Math Learning Center Apps
Fill the Chute Virtual Dice	NRICH Maths: Next Domino Next Domino Student Task	Compose Shapes Students can use this online tool to compose shapes from other shapes. There is also a tool at the bottom left corner of the screen where students can compose a given shape	How does our class compare? (US Census Activity)	How Many Under the Shell? (NCTM)	A Day at the Beach One is a Snail, Ten is a Crab, by April Pulley Sayre and Jeff Sayre (read aloud)	3-Act Tasks for Elementary Students
Counting to Twenty Peg + Cat (PBS Kids Lab)	More, Fewer, Same (PBS Kids Activity)	Desmos Activity: Polygraph: Where's Abe? (Create a free account to use this activity)	Take Flight Paper Airplane Activity	 What is the same? 0 1 2 3 4 5 6 7 8 9 10 What is different? Show students this image. Ask the questions: What is the Same? What is Different?	Number Partners of 10	Bedtime Math (Fun Math At Home) Games

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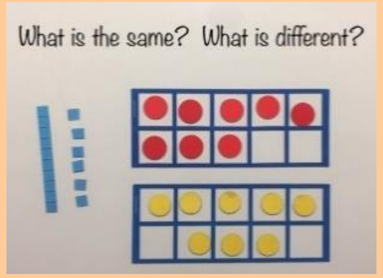
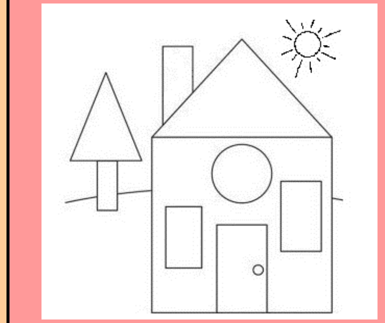
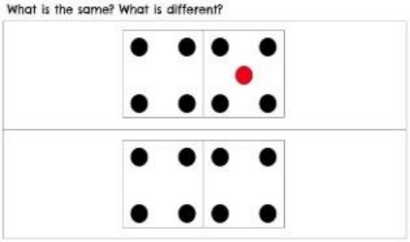
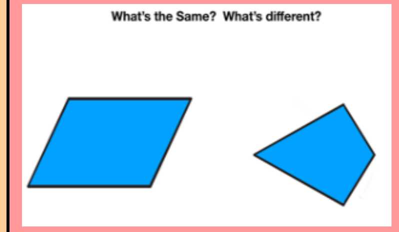
GSE Kindergarten Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Counting On	Comparing Number Values Game	Sesame Street Hexagon	Online Kindergarten Measurement Games	Modeling a Ten Frame	Number Bonds	YouCubed Tasks
Counting Chickens Peg + Cat (PBS Kids Lab)	Comparing Number Video with Activities and Games for Students	Shapes and Their Attributes Peg + Cat (PBS Kids Lab)	Measurement Sentence Frames Activity (sorting activity for learners)	Number Partners of Ten	Sesame Street Word on the Street: Subtraction	Kaplinsky Math Lessons
Hands-On and Kinesthetic Activities						
Count out 10 household objects with the same shape.	Open Middle: Teen Numbers with Ten-Frames: I have 2 ten-frames that have counters on them. One is full and one is not. What is the largest number I could make? What is the smallest number I could make?	Shapes all Around	Kindergarten Measurement Formative Assessment Lesson (FAL)	Open Middle: Sum of 5 I rolled 2 dice and when I counted the pips (dots), there were 5 altogether. What could I have rolled on the dice? I rolled again and got 5 again, but I didn't get the same numbers as before. What could my new roll be?	Got Your Number A deck of playing cards is needed for this practice game.	Would You Rather Math?
Read a book related to counting	Before and After Game	Listen and Do	Riddle Me!	Going Bananas	By the Riverside	GSE Mathematics Videos (GADOE)
Do 10 jumping jacks and count each jump along the way	 Show students this image. Ask the questions: What is the Same? What is Different?	 Open Middle: Identifying Shapes	Find two things longer than your foot. Find two things shorter than your foot.	The Bike Shop	 Show students this image. Ask the questions: What is the Same? What is Different?	Which One Doesn't Belong?
ESTIMATION180.com Estimation 180: How many pieces of Candy Corn in the cup?	The Pocket Game (YouCubed Activity)	 What is the same and what is different about these shapes?	Find three things that are different colors. Put them in order from shortest to longest. Draw them in that order.	Make 5 (or 10) go Fish A deck of playing cards will be needed for this game.	Face Off Game	Same but Different Math Thinking Activities

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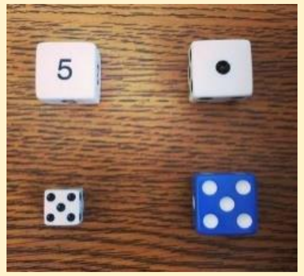
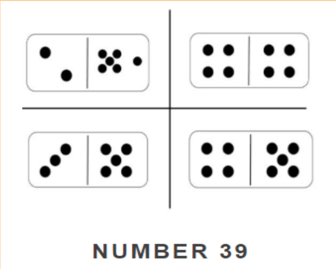
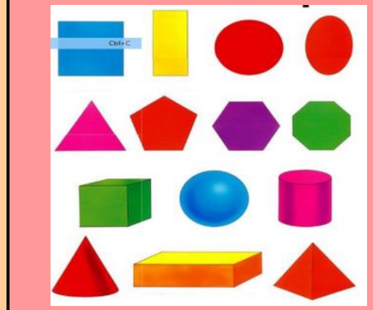
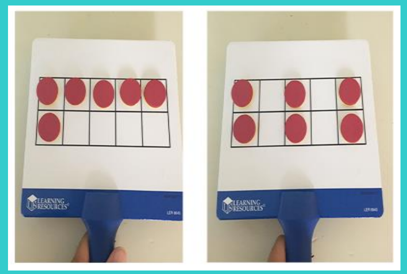
 Show students this image. Ask the questions: Which one doesn't belong? Why?	 Show students this image. Ask the questions: Which one doesn't belong? Why?	 Open Middle: Describing Shapes	Draw three things that would be heavier than a potato. Write three things that would be lighter than a potato.	Young Farmer MacDonald	 Show students this image. Ask the questions: What is the Same? What is Different?	Open Middle Math Problems

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GSE First Grade Mathematics Curriculum Map

Grade Level Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Creating Routines Using Data	**Developing Base-Ten Number Sense**	**Operations and Algebraic Thinking**	**Sorting, Comparing, and Ordering**	**Understanding Place Value**	**Understanding Shapes and Fractions**	**Show What We Know** ***(Free Math Apps for all Units)***
Web-based Resources						
M&M March Madness Activity	Button, Button! Coduroy, by Don Freeman Read Aloud Virtual Manipulatives	NRICH Maths: Noah Virtual Space to Draw and Problem Solve	Greater Than Less Than Video Have students watch the video and reflect by answering questions such as: What is one thing you learned from the video? What do you wonder after watching the video? What does greater mean? What does less mean? How do you represent these?	Online Place Value Games (Students should complete all 5 place value games)	What are attributes? Virtual Attribute Blocks and Circles for Sorting	PBS Learning Media
Spin and Represent Interactive 1-10 Spinner	Finding Neighbors Interactive Number Chart	Walk This Way (Coding and Algebraic Reasoning Activity) - The activity is at the above link. Students can use Tynker for coding support.	Desmos Activity: Card Sort: Time (Hours and Half Hours) (Create a free account to use this activity)	Funny Numbers Game	Make Your Own Puzzle Follow up with Virtual Tangrams	Bedtime Math (Fun Math At Home) Games
Exploring the 99 Chart Virtual 0-9 Dice	Understanding Place Value Video (Have the student take another number between 11 and 19 and represent in a variety of ways as shown in the video.)	Desmos Activity: Number Bonds - Three Addends (Create a free account to use this activity)	Groundhog's Garden How Groundhog's Garden Grew by Lynne Cherry - Read Aloud	Candy Jar	Pattern Block Pictures Virtual Pattern Shapes	The Math Learning Center Apps
Pieces of a Hundreds Chart	Estimation 180: How Many Green Mallows in the Glass?	The Wheel Shop	Turtle Pond Use measurement units to guide a turtle to the pond with computer commands!	Ordering Numbers	Super Peg + Cat Guy Geometry Web Game (PBS Kids Lab)	Greg Tang Math Games

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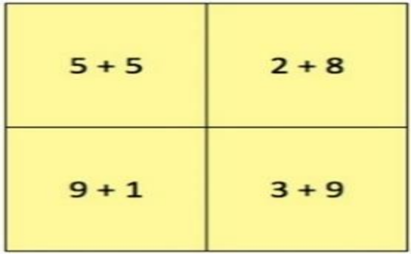
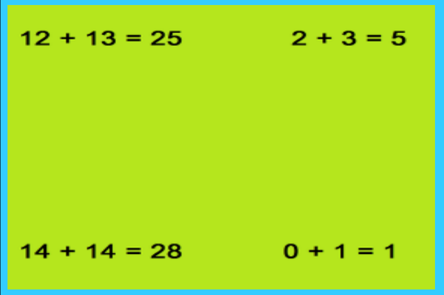
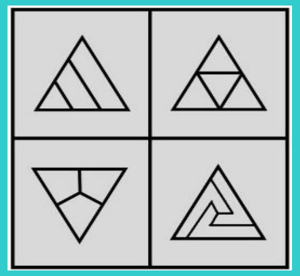
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Desmos Activity: Polygraph: Base Ten Numbers (Create a free account to use this activity)	Riddle Me This Virtual Manipulatives	Sums Investigation Activity	Fetch Fone Game (PBS Kids)	Comparing Number Values Game	Desmos Activity: Polygraph: Shape Bucket (Create a free account to use this activity)	YouCubed Tasks
Trashcan Basketball	Get a Jump On It Hopscotch Game	Developing Meaning by Using Story Problems: Start Unknown	Desmos Activity: One Handed Clock Time Match (Create a free account to use this activity)	Grouping and Grazing Count by 5s or 10s, add or subtract in this contextual math game from NCTM.	Geoboard Fractions Virtual Geoboard	Kaplinsky Math Lessons
Hands-On and Kinesthetic Activities						
Open Middle: Make a graph that shows a possible result of 7 students' favorite color, with red being the most popular color.	Open Middle: Use the digits 1-9, at most one time each. Place the digits in each box on the number line to make the number line true.	Oh, No 20! Playing cards will be required to play this addition and subtraction game.	Open Middle - Ordering Shapes: Order the squares from shortest to tallest. Order the rectangles from tallest to shortest. Order both the squares and rectangles from tallest to shortest.	Open Middle: Subtracting Two-Digit Numbers - Using the digits 1 to 9 at most one time each, fill in the boxes to make the smallest (or largest) difference.	Open Middle Shape Partitions: Using the same cut pattern for each figure, partition each shape into fourths. Using different cut patterns for each figure, partition each shape into fourths.	Would You Rather Math?
I Spy a Number	 What is the Same? What is Different?	 5 + 5 2 + 8 9 + 1 3 + 9 Which one doesn't belong? Why?	Venn There Done That Activity	 12 + 13 = 25 2 + 3 = 5 14 + 14 = 28 0 + 1 = 1 Which one doesn't belong? Why?	 Which one doesn't belong? Why?	Which One Doesn't Belong?
Open Middle: Use the digits 1 to 9, at most one time each, place a digit in each box on the number line to make the number line true.	6 Beads	Developing Meaning by Using Story Problems: Result Unknown	How Long is Your Name	Counting Cathy	Open Middle: Shape Partitions	Same but Different Math Thinking Activities

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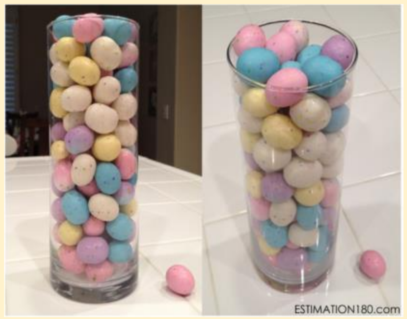
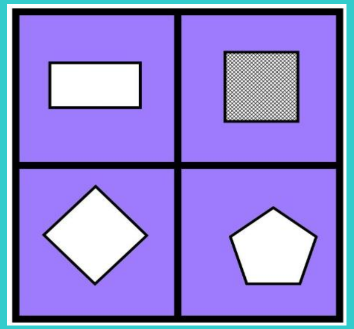
You have seven full ten-frames and one ten-frame with 3 dots. What is the value of these ten-frames? What would you need to make 100?	What is the Same? What is Different?	[Developing Meaning by Using Story Problems: Change Unknown]()	[Take Flight Paper Airplane Activity]()	[Open Middle: Subtracting Two-Digit Numbers]()	[Glow In The Dark Geometry Activity]()	[Open Middle Math Problems]()
 Estimation 180: How many malted eggs are in the cylinder?	[Open Middle: Open Number Line]()	[Face Off Game]()	[Open Middle: Representing Data]()	[Got Rhythm - Silly Simon Game]()	 Show students this image. Ask the questions: Which of these doesn't belong? Why?	[3-Act Tasks for Elementary Students]()

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GSE Second Grade Mathematics Curriculum Map

Grade Level Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Extending Base Ten Understanding	**Becoming Fluent with Addition and Subtraction**	**Understanding Measurement, Length, and Time**	**Applying Base-Ten Understanding**	**Understanding Plane and Solid Figures**	**Developing Multiplication**	**Show What We Know** ***(Free Math Apps for all Units)***
Web-based Resources						
Zeros Are Disappearing Odd Squad PBS Learning Media Have students watch the video and write a brief reflection on the meaning of zero in each place of a number.	Number Destinations	Solving Problems on a Number Line Virtual Number Line	Funny Money: Time for a Change (Bedtime Math Game)	Partition Shapes Interactive Geometry Game	Seating the Class Virtual Manipulatives	Bedtime Math (Fun Math At Home) Games
Desmos Activity: Polygraph: Base Ten Numbers (Create a free account to use this activity)	Subtraction Story Problems Virtual Manipulatives	Time of Your Life Game	Coin Bubble Interactive Game	Board Block Virtual Circular Geo-Board	The Candy Box Virtual Manipulatives	PBS Learning Media
Desmos Activity: Polygraph: Less than 1000 (Create a free account to use this activity)	Walk This Way (Coding and Algebraic Reasoning Activity) - The activity is at the above link. Students can use Tynker for coding support.	Measuring Lengths Interactive Game	Money to Spend Virtual Money Manipulatives	Composing Shapes with Tangrams	Desmos Activity Polygraph: Arrays (up to 5 x 5) (Create a free account to use this activity)	The Math Learning Center Apps
Place Value Play Virtual Dice Virtual Base Ten Blocks	Youcubed - Tic - Tac - Toe Sums	Use virtual coins from this website: Answer the following questions: What is the fewest number of coins you could use to make 73¢? How could you make 73¢ using exactly 10 coins?	Multi-Digit Addition Strategies Virtual Manipulatives	Geogebra: Shape Debates - What are these shapes?	Roll an Array Virtual Dice	Steve Wyborney Online Math Resources
Building Base-Ten Numbers Virtual Dice Virtual Base-Ten Blocks	Shake, Rattle, and Roll Virtual Dice Virtual Number Lines	Geogebra: Telling time using an analog and digital clock. What do you notice? What do you wonder?	Subtraction Modeling with Regrouping Revisited Virtual Base Ten Blocks	Math for Love - Don't Make a Triangle	Seating the Class Virtual Manipulatives	YouCubed Tasks

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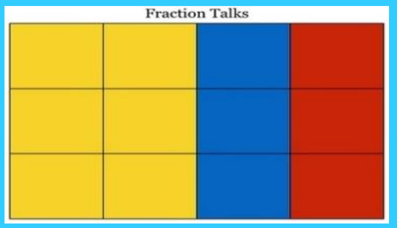
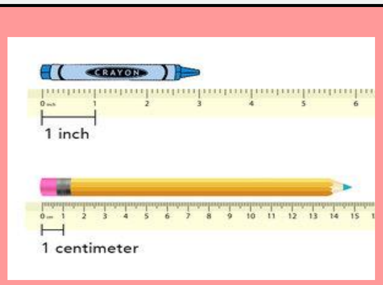
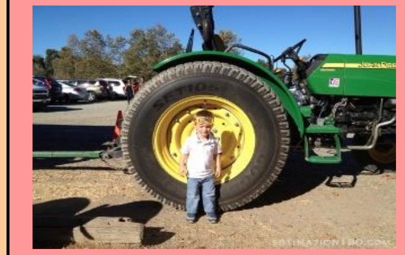
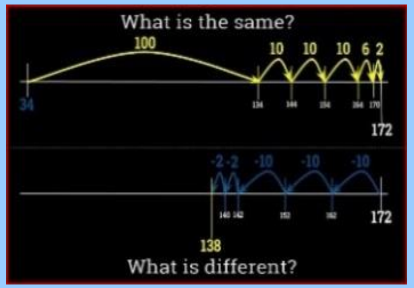
Building Numbers with Base Ten Materials And Arrow Cards Students can build numbers with base ten blocks and arrow cards at the same time, then expand the arrow cards.	Addition Strategies Virtual Manipulatives	Geogebra: Cash Register - Click start for problems involving coins up to $1.00	Take a three-digit number, reverse its digits and subtract the smaller from the larger. Reverse the digits of the result and add. Virtual Base-Ten	 Math for Love - What fraction is shown by each color? How do you know?	Youcubed - Pepperoni Pizza Virtual Dice	Kaplinsky Math Lessons
Hands-On and Kinesthetic Activities						
What's My Number?	Open Middle: Create and Equation - Use only the digits 1 to 7, at most one time each, fill in the boxes to create a true equation.	 Show students this image. Ask the questions: What is the same? What is different?	Open Middle: Sum to 1000 - Two Addends - Arrange the digits 1-6 into two 3-digit whole numbers. Make the sum as close to 1000 as possible.	Open Middle: Drawing and Naming Shapes by Angles - Directions: Draw and name a shape that has the following characteristics: Has 3 angles Has 4 angles Has 5 angles Has 6 angles Has two equal sides Has five equal sides	 Show students this image. Ask the questions: What is the same? What is different?	Which One Doesn't Belong?
Would You Rather have 23 hundreds, 48 tens and 9 ones OR 26 hundreds, 17 tens, and 22 ones? Justify your reasoning with mathematics.	Get a Jump On it Hopscotch Game	 Estimation 180: Show students this image. Ask the question: What is the height of the tractor tire?	 What is the same? 100 10 10 10 6 2 172 -2 -2 -10 -10 -10 172 138 What is different? Show students this image. Ask the questions: What is the same? What is different?	Teeth Graph	Sweethearts LOVE BUG Estimation 180: Show students this image. Ask the question: How many Sweethearts come in a box?	Would You Rather Math?

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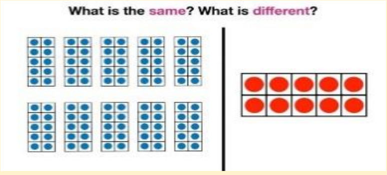
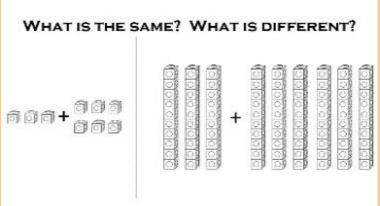
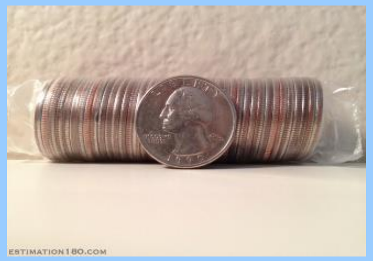
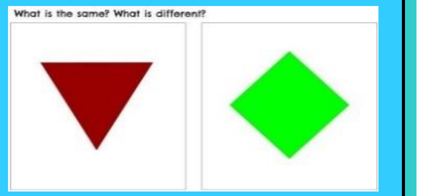
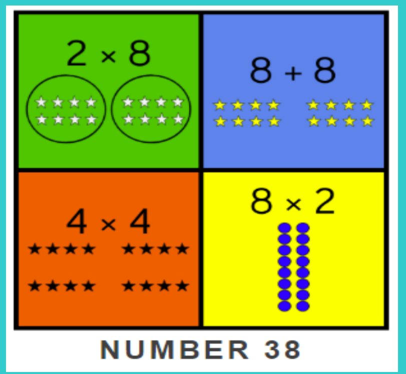
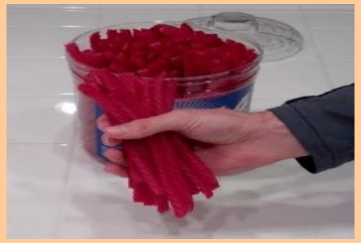
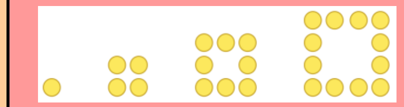
 What is the same? What is different? Show students this image. Ask the questions: Which one doesn't belong? Why?	 WHAT IS THE SAME? WHAT IS DIFFERENT? Show students this image. Ask the questions: What is the same? What is different?	Open Middle: Making Change - Make 47¢ in three different ways with either quarters, dimes, nickels, or pennies.	 Estimation 180: Show students this image. Ask the question: What is the value of the roll of quarters?	 What is the same? What is different? Show students this image. Ask the questions: What is the same? What is different?	 Show students this image. Ask the questions: Which one doesn't belong? Why?	Same but Different Math Thinking Activities
High Roller Virtual Dice	Open Middle: Subtracting Two-Digit Numbers - Using the digits 1 to 9 at most one time each, fill in the boxes to make the smallest (or largest) difference.	Footprints on the Rug	Open Middle: Sum to 100 - Using the digits 1 to 9 at most one time each, fill in the boxes to create the closest possible sum to 100.	Open Middle: Shape Partitions - Using the same cut pattern for each figure, partition each shape into fourths. Using different cut patterns for each figure, partition each shape into fourths.	Cover a Rectangle Task	Open Middle Math Problems
M&M March Madness Activity	 Estimation 180: Show students this image. How many red licorice are in my hand?	 Choose a coin to use to build this pattern. Build the next image in the pattern using your chosen coins. How much will the image you made be worth? How much will all 5 images be worth?	Story Problems	Making a Cake	Get 12 pennies, counters, or other object. How many ways can you arrange these 12 objects in a rectangular array? Draw a record of all of the arrays you found. How many arrays do you think you can make with 24 objects? Try it! Were you right?	3-Act Tasks for Elementary Students

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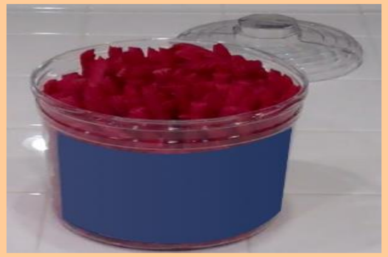
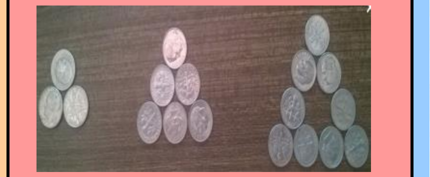
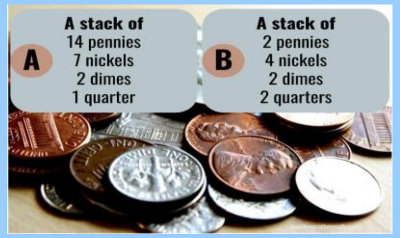
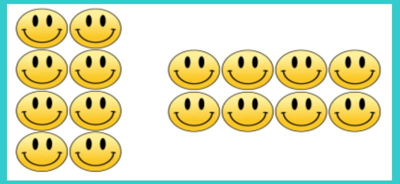
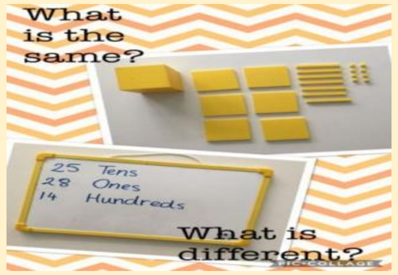
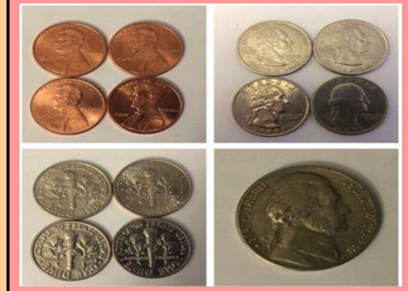
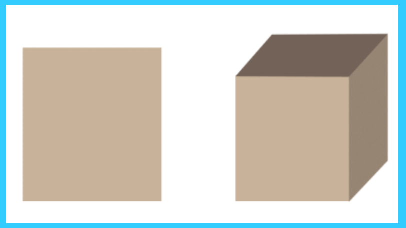
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
☐☐+☐☐+☐☐ Open Middle: Sums to 100 - Using the digits 1 to 9 at most one time each, fill in the boxes to create the closest possible sum to 100.	 Estimation 180: Show students this image. Ask the question: How many red licorice come in a container?	 Visual Patterns. Draw the next image in the pattern. How many dimes are used? What is the value of the image you drew?	 A stack of A 14 pennies 7 nickels 2 dimes 1 quarter A stack of B 2 pennies 4 nickels 2 dimes 2 quarters Would you Rather have a stack of 14 pennies, 7 nickels, 2 dimes, and 1 quarter OR a stack of 2 pennies, 4 nickels, 2 dimes, and 2 quarters?	**Create a Zukei Puzzle** Directions: Each puzzle is made up of several dots. Some of these dots will be used as verticies of the shape named above the puzzle. The remaining dots are inconsequential to the puzzle, essentially they are used as distractors. Zukei Puzzles	 Show students this image. Ask the questions: What is the same? What is different?	Greg Tang Math Games
 What is the same? 25 Tens 28 Ones 14 Hundreds What is different? Show students this image. Ask the questions: What is the same? What is different?	Our Number Riddles	 Show students this image. Ask the questions: Which one doesn't belong? Why?	Knockin' Hockey Game	 Show students this image. Ask the questions: What is the same? What is different?	Math Pickle - Mondrian Art Puzzles	Georgia Numeracy Project Tasks, Games, and Activities

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GSE Third Grade Mathematics Curriculum Map

Grade Level Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Numbers and Operations in Base Ten	**The Relationship Between Multiplication and Division**	**Patterns in Addition and Multiplication**	**Geometry**	**Representing and Comparing Fractions**	**Measurement**	**Show What We Know** ***(Free Math Apps for all Units)***
Web-based Resources						
Math for Love - Number Palindromes Virtual Interactive Hundreds Chart	YouCubed Math Cards Activity Virtual Base Ten Blocks	Interactive Arrays	Math for Love - Pattern Block Triangles Virtual Pattern Blocks	Who Gets More? Virtual Fraction Pieces	Capacity Countdown	The Math Learning Center App YouCubed Tasks
The Island Hop	Desmos Activity: Slicing Arrays (Sign up for a free account to use this activity)	Count Me In! Virtual Arrays	Party Designer	Desmos Activity: Polygraph: Shaded Rectangles (Sign up for a free account to use this activity)	Desmos Activity: Polygraph: Clocks (Sign up for a free account to use this activity)	Estimation 180 Activities
Rounding to the Nearest 100 and 1000 Virtual Interactive Number Line	The Product Game	Desmos Activity: Polygraph: Arrays (Sign up for a free account to use this activity)	Score it!	Comparing Fractions Using Models	Open Middle: Operations with Time	Bedtime Math (Fun Math At Home) Games
Greatest Difference of Two Rounded Numbers Interactive number line from Gizmos	Desmos Activity: Multiplication and Division Card Sort (Sign up for a free account to use this activity)	How Many Rows? How Many in Each Row? To play virtually, use the two links below: Virtual Dice 10 x 10 Grid	Desmos Activity: Polygraph: Shapes Bucket (Sign up for a free account to use this activity)	Desmos Activity: Fractions on a Number Line (Sign up for a free account to use this activity)	Tricks of the Eye Optical Illusions Activity	Desmos Activities for Elementary Grades
Math for Love - Don't Break the Bank Virtual Dice	Persistence	Multiplication with Base 10 Blocks Virtual Base Ten Blocks	Rectangles Rule Virtual Geoboard	Pattern Block Fractions Revisited Virtual Pattern Blocks	Reading Scales	Kaplinsky Math Lessons

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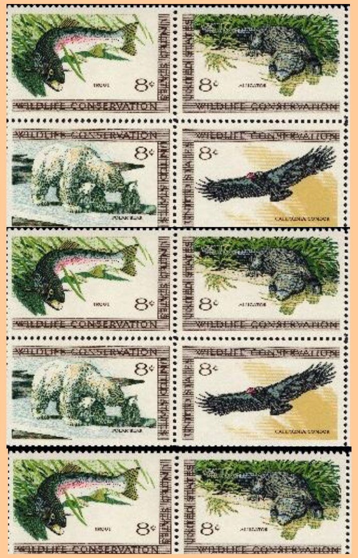
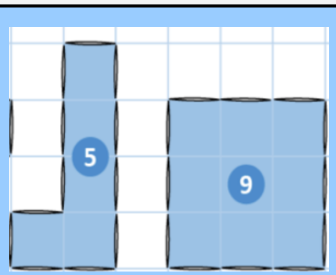
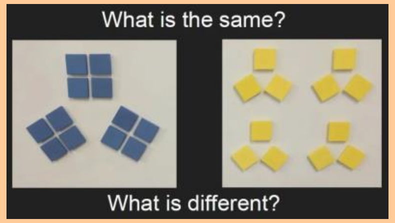
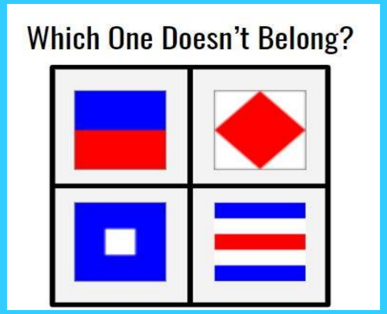
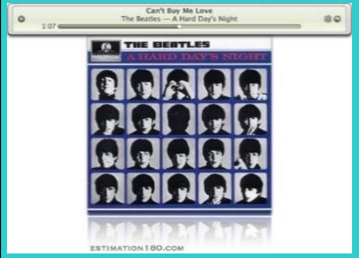
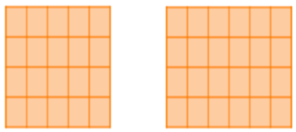
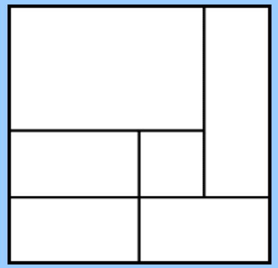
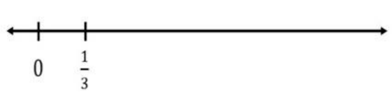
GSE Third Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Hands-On and Kinesthetic Activities						
Would you Rather Problem: Would you rather have 364 jelly beans and give 188 to friends OR have 281 jelly beans and give 137 to friends?	 How many stamps do you see? What is the total cost of the stamps?	Open Middle Problem: Daniel was making chocolate cookies. He had _ _ cookies in each row and _ _ many rows. There were a total of 84 cookies. How many cookies were there in each row and how many rows of cookies were there? Draw a model to support your answer. You may use the digits 0-9 once in any of the blank boxes. (The answer of 84 cookies does not eliminate the 8 or the 4.)	 Twelve toothpicks can outline shapes with areas of 5 square units and 9 square units. What other areas can you outline with 12 toothpicks?	Open Middle Problem: Using the given number line, label the point where 3/4 belongs on the number line. Be as precise as possible.	Open Middle Problem: Use the digits 1 to 9, at most one time each, to fill in the boxes to make the latest possible time.	Would You Rather Math?
Math for Love - Subtracting Reverses	 Share this "What is the same? What is different?" image with students and have them reflect and discuss responses.	Math Pickle - Ninja Bedbug	Terrifically Twisted Tangrams Activity	 Which One Doesn't Belong? Which one doesn't belong? Why?	 Can't Buy Me Love The Beatles — A Hard Day's Night THE BEATLES A HARD DAY'S NIGHT ESTIMATION180.COM Estimation 180: How long is "Can't Buy Me Love?"	Which One Doesn't Belong?
4☐☐ – 1☐☐ Fill in the blanks with digits to make the answer closer to 200 than 300.	Open Middle: Planting Carrots - Using the digits 1 to 9 at most one time each, fill in the blanks to make the following problem true. Sarah planted __ __ carrots in her garden. She planted them in __ rows. Each row had __ carrots.	 What is the same? What is different	 What fraction of the big square is represented by each region?	 Label the point where 3/4 belongs on the number line. Be as precise as possible.	Would you Rather Problem: Which would you rather have, 1 lb of dimes or 1 lb of quarters?	Same but Different Math Thinking Activities

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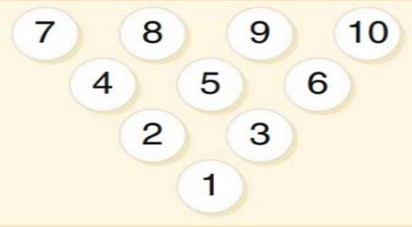
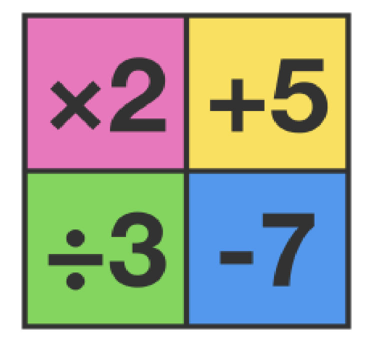
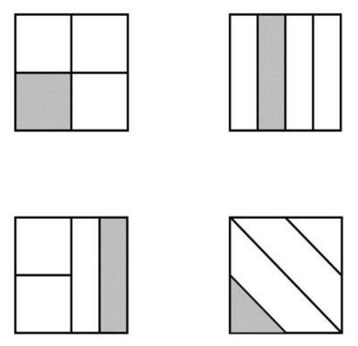
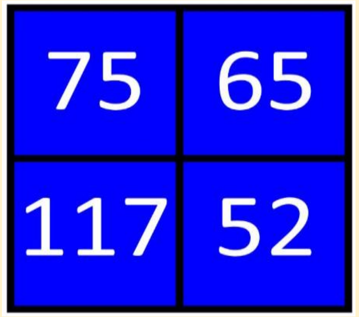
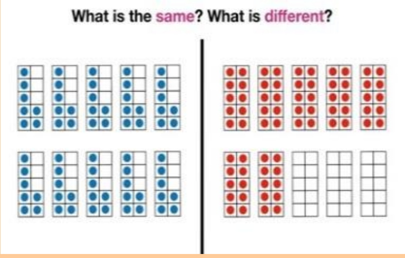
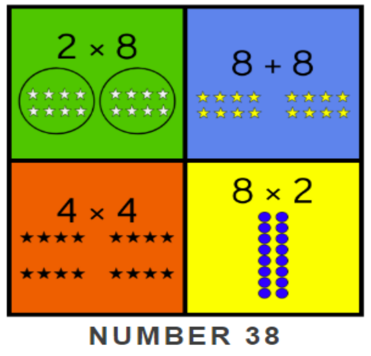
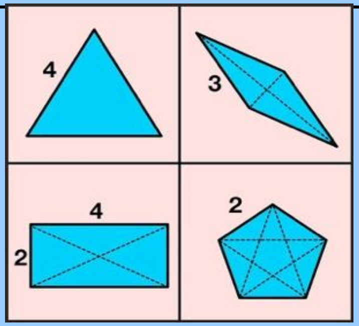
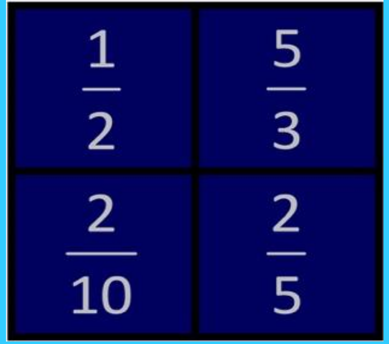
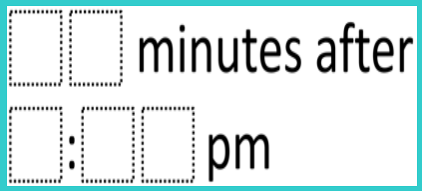
GSE Third Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Solve the following open number sentences. Explain how you found the missing number. 73 + 56 = 71 + ☐ 126 - 37 = ☐ - 40 68 + 58 = 57 + 69 + ☐	 Bowl a Fact: Students draw circles in a triangle as shown above. Students then use three dice (or virtual dice - see link below) to generate three random numbers. These three numbers are used to "knock down" the numbered circles. For example, if a student rolls a 3, 4, and 1, they could "knock down" the 8. 8 = 3+ 4 +1. They could also knock down the 7. 7 = (3 x 1) + 4. Students should use the numbers rolled to try to removed all of the squares (a strike). If needed, students can roll again and try to get a spare.	 You have a calculator with 4 buttons as shown; they multiply the current value shown on the calculator by 2, divide the current value by 3, add 5 to the current value, or subtract 7 from the current value. If the screen starts at 6, what are the button presses you need to make to get a value of 1?	Using 5 post-it notes (or squares of paper) find all possible arrangements of the five squares where each square shares at least one side with another square. Each of these is called a pentomino. Find all possible pentominoes and record them on grid paper. Record the perimeter and area for each pentomino. How did you know when you found them all? What did you notice about the areas and perimeters of the pentominoes?	 Which of the shapes above show fourths? How do you know?	It takes me 15 minutes to mix up the batter for a batch of brownies. It takes 25 minutes to bake the brownies. Then I have to wait 17 minutes to let them cool enough to cut them and serve them. How long does it take to have brownies "ready to eat?" If I start making the brownies at 3:15 pm, what time will they be ready to eat?	Open Middle Math Problems
 Show the student this image. Have them reflect and answer the questions: Which one doesn't belong? Why?	 What is the same? What is different?	 Show students this image. Ask the questions: Which one doesn't belong? Why?	 Show the student this image. Have them reflect and answer the questions: Which one doesn't belong? Why?	 Which one doesn't belong? Why?	 Use the digits 1 to 9, at most one time each, to fill in the boxes to make the latest possible time.	Visual Patterns

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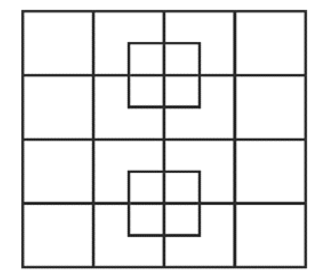
GSE Fourth Grade Mathematics Curriculum Map

Grade Level Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Whole Numbers, Place Value and Rounding in Computation	**Multiplication and Division of Whole Numbers**	**Fraction Equivalents**	**Operations with Fractions**	**Fractions and Decimals**	**Geometry**	**Measurement**	**Show What We Know** *(Free Math Apps for all Units)*
Web-based Resources							
Making Sense of the Algorithm Virtual Base-Ten Blocks	Explore the Partial Products Learning App to make sense of partial products strategy for multiplication. https://apps.mathlearningcenter.org/partial-product-finder/	Explore equivalent fractions with NCTM's Illuminations Equivalent fractions online tool.	Fraction Clues Virtual Color Tiles	Decimal Designs Fill in your 100 grid with colors online with this link.	Geometry Town	Party Designer - Area and Perimeter	The Math Learning Center App YouCubed Tasks
Carnival Tickets Virtual Money to Manipulate	US Census Activity on College Degrees and Lifetime Earning (Number and Operations in Base Ten)	Find Grampy	Running Laps	How Many Tenths and Hundredths?	Desmos Activity: Polygon Properties (Sign up for a free account to use this activity)	Directions to Hen Rock - Introduction to Angle Measure Activity	Clothesline Math Activities
Geogebra: Rounding numbers using a number line	Carrying Cards	Light Blue, Dark Blue	Farmer Fred Virtual Pattern Blocks	Dimes and Pennies Virtual Coin Manipulatives	Finding Lines of Symmetry	Measuring Angles - Practice with a Protractor	Estimation 180 Lessons
To Regroup or Not to Regroup Virtual Base Ten Blocks	Comparing Money Raised Virtual Money Manipulatives	Fresh Baked Fractions Interactive Game Virtual Fractions Manipulatives	Sugar in Six Cans of Soda Virtual Fractions Manipulatives	Zooming in on a Number Line Write down three things you notice and one thing you wonder about this number line.	Desmos Activity: Polygraph Triangles (Sign up for a free account to use this activity)	 How many squares do you see? How did you count them?	Bedtime Math (Fun Math At Home) Games

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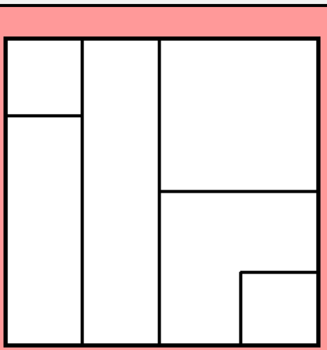
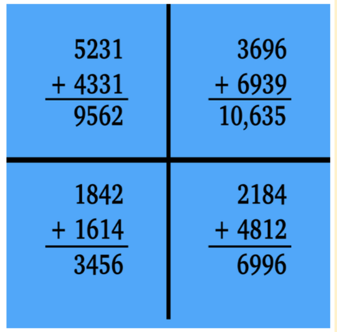
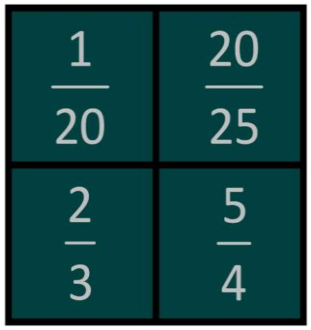
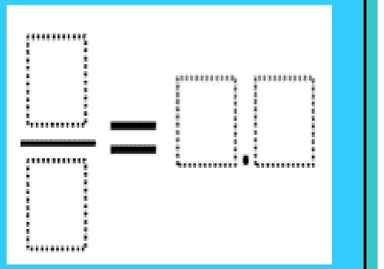
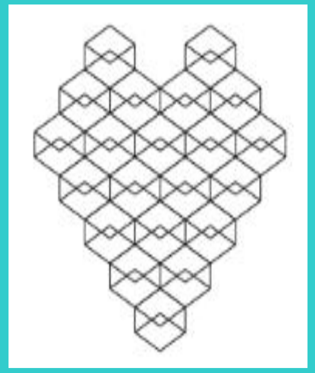
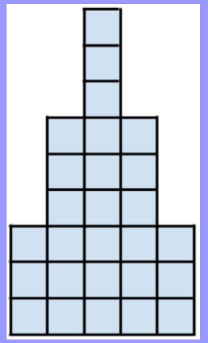
GSE Fourth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Adding Whole Numbers Desmos Activity	Yummy Math - Ghost Whisperer	Listing Fractions in Increasing Size Virtual Fraction Manipulatives	Birthday Cookout	Decimal Models - Tenths and Hundredths	Lines of Symmetry for Triangles	Desmos Activity: Decomposing Rectilinear Shapes	Kaplinsky Math Lessons
Hands-On and Kinesthetic Activities							
A recent expedition to the North Pole found a message from an explorer of long ago. In the message the explorer talked about an addition problem she was working on, but only the answer to the problem was readable. The explorer said the 2 numbers she added used each digit 1-8 only once. The answer that the explorer could read was 7785. What was the problem?	Numerical Thinking Game: Have students reflect on the following, "I am thinking of two whole numbers that multiply to 1000. Neither of my numbers contain the digit zero, What is the sum of these two numbers?" Have students record their answers in a variety of ways using words, pictures, and numerical representations.	 What fraction of the big square is represented by each region? (Do all your fractions add up to one whole?)	Birthday Cakes - Fractions of a Set (Georgia Numeracy Project Activity)	Decimal Designs (Georgia Numeracy Project Activity)	Shape Draw	Finding an Unknown Angle	Which One Doesn't Belong?
 5231 + 4331 = 9562 3696 + 6939 = 10,635 1842 + 1614 = 3456 2184 + 4812 = 6996 Show students this image. Ask the questions: Which of these doesn't belong? Why?	**Build it, and Break it** Select a problem such as 24 x 16. Use Base-ten blocks or grid paper to build the corresponding area model. Show and record as many ways as possible to "slice" the array in pieces. Before launching this activity, provide students, particularly ELLs and students with disabilities, a labeled visual of an array (or area model) that includes the terms array, area model, slice, vertical, and horizontal. Virtual base-ten blocks	 $\frac{1}{20}$ $\frac{20}{25}$ $\frac{2}{3}$ $\frac{5}{4}$ Show students this image. Ask the questions: Which one doesn't belong? Why?	Candy is Dandy - Fractions of a Set (Georgia Numeracy Project)	 Open Middle: Fraction and Decimal - Using the digits 0 through 9, at most one each time, create an an equivalent fraction and decimal number.	 YouCubed My Heart	 How Many Squares? How did you count them?	Would You Rather Math?

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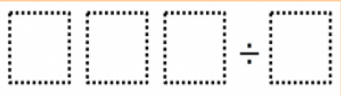
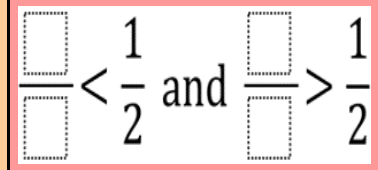
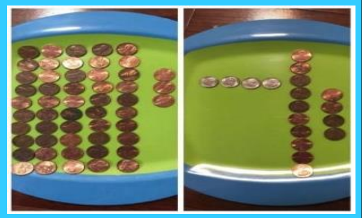
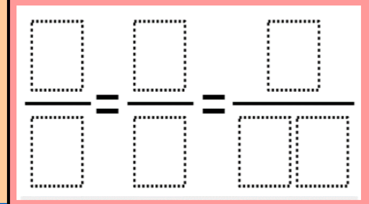
GSE Fourth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Open Middle: Greatest Difference of Two Rounded Numbers - Using the digits 0 through 9, find two numbers that round to 500, and have the greatest possible difference. Each digit can only be used once.	 Open Middle: Dividing by 1-Digit Numbers - Using the digits 1 through 9 at most one time each, fill in the boxes to create the smallest (or largest) whole number quotient.	The Same, But Different Georgia Numeracy Project Task	Paper Folding Task	Decimals on a Number Line	National Flags	Tricks of the Eye Optical Illusions Activity	Open Middle Math Problems
Open Middle: Subtracting Multi-digit Numbers - Drag one number into each box to complete the subtraction problem shown.	Open Middle: Pocket Change 2 - ou have $1.00 in your pocket. You only have pennies, nickels, and dimes. You don't have any quarters or other coins. What coins are in your pocket? Coins or virtual coins may be helpful to students	 Open Middle: Comparing Fractions - Use the digits 1 to 9, at most one time each, to fill in the boxes to create two different fractions: one that is less than one half and one that is more than one half.	Tangram and Mosaic Fraction Puzzles	 What is the same? What is different?	Hidden Meaning	Wacky Water Race Game	Same but Different Math Thinking Activities
Money Making Holiday Movies	Get A Jump On It Hopstcotch Game	 Open Middle: Comparing Fractions - Use the digits 1 to 9, at most one time each, to make three equivalent fractions.	Yummy Math - Someone Ate My Cake!	Representing Decimals Georgia Numeracy Project Task	Take Flight Paper Airplane Activity	Shooting Stars Activity	Visual Patterns

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GSE Fifth Grade Mathematics Curriculum Map

Grade Level Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Order of Operations and Whole Numbers	**Adding and Subtracting with Decimals**	**Multiplying and Dividing with Decimals**	**Adding, Subtracting, Multiplying and Dividing Fractions**	**2D Figures**	**Volume and Measurement**	**Geometry and the Coordinate Plane**	**Show What We Know** ***(Free Math Apps for all Units)***
Web-based Resources							
Order of Operations - Choose any 5 problems to work out the answers. Check your answers using www.desmos.com/scientific=UTF-8.	Pipe Music with Decimals - Practice adding decimals using place value strategies. Solve word problems involving addition and subtraction of decimals.	Geogebra - Decimal Multiplication: This applet provides step-by-step instructions for multiplying a whole number by a decimal.	Multiplying Fraction - Game: Multiplifraction: The goal of the game is to make a set of 3 cards displaying the pictorial representation of the matching number sentence and the correct product.	Youcubed - Trap the Zoid: Measuring trapezoids.	Building Problems - Finding patterns in volumes of rectangular prisms	Battleship Game: http://en.battleship-game.org/ OR https://www.battleshiponline.org/	YouCubed Tasks
Patterns-R-Us: Exploring powers of 10.	Desmos - The Decimal Challenge: Practice adding and subtracting decimals. They will create expressions to match given criteria. (Sign up for free to access activity. Creation of Class Code Required)	Multiplication Startegies with Tenths - Use the strategies of compensation and place value to practice multiplying decimals. Try any 10 problems.	Desmos - The Fraction Challenge: Practice adding and subtracting fractions by creating expressions to match a given criteria. (Sign up for free to access activity. Creation of Class Code Required)	Desmos - Polygraph: Advanced Quadrilaterals (Sign up for free to access activity. Creation of Class Code required)	Penny's Box - Finding the dimensions of a box to hold cubes.	Desmos - Guess My Rule: Students will explore input-output pairs in a table. (Sign up for free to access activity. Creation of Class Code required.)	The Math Learning Center Apps
Geogebra - Division of a Decimal by a Power of 10: This applet demonstrates the division of quantities by 10. It emphasizes the shifting of digits rather than moving the decimal point.	Geogebra - Decimal Addition/Subtraction: Practice adding and subtracting decimals and whole numbers.	Youcubed - Tic-Tac-Toe Products: The game provides a great way to practice and build fluency in single digit multiplication. (This game be adapted to involve the multiplication of decimals.)	Geogebra - Multiplying Fractions with Area Model: This applet will demonstrate why the algorithms for multiplying fractions make sense.	Desmos - Polygraph: Basic Quadrilaterals Students will be able to identify important features of quadrilaterals. (Sign up for free to access activity. Creation of Class Code required)	Geogebra - Cube, Prims, Volume: Students use sliders to create a rectangular prism, and then find the volume of the prism.	Pirate Treasure Hunt	Clothesline Math Activities

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GSE Fifth Grade Mathematics Curriculum Map							
Unit 1	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**	**Unit 7**	**Unit 8**
Geogebra - Multiplying by 10, 100: Practice multiplying decimals by 10 or 100.	Youcubed - Get to Zero: This game provides students practice subtracting from 999. Students should be encouraged to check each players work and provide feedback for mistakes. Remember, mistakes are awesome and they make our brain grow! (Students should create 3 digit decimals to the hundredths.)	Base Ten Activity: Use base ten representations to model multiplication and division with decimals.	Geogebra - Multiplying Mixed Number Fractions: This applet models the multiplication of mixed number fractions using the area model.	Youcubed - Youcubed My Heart: What is the area of the shape? What is the perimeter of the shape? How many rhombuses do you see? How many triangles do you see? How would you color my youcubed heart? What questions can you ask?	Youcubed - Painting Youcubed: Students build and draw three-dimensional cubes made up of small unit cubes. Student study patterns by analyzing the number of sides painted of each unit cube, which made up the larger painted cube.	Geogebra - Coordinate Plane for Mystery Map: Input ordered pairs to plot in first quadrant.	Estimation 180 Lessons
Preparing a Prescription - Multiplying multi-digit numbers in context.	It All Adds Up - Given the first number of 2.57 and the last number of 3.61, determine what quantity can be added repeatedly to go from the first number to the last.	Place the Point - The digits in the computation below are all correct, but the decimal point has been removed.	Dividing Fractions - Use reasoning to solve problems.	Geogebra - Classifying Quadrilaterals	Survival Badge - Students will create line plots to evenly distribute a supply of water for a scout troop.	Geogebra - Boat Coordinate Game: Change the coordinates x and y below to find the submarine in the viewfinder. (Positions can be changed to place submarine in the first quadrant only. Students are not expected to work within any other quadrant.)	Kaplinsky Math Lessons

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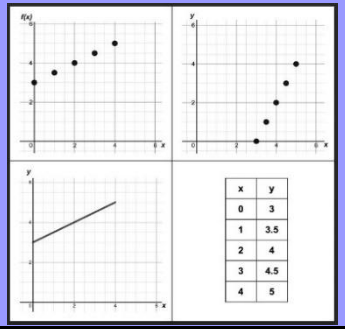
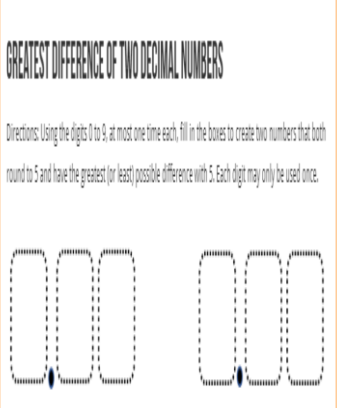
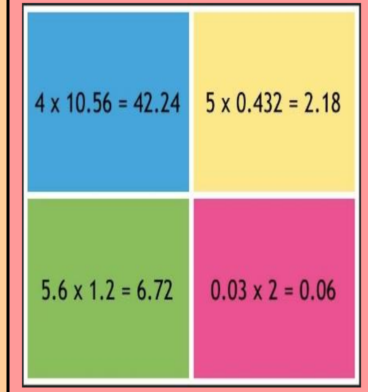
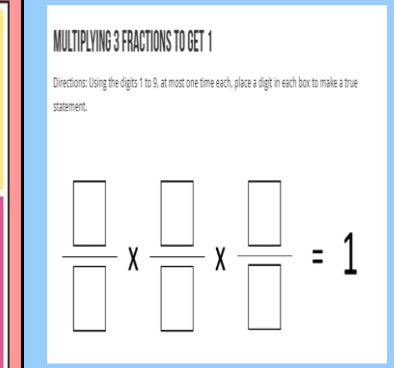
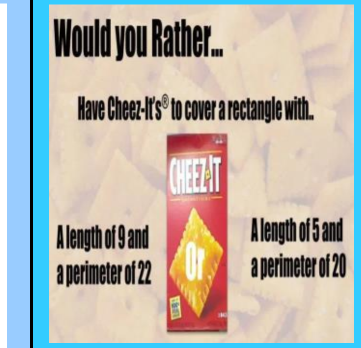
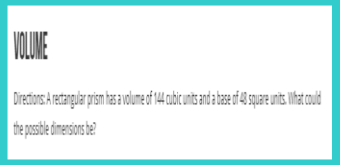
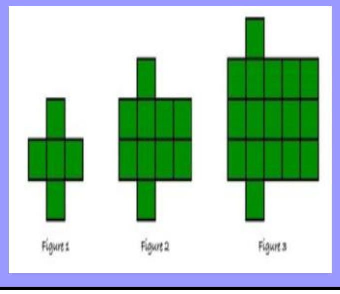
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Hands-On and Kinesthetic Activities							
Draw a pictorial representation for 1, 10, 100, 1,000. Record the similarities and differences in your representations.	Open Middle - Adding Decimals	Open Middle - Multiplying Decimals	Open Middle - Multiplying Fractions	Open Middle - Which Quadrilateral Has a Greater Area?	Open Middle - Volume of Rectangular Prisms	Which graph does not belong with the others? Why?  x | y 0 | 3 1 | 3.5 2 | 4 3 | 4.5 4 | 5	Which One Doesn't Belong?
Solve this number string: 1 x 23 10 x 23 100 x 23	Open Middle - Greatest Difference of Two Decimals  GREATEST DIFFERENCE OF TWO DECIMAL NUMBERS Directions: Using the digits 0 to 9, at most one time each, fill in the boxes to create two numbers that both round to 5 and have the greatest (or least) possible difference with 5. Each digit may only be used once. ☐.☐☐ ☐.☐☐	Which equation does not belong with the others? Why?  4 x 10.56 = 42.24 5 x 0.432 = 2.18 5.6 x 1.2 = 6.72 0.03 x 2 = 0.06	Open Middle - Multiplying 3 Fractions to Get 1  MULTIPLYING 3 FRACTIONS TO GET 1 Directions: Using the digits 1 to 9, at most one time each, place a digit in each box to make a true statement. $\frac{\square}{\square} \times \frac{\square}{\square} \times \frac{\square}{\square} = 1$	Would you rather Have Cheez-It's to cover a rectangle with...  Would you Rather... Have Cheez-It's® to cover a rectangle with... A length of 9 and a perimeter of 22 Or A length of 5 and a perimeter of 20	Open Middle - Volume  VOLUME Directions: A rectangular prism has a volume of 144 cubic units and a base of 48 square units. What could the possible dimensions be?	Visual Pattern (Source: visualpatterns.org) Below is a pattern of squares in stages 1-3 below. Draw what you think stage 4 might look like. Draw or describe what you think stage 10 might look like. Label how many squares are in each stage.  	Would You Rather Math?

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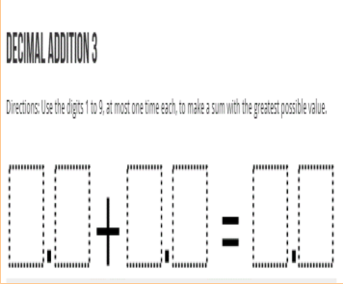
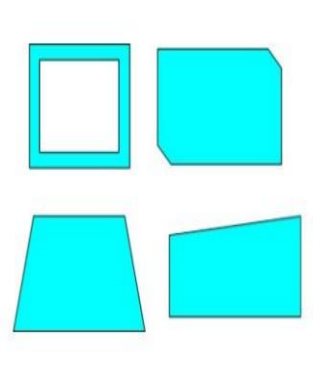
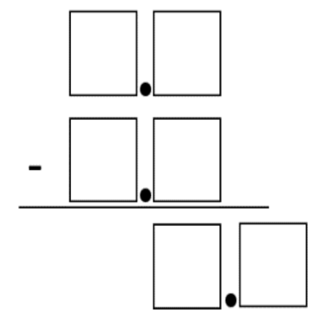
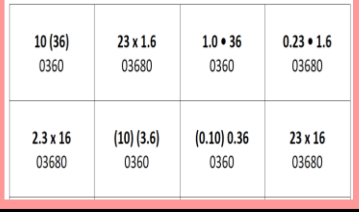
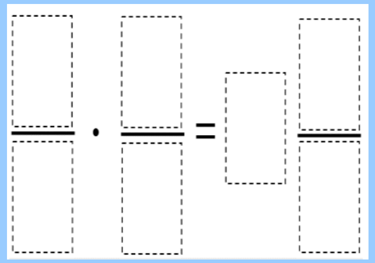
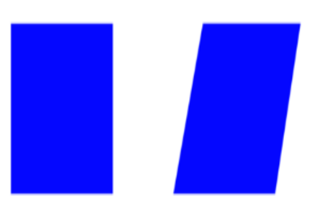
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Choose a task that has 3 or more steps, such as brush teeth, take a shower or put on clothes. Write the steps of the taks in order. Then rewrite the task in a different order. How has the task changed? Why is order important?	Open Middle - Decimal Addition 3  DECIMAL ADDITION 3 Directions: Use the digits 1 to 9, at most one time each, to make a sum with the greatest possible value. ☐.☐ + ☐.☐ = ☐.☐	Story Problem (Source: mathlearningcenter.org) Six friends had lunch together and decided to split the bill evenly. If the bill was $48.60, what was each person's share? Show your work. After tax and tip, the bill totaled $63.00. What was each person's share? Show your work.	Valentine's Day (Source: mathlearningcenter.org) Billy made 60 cards to give away on Valentine's Day. Help Billy figure out how many cards he will give to his family, his teachers, and his friends. Show your work. If Billy gives 1/3 of his cards to his family, how many cards does Billy give his family? If Billy gives 1/4 of his cards to his teachers, how many cards does Billy give his teachers?	Which figure does not belong with the others? Why? 	**Sacks of Flour** A baker had 10 sacks containing the following amounts of flour: 4 1⁄2 kg, 3 1⁄4 kg, 2 1⁄2 kg, 2 1⁄2 kg, 4kg, 3 1⁄4 kg, 4 1⁄4 kg, 5kg, 2 1⁄2 kg, 3 1⁄4 kg Plot the measurements on a line plot. Give the line plot a title and label the axis. If the baker redistributed the flour equally among the ten bags, how much flour would be in each bag? Explain your thinking.	Ratio Tables (Source: mathlearningcenter.org) Maria is planning to make friendship bracelets to sell at the farmers' market. Each bracelet costs $1.25 to make. Use a ratio table to show your strategy for finding the cost to make 19 bracelets.	Same but Different Math Thinking Activities
Open Middle - Order of Operations	Subtracting Numbers to Get Close to Zero Using the digits 1-9, subtract two numbers to get a difference closest to 0. 	Forgotten Decimals Without calculating or using an algorithm, estimate and determine where the decimal goes in the answer. Writes on the card where the forgotten decimal should go. Use place value of factors to determine the placement of the decimal in the product. Justify your decimal placement and record your reasoning on the back of each square.  10 (36) 0360 · 23 x 1.6 03680 · 1.0 • 36 0360 · 0.23 • 1.6 03680 2.3 x 16 03680 · (10) (3.6) 0360 · (0.10) 0.36 0360 · 23 x 16 03680	Open Middle - Multiplying Fractions 4 : Using the digits 1 to 9 at most once each time, fill the boxes to make the greatest possible product. 	What is the same? What is different? 	Joe's Buildings Joe built a model town. He constructed three buildings with a volume of 18cm3. Each building was made from two rectangular prisms that were joined to make one solid figure with no overlapping parts. Each building looked different. What might Joe's buildings have looked like? Build and sketch three possible buildings. Prove that each building has a volume of 18cm3.	Ratio Tables (Source: mathlearningcenter.org) Maria is planning to make friendship bracelets to sell at the farmers' market. Each bracelet costs $1.25 to make. Use a ratio table to show your strategy for finding how many bracelets Maria can make for $126.25.	Open Middle Math Problems

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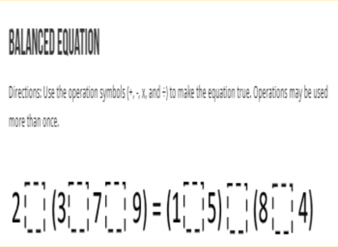
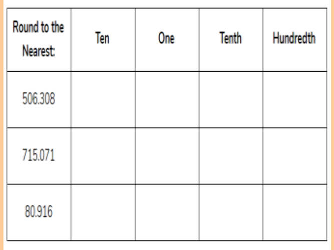
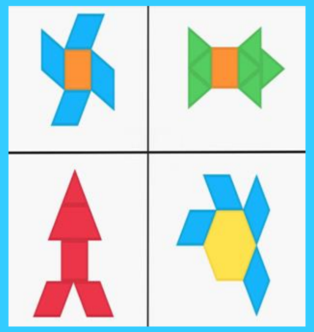
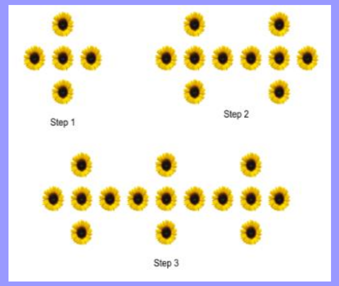
<table>
<tr><th>Unit 1</th><th>Unit 2</th><th>Unit 3</th><th>Unit 4</th><th>Unit 5</th><th>Unit 6</th><th>Unit 7</th><th>Unit 8</th></tr>
<tr>
<td>Open Middle - Balanced Equations

BALANCED EQUATION
Directions: Use the operation symbols (+, -, x, and ÷) to make the equation true. Operations may be used more than once.
2 ☐ (3 ☐ 7 ☐ 9) = (1 ☐ 5) ☐ (8 ☐ 4)</td>
<td>Rounding
Fill in the table to round numbers to the nearest ten, one, tenth, and hundredth.

<table>
<tr><th>Round to the Nearest:</th><th>Ten</th><th>One</th><th>Tenth</th><th>Hundredth</th></tr>
<tr><td>506.308</td><td></td><td></td><td></td><td></td></tr>
<tr><td>715.071</td><td></td><td></td><td></td><td></td></tr>
<tr><td>80.916</td><td></td><td></td><td></td><td></td></tr>
</table></td>
<td>Open Middle - Greatest Difference of Two Decimal Numbers: Directions: Using the digits 0 to 9, at most one time each, fill in the boxes to create two numbers that both round to 5 and have the greatest (or least) possible difference with 5. Each digit may only be used once.</td>
<td>Open Middle - Fractions: Sum of 2: Directions: Use the digits 0 to 9, at most one time each, to fill in the boxes so that the sum is equal to 2 wholes.</td>
<td>Which figure does not belong with the others? Why?
</td>
<td>Designing a Toy Box
A carpenter has been asked to build a wooden toy box for a child’s bedroom. The toy box needs to be able to hold 30 cubic meters of toys. What might the dimensions of the toy box be?

Which design do you think would be best for a child’s bedroom? Why?
Draw and label two possible designs for the toy box.

Use cardboard boxes to build one of your designs.</td>
<td>Visual Pattern (Source: visualpatterns.org)Below is a pattern of sunflowers in steps 1-3 below. Draw what you think step 4 might look like. Draw or describe what you think step 10 might look like. Label how many sunflowers are in each stage.
 </td>
<td>Visual Patterns</td>
</tr>
</table>

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Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Number System Fluency	Rate, Ratio and Proportional Reasoning Using Equivalent Fractions	Expressions	One-Step Equations and Inequalities	Area and Volume	Statistics	Rational Explorations: Numbers and their Opposites
Web-based Resources						
Illustrative Mathematics (Open Up Resources) - Unit 4 Dividing Fractions	Desmos - Des-Farm: _Students will find part-to-whole ratios of plants on a farm and use these ratios to determine th eequivalent fraction, decimal or percent representation. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Equivalent Expressions: Students sort cards to strengthen their understanding of equivalent expressions. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Inequalities: Students explore linear inequalities and make connections among multiple representations. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Exploring Triangle Area with Geoboards: Students will use Desmos-powered geoboards to explore triangles and their angles. (Sign up for free to access the activity. Creation of Class Code required.)	Geogebra - Dot Plot Tool Students can change the values on the spreadsheet to create a dot plot of the data.	Desmos - Polygraph: Rational Numbers: This Custom Polygraph is designed to spark vocabulary-rich conversations about rational numbers. Key vocabulary that may appear in student questions includes: numerator, denominator, positive, negative, proper, improper, simplified, equivalent, terminating, repeating, closer to 1, and closer to 0. (Sign up for free to access the activity. Creation of Class Code required.)
Illustrative Mathematics (Open Up Resources) - Unit 5 Arithmetic in Base Ten	Desmos - Intro to Unit Rate (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Expressions Mash-Up: Students sort cards to strengthen their understanding of multiple representations, including: algebraic expression, verbal description, table of values, and algebra-tile model. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics (Open Up Resources) - Unit 6 Expressions and Equations	Illustrative Mathematics (Open Up Resources) - Unit 1 Area and Surface Area	Geogebra - Forest Hills Students can drag a point and notice how the data changes.	Desmos - Collect the Coconuts: This is an introduction to distance on the coordinate plane, students will sail from island to island in search of fruit. (Creation of Class Code required)

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Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Dividing Fractions in Context	Desmos - Exchange Rates: Students will strengthen their understanding of multiple representations of ratios through the context of currency exchange. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Central Park: Students use arithmetic computations to inform their use of algebraic symbols. (Sign up for free to access the activity. Creation of Class Code required.)	SolveMe Mobiles - The SolveMe Mobile app is designed to support algebraic reasoning in a fun and interactive format.	Illustrative Mathematics - Areas of Right Triangles task: This task is intended to help build understanding as students work toward deriving a general formula for the area of any triangle.	Geogebra - Creating a Box and Whisker Plot: Students will drag points to create a box plot that matches the data in the table.	Desmos - Battle Boats Students build coordinate plane proficiency. (Creation of Class Code required)
Georgia Frameworks - Sercet Number: In this task, students will demonstrate understanding of factors and multiples.	Desmos - Water Slide: Students will use equivalent ratios to create a smooth ramp for a water slide. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Pool Border: Students will first construct expressions with numbers to determine the number of tiles that border a pool. Then they'll use those numerical expressions to help them write an expression with VARIABLES. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics - Chocolate Bar Sales: In this task students use different representations to analyze the relationship between two quantities and to solve a real world problem.	Illustrative Mathematics - Banana Bread: The purpose of this task is two-fold. One is to provide students with a multi-step problem involving volume. The other is to give them a chance to discuss the difference between exact calculations and their meaning in a context.	Geogebra - Open Middle Box Plots: Students will use digits 1 to 9 at most once each to fill in the input boxes to represent a data set with the smallest possible interquartile range, largest possible range, and that is skewed right.	Illustratives Mathematics (Open Up Resources) - Unit 7 Rational Numbers
Georgia Frameworks - Let's Distribute: In this task, students will use the distributive property to express the sum of two numbers using a variety of common factors.	Illustrative Mathematics (Open Up Resources) - Unit 2 Introducing Ratios	Illustrative Mathematics (Open Up Resources) - Unit 6 Expressions and Equations	Desmos - Point Collector: Students apply (and deepen) their knowledge of one-variable inequalities to "collect" as many points on the number line as they can. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics - Nets for Pyramids and Prisms: The goal of this task is to work with nets for three-dimensional shapes and use them to calculate surface area.	Desmos - Creating Histograms: Students will encounter the limits of tables and the value of histograms through their analysis of movie data. (Sign up for free to access the activity. Creation of Class Code required.)	Illustratives Mathematics - Walking the Block The purpose of this task is for students to apply the calculation of distances on a coordinate plane to a real life context.

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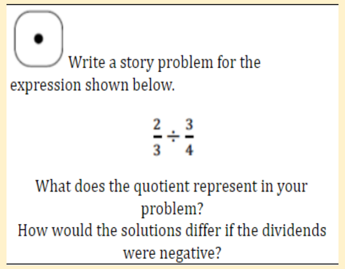
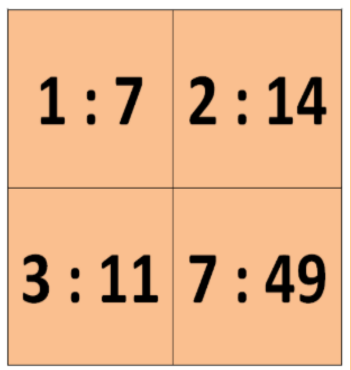
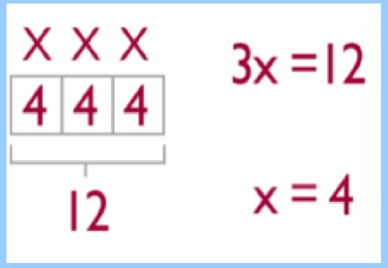
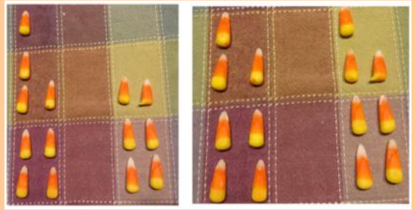
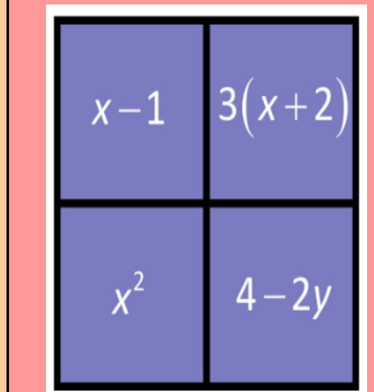
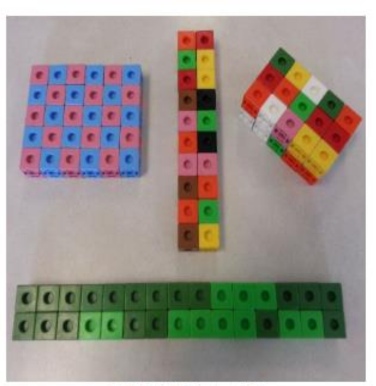
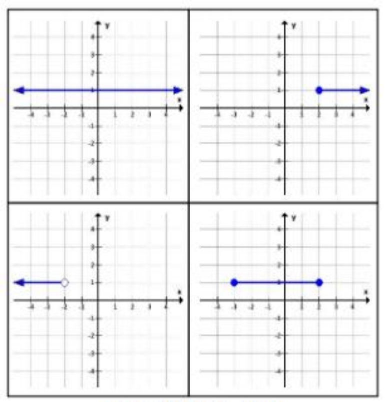
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Hands-On and Kinesthetic Activities						
 Write a story problem for the expression shown below. $\frac{2}{3} \div \frac{3}{4}$ What does the quotient represent in your problem? How would the solutions differ if the dividends were negative?	Which ratio does not belong with the others? Why?  NUMBER 11	Clothesline Math - Algebraic Expressions: Students build and strength conceptual understanding of algebraic expressions.	What is the same? What is different?  	Open Middle - Area of a Quadrilateral on a Coordinate Plane	Open Middle - Lower and Upper Quartiles with Constraints: Create a statistical data set of at least 10 numbers	Clothesline Math - Rational Numbers: Use a variety of rational numbers for comparison on the clothesline.
Open Middle - Multiplying Decimals: Using the digits 1 to 9 at most one time each, fill in the boxes to make the smallest (or largest) product.	What is the same? What is different? 	Which expression does not belong with the others? Why?  NUMBER 17	What is the same? What is different? $2/3y = 24$ $1/3y = 12$	Which figure does not belong with the others? Why?  SHAPE 18	Open Middle - Mean, Median and Range Create a set of five positive integers from 1 to 20 that have the same mean, median and range.	Which graph does not belong with the others? Why?  GRAPH 41

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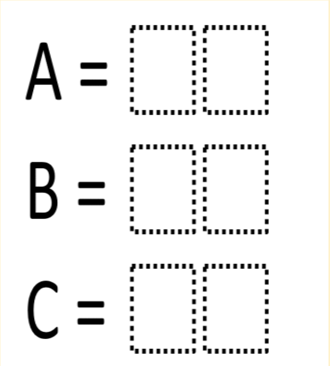
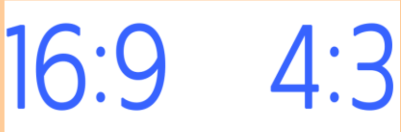
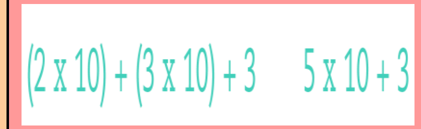
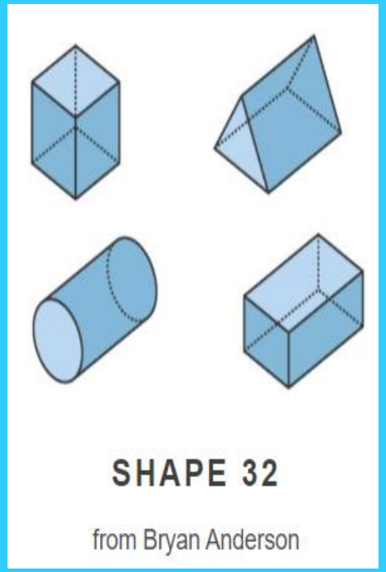
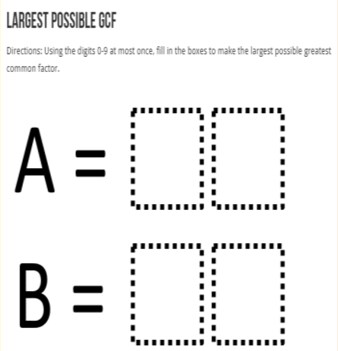
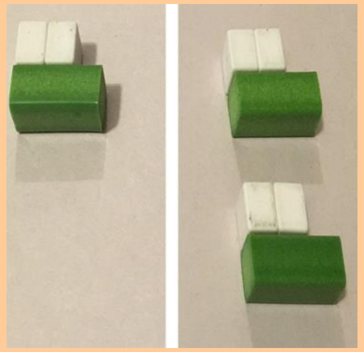
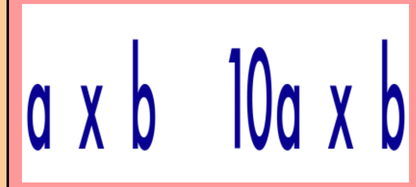
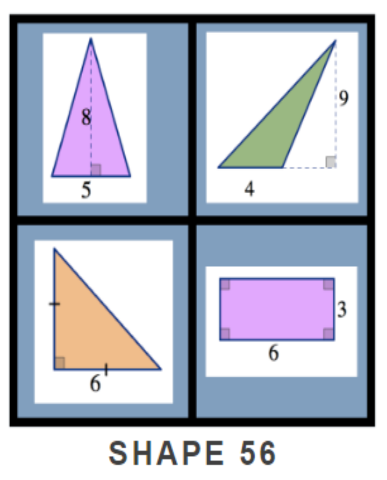
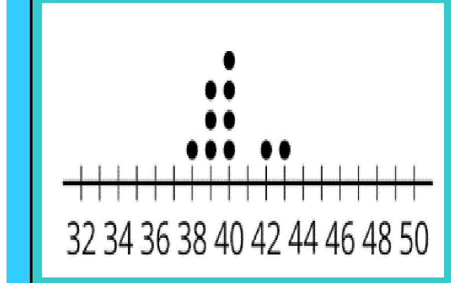
GSE Sixth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Open Middle - Smallest Possible LCM: Using the digits 0-9 at most once, fill in the boxes to make the smallest possible least common multiple.  A = ☐☐ B = ☐☐ C = ☐☐	What is the same? What is different?  16:9 4:3	What is the same? What is different?  $(2 \times 10) + (3 \times 10) + 3$ $5 \times 10 + 3$	Open Middle - Equation: Write three equations whose solution is x = 3.	Which figure does not belong with the others? Why?  SHAPE 32 from Bryan Anderson	Open Middle - Median with Constraints: Create a statistical data set of at least 10 numbers such that: 1. All of the numbers in the data set are whole numbers. 2. The median is not a whole number. 3. The median is not part of the data set.	Open Middle- Area of a Quadrilateral on a Coordinate Plane: Using the digits 0 to 9 at most one time each, fill in the blanks to create a quadrilateral with an area of 16 square units.
Open Middle - Largest Possible GCF: Using the digits 0-9 at most once, fill in the boxes to make the largest possible greatest common factor.  LARGEST POSSIBLE GCF Directions: Using the digits 0-9 at most once, fill in the boxes to make the largest possible greatest common factor. A = ☐☐ B = ☐☐	What is the same? What is different? 	What is the same? What is different?  $a \times b$ $10a \times b$	Open Middle - Equation: Write three equations whose solution is x = 3.	Which figure does not belong with the others? Why?  	What statisical question might have been asked to collect the following data?  	Open Middle - Graphing Points on a Coordinate Plane: Make four points using the integers -4 to 4 at most one time each so that each point is in a different quadrant.

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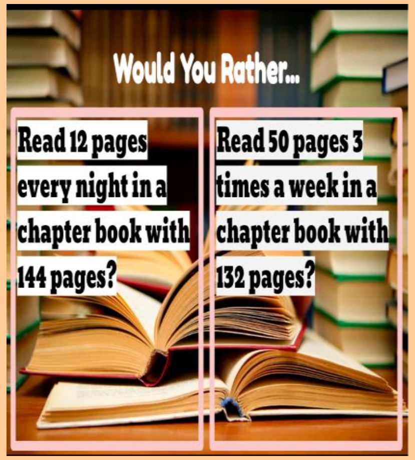
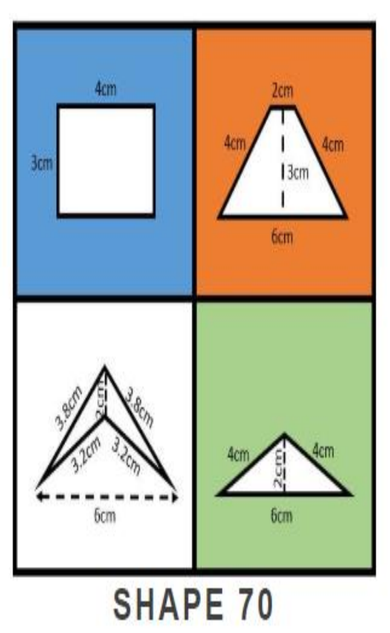
GSE Sixth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Open Middle - Dividing Fractions: Using the digits 1 to 9 at most one time each, fill in the boxes to make the smallest (or largest) quotient.	Would you rather…  Would You Rather... Read 12 pages every night in a chapter book with 144 pages? Read 50 pages 3 times a week in a chapter book with 132 pages?	Open Middle - Product of Distributive Property: Decide if 30x – 12 could be a result of using the distributive property. If it is, find the possible combinations of factors whose product would be 30x – 12 (using integer coefficients and constants).	Open Middle - Solving One-Step Equations (Greatest Solution)	Which figure does not belong with the others? Why?  4cm 3cm 2cm 4cm 4cm 3cm 6cm 3.8cm 3.8cm 2cm 3.2cm 3.2cm 6cm 4cm 4cm 2cm 6cm SHAPE 70	Sixth-grade students were asked, "What grade are you in?" This is not a statistical question. How might the question be asked differently to make it a statisical question?	Guess My Location: Choose a horizontal or a vertical line on a coordinate grid. Draw 4 points on the line and label each point with its coordinates. Tell whether your line is horizontal or vertical, and have a partner guess the locations of your points by naming coordinates. If a guess is correct, put an X through the point. If your partner guessed a point that is on your line but not the point that you plotted, say, "That point is on my line, but is not one of my points." Take turns guessing each other's points, 3 guesses per turn.

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GSE Seventh Grade Mathematics Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Operations with Rational Numbers	Expressions and Equations	Ratios and Proportional Relationships	Geometry	Inferences	Probability
Web-based Resources					
Desmos - Polygraph: Rational Numbers: This Custom Polygraph is designed to spark vocabulary-rich conversations about rational numbers. Key vocabulary that may appear in student questions includes: numerator, denominator, positive, negative, proper, improper, simplified, equivalent, terminating, repeating, closer to 1, and closer to 0. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Smallest Solution: Students will practice solving equations with multiple steps and with variables on both sides of the equality. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Turtle Time Trials: Students explore connections among different representations of proportional relationships, with glimpse at non-proportional relationships. (Sign up for free to access activity. Creation of Class Code required.)	Geogebra - Cross Sections of a Cube: Students will explore the cross sections of a cube.	Geogebra - Where's the Mean: Students will compare populations by determing where the mean is located for two box plots.	Desmos - Chance Experiments: This activity introduces students to probability through a spinner game. Which result is more likely—red or blue? (Sign up for free to access the activity. Creation of Class Code required.)
Desmos - Adding Integers: Students practice adding integers in the context of a card game. (Creation of Class Code required)	Desmos - Equivalent Expressions: Students sort cards to strengthen their understanding of equivalent expressions. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Balloon Float: Students will use ratios to determine the number of balloons needed to float different objects. (Sign up for free to access the activity. Creation of Class Code required.)	Geogebra - Sections of Cylinders: Students will explore cross sections of cylinders.	Desmos - Human Stopwatch: Students learn how to use variability to describe sets of data. (Sign up for free to access the activity. Creation of Class Code required.)	Geoebra - Fishy Probabilities: Students will explore calculating probabilities for independent events.
Geogebra - Integer Multiplication: Students will answer questions involving integer multiplication.	SolveMe Mobiles - The SolveMe Mobile app is designed to support algebraic reasoning in a fun and interactive format.	Desmos - Exchange Rates: Students will strengthen their understanding of multiple representations of ratios through the context of currency exchange. (Sign up for free to access the activity. Creation of Class Code required.)	Geogebra - Sections of Rectangular Pyramids: Students will explore cross sections of rectangular prisms.	Desmos - Strength in Numbers: Students complete three rounds of estimation challenges. After each initial estimate, they view a dot plot of their classmates' responses and decide whether (and how) to revise their estimate. (Sign up for free to access the activity. Creation of Class Code required.)	Geogebra - Probability: Students will solve various problems about probability.

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GSE Seventh Grade Mathematics Curriculum Map					
Unit 1	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**
Geogebra - Adding and Subtracting Integers: Students will add and subtract integers on a numberline.	Geogebra - Solving Equations with Model: Students solve equations using models.	Desmos - Tile Pile: This lesson helps students count large numbers of things by using the mathematical structures of area and proportionality. Students use a ratio table to keep track of their work as they count the number of tiles required to cover a floor, and the time required to put those tiles in place. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics (Open UP Resources) - Drawing Triangles Part 1: Students will determine how many different triangles can be drawn with certain measurements.	Illustrative Mathematics (Open Up Resources) - Unit 8 Probability and Sampling	Geoebra - Experimental Probability Spinner: Students will complete a task involving a spinner to discuss experimental probability. The task is followed by two discussion questions.
Geogebra - Spaceship Racing Game: Students play a game to practice adding and subtracting integers.	Geogebra - Solving Two-Step Linear Equations: Students solve equations using a balance scale.	Desmos - Nana's Chocolate Milk: In this activity, students will use double number lines and proportional reasoning to help Dan fix his chocolate milk mix-up. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics (Open UP Resources) - Unit 7 Angles, Triangles, and Prisms.	Geogebra - Compare Two Populations using Dot Plots: Students will use the dot plots to compare the heights of the girls in the two classes.	Geogebra - Long Run Probability: Students complete a task from Illustrative Mathematics to understand the relationship between experimental and theoretical probability.

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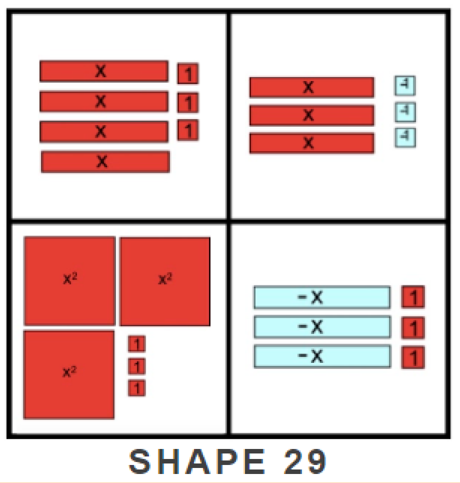
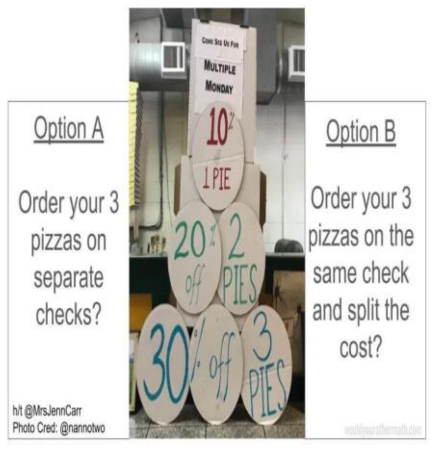
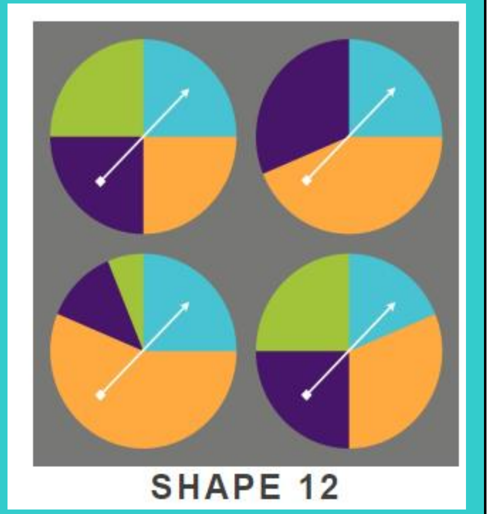
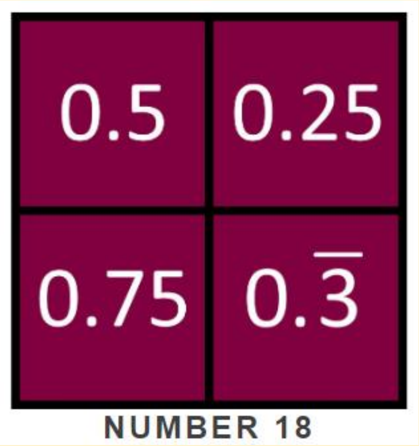
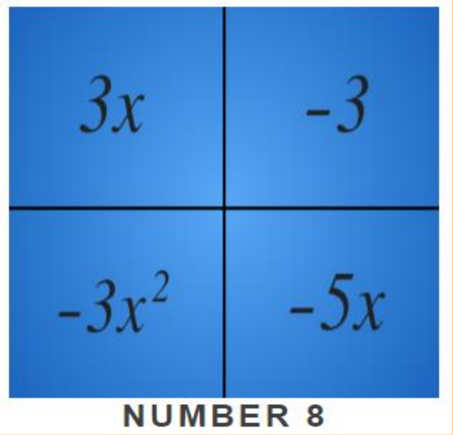
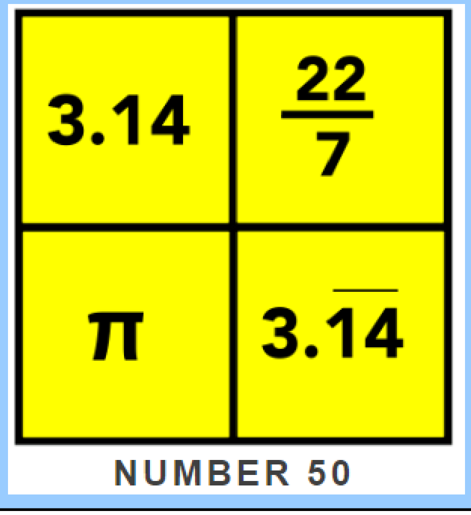
GSE Seventh Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Hands-On and Kinesthetic Activities					
Clothesline Math - Integer Game Addition & Subtraction	Which representation does not belong with the others? Why?  SHAPE 29	You and two friends each decide to order a pizza for lunch. Would you rather...  Option A Order your 3 pizzas on separate checks? Option B Order your 3 pizzas on the same check and split the cost? Multiple Monday 10% 1 PIE 20% off 2 PIES 30% off 3 PIES h/t @MrsJennCarr Photo Cred: @nannotwo	Would you rather run the circumference of the circle OR perimeter of the rectangle?	Paper Planes - With one other person, create your own aeroplane. Fly your plane 20 times, noting the distance in feet it flew each time. Use the data to create a box plot and 5 number summary. Complete the the box plots.	Which spinner does not belong with the others? Why?  SHAPE 12
Which quantity does not belong with the others? Why?  0.5 0.25 0.75 $0.\overline{3}$ NUMBER 18	Which expression does not belong with the others? Why?  $3x$ -3 $-3x^2$ $-5x$ NUMBER 8	Clothesline Math - Yogurt Proportions: Students explore proportional relationships.	Which expression does not belong with the others? Why?  3.14 $\frac{22}{7}$ π $3.\overline{14}$ NUMBER 50	DIY Angry Birds - Set up 5 objects and 1 smaller object. Toss the smaller object at the larger objects. Each time you make a direct hit, count it as 14 points, falling short of a hit is 10 points, over shooting is 12 points and a misfire is 8 points. Play 10 times (playing multiple rounds counts toward the 10 times). Create a line plot of your data. Explain the typical points earned and how you determined it.	Open Middle - Probability with Marbles Directions: There are _____ red marbles and _____ blue marbles in Bag A. There are _____ red marbles and _____ green marbles in Bag B. Using the digits 1 to 9 at most one time each, fill in the boxes to make the probability of drawing a red marble from either bag the same.

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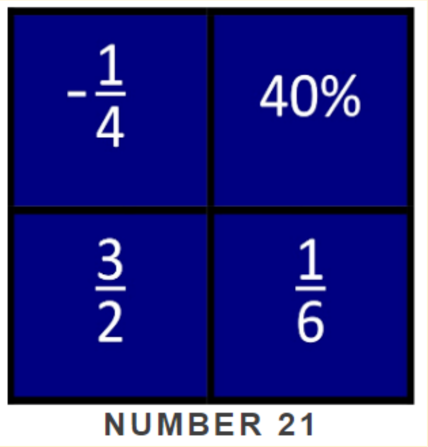
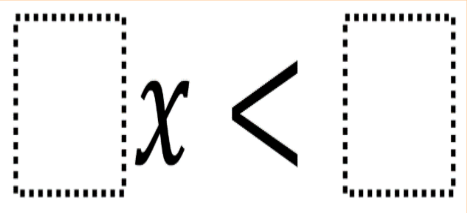
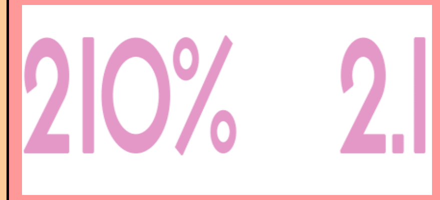
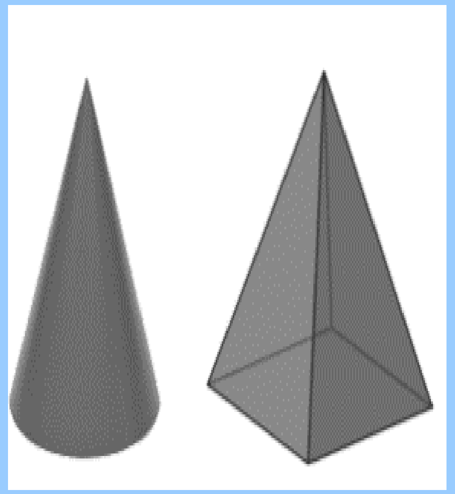
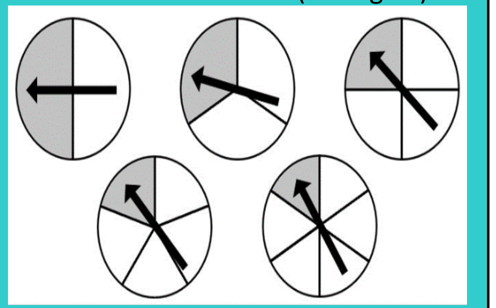
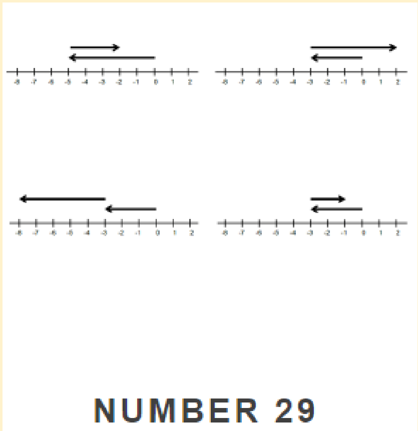
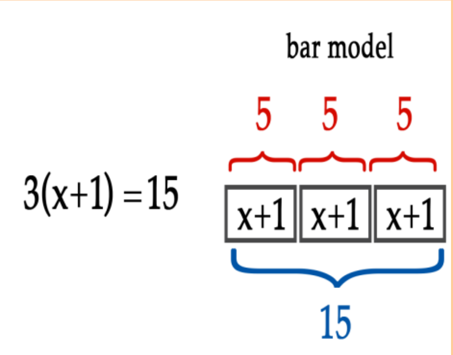
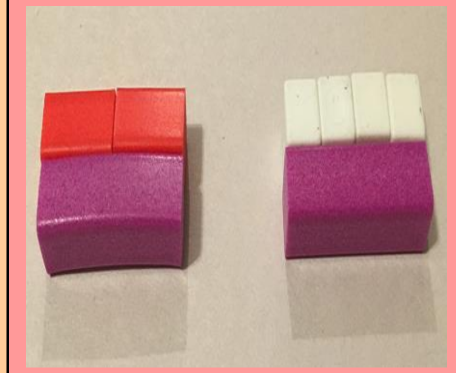
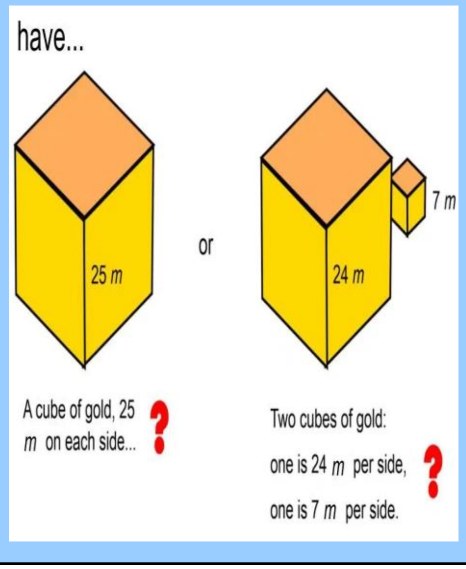
GSE Seventh Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Which quantity does not belong with the others? Why?  $-\frac{1}{4}$ 40% $\frac{3}{2}$ $\frac{1}{6}$ NUMBER 21	Open Middle - Creating Inequalities: Using the integers -4 to 4, at most one time each, create an inequality with solutions of x > 2/3.  	What is the same? What is different?  	Consider cross sections. What is the same? What is different? 	Notice and Wonder - Comparing Heights: What do you notice about the heights? What do you wonder about the height?	Open Middle - Probability with Spinners: Select three of the spinners from the image below (you may pick more than one of each) such that the total number of sectors in all three spinners totals 10. Select spinners so that the probability of all three spinners landing in the shaded sector is the smallest (or largest). 
Which representation does not belong with the others? Why?  	What is the same? What is different?  bar model $3(x+1)=15$ 5 5 5 x+1 x+1 x+1 15	What is the same? What is different? 	Would you rather...  have... 25 m or 24 m 7 m A cube of gold, 25 m on each side... Two cubes of gold: one is 24 m per side, one is 7 m per side.	The price per pound of catfish at a fish market was recorded for 100 weeks.What do you notice about the data from the dot plots showing the population and each of the samples within that population? What do you wonder?	Open Middle - Probability of Rolling Two Six Sided Dice: What value(s) have a 1/12 chance of being rolled as the sum of two 6-sided dice?

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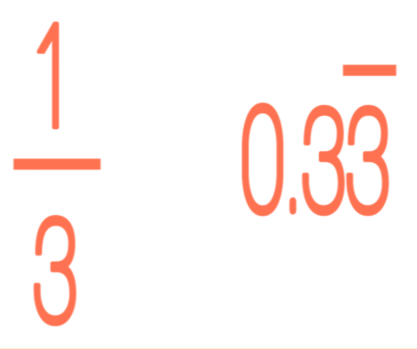
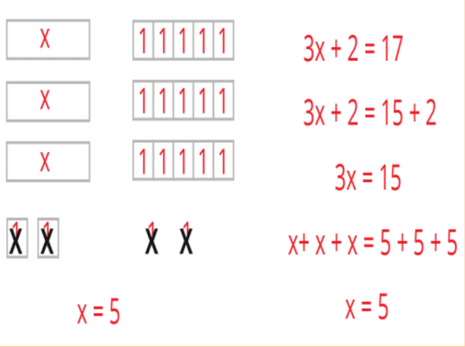
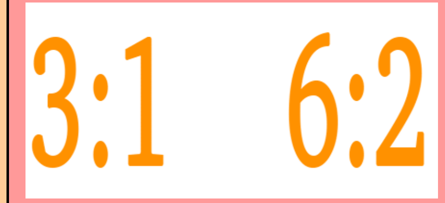
GSE Seventh Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
What is the same? What is different? 	What is the same? What is different?  x 1 1 1 1 1 3x + 2 = 17 3x + 2 = 15 + 2 3x = 15 x + x + x = 5 + 5 + 5 x = 5 x = 5	What is the same? What is different? 	A local pizzeria has decided to support mathematics education by running a special promotion for Pi Day, which falls on March 14. Pizzas will be made in a number of different diameters, from small pizzas for one to gigantic pizzas for many. Create advertising materials explaining the math involved in finding the diameter, circumference, and area of a circular pizza pie.	An online shopping company tracks how many items they sell in different categories during each month for a year. Three different auditors each take samples from that data. Use the samples to draw dot plots of what the population data might look like for the furniture and electronics categories.	Open Middle - Rolling with the Same Probability: Directions: Using the digits 1 to 9 at most one time each, fill in the boxes to complete this sentence: Rolling a sum of ___ on two ___-sided dice is the same probability as rolling a sum of ___ on two ___-sided dice.

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GSE Eighth Grade Mathematics Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Transformation, Congruence and Similarity	**Exponents and Equations**	**Geometric Applications of Exponents**	**Functions**	**Linear Functions**	**Linear Models and Tables**	**Solving Systems of Equations**
Web-based Resources						
Illustratitive Mathematics Lessons - Rigid Transformations and Congruence	Illustrative Mathematics Lessons - Exponents and Scientific Notation	Illustrative Mathematics Lessons - Pythagoream Theorem and Irrational Numbers	Illustrative Mathematics Lessons - Functions and Volume (Lessons 1 - 7)	Illustrative Mathematics Lessons - Functions and Volume (Lessons 8 -10)	Illustrative Mathematics Lessons - Associations in Data	Illustrative Mathematics Lessons - Linear Equations and Linear Systems (Lessons 10 -16)
Desmos Activity - Transforming Shapes	Exponents and Scientific Notation Lessons - https://access.openupresources.org/curricula/our6-8math/en/grade-8/unit-7/index.html	Pythagorean Theorem: https://access.openupresources.org/curricula/our6-8math/en/grade-8/unit-8/index.html	Desmos - Graphing Stories: Watch the 15-second videos and translate them into graphs using online graphing tools. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics Lessons - Linear Relationships (Lessons 1 - 10)	Geogebra - Scatter Plot Relationships- Students will determine the correlation of the scatter plot.	Desmos - Card Sort: Linear Systems: Students practice what they've learned about solving systems of linear equations. (Sign up for free to access the activity. Creation of Class Code required.)
Illustratitive Mathematics Lessons - Dilations, Similarity, and Introducing Slope	Desmos - Polygraph: Rational: This Custom Polygraph is designed to spark vocabulary-rich conversations about functions and relations. Key vocabulary that may appear in student questions includes: positive, negative, fraction, rational, and irrational. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics Lessons - Functions and Volume (Lessons 11 -21)	Estimation 180 Activity: Styrofoam Cups	Geogebra - Graph the Line (v.2): Students will drag points so the line matches the equation.	Desmos - Robots: What a Point in a Scatter Plot Means: Students interpret points in a scatter plot within a context and add points to a scatter plot given information. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Line Zapper: Students "zap" lines by identifying their solutions. (Sign up for free to access the activity. Creation of Class Code required.)
Desmos - Polygraph: Angle Relationships: Students may notice graph features of angle types. (Sign up for free to access activity. Creation of Class Code required.)	Illustrative Mathematics Lessons - Linear Equations and Linear Systems (Lessons 1 - 9)	GeoGebra Activity - Proof without Words (Pythagorean Theorem)	Desmos - Card Sort: Functions: In this activity, students sort graphs, equations, and contexts according to whether each one represents a function. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Polygraph: Lines: Students will identify important features of lines. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Scatter Plot Capture: Students use observations about scatterplot relationships to make predictions about future points in the plot. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Systems of Two Linear Equations: Students write and solve a system of two linear equations to explore numerical and graphical meaning of "solution". (Sign up for free to access the activity. Creation of Class Code required.)

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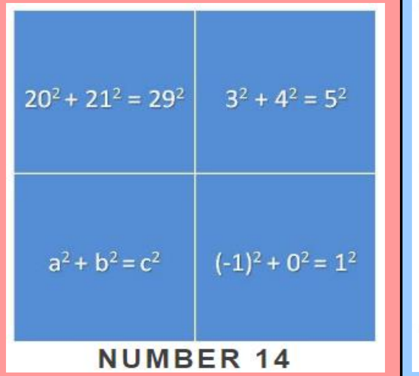
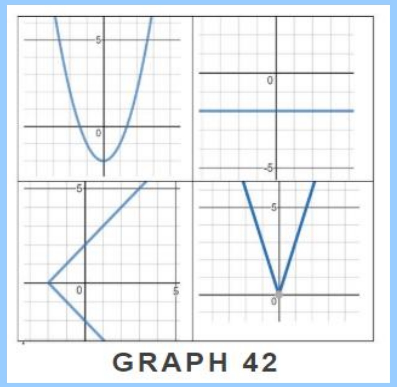
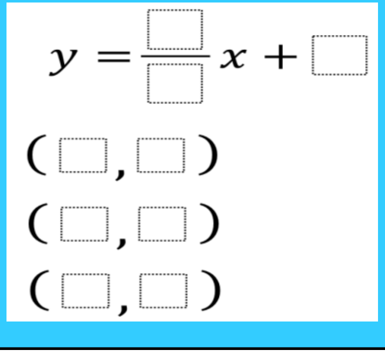
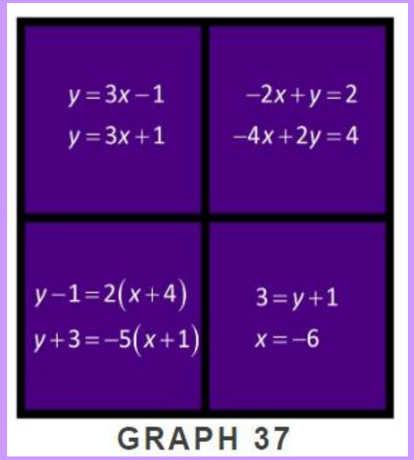
GSE Eighth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Desmos - Puzzling It Out: Students solve angle puzzles to apply what they've learned about angle relationships and to informally learn the Triangle Sum theorem. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos Activity - Balance the Scale: Estimate, multiply, and divide with numbers in scientific notation by balancing objects on a scale. (Creation of Class Code required)	Describe what is happening in this video and connect the visual to the proof of the Pythagorean Theorem. Justify your conclusion using precise mathematical language and descriptions.	Desmos - Points on a Line: Students focus on slope. (Sign up for free to access the activity. Creation of Class Code required.)	Illustrative Mathematics Lessons - Linear Relationships (Lessons 11 - 14)	Desmos - Line of Best Fit: Students visualize a line to fit a data set. (Sign up for free to access the activity. Creation of Class Code required.)	Desmos - Playing Catch-Up: Students will develop their understanding of systems of equations, particularly as they're represented as tables, equations, and graphs. (Sign up for free to access the activity. Creation of Class Code required.)
Hands-On and Kinesthetic Activities						
Angle Pairs Matching Activity - Match the angle pairs with the correct characteristics.	Tape a long (10 ft.) piece of string on a wall in your room or house. Print or recreate these cards (using index cards or paper). Create a number line with the string and order the numbers provided.	Which equation does not belong with the others? Why?  $20^2 + 21^2 = 29^2$ $3^2 + 4^2 = 5^2$ $a^2 + b^2 = c^2$ $(-1)^2 + 0^2 = 1^2$ NUMBER 14	Which graph does not belong with the others? Why?  GRAPH 42	Open Middle Task - Using the digits 1 through 8 [You will use each number only once, except for one number that will be used twice in the same coordinate point. i.e.(1,1), (2,2), (3,3), (4,4), (5,5), (6,6), (7,7) or (8,8)], find three coordinate points that lie on the same line. Write the equation of the line represented by the three points and have the following requirements:a.) It has a positive slopeb.) The slope is less than one.  $y = \frac{\square}{\square}x + \square$ $(\square, \square)$ $(\square, \square)$ $(\square, \square)$	Which graph does not belong with the others? Why? Use Graph 23	Which equation does not belong with the others? Why?  $y = 3x - 1$ $y = 3x + 1$ $-2x + y = 2$ $-4x + 2y = 4$ $y - 1 = 2(x + 4)$ $y + 3 = -5(x + 1)$ $3 = y + 1$ $x = -6$ GRAPH 37

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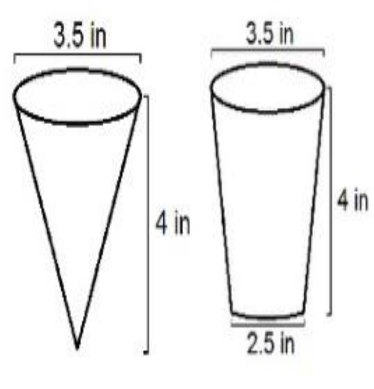
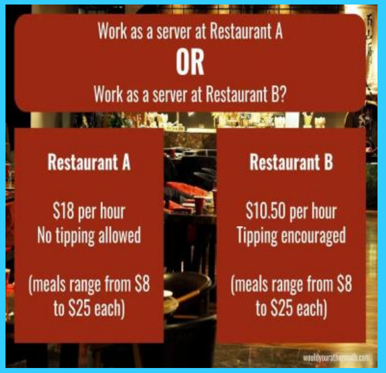
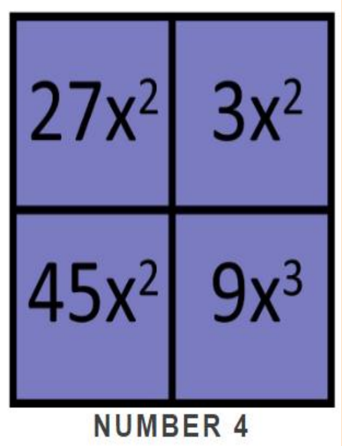
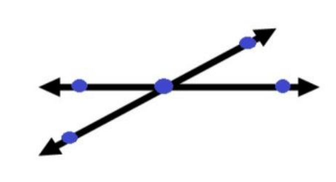
GSE Eighth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Use index cards or small pieces of paper to create angle pair reference cards.	Clothesline Math - Square Roots: Students will use a variety of visuals and benchmarks to locate perfect squares and approximate the value of non-perfect square numbers.	Which container would hold more shaved ice?  	A parking meter takes only dimes and each dime is worth 6 minutes on the meter. Determine the minutes of parking when 2 dimes, 3 dimes and 7 dimes are inserted. Determine the number of dimes used for 0, 12 and 54 minutes of parking.	Would you rather work as a server at Restaurant A or work as a server at Restaurant B?  Work as a server at Restaurant A OR Work as a server at Restaurant B? Restaurant A $18 per hour No tipping allowed (meals range from $8 to $25 each) Restaurant B $10.50 per hour Tipping encouraged (meals range from $8 to $25 each)	Open Middle - Non-Linear Correlation: Using the integers 0-9 (without repeating any number), create a set of points that have the following characteristics: Non-linear Positive Correlation (__,__) (__,__) (__,__) (__,__) (__,__) Non-linear Negative Correlation (__,__) (__,__) (__,__) (__,__) (__,__) No Correlation (__,__) (__,__) (__,__) (__,__) (__,__)	Open Middle - Create a System of Two Equations Using the digits 1 to 30, at most one time each, fill in the boxes to create a system of two linear equations where (3, 2) is the solution to the system. $\begin{cases} \square x + \square y = \square \\ \square x + \square y = \square \end{cases}$
Draw a triangle 3 times and cut it out. Paste the triangle on a spearate sheet of paper to demonstrate the following series of transformations: Pre-image, Rotate 90 degrees clockwise, then Reflect over a horizontal line	Which expression does not belong with the others? Why?  	Find the difference between (4,7) and (-6,0) without plotting the points.	Using the vocabulary of domain, range, input, output, relation and function, explain how the real life experience is like a function. Suki babysat three nights last week. One night she babysat 3 hours and earned $45. The next night she babysat 2 hours and earned $30. On the third night she babysat five hours and earned $75. She knows if she can babysit for 10 hours she will earn $150.	Clothesline Math - Slope Intercept: Students compare and contrast the slopes and y-intercepts of 3 linear functions.	Open Middle - Line of Best Fit: Using the integers 0-9 (without repeating any number), create 4 points that could generate a line of best fit with the equation y=-x+8. (___,___) (___,___) (___,___) (___,___)	Open Middle - Solution of Two Linear Equations Using the Integers 0-9 (without duplication), provide four sets of points that represent two distinct lines. These lines can be written as two linear equations. Then provide a fifth point that represents the intersection (or solution) of those equations.  Line 1: (__, __) and (__, __) Line 2: (__, __) and (__, __) Solution (__, __)

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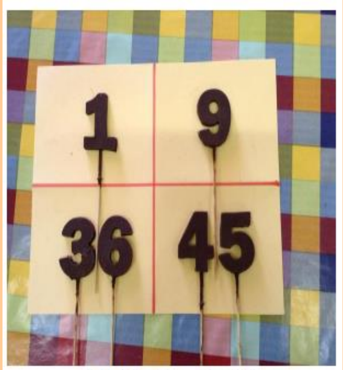
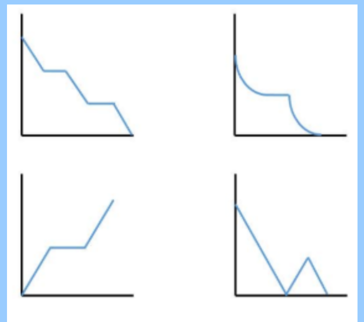
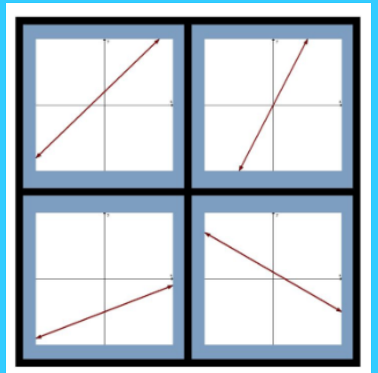
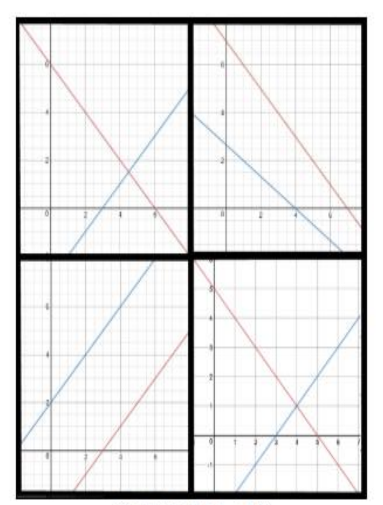
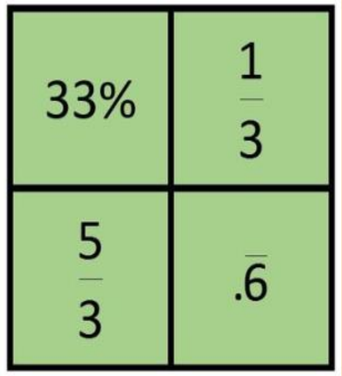
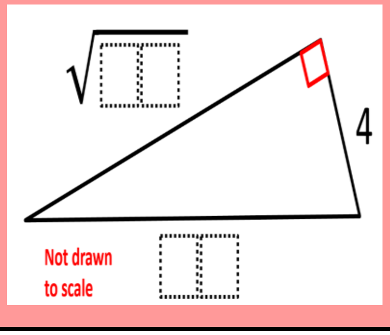
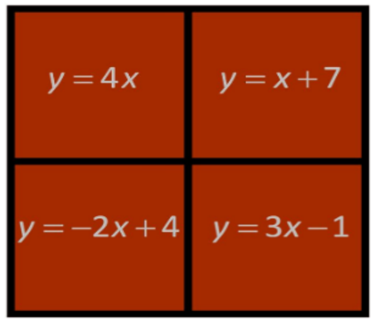
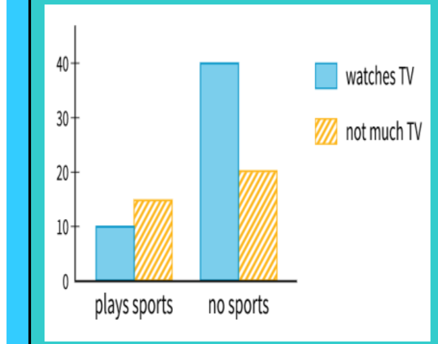
GSE Eighth Grade Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Describe a series of transformations to map triangle ABC onto triangle DEF.	Which quantity does not belong with the others? Why?  NUMBER 30	Think of a triangle. Determine the length of leg c if the length of leg a is 3cm and the length of leg b is 5cm. Explain the relationship between the 3 legs.	Which graph does not belong with the others? Why?  GRAPH 38	Which graph does not belong with the others? Why?  GRAPH 5	Which graph does not belong with the others? Why?	Which graph does not belong with the others? Why?  GRAPH 40
Create a flipbook of a series of transformations. You will need 6 small pieces of paper. Ensure they're all the same size. Draw a scalene triangle on the first page. Translate each vertex of the triangle down 2 spaces and right 1 space. Repeat the procedure until all six pages have a triangle plotted on them. Stack the cards in order and flip through them to view the traveling triangle.	Which quantity does not belong with the others? Why?  NUMBER 33	Open Middle - Pythagorean Theorem 2: Using the digits 0 to 9, at most one time each, fill in the boxes to find the lengths of the missing sides such that the missing leg's length is as long as possible.  	Open Middle - Table of Values: Not a Function Create a table of values that is not a function.	Which equation does not belong with others? Why?  GRAPH 8	What do you notice? What do you wonder?  	Open Middle - Create a System of Linear Equations, Given 1 Equation and the Solution: Write at least two linear equations so that the solution of the system of equations of that line and 4x + y = 8 is (3, -4).

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GSE Coordinate Algebra Mathematics Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Relationships Between Quantities	**Reasoning with Equations and Inequalities**	**Linear and Exponential Functions**	**Describing Data**	**Transformations in the Coordinate Plane**	**Connecting Algebra and Geometry Through Coordinates**	**Free Math Apps for all Units**
Web-based Resources						
Illustrative Mathematics Lessons - Linear Equations, Inequalities, and Systems (Lessons 1 - 3, 5 - 6)	Illustrative Mathematics Lessons - Linear Equations, Inequalities, and Systems (Lessons 4, 7 - 23)	Illustrative Mathematics Lessons - Functions (Lessons 1 - 11)	Illustrative Mathematics Lessons - One Variable Statistics	Illustrative Mathematics Lessons - Constructions and Rigid Transformations (Lessons 10 -18)	Illustrative Mathematics Lessons - Coordinate Geometry (Lessons 9 - 12, 15 - 16)	GeoGebra Activities - Algebra
Georgia Framworks Task - Acting Out (Creating Equations & Inequalites)	GeoGebra Activities - Linear Equations	Illustrative Mathematics Lessons - Introduction to Exponential Functions	Illustrative Mathematics Lessons - Two Variable Statistics	Desmos Activity - Connecting the Dots (Transformations)	Desmos Activity - Parallel Lines	GeoGebra Activities - Geometry
Illustrative Mathematics Task - The Physics Professor	TI Activity - Boats in Motion (Systems of Equations)	Robert Kaplinsky Lesson - How Much Did Patrick Peterson Lose By Not Cashing His Check?	GeoGebra Activities - Statistics	Illustrative Mathematics Lessons - Coordinate Geometry (Lessons 1 - 3)	Georgia Frameworks Task - New York City (Partitioning a Segment)	Estimation 180 Lessons
Robert Kaplinsky Task - How Much Does A 100x100 In-N-Out Cheeseburger Cost?	Desmos Activity - Linear Systems: Gym Membership	Desmos Activity - What Comes Next? (Comparing Exponential and Linear Functions)	TI Activities - Data Analysis and Statistics	Desmos Activities - Transformations	Illustrative Mathematics Task - A Midpoint Miracle	Math Open Ref Resource
Illustrative Mathematics Task - Basketball (Creating Equations & Inequalites)	GeoGebra Activities - Linear Inequalities	Desmos Activities - Linear Functions	Illustrative Mathematics Task - Haircut Costs (Summarizing Data)	Desmos Activity - Sketchy Dilations	Robert Kaplinsky Lesson - How Big Is The Bermuda Triangle?	Desmos Activities

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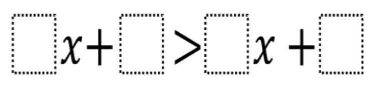
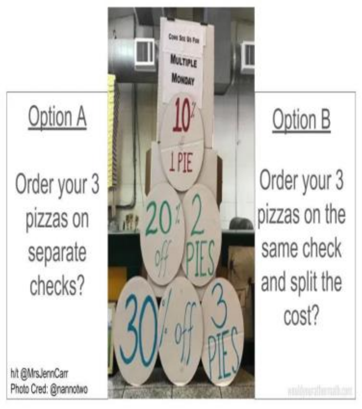
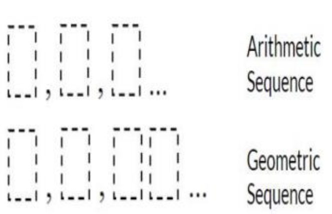
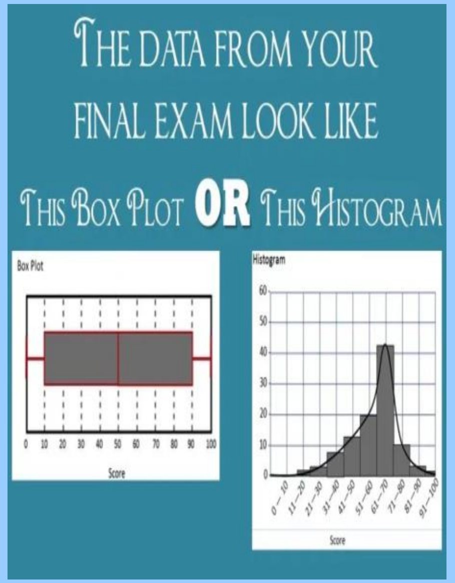
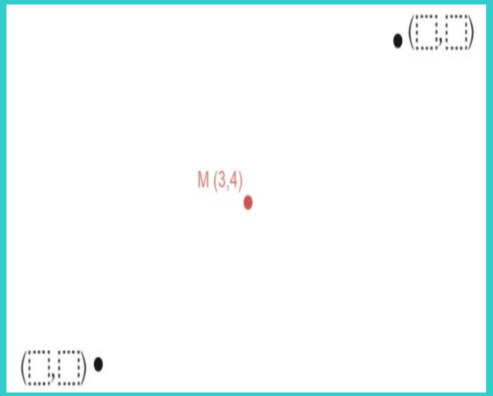
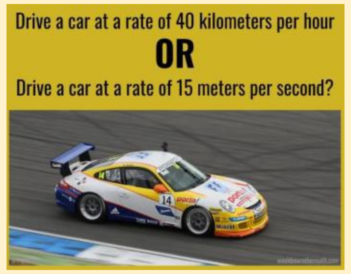
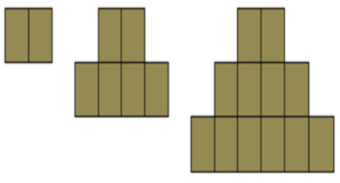
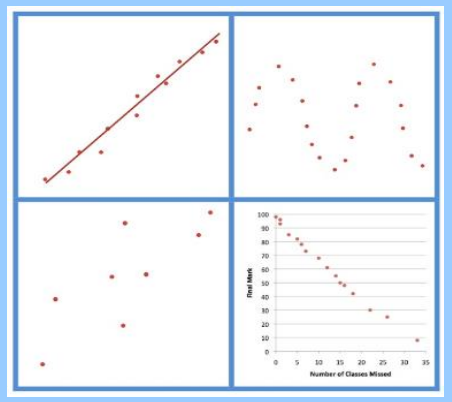
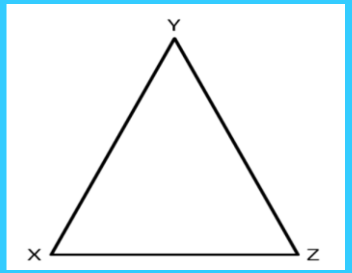
GSE Coordinate Algebra Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Hands-On and Kinesthetic Activities						
Open Middle Task - Using the digits 0 to 9 at most one time each, fill in the boxes to create an inequality whose solution set is x < -1/2.  	You and two friends each decide to order a pizza for lunch. Would you rather order using option A or option B? Why?  Option A Order your 3 pizzas on separate checks? Option B Order your 3 pizzas on the same check and split the cost? h/t @MrsJennCarr Photo Cred: @nannotwo	Using the digits 1-9, at most one time each, complete the first three terms of the arithmetic and geometric sequences. What sequences result in the greatest sum of their second terms? (e.g. 3, 5, 7 and 2, 6, 18 would result in a sum of 5 + 6 = 11). What sequences result in the least sum of their second terms?  Arithmetic Sequence Geometric Sequence	Would you rather have the data from your final exams look like the box plot on the left or the histogram on the right? Why?  	Open Middle Task - Given triangle ABC with vertices (-8,2), (-2,2), and (-2, 8), create triangle DEF in quadrant one that uses a translation, rotation, and reflection (in any order) to take that triangle to triangle ABC and show congruence.	Open Middle Task - Create two pairs of coordinates on the same line segment that have M (3,4) as their midpoint.  	Visual Patterns
Would you rather drive a car at a rate of 40 kilometers per hour OR drive a car at a rate of 15 meters per second? Why?  Drive a car at a rate of 40 kilometers per hour OR Drive a car at a rate of 15 meters per second?	Would you rather work as a server at restaurant A which pays $18 per hour, with no tipping allowed OR work as a server at restaurant B which pays $10.50 per hour, with tipping encouraged? Meals at both restaurants range from $8 to $25 each. Explain your choice. Work as a server at Restaurant A OR Work as a server at Restaurant B? Restaurant A $18 per hour No tipping allowed (meals range from $8 to $25 each) Restaurant B $10.50 per hour Tipping encouraged (meals range from $8 to $25 each)	Visual Patterns #34 - What are the next two images of the pattern? What equation describes this pattern? 	Which graph doesn't belong? Why? (Graph #23)  	Open Middle Task - How many ways can you determine the location of the line of reflection for isosceles triangle XYZ that maps Point X to Point Z?  	Here are some equations of straight lines. y + 2x = 8, 2y = 4 - x, y = 2x + 2, y = 1/2x + 2, 2y + x = 1, and 2y = x -4. Which four lines form the four sides of a rectangle? Explain how you know.	Clothesline Math Activities

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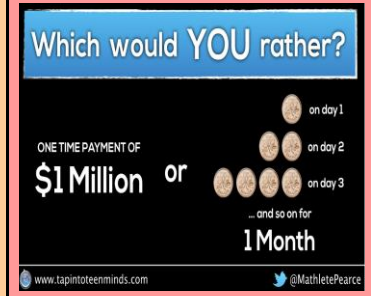
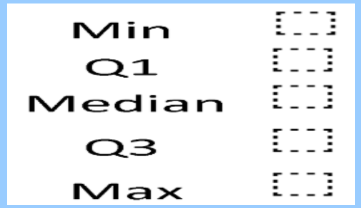
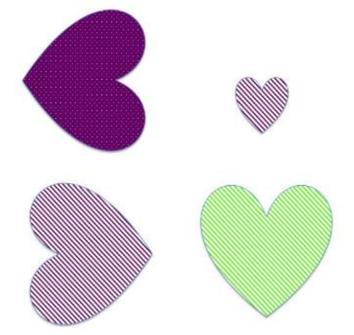
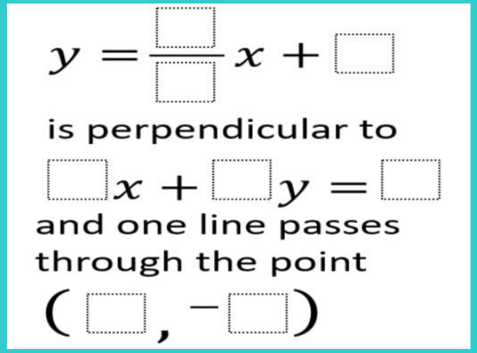
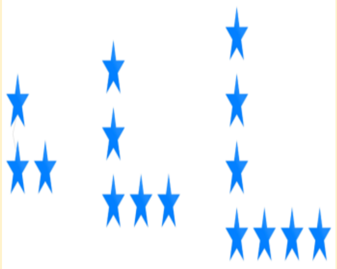
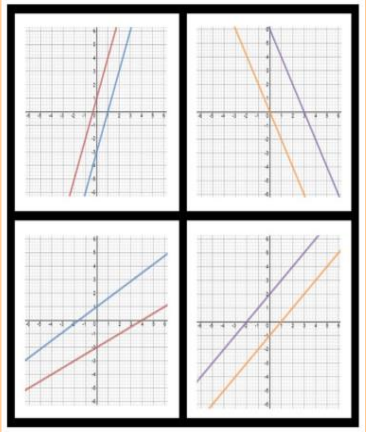
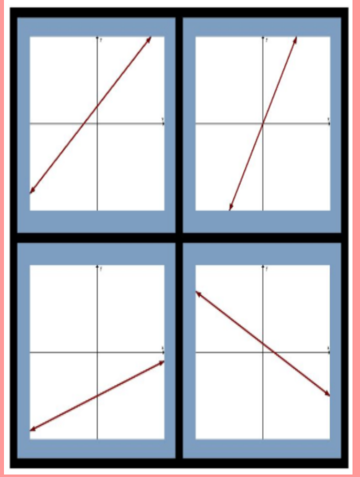
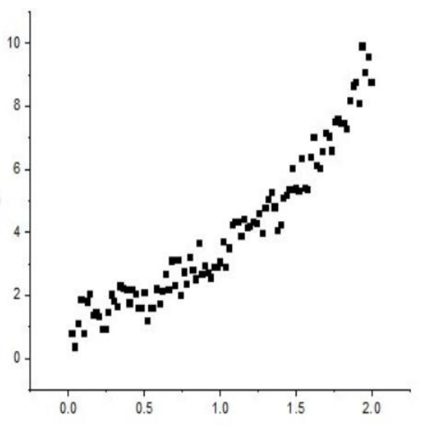
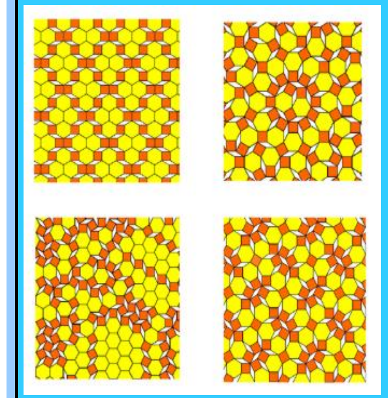
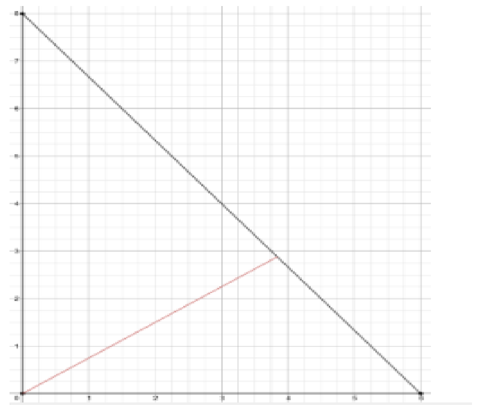
GSE Coordinate Algebra Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Open Middle Task - Create 5 ordered pairs using the whole digits 0 – 9 exactly one time each. Then, create a linear inequality such that: 1. Two of the ordered pairs are solutions to the linear inequality. 2. Two of the ordered pairs are not solutions to the linear inequality. 3. One of the ordered pairs is on the boundary line but not a solution to the linear inequality.	Would you rather buy unleaded gasoline for $3.49 per gallon with cash OR $3.59 with a credit card that gives 3% cash back? Why? 	Would you rather recieve a one time payment of 1 million dollars OR recieve a penny on day 1, two pennies on day 2, four pennies on day 3, and so on for a month? Why?  Which would YOU rather? ONE TIME PAYMENT OF $1 Million or on day 1 on day 2 on day 3 ... and so on for 1 Month www.tapintoteenminds.com @MathletePearce	Open Middle Task - Use the digits 1 to 9 at most once each, to fill in the blanks to represent a data set with: #1. The smallest possible interquartile range, largest possible range, and that is skewed right. #2. An interquartile range greater than 5, range that is greater than 7, and that is skewed left. 	Describe the transformation or sequence of transformations that would map the dark purple heart onto each of the other hearts. (Shape #68) 	Open Middle Task- Using the digits 0 to 9 at most one time each, fill in the boxes to create a correct statment:  $y = \frac{\square}{\square}x + \square$ is perpendicular to $\square x + \square y = \square$ and one line passes through the point $(\square, -\square)$	Would You Rather Math?
Visual Patterns #11 - What are the next two images of the pattern? What equation describes this pattern? 	Which graph doesn't belong? Why? (Graph #7) 	Which graph doesn't belong? Why? (Graph #5) 	Which type of function best models the scatter plot? Justify your answer. 	Which one doesn't belong? Why? (Shape #34) 	Open Middle Task - The black triangle is a right triangle with legs 8 and 6. The vertices are at the points (0,0), (0,8), and (6,0). The red line segment is perpendicular to hypotenuse. Find the length of the red line segment. 	Open Middle Math

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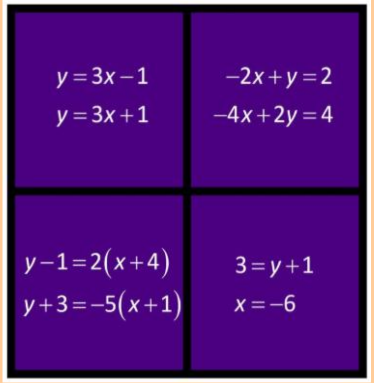
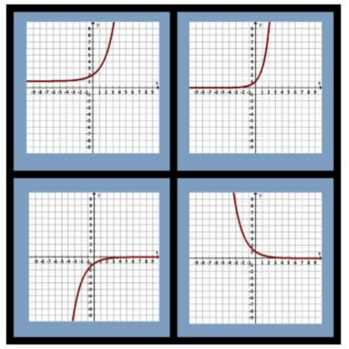
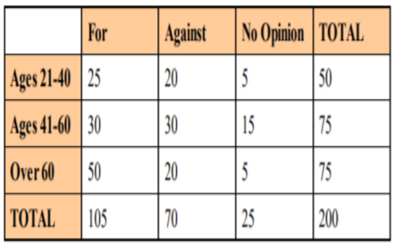
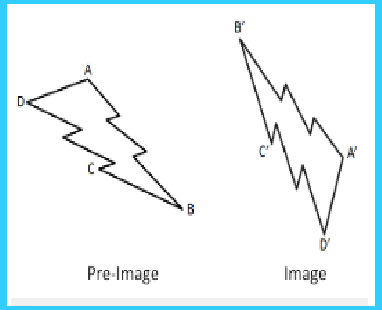
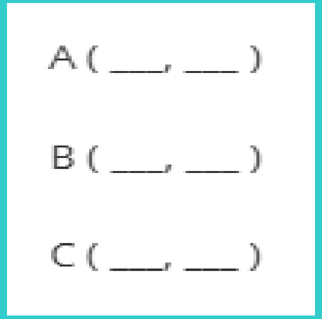
GSE Coordinate Algebra Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Would you rather have a pool that is 40 ft. x 9 ft. x 4 ft. OR a pool that is 7 yds. x 4 yds. x 2 yds.? Why? HAVE A POOL THAT IS OR 40 ft x 9 ft x 4 ft 7 yds x 4 yds x 2 yds	Which system of equations does not belong? Why? (Graph #37)  $y=3x-1$ $y=3x+1$ $-2x+y=2$ $-4x+2y=4$ $y-1=2(x+4)$ $y+3=-5(x+1)$ $3=y+1$ $x=-6$	Which graph doesn't belong? Why? (Graph #33) 	Use the table below to answer the following questions. 1.) What percentage of those individuals surveyed were in the 21 – 40 age group and for increasing the minimum wage? 2.) For the 21 to 40 age group, what percentage supports increasing the minimum wage? 3.) For the 21 to 40 age group, what percentage supports increasing the minimum wage? Explain how you arrived at each of your percentages. 	Open Middle Task - What is the fewest number of transformations needed to take pre-image ABCD to image A'B'C'D'?  A B C D A' B' C' D' Pre-Image Image	Open Middle Task - Use the digits 0 to 9, at most one time each, to fill in ordered pairs for all three points, such that the area of Triangle ABC is closest to 6 square units.  A (___, ___) B (___, ___) C (___, ___)	Which One Doesn't Belong?

	For	Against	No Opinion	TOTAL
Ages 21-40	25	20	5	50
Ages 41-60	30	30	15	75
Over 60	50	20	5	75
TOTAL	105	70	25	200

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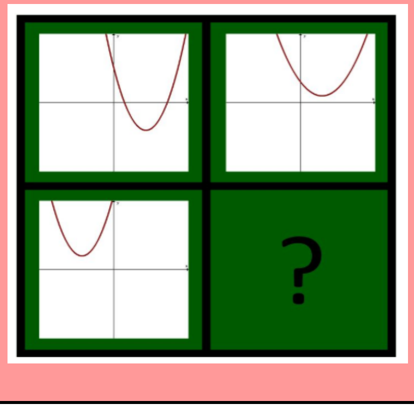
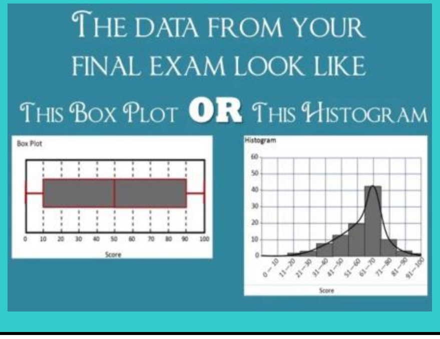
GSE Algebra I Mathematics Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	
Relationships Between Quantities and Expressions	**Reasoning with Linear Equations and Inequalities**	**Modeling & Analyzing Quadratic Functions**	**Modeling & Analyzing Exponential Functions**	**Comparing and Contrasting Functions**	**Describing Data**	**Free Math Apps for all Units**
Web-based Resources						
Illustrative Mathematics Lesson - Equivalent Equations	Illustrative Mathematics Lessons - Linear Equations, Inequalities, and Systems	Illustrative Mathematics Lessons - Introduction to Quadratic Functions	Illustrative Mathematics Lessons - Introduction to Exponential Functions	Illustrative Math Lesson - Growing and Growing	Illustrative Mathematics Lessons - One Variable Statistics	GeoGebra Activities - Algebra
Georgia Framworks Task - Visualizing Square Roots	Desmos Activities - Linear Functions	Illustrative Mathematics Lessons - Quadratic Equations	Desmos Activities - Exponential Functions	Illustrative Mathematics Lesson - Comparing Quadratic and Exponential Functions	Illustrative Mathematics Lessons - Two Variable Statistics	Estimation 180 Lessons
Illustrative Mathematics Task - The Physics Professor	Illustrative Mathematics Lessons - Functions (Lessons 1 - 11)	GeoGebra Activities - Quadratics	GeoGebra Activities - Exponential Functions	Illustrative Mathematics Lesson - Patterns of Growth	GeoGebra Activities - Statistics	https://www.mathopenref.com/
Illustrative Mathematics Task - Rational or Irrational	GeoGebra Activities - Linear Functions	Robert Kaplinsky Lesson - Where Would The Angry Birds Have Landed?	Robert Kaplinsky Lesson - How Much Did Patrick Peterson Lose By Not Cashing His Check?	Desmos Activity - What Comes Next? (Comparing Exponential and Linear Functions)	TI Activities - Data Analysis and Statistics	Desmos Acitivities
Robert Kaplinsky Task - How Much Does A 100x100 In-N-Out Cheeseburger Cost?	GeoGebra Activities - Linear Equations	Desmos Activities - Quadratic Functions	Desmos Activity - Card Sort: Modeling (Linear, Quadratic, & Exponential)	Desmos Activity - Avi and Benita's Repair Shop (Comparing Exponential and Linear Functions)	Illustrative Mathematics Task - Haircut Costs (Summarizing Data)	YouCubed Tasks
Hands-On and Kinesthetic Activities						
Open Middle Task - Fill in the boxes with any numbers that make the equation true. $(\square x-3)(\square x+\square)=$ $12x^2-\square x-15$	Open Middle Task - Using the digits 0 to 9 at most one time each, fill in the boxes to create an inequality whose solution set is x < -1/2. $\square x+\square>\square x+\square$	What image is needed to complete this set? Why? (Incomplete Set #3)  	Using the digits 1-9, at most one time each, complete the first three terms of the arithmetic and geometric sequences. What sequences result in the greatest sum of their second terms? (e.g. 3, 5, 7 and 2, 6, 18 would result in a sum of 5 + 6 = 11). What sequences result in the least sum of their second terms? $\square,\square,\square\ldots$ Arithmetic Sequence $\square,\square,\square\ldots$ Geometric Sequence	Open Middle Task - Using the digits 1 to 9, at most one time each, fill in the boxes so that the two functions are equivalent. $f(x)=\square x+\square$ $g(x)=\square x^2+\square x+\square$ $f(\square)=g(\square)$	Would you rather have the data from your final exams look like the box plot on the left or the histogram on the right? Why?  	Visual Patterns

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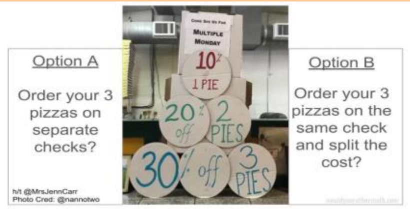
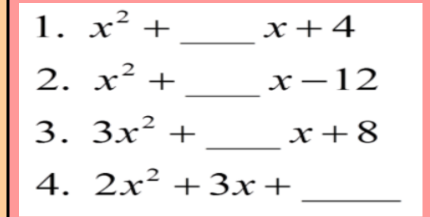
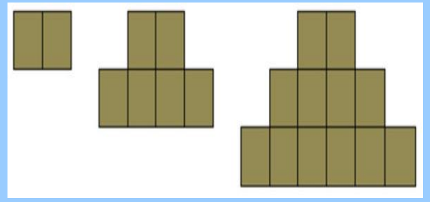
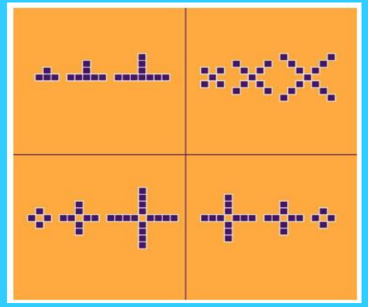
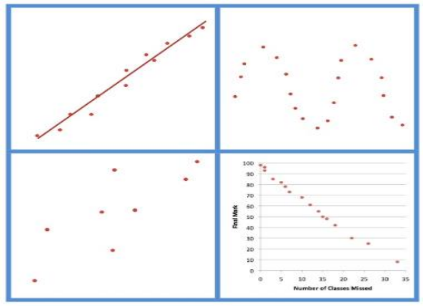
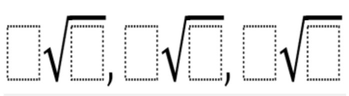
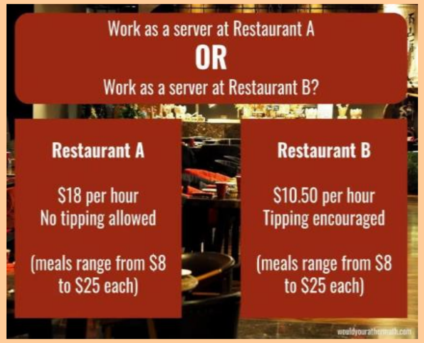
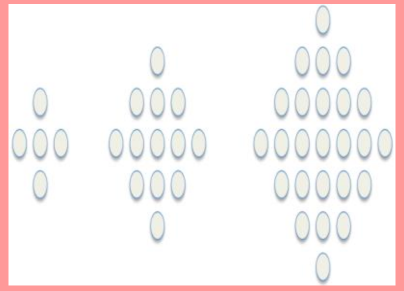
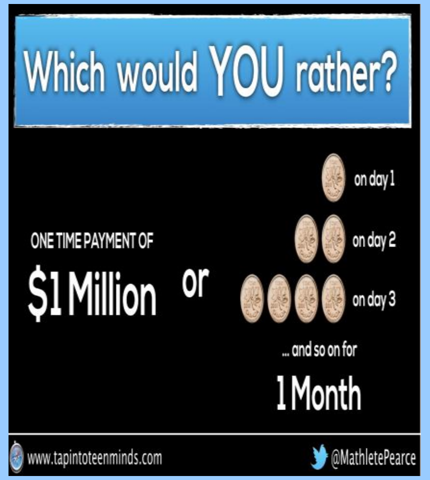
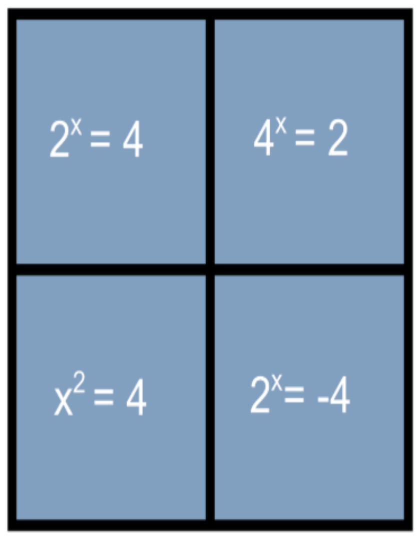
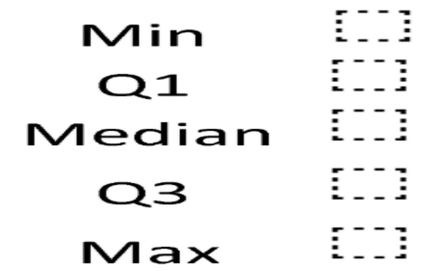
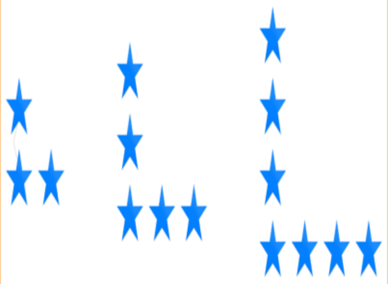
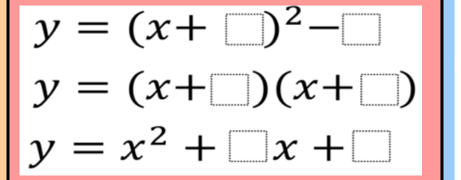
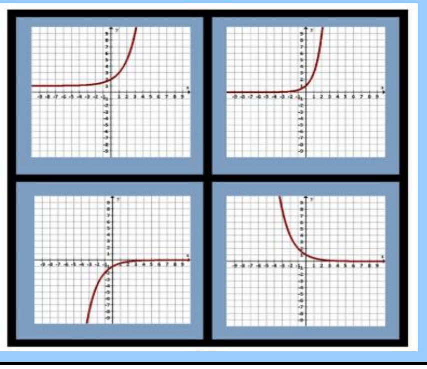
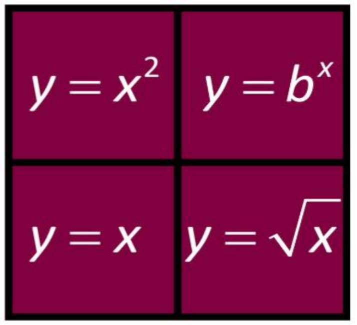
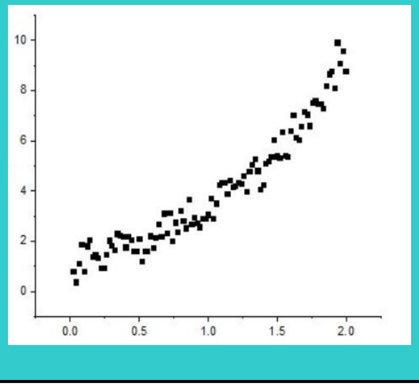
GSE Algebra I Mathematics Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Would you rather drive a car at a rate of 40 kilometers per hour OR drive a car at a rate of 15 meters per second? Why? Drive a car at a rate of 40 kilometers per hour OR Drive a car at a rate of 15 meters per second?	You and two friends each decide to order a pizza for lunch. Would you rather order using option A or option B? Why?  Option A Order your 3 pizzas on separate checks? 10% 1 PIE 20% 2 PIES 30% off 3 PIES Option B Order your 3 pizzas on the same check and split the cost?	Open Middle Task - Fill in the blanks with integers so that the quadratic expression is factorable.  1. $x^2 + \_\_\_\_\ x + 4$ 2. $x^2 + \_\_\_\_\ x - 12$ 3. $3x^2 + \_\_\_\_\ x + 8$ 4. $2x^2 + 3x + \_\_\_\_$	Visual Patterns #34 - What are the next two images of the pattern? What equation describes this pattern? 	Which one doesn't belong? Why? (Shape #13) 	Which graph doesn't belong? Why? (Graph #23) 	Clothesline Math Activities
Open Middle Task - Using the digits 1-9 at most one time each, create radicals that are in numerical order and cannot be simplified anymore.  $\square\sqrt{\square}, \square\sqrt{\square}, \square\sqrt{\square}$	Would you rather work as a server at restaurant A which pays $18 per hour, with no tipping allowed OR work as a server at restaurant B which pays $10.50 per hour, with tipping encouraged? Meals at both restaurants range from $8 to $25 each. Explain your choice.  Work as a server at Restaurant A OR Work as a server at Restaurant B? Restaurant A $18 per hour No tipping allowed (meals range from $8 to $25 each) Restaurant B $10.50 per hour Tipping encouraged (meals range from $8 to $25 each)	Visual Patterns #148 - What are the next two images of the pattern? What equation describes this pattern? 	Would you rather recieve a one time payment of 1 million dollars OR recieve a penny on day 1, two pennies on day 2, four pennies on day 3, and so on for a month? Why?  Which would YOU rather? ONE TIME PAYMENT OF $1 Million or on day 1 on day 2 on day 3 ...and so on for 1 Month www.tapintoteenminds.com @MathletePearce	Which equation doesn't belong? Why? (Number Set #44)  $2^x = 4$ $4^x = 2$ $x^2 = 4$ $2^x = -4$	Open Middle Task - Use the digits 1 to 9 at most once each, to fill in the blanks to represent a data set with: #1. The smallest possible interquartile range, largest possible range, and that is skewed right. #2. An interquartile range greater than 5, range that is greater than 7, and that is skewed left.  Min ☐ Q1 ☐ Median ☐ Q3 ☐ Max ☐	Would You Rather Math?
Would you rather have a pool that is 40 ft. x 9 ft. x 4 ft. OR a pool that is 7 yds. x 4 yds. x 2 yds.? Why? HAVE A POOL THAT IS OR 40 ft x 9 ft x 4 ft 7 yds x 4 yds x 2 yds	Visual Patterns #11 - What are the next two images of the pattern? What equation describes this pattern? 	Open Middle Task - Using the digits 0 to 9 at most one time each, fill in the boxes to create three equations that produce the exact same parabola.  $y = (x+\square)^2 - \square$ $y = (x+\square)(x+\square)$ $y = x^2 + \square x + \square$	Which graph doesn't belong? Why? (Graph #33) 	Which function doesn't belong? Why? (Graph #22)  $y = x^2$ $y = b^x$ $y = x$ $y = \sqrt{x}$	Which type of function best models the scatter plot? Justify your answer.  	Open Middle Math

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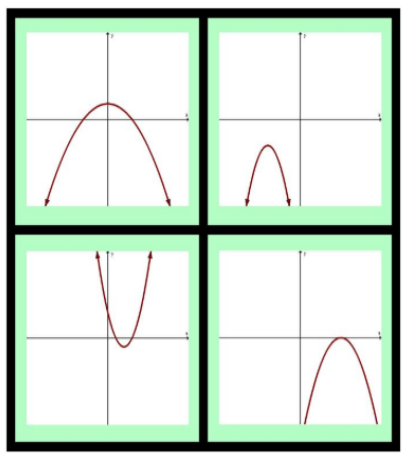
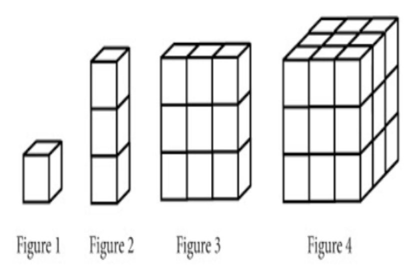
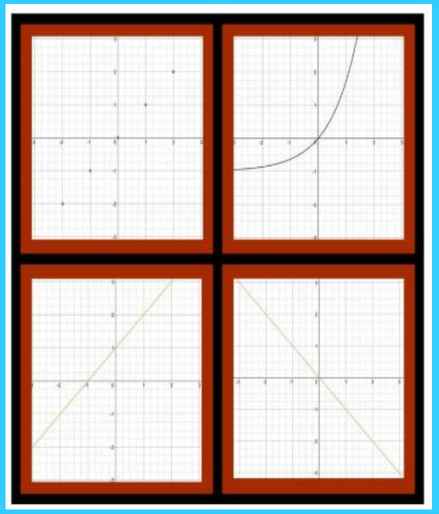
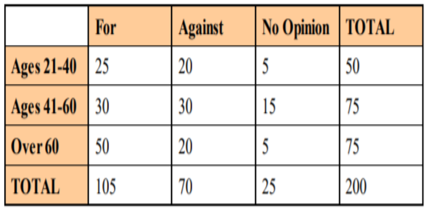
<table>
<tr><th colspan="7">GSE Algebra I Mathematics Curriculum Map</th></tr>
<tr><th>Unit 1</th><th>Unit 2</th><th>Unit 3</th><th>Unit 4</th><th>Unit 5</th><th>Unit 6</th><th>Free Math Apps for all Units</th></tr>
<tr>
<td>Open Middle Task - Use the digits 1-9, at most one time each, to create a true statement.
$\square x^2 + \square x^3 + \square x^2 - \square x^3 =$
$\square x^2 + \square x^3 - \square x^2$</td>
<td>Open Middle Task - Create 5 ordered pairs using the whole digits 0 – 9 exactly one time each. Then, create a linear inequality such that: 1. Two of the ordered pairs are solutions to the linear inequality. 2. Two of the ordered pairs are not solutions to the linear inequality. 3. One of the ordered pairs is on the boundary line but not a solution to the linear inequality.</td>
<td>Which graph doesn't belong? Why? (Graph #6)
</td>
<td>Visual Patterns #166 - What are the next two images of the pattern? What equation describes this pattern?

 </td>
<td>Which graph doesn't belong? Why? (Graph #28)
</td>
<td>Use the table below to answer the following questions. 1.) What percentage of those individuals surveyed were in the 21 – 40 age group and for increasing the minimum wage? 2.) For the 21 to 40 age group, what percentage supports increasing the minimum wage? 3.) For the 21 to 40 age group, what percentage supports increasing the minimum wage? Explain how you arrived at each of

<table>
<tr><th></th><th>For</th><th>Against</th><th>No Opinion</th><th>TOTAL</th></tr>
<tr><td>Ages 21-40</td><td>25</td><td>20</td><td>5</td><td>50</td></tr>
<tr><td>Ages 41-60</td><td>30</td><td>30</td><td>15</td><td>75</td></tr>
<tr><td>Over 60</td><td>50</td><td>20</td><td>5</td><td>75</td></tr>
<tr><td>TOTAL</td><td>105</td><td>70</td><td>25</td><td>200</td></tr>
</table></td>
<td>Which One Doesn't Belong?</td>
</tr>
</table>

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GSE Analytic Geometry Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Similarity, Congruence, and Proofs	**Right Triangle Trigonometry**	**Circles and Volume**	**Extending the Number System**	**Quadratic Functions**	**Geometric and Algebraic Connections**	**Applications of Probability**
Web-based Resources						
Illustrative Mathematics Lessons - Constructions and Rigid Transformations (Lessons 1 - 9, 19 - 22)	Illustrative Mathematics Lessons - Rigth Triangle Trigonometry	Illustrative Mathematics Lessons - Circles	Georgia Framworks Task - Visualizing Square Roots	Illustrative Mathematics Lessons - Introduction to Quadratic Functions	Illustrative Mathematics Lessons - Coordinate Geometry (Lessons 4 - 6)	Illustrative Mathematics Lessons - Conditional Probability
Illustrative Mathematics Lessons - Congruence	TI Activities - Right Triangles and Trigonometry	Illustrative Mathematics Lessons - Solid Geometry (Lessons 1 -15)	Illustrative Mathematics Task - Rational or Irrational	Illustrative Mathematics Lessons - Quadratic Equations	Robert Kaplinsky Lesson - How Many Does the Aluminum Foil Prank Cost?	GeoGebra Activities - Probability
Illustrative Mathematics Lessons - Similarity	GeoGebra Activity - Similar Right Triangles	Recreate this graph using www.desmos.com or some other digital graphing tool. Show the equation and explain your steps and reasoning.	Multiplying Binomials Using Algebra Tiles	GeoGebra Activities - Quadratic Functions	Estimation 180 Task - How many large marshmellows will fit in the glass?	Illustrative Mathematics Task - The Titanic 1
Illustrative Mathematics Lesson - Coordinate Proof	Georgia Frameworks Task - Eratosthenes Finds the Circumference of the Earth	Explore epitrochoids and hypotrochoids using the information at this link. Describe the behavior of each and describe real-world uses for these curves.	Factoring Trinomials Using Algebra Tiles	Robert Kaplinsky Lesson - Where Would The Angry Birds Have Landed?	Estimation 180 Task - What is the maximum occupancy of the swimming pool?	Illustrative Mathematics Task - The Titanic 2
TI Activities - Similarity and Proportions	Illustrative Mathematics Task - Setting Up Sprinkers (Using the Pythagorean Theorem and Trigonometric Ratios)	GeoGebra Activities - Solids (Cones, Cylinders, Pyramids, Spheres, Cross-Sections, Cavalieri's)	Completing the Square Using Algebra Tiles	Desmos Acitivites - Quadratic Functions	Desmos Activity - Circle Patterns	Robert Kaplinsky Lesson - How Many Royal Flushes Will You Get?

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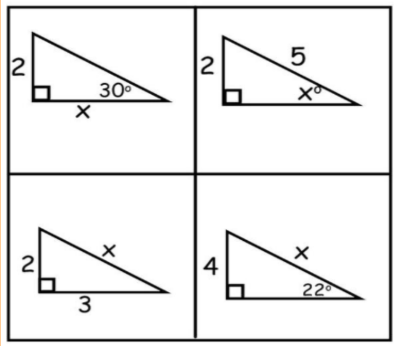
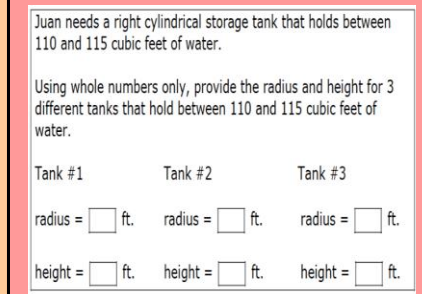
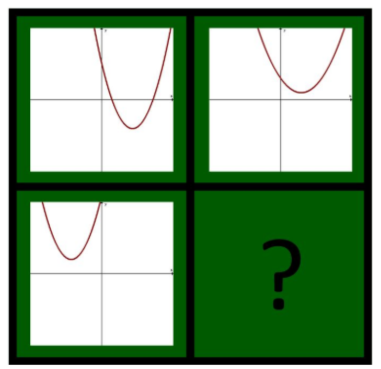
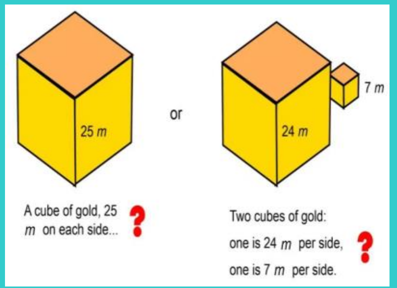
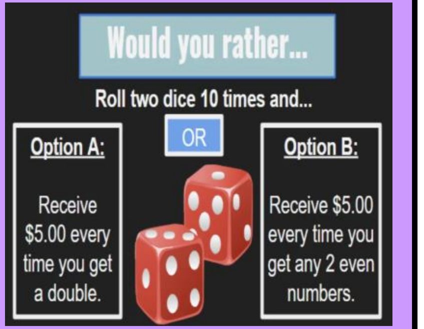
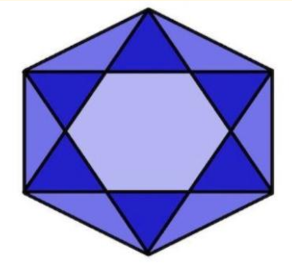
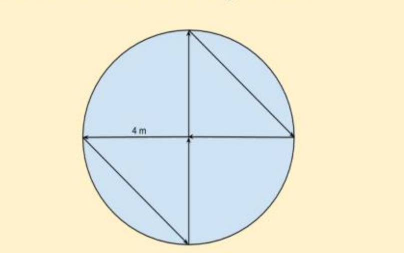
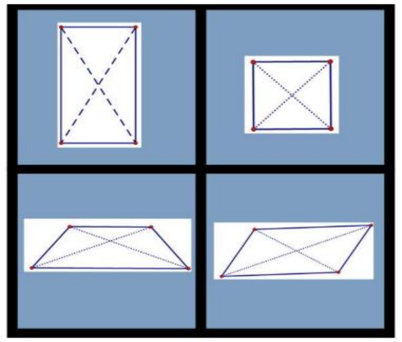
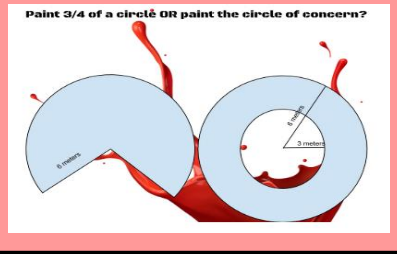
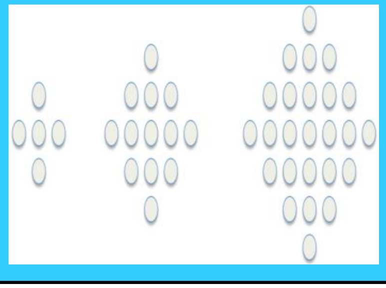
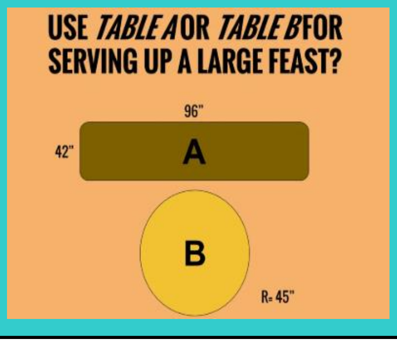
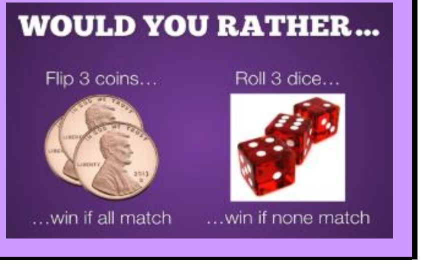
GSE Analytic Geometry Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Hands-On and Kinesthetic Activities						
Print and put together this puzzle and describe the relationship between the radius of the circles and the sides of the triangles. https://www.flexagon.net/flexagons/TriHexSangakuTemplate.jpg	Which one doesn't belong? Why? (Shape #23)  2 30° x 2 5 x° 2 x 3 4 x 22°	Open Middle Task - Juan needs a cylindrical storage tank that holds between 110 and 115 cubic feet of water. Using whole numbers only, provide the radius and height for three different tanks that hold between 110 and 115 cubic feet of water.  Juan needs a right cylindrical storage tank that holds between 110 and 115 cubic feet of water. Using whole numbers only, provide the radius and height for 3 different tanks that hold between 110 and 115 cubic feet of water. Tank #1 Tank #2 Tank #3 radius = ☐ ft. radius = ☐ ft. radius = ☐ ft. height = ☐ ft. height = ☐ ft. height = ☐ ft.	Open Middle Task - Fill in the boxes with any numbers that make the equation true. $(\square x-3)(\square x+\square)=$ $12x^2-\square x-15$	What image is needed to complete this set? Why? (Incomplete Set #3) 	Would you rather have a cube of gold, 25 meters on each side OR two cubes of gold , one is 24 meters on each side and the second is 7 meters on each side? Why?  25 m or 24 m 7 m A cube of gold, 25 m on each side... Two cubes of gold: one is 24 m per side, one is 7 m per side.	Would you rather roll two dice 10 times and recieve $5 every time you get a double OR recieve $5 every time you get two even numbers? Why?  Would you rather... Roll two dice 10 times and... Option A: Receive $5.00 every time you get a double. OR Option B: Receive $5.00 every time you get any 2 even numbers.
Explain how the 13 pieces making up the regular hexagon shown in the diagram can be reassembled to form 3 smaller regular hexagons congruent to each other. 	Open Middle Task - What is the side length of an equilateral triangle that has an area of 5 square units?	Would you rather travel along the path of the triangles OR the circle's circumference (r = 4 m)? Why?  Travel along the path of the triangles or the circle's circumference?	Open Middle Task - Using the digits 1-9 at most one time each, create radicals that are in numerical order and cannot be simplified anymore. $\square\sqrt{\square}, \square\sqrt{\square}, \square\sqrt{\square}$	Open Middle Task - Fill in the blanks with integers so that the quadratic expression is factorable. 1. $x^2+\_\_\_x+4$ 2. $x^2+\_\_\_x-12$ 3. $3x^2+\_\_\_x+8$ 4. $2x^2+3x+\_\_\_$	Open Middle Task - Using any integers, fill in the blanks so that the equation's graph is a circle, the circle is completely inside the 1st quadrant, the circle's radius is a whole number 1 through 9, and the circle has the largest area possible. $x^2+\_\_\_x+\_\_\_+y^2+\_\_\_y+\_\_\_=\_\_\_$	A bowl contains 75 candies, identical except for color. Twenty are red, 25 are green, and 30 are brown. Without looking, what is the least number of candies you must pick in order to be absolutely certain that three of them are brown?
Which one doesn't belong? Why? (Shape #27) 	Create a clinometer using these steps HERE. Go outside and find a tree. Use the clinometer you created to determine the height of the tree. Describe your steps and explain your solution.	Would you rather paint 3/4 of a circle with radius of 6m OR the ring created by concentric circles with radii of 3m and 6m? Why?  Paint 3/4 of a circle OR paint the circle of concern?	Open Middle Task - Use the digits 1-9, at most one time each, to create a true statement. $\square x^2+\square x^3+\square x^2-\square x^3=$ $\square x^2+\square x^3-\square x^2$	Visual Patterns #148 - What are the next two images of the pattern? What equation describes this pattern? 	Would you rather use table A or table B to serve up a large feast? Why?  USE *TABLE A* OR *TABLE B* FOR SERVING UP A LARGE FEAST?	Would you rather flip 3 coins and win if they all match (all heads or all tails) OR roll 3 dice and win if none of the numbers are the same? Why?  WOULD YOU RATHER... Flip 3 coins... Roll 3 dice... ...win if all match ...win if none match

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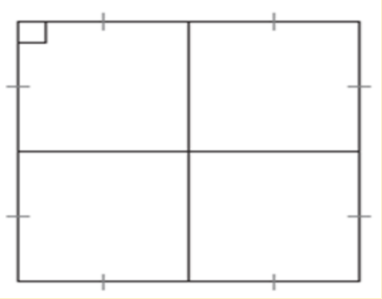
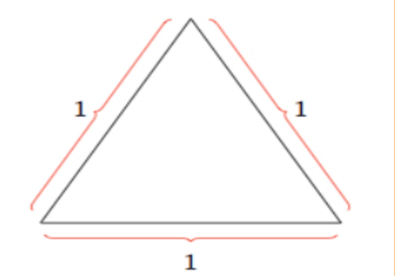
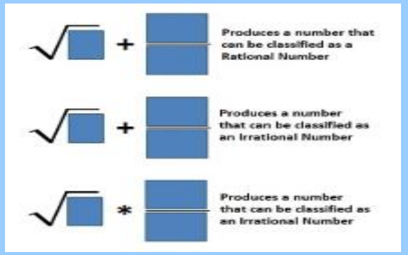
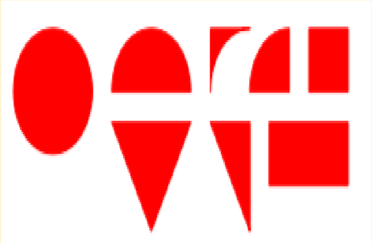
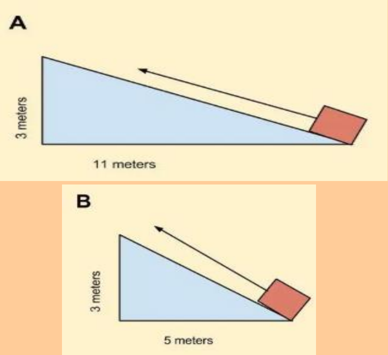
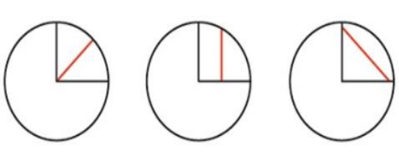
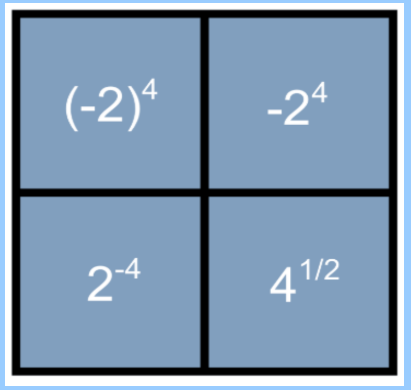
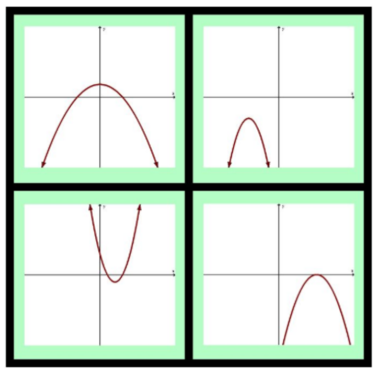
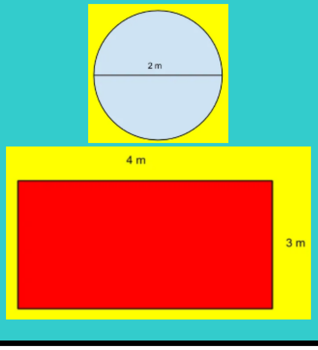
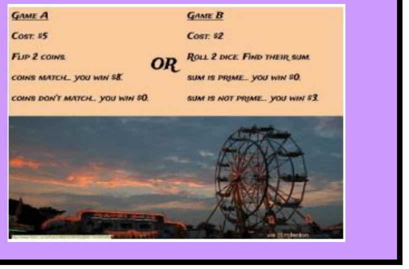
GSE Analytic Geometry Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Open Middle Task - How many squares are shown in the diagram below? 	Below is an equilateral triangle whose side lengths are each 1 unit. Find the area of △ABC. 	Would you rather have one slice of a large 24-inch pizza cut into 12 slices OR one slice of a medium 20 inch pizza with a crust length (arc length) of 7.85 inches per slice? Why? Would You Rather…… One slice of a Large 24-inch pizza cut into 12 slices. One slice of a Medium 20-inch pizza with a crust length of 7.85 in per slice.	Open Middle Task - Using only numbers 1-9 (without repeating any number), fill in the boxes to create the following number types:  + Produces a number that can be classified as a Rational Number + Produces a number that can be classified as an Irrational Number * Produces a number that can be classified as an Irrational Number	Open Middle Task - Using the digits 0 to 9 at most one time each, fill in the boxes to create three equations that produce the exact same parabola. $y=(x+\square)^2-\square$ $y=(x+\square)(x+\square)$ $y=x^2+\square x+\square$	Open Middle Task - Which circle is bigger? Circle A with an area of 25 square units or Circle B with the equation x^2 + y^2 = 25	A simple game is devised in which 3 white and 3 black balls are placed in a bag, and the bag is shaken. Without looking, you take two balls from the bag. You win the game if the two balls are the same color. If they are different colors, then I win the game. Is this a fair game? If not, who is most likely to win the game? Explain your reasoning.
Make a heart using any of the shapes below. You can change their size, but you cannot change their shape. You can use a shape more than once. 	Would you rather push a 20 kg box up the hypotenuse of triangle A OR triangle B? Whichever option you choose, justify your choice.  A 3 meters 11 meters B 3 meters 5 meters	In the diagram , three different line segments each divide a quarter-circle into two regions of equal area. Rank those three segments from shortest to longest. 	Which one doesn't belong? Why? (Number Set #44)  $(-2)^4$ -2^4 2^{-4} $4^{1/2}$	Which graph doesn't belong? Why? (Graph #6) 	Would you rather design a room with circular tables that have a diameter of 2 meters or rectangular tables with dimensions of 4 meters and 3 meters? Why? 	Would you rather choose to play Game A: Cost $5, flip two coins and win $8 if they match (both heads or both tails), $0 if they do not match, OR Game B: Cost $2, roll two dice and win $3 if sum is not prime, $0 if sum is prime. Expain your choice.  Game A Cost: $5 Flip 2 coins. coins match.. you win $8. coins don't match.. you win $0. OR Game B Cost: $2 Roll 2 dice. Find their sum. sum is prime.. you win $0. sum is not prime.. you win $3.

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GSE Geometry Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	
Transformations in the Coordinate Plane	**Similarity, Congruence, and Proofs**	**Right Triangle Trigonometry**	**Circles and Volume**	**Geometric and Algebraic Connections**	**Applications of Probability**	**Free Math Apps for all Units**
Web-based Resources						
Illustrative Mathematics Lessons - Constructions and Rigid Transformations (Lessons 10 -18)	Illustrative Mathematics Lessons - Constructions and Rigid Transformations (Lessons 1 - 9, 19 - 22)	Illustrative Mathematics Lessons - Rigth Triangle Trigonometry	Illustrative Mathematics Lessons - Circles	Illustrative Mathematics Lessons - Coordinate Geometry (Lessons 4 - 6, 9 - 12, 14 - 17)	Illustrative Mathematics Lessons - Conditional Probability	GeoGebra Activities - Geometry
Desmos Activity - Connecting the Dots (Transformations)	Illustrative Mathematics Lessons - Congruence	TI Activities - Right Triangles and Trigonometry	Illustrative Mathematics Lessons - Solid Geometry (Lessons 1 -15)	Robert Kaplinsky Lesson - How Many Does the Aluminum Foil Prank Cost?	GeoGebra Activities - Probability	Desmos Activities
Illustrative Mathematics Lessons - Coordinate Geometry (Lessons 1 - 3)	Illustrative Mathematics Lessons - Similarity	GeoGebra Activity - Similar Right Triangles	Recreate this graph using www.desmos.com or some other digital graphing tool. Show the equation and explain your steps and reasoning.	Estimation 180 Task - How many large marshmellows will fit in the glass?	Illustrative Mathematics Task - The Titanic 1	Estimation 180 Lessons
Desmos Activities - Transformations	TI Activities - Similarity and Proportion	Georgia Frameworks Task - Eratosthenes Finds the Circumference of the Earth	GeoGebra Activities - Solids (Cones, Cylinders, Pyramids, Spheres, Cross-Sections, Cavalieri's)	Estimation 180 Task - What is the maximum occupancy of the swimming pool?	Illustrative Mathematics Task - The Titanic 2	Robert Kaplinsky Lessons
Desmos Activity - Sketchy Dilations	TI Activities - Transformational Geometry	Illustrative Mathematics Task - Setting Up Sprinklers (Using the Pythagorean Theorem and Trigonometric Ratios)	Explore epitrochoids and hypotrochoids using the information at this link. Describe the behavior of each and describe real-world uses for these curves.	Desmos Activity - Circle Patterns	Robert Kaplinsky Lesson - How Many Royal Flushes Will You Get?	

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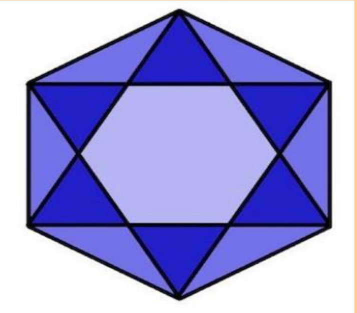
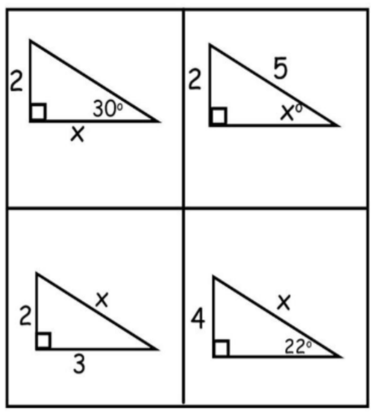
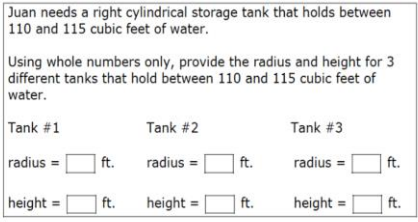
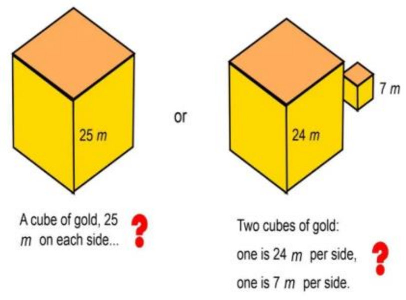
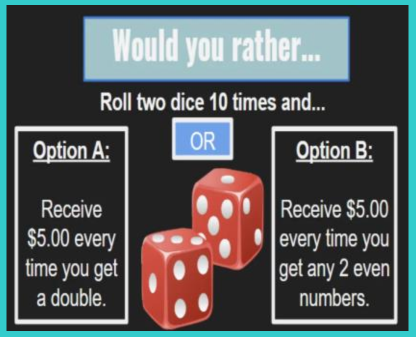
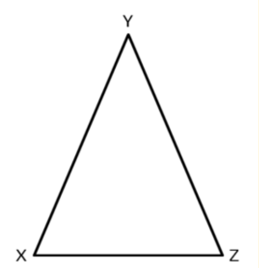
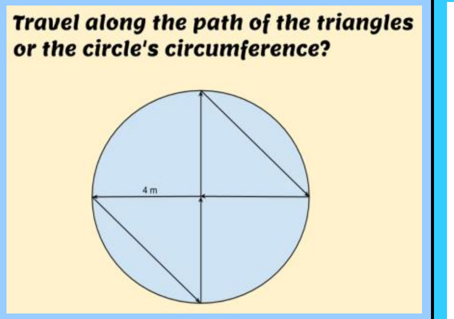
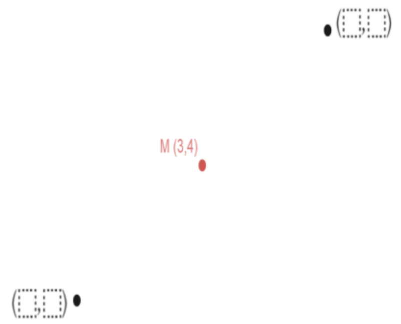
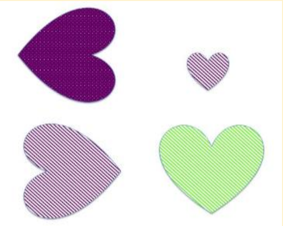
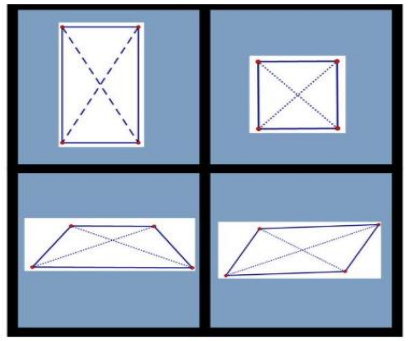
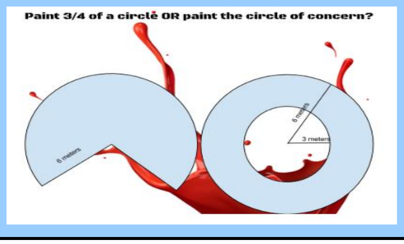
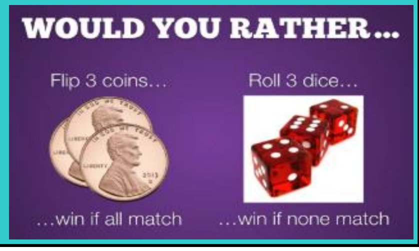
GSE Geometry Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Hands-On and Kinesthetic Activities						
Open Middle Task - Given triangle ABC with vertices (-8,2), (-2,2), and (-2, 8), create triangle DEF in quadrant one that uses a translation, rotation, and reflection (in any order) to take that triangle to triangle ABC and show congruence.	Explain how the 13 pieces making up the regular hexagon shown in the diagram can be reassembled to form 3 smaller regular hexagons congruent to each other. 	Which one doesn't belong? Why? (Shape #23)  2 30° x 2 5 x° 2 x 3 4 x 22°	Open Middle Task - Juan needs a cylindrical storage tank that holds between 110 and 115 cubic feet of water. Using whole numbers only, provide the radius and height for three different tanks that hold between 110 and 115 cubic feet of water.  Juan needs a right cylindrical storage tank that holds between 110 and 115 cubic feet of water. Using whole numbers only, provide the radius and height for 3 different tanks that hold between 110 and 115 cubic feet of water. Tank #1 radius = ☐ ft. height = ☐ ft. Tank #2 radius = ☐ ft. height = ☐ ft. Tank #3 radius = ☐ ft. height = ☐ ft.	Would you rather have a cube of gold, 25 meters on each side OR two cubes of gold , one is 24 meters on each side and the second is 7 meters on each side? Why?  25 m or 24 m 7 m A cube of gold, 25 m on each side... ? Two cubes of gold: one is 24 m per side, one is 7 m per side. ?	Would you rather roll two dice 10 times and recieve $5 every time you get a double OR recieve $5 every time you get two even numbers? Why?  Would you rather... Roll two dice 10 times and... Option A: Receive $5.00 every time you get a double. OR Option B: Receive $5.00 every time you get any 2 even numbers.	Would You Rather Math?
Open Middle Task - How many ways can you determine the location of the line of reflection for isosceles triangle XYZ that maps Point X to Point Z?  	Print and put together this puzzle and describe the relationship between the radius of the circles and the sides of the triangles. https://www.flexagon.net/flexagons/TriHexSangakuTemplate.jpg	Open Middle Task - What is the side length of an equilateral triangle that has an area of 5 square units?	Would you rather travel along the path of the triangles OR the circle's circumference (r = 4 m)? Why?  Travel along the path of the triangles or the circle's circumference? 4 m	Open Middle Task - Create two pairs of coordinates on the same line segment that have M (3,4) as their midpoint.  	A bowl contains 75 candies, identical except for color. Twenty are red, 25 are green, and 30 are brown. Without looking, what is the least number of candies you must pick in order to be absolutely certain that three of them are brown?	Open Middle Math
Describe the transformation or sequence of transformations that would map the dark purple heart onto each of the other hearts. (Shape #68) 	Which one doesn't belong? Why? (Shape #27) 	Create a clinometer using these steps HERE. Go outside and find a tree. Use the clinometer you created to determine the height of the tree. Describe your steps and explain your solution.	Would you rather paint 3/4 of a circle with radius of 6m OR the ring created by concentric circles with radii of 3m and 6m? Why?  Paint 3/4 of a circle OR paint the circle of concern? 6 meters 6 meters 3 meters	Open Middle Task - Use the digits 0 to 9, at most one time each, to fill in ordered pairs for all three points, such that the area of Triangle ABC is closest to 6 square units. A (__ , __) B (__ , __) C (__ , __)	Would you rather flip 3 coins and win if they all match (all heads or all tails) OR roll 3 dice and win if none of the numbers are the same? Why?  WOULD YOU RATHER... Flip 3 coins... Roll 3 dice... ...win if all match ...win if none match	Visual Patterns

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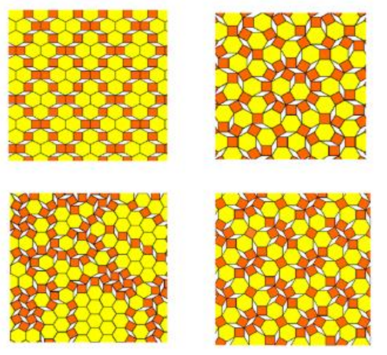
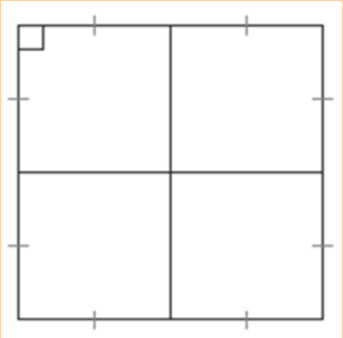
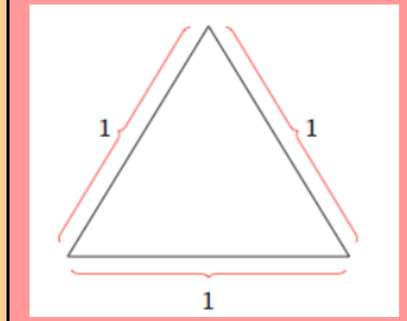
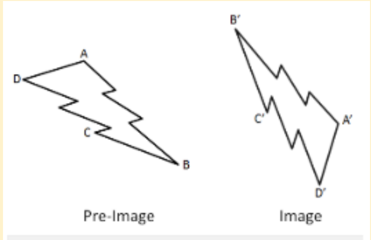
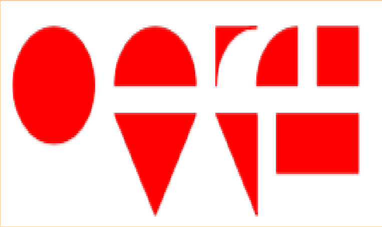
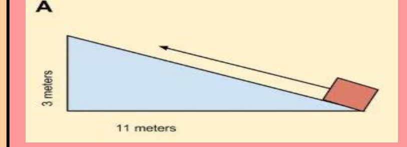
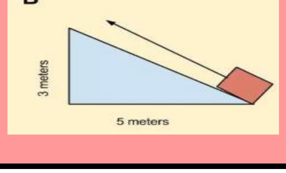
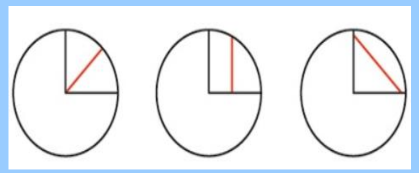
GSE Geometry Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Free Math Apps for all Units
Which one doesn't belong? Why? (Shape #34) 	Open Middle Task - How many squares are shown in the diagram below? 	Below is an equilateral triangle whose side lengths are each 1 unit. Find the area of △ABC.  	Would you rather have one slice of a large 24-inch pizza cut into 12 slices OR one slice of a medium 20 inch pizza with a crust length (arc length) of 7.85 inches per slice? Why? Would You Rather...... One slice of a Large 24-inch pizza cut into 12 slices. One slice of a Medium 20-inch pizza with a crust length of 7.85 in per slice.	Here are some equations of straight lines. y + 2x = 8, 2y = 4 - x, y = 2x + 2, y = 1/2x + 2, 2y + x = 1, and 2y = x -4. Which four lines form the four sides of a rectangle? Explain how you know.	A simple game is devised in which 3 white and 3 black balls are placed in a bag, and the bag is shaken. Without looking, you take two balls from the bag. You win the game if the two balls are the same color. If they are different colors, then I win the game. Is this a fair game? If not, who is most likely to win the game? Explain your reasoning	Which One Doesn't Belong?
Open Middle Task - What is the fewest number of transformations needed to take pre-image ABCD to image A'B'C'D'?  A B C D A' B' C' D' Pre-Image Image	Make a heart using any of the shapes below. You can change their size, but you cannot change their shape. You can use a shape more than once. 	Would you rather push a 20 kg box up the hypotenuse of triangle A OR triangle B? Whichever option you choose, justify your choice. A  B  	In the diagram , three different line segments each divide a quarter-circle into two regions of equal area. Rank those three segments from shortest to longest. 	Open Middle Task - Using any integers, fill in the blanks so that the equation's graph is a circle, the circle is completely inside the 1st quadrant, the circle's radius is a whole number 1 through 9, and the circle has the largest area possible. $x^2 + \_\_\_x + \_\_\_ + y^2 + \_\_\_y + \_\_\_ = \_\_\_$	Would you rather choose to play Game A: Cost $5, flip two coins and win $8 if they match (both heads or both tails), $0 if they do not match, OR Game B: Cost $2, roll two dice and win $3 if sum is not prime, $0 if sum is prime. Expain your choice. Game A Cost: $5 Flip 2 coins coins match... you win $8. coins don't match... you win $0. OR Game B Cost: $2 Roll 2 dice. Find their sum. sum is prime... you win $0. sum is not prime... you win $3.	NCTM Illuminations - Brain Teasers

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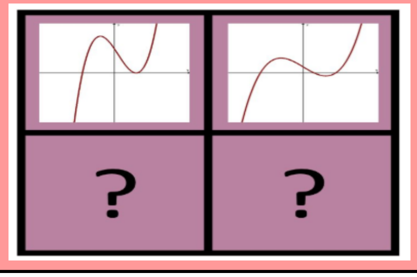
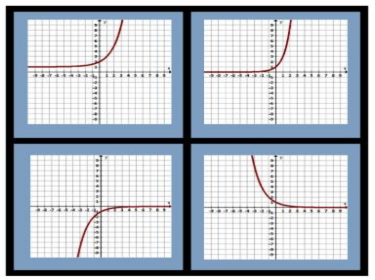
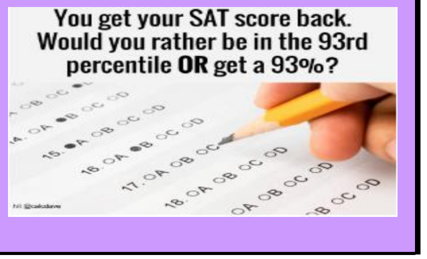
GSE Advanced Algebra & Algebra II Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Quadratics Revisited	**Operations with Polynomials**	**Polynomial Functions**	**Rational & Radical Relationships**	**Exponentials & Logarithms**	**Mathematical Modeling**	**Inferences and Conclusions from Data**
Web-based Resources						
Illustrative Mathematics Lessons - Complex Numbers and Rational Exponents	Illustrative Mathematics Lessons - Polynomials and Rational Functions (Lessons 1 - 15)	Illustrative Mathematics Lessons - Polynomials and Rational Functions (Lessons 1 - 15)	Illustrative Mathematics Lessons - Polynomials and Rational Functions (Lessons 16 - 22)	Illustrative Mathematics Lessons - Exponential Functions and Equations	Illustrative Mathematics Lessons - Sequences and Functions	Illustrative Mathematics Lessons - Statistical Inferences
Robert Kaplinsky Lesson - Where Would The Angry Birds Have Landed?	Explore the composition of functions applet to determine and verify if one function is an inverse of another function. https://www.geogebra.org/m/mpzEhxsq#material/vwray69h	GeoGebra Activities - Polynomial Functions	GeoGebra Activity - Rational Function End Behavior	Understanding "e": https://www.geogebra.org/m/mpzEhxsq#material/sjse4mtB	Analyze the graph of polynomial functions and describe the characteristics of the graph: https://www.geogebra.org/m/mpzEhxsq#material/s97jVM5Z	GeoGebra Activities - Statistics
GeoGebra Activities - Quadratic Equations	Illustrative Mathematics Task - Building an Explicit Function By Composition	Explore, analyze and describe the characteristics of a cubic function using this applet. Descrbe what happens to a graph when a, b, c, and d change.	GeoGebra Activities - Piecewise Functions	Desmos Acitivity - Polygraph: Exponential & Logarithmic Functions	Compare and contrast various functions: https://www.geogebra.org/m/mpzEhxsq#chapter/46557	GeoGebra Activities - Confidence Interval
Desmos Activities - Quadratic Functions	Illustrative Mathematics Task - A Sum of Functions	Desmos Activity - Constructing Polynomials	GeoGebra Activities - Power Functions	Robert Kaplinsky Lesson - How Much Money Should Dr. Evil Demand?	Recreate this graph using piecewise functions using www.desmos.com or some other digital graphing tool.	Understanding Taxes: IRS Simulations
Illustrative Mathematics Task - Evaluating Exponential Expressions	Illustrative Mathematics Task - Combined Fuel Efficiency	Desmos Activity - Polygraph: Polynomial Functions	Desmos Activities - Piecewise Functions	Pandemic Mathalicious Activity	Recreate this graph using piecewise functions using www.desmos.com or some other digital graphing tool.	US Census Bureau: Statistics Activities
Hands-On and Kinesthetic Activities						
Open Middle Task - Using any number between 1 and 9, fill in the boxes to create a true statement. You may only use a number once. $\frac{X^{\square}}{X^{\square}} < X^{\left(\frac{\square}{\square}\right)} < \frac{X^{\square}}{X^{\square}}$	Open Middle Task - Determine values to place in the missing spots to solve the equation below. You may use integer values. $\frac{x^2+2x-8}{x^2+9x+20} \div \frac{x^2+\square x+\square}{x^2+\square x+\square} = \frac{x-1}{x+5}$	What graphs are needed to complete this set? Why? (Incomplete Set #2)  	Open Middle Task - Create an absolute value equation such that x = – 2 is an extraneous solution.	Which graph doesn't belong? Why? (Graph #33) 	Cut out 8 strips of paper from four different sheets of paper, two strips of each of the four colors. Follow the steps to create the Dragon Curve. Describe the curve using words, numbers, and drawings. https://cutoutfoldup.com/216-dragon-curve.php	You get your SAT score back. Would you rather be in the 93rd percentile OR get a 93%? 

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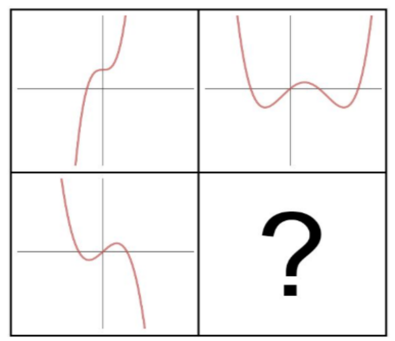
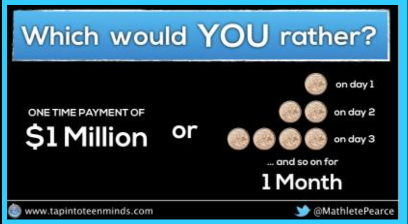
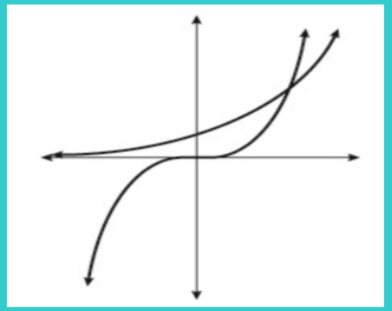
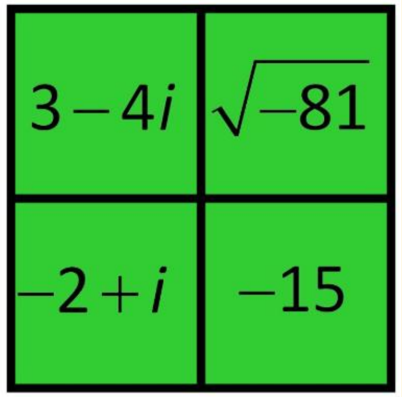
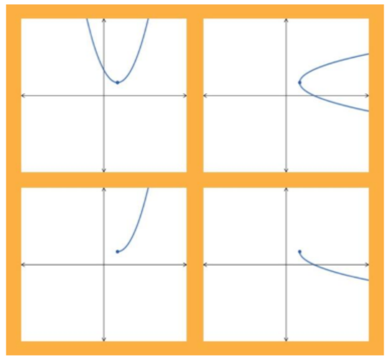
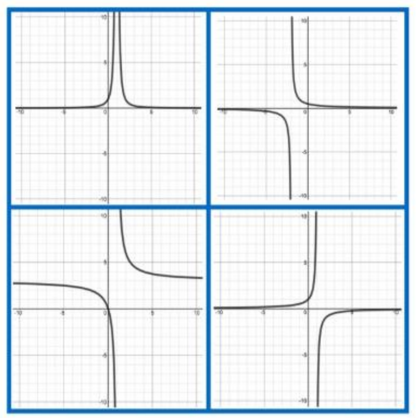
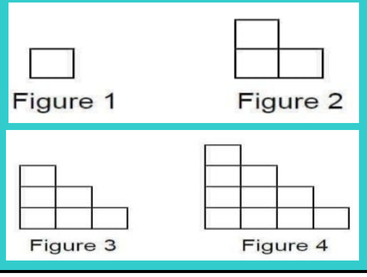
GSE Advanced Algebra & Algebra II Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Using the digits 0 to 9 at most one time each, fill in the boxes to make one function have no real roots, another function have one real root, and the last function have two real roots. $y=\square x^2+\square x+\square$ $y=\square x^2+\square x+\square$ $y=\square x^2+\square x+\square$	Open Middle Task - Using the digits 1 to 9 at most one time each, fill in the boxes to make a polynomial of the highest degree. $(\square x^{\square}+\square)^{\square}\cdot(\square x^{\square}+\square)^{\square}$	What graph is needed to complete this set? Why? (Incomplete Set #6) 	Open Middle Task - Using the digits 0-9 at most one time each, make both of these equations true. $\sqrt{\square\square}=\square\sqrt{\square}$ $\sqrt{\square\square}=\square$	Would you rather recieve a one time payment of 1 million dollars OR recieve a penny on day 1, two pennies on day 2, four pennies on day 3, and so on for a month? Why?  Which would YOU rather? ONE TIME PAYMENT OF $1 Million or on day 1 on day 2 on day 3 ...and so on for 1 Month www.tapintoteenminds.com @MathletePearce	What is the smallest integer n > 1 for which 3^n > n^9? 	US Census Lesson (Teacher & Student Version) - Over the Hill - Aging on the Normal Curve
Which one doesn't belong? Why? (Number Set #31)  $3-4i$ $\sqrt{-81}$ $-2+i$ -15	Find four positive integers a, b, c, and d such that the product abcd is equal to the sum of the squares, a^2 + b^2 + c^2 + d^2. Can you find a solution that: 1.) Uses the same number four times? 2.) Uses the same number three times? 3.) Uses the same number twice? 4.) Uses four different numbers?	If (x - 2) is a factor of the polynomial function P(x) = x^4 – 3x^3 + ax^2 – 6x + 14, and a is an unknown real number, what is the value of a?	Carpe Donut in Charlottesville, Virginia, has an interesting pricing scheme. You can buy one donut for $2, two donuts for $3, three for…well, you get the idea. This means that two people could pay less by purchasing their donuts together. Three people could do even better. So how does the average cost per donut change, and how much should we be paying for each?	Open Middle Task - Using the digits 0 to 9 at most one time each, fill in the boxes so that the values of each expression increases from least to greatest. Each number may only be used once. $\log\left(\frac{\square}{\square}\right)$ $\log_2 \square^{\square}$ $\log_2 \square - \log_2 \square$ $\log \square + \log \square$ $\log_2 \square + \log_2 \square$ ← Increasing in size	Mathalicious Lesson - XBox Xponential 	US Census Lesson (Teacher & Student Version) - The New Normal
Which one doesn't belong? Why? (Graph #4) 	There seems to be an interesting pattern between the first three powers of 11 and powers of (x +1). The digits of the number 11^n are the same as the coefficients of the polynomial (x+1)^n. I Does this pattern continue for n=3 and n=4? Is this pattern always true? $11^0=1 \quad (x+1)^0=1$ $11^1=11 \quad (x+1)^1=x+1$ $11^2=121 \quad (x+1)^2=x^2+2x+1$	(A) Find all the values of x for which the equation 9x = x^3 is true. (B) Use graphing technology to graph f(x)=x^3 – 9x. Explain where you can see the answers from part (A.) in this graph, and why. (C) Someone attempts to solve 9^x = x^3 by dividing both sides by x, yielding 9 = x^2, and going from there. Does this approach work? Why or why not?	Which graph doesn't belong? Why? (Graph #35) 	Open Middle Task - Using the integers 1 through 9, at most one time each, find the value of x that is closest to 0. $\log_6 \square - \log_6 \square = x$	How do you see the pattern growing? How many squares are in figure 10? Explain how you know. How many squares are in figure 55? How do you know? Can you describe this pattern with an equation? 	Suppose that SAT mathematics scores for a particular year are approximately normally distributed with a mean of 510 and a standard deviation of 100. (A) What is the probability that a randomly selected score is greater than 610? (B) Greater than 710? (C) Between 410 and 710? (D) If a student is known to score 750, what is the student's percentile score (the proportion of scores below 750)?

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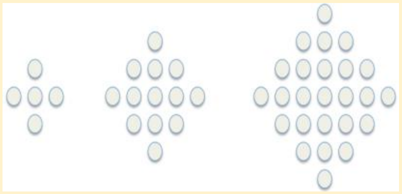
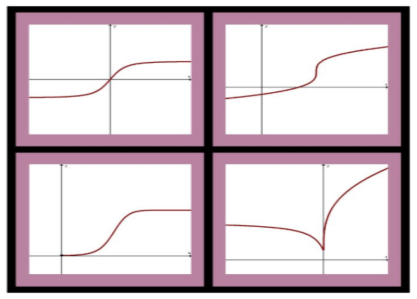
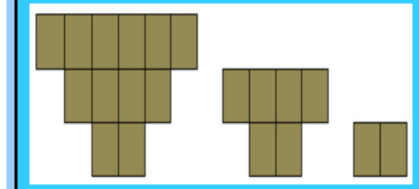
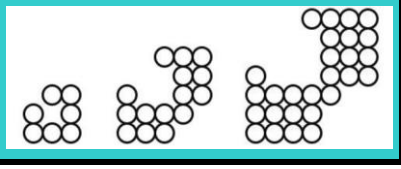
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Visual Patterns #148 - What are the next two images of the pattern? What equation describes this pattern? 	Open Middle Task - What numbers go in the blanks to make the equation true? $(2x^2+\_x+3)(\_x+4)$ $=4x^3+20x^2+30x+12$	Sketch the graphs of the functions described by f(x)=x^2 and f(x)=x^4. Label any points of intersection. Compare and contrast the key characteristics of the functions. Do the same for the graphs of f(x)=x^3 and f(x)=x^5, and for the graphs of f(x)=x^2 and f(x)=x^3.	Which graph doesn't belong? Why? (Graph #2) 	What are the next two images of this pattern? What equation describes this patttern? 	How do you see the pattern growing? What would the 4th case look like? What would the 0 case look like? What would the -1 case look like? Can you describe this pattern with an equation? 	Illustrative Mathematics Task - Strict Parents (Inferences and Conclusions)

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GSE Pre-Calculus Curriculum Map

Comprehensive Course Overview

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Introduction to Trigonmetric Functions	**Trigonometric Functions**	**Trigonometry of General Triangles**	**Trigonometric Identities**	**Matrices**	**Conics**	**Vectors**	**Probability**
Web-based Resources							
Explore the angles of the unit circle and describe the relationship between the degrees, radians, and unit circle.	Illustrative Mathematics Lessons - Trigonometric Functions	Explore trigonometric laws using the Geogebra activities here. Describe the behavior of each triangle and explain why it works.	Analyze the two visual proofs of a basic trigonometric identity. Using the applet to change the a value and translate the image. Describe the behavior and explain the trigonometric identities shown by these visuals.	Add two matrices using the interactive tool and explain the steps.	Conic Sections: Complete 7 Desmos Activites to interactively explore the details of conic sections	Analyze this video on vectors and understanding what a vector is: https://www.interactive-maths.com/vectors-and-scalars-video.html. Recreate the video using an app-based or online recording tool such as Garage Band, iMovie, Educreations, or some other app to explain it to someone who is first learning the concept.	Calculuate the probability of a win, loss, or tie for this basketball team. Complete the entire activity using the resources on the webpage.
Explore the six basic trig functions and complete a summary presentation outlining the specific characteristics of each typ of function given the information provided at this webpage (Math Open Ref).	Describe the details of the video shown here. Explain the details of the six basic trig functions usig trigonometric intuition.	Solve the oblique triangles using the Law of Sine and Law of Cosine.	Play the trigonometric identities game to practice basic trig identities	Explore the applet at this link. Describe the connection between trigonometric functions and the commutativity of matrices.	Conic Sections - Interactive 3-D graph. Explore the various conic sections using this interactive graph. Explain the characteristics of each type of function.	Analyze this video on writing vectors using vector notation: https://www.interactive-maths.com/vector-notation-video.html. Recreate the video using an app-based or online recording tool such as Garage Band, iMovie, Educreations, or some other app.	To play or not to play? That is the question.

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GSE Pre-Calculus Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Explore Right Triangles in the Unit Circle. Identify reference angles, coterminal angles, and the measures of sine and cosine of the angle presented - https://www.geogebra.org/m/mpzEhxsq#material/hz4rzhqv	Burning Daylight Activity - explore sinusoidal waves to model daylight data and make predictions - https://teacher.desmos.com/activitybuilder/custom/56d8aee5637a85a2078c257d	Trigonometry Jeopardy Review Game	Explore cofunction identities and explain the relationship between sine and cosecant, cosine and secant, and tangent and cotangent based on the behavior of Θ_1 and Θ_2. https://www.geogebra.org/m/mpzEhxsq#material/pG9ZT8zR	Subtract one matrix from another using the interactive tool and explain the steps.	Explore each of the Conic Sections using the applet and describe the characteristics of the image as you move the plane using the tilt, shift, and height features. https://www.geogebra.org/m/mpzEhxsq#material/nbtRZqd9	Analyze the video on resultant vectors and combining vectors given as line segments: https://www.interactive-maths.com/resultant-vectors-video.html. Recreate the video using an app-based or online recording tool such as Garage Band, iMovie, Educreations, or some other app.	Analyze the Expected Value discussion and write a synopsis of the information. The discussion can be found at this link: http://www.shodor.org/interactivate1.9/discussions/pd10.html
Explore sine and cosine in 3D using the Unit Circle applet. Describe what you see using precise mathematical vocabulary. https://www.geogebra.org/m/mpzEhxsq#material/datzhvc9	Compare and contrast the graphs of sine and cosine functions using the applet: https://www.geogebra.org/m/mpzEhxsq#material/azzwxBPC	Create a multimedia presentation demonstrating how to find the area of an oblique triangle.	Analyze the visuals presented at this site. Describe the connections between the trig functions and the Pythagorean theorem and similar triangles based on the information presented.	Multiply a matrix by a scalar using the interactive tool and explain the steps.	Explore the effects of the coefficients of the General Form of a conic section equation using the following applet: https://www.geogebra.org/m/mpzEhxsq#material/pXMFCnha. Describe the behavior of the graph and submit a brief paragraph summary showing the behavior ad characteristics of the graph.	Analyze the video on combining column vectors and understanding the resultants of column vectors: https://www.interactive-maths.com/resultants-of-column-vectors-video.html. Recreate the video using an app-based or online recording tool such as Garage Band, iMovie, Educreations, or some other app.	Stock Exchange Game: Play the Stock Exchange game, answer the questions, and write a brief description of how expected value is used in the New York Stock Exchange.
Analyze the sine wave and the superposition of sine waves using the activities here. Describe the period, amplitude, and the effects of overlapping multiple waves in space and time.	Explore the periodicty of trigonmetric functions. Describe how the period affects the graph of the sine, cosine, and tangent functions: https://www.geogebra.org/m/mpzEhxsq#material/Eg8pkmAY	Prove and use the Law of Sine and Law of Cosine to solve problems. Use the following applet to justify the specific proofs. Describe what is happening in the activities. https://www.geogebra.org/m/mpzEhxsq#chapter/26933	Prove trigonometric identities using the following solver. Using the information provided, explain the steps to justify the reasoning: https://www.snapxam.com/calculators/proving-trigonometric-identities-calculator	Multiply two matrices using the interactive tool and explain the steps.	Use the Interactive Conic Sections grapher using Standard Form parameters to explore and describe the behavior of conic sections. Describe the graphical behavior using words, symbols, and visual representations of the graphs to justify your reasoning. https://www.geogebra.org/m/mpzEhxsq#material/ssNngpcj	Analyze this video on combining a scalar with a vector (scalar multiplication): https://www.interactive-maths.com/scalar-multiplication-video.html. Recreate the video using an app-based or online recording tool such as Garage Band, iMovie, Educreations, or some other app.	The Monty Hall Problem: Use this link to explore the Monty Hall problem. Describe the details of the problem and explain the probability behind the solution.

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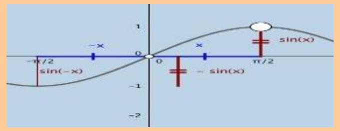
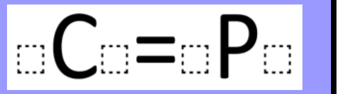
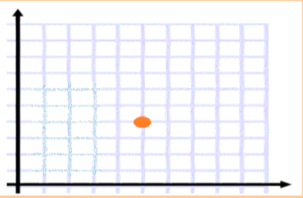
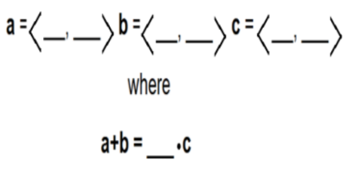
GSE Pre-Calculus Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Evaluate basic trigonometric functions using mental reasoning strategies	Explore the various graphs of trigonometric functions and describe the behaviors and characteristics of each type of graph: https://www.geogebra.org/m/mpzEhxsq#chapter/46563	Explore the various cases of Law of Sine and Law of Cosine. Describe, in detail, the ambiguous case and Cases 1, 2, 3, and 4 for finding the third side after exploring the app: https://www.geogebra.org/m/mpzEhxsq#chapter/26933	Trigonometric Identities Online Math Games	Matrix Operations Kahoot Game: Play and Have Fun!	Recreate this graph using www.desmos.com or some other graphing tool. Show your steps and the equation you created. Explain your reasoning.	Analyze the video on how to calculate the magnitude (or size) of a vector. https://www.interactive-maths.com/magnitude-of-a-vector-video.html Recreate the video using an app-based or online recording tool such as Garage Band, iMovie, Educreations, or some other app.	Advanced Monty Hall Simulation: Complete this simulation after reading and engaging with the Monty Hall Problem above.
Hands-On and Kinesthetic Activities							
Use a paper plate, piece of plain white paper, construction paper, etc. to draw the unit circle (without the aid of the internet). Include both degree measures and radian measures, and accurate coordinates.	Recreate this graph on paper (graph paper or plain white paper) and extend to -2π on the left and 2π on the right. 	THINK LIKE AN ENGINEER! Use a protractor, spaghetti noodles, or string to determine the distance to cross the river. Describe your mathematical calculations and reasoning.	Magic Square Trig Identities	Matrix Cube Activity	Look at Graph 32 on this webpage. Provide a rationale for which one doesn't belong.	Create notecards summarizing the information presented in this interactive tool to record the purpose and importance of vectors. Use the following link: http://immersivemath.com/ila/ch02_vectors/ch02.html	Open Middle Task - Using the digits 1 through 9, once each, fill in the blanks so that the statement is true.  □C□=□P□
How far away should you sit from the TV? (Mathalicious Activity)	Using the digits 1 to 9 at most one time each, fill in the empty blanks so that you create a triangle whose Cos ϴ = √2/2: (5, 4), (__,__) and (__,__). 	Create a clinometer using these steps HERE. Go outside and find a tree. Use the clinometer you created to determine the height of the tree. Describe your steps and explain your solution.	Discovering Trig Identities (Reciprocal identities Flipchart)	Experiment with the matrix tool found at this site. Explain what is happening with matrix multiplication by adjusting the numbers and hovering over the various elements in different positions to make sense of the mathematical calculations. Explain the mathematical reasoning.	Introduction to Conic Sections Hands-On Graphing Calculator Activity	Using any number between 0 and 9, fill in the boxes to create a true statement. You may only use a number once.  $a=\langle \_\_,\_\_ \rangle$ $b=\langle \_\_,\_\_ \rangle$ $c=\langle \_\_,\_\_ \rangle$ where $a+b=\_\_\cdot c$	Read and interpret theinformation on math games and expected value. Take detailed notes. Create a presentation to explain the purpose and examples for calculating expected value.

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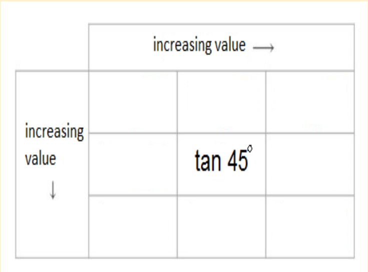
GSE Pre-Calculus Curriculum Map

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Write the numerals 1 - 9 on small pieces of paper or index cards. Use the digits 1 through 9, at most one time each, to fill in the boxes and make THREE true number sentences: $\sin(\frac{\square\pi}{\square}) = 0$ $\sin(\frac{\square\pi}{\square}) = \frac{1}{2}$ $\sin(\frac{\square\pi}{\square}) = 1$	Write the numerals 1-9 on small pieces of paper or index cards. Using the digits 1 to 9 at most one time each, place a digit in each box to make the trigonometric equation below true: $\square = \square \sin\left(\frac{\pi}{\square}(\square - \square)\right) + \square$	Complete the Trigonometric Applications Outside of the Classroom activity at the bottom of this webpage after completing the Clinometer Activity Part 1.	Proofs of Identities Graphing Calculator Activity	Write the numerals 1-9 on small pieces of paper or index cards. Using the digits 1-9, each only once, fill in the blanks to create the smallest possible value for $\begin{bmatrix} \_ & \_ & \_ \\ \_ & \_ & \_ \end{bmatrix}\begin{bmatrix} \_ \\ \_ \\ \_ \end{bmatrix} = \begin{bmatrix} a \\ b \end{bmatrix}$	Conic Sections Paper Cup Activity	What are the properties of vectors? How does adding vectors relate to multiplying by a scale factor?	Create a game board and game using probability basics and expected value. Outline the details of the game instructions and make predictions on the outcomes based on your game setup.
Using the following trig ratios, complete the following table: cos 30º, sin 30º, cos 45º, sin 45º, tan 30º, cot 30º, sec 30º, csc 30º.  increasing value → increasing value ↓ tan 45°	Trigonometric Applications Outside the Classroom (NZ Maths Activity)	Hands-on Trigonometry Activities (NCTM)	Discovering Trig Identities (Graphing Calculator Activity)	Matrices Word Problems	Wax Paper Folding - Discovering the Conic Sections	Vector Voyage Engineering Activity	Write the numerals 1-9 on small pieces of paper or index cards. Using the digits 1-9, each only once, fill in the blanks to create the smallest possible value for $20 \leq \square C \square \leq 30$
Complete exercises 1 & 2 related to circular arcs and circular sectors using the unit circle Geogebra applet HERE or the unit circle created from the previous activity.	Is a 51-foot ladder long enough? In 2005, when discussing the proposed border wall between the United States and Mexico, then- Arizona governor Janet Napolitano said, "You show me a fifty foot wall. I'll show you a fifty-one foot ladder." Politics aside, would a 51-foot ladder actually be long enough to climb a 50-foot wall?	Include these problems in your online learning platform for students to engage with and discuss with their peers via virtual platforms.	Print the following handout. Show steps and provide a description to explain why the solution provided is correct. Be detailed in your justification.	Matrices Fish Activity	Oustide Ellipse Activity	Science of NHL Hokey	Design a Lottery Game GADOE Frameworks Task

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RESOURCES FOR CALCULUS-BASED HIGH SCHOOL COURSES

Calculus	Advanced Mathematical Topics	Multivariable Calculus	Engineering Calculus	Differential Equations	History of Mathematics
Web-based Resources					
Limits & Continuity: https://www.geogebra.org/m/mpzEhxsq#material/Jf7rP6uK	Polar Rose Online Graphing Activity: https://www.geogebra.org/m/jbYVwRwp	Polar Rose Online Graphing Activity: https://www.geogebra.org/m/jbYVwRwp	Determine an equation to represent this pendulum wave. Graph that equation using an online graphing tool.	Recreate this Limaçon using www.desmos.com or some other digital graphing tool.	MacTutor History of Mathematics Activities
Understanding "x approaching c"	Recreate this graph using one single function. Show your equation and explain your reasoning.	Recreate this graph with one function using www.desmos.com or some other graphing tool.	Ohio State University Online Resources	Recreate this graph using www.desmos.com or some other digital graphing tool. Describe your steps.	Going Places with Mathematicians
Continuity of a Function Lesson	Calculate the dimensions of the von Koch Snowflake	Recreate this graph with one function using www.desmos.com or some other graphing tool.	Engineering Calculus for Electrical Engineers Course	Determine an equation to represent this pendulum wave. Graph that equation using an online graphing tool.	History of Mathematics Video Library
Maximizing Volume Activity	Explore the derivatives of trig functions. Describe the details and behaviors of each derivative based on what you observe with the applet.	Determine an equation to represent this pendulum wave. Graph that equation using an online graphing tool.	Card Sort: Derivatives Match	Engineering Calculus and Differential Equations for Electrical Engineers Course	Take a virtual tour of a museum to analyze the sculptures of Henry Moore. Describe the impact mathematics had on the sculptures of Henry Moore.
Analyzing Graphical Solutions to Polynomial Equations & Inequlaities	Burning Daylight: Sinusoidal Models	Explore L'Hopital's Rule using this applet. Explain the behavior of the graphs.	Route to Infinity Activity	Differential Equations and Slope Fields Graphing Calculator Activity	Choose one theorem at this site to explore further. Create a multimedia presentation describing the theorem and showing the mathematical history related to the chosen theorem.
Parametric Equations Activity	Number Theory Activities (Wolfram MathWorld)	Multivariable Calculus Demonstrations	Internet Differential Equations Activities (IDEA) - Washington State University	Internet Differential Equations Activities (IDEA) - Washington State University	Read and analyze the text Geometry in the Age of Enlightenment

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RESOURCES FOR CALCULUS-BASED HIGH SCHOOL COURSES

Calculus	Advanced Mathematical Topics	Multivariable Calculus	Engineering Calculus	Differential Equations	History of Mathematics
Polar Coordinates Activity	Read the content presented here on Karnaugh Maps: http://www.ee.surrey.ac.uk/Projects/Labview/minimisation/karnaugh.html Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Read the content presented here on Eigenvectors and Eigenvalues. https://setosa.io/ev/eigenvectors-and-eigenvalues/ Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Free Engineering Calculus Video Lessons	Active Calculus: Separable Differential Equations Practice Activities	Read and analyze the source titled A Brief History of the Axiomatic Method
Hands-On and Kinesthetic Activities					
Explain how Riemann sums approximate the value of a definite integral. Describe, in detail, the behavior of the graphs of each of the functions listed and describe the area when the number of rectangles increase or decrease.	Would You Rather? Series Problem	Read the content presented here. https://www.unioviedo.es/compnum/labs/lab07_der_int/lab07_der_int.html Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Read the content presented here. http://tutorial.math.lamar.edu/Classes/CalcIII/TripleIntegrals.aspx Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Differential Equations Practice Activity	Create a brochure or electronic presentation comparing and contrasting the different number systems discussed in the history of mathematics. Review the details of each historical number system found HERE.
Open Middle Problems: Calculus	Determine an equation to represent this pendulum wave. Graph that equation using an online graphing tool.	Parametric Curve Project - Create a parametric curve using an online graphing tool.	Read the content presented here. https://math.la.asu.edu/~dummit/docs/calc3_3_multiple_integration.pdf Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Read the content presented here. https://www.unioviedo.es/compnum/labs/lab07_der_int/lab07_der_int.html Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Write a brief report answering the question: Where Did Numbers Originate?

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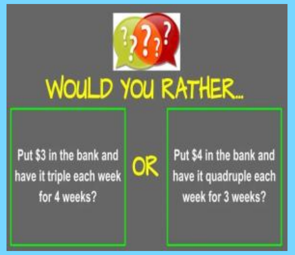
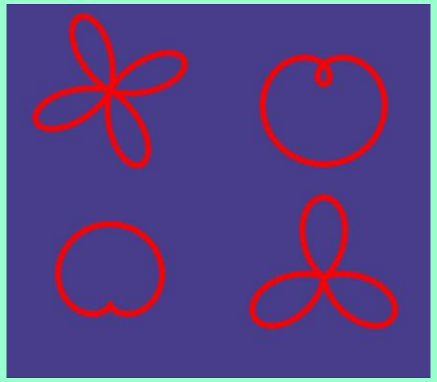
RESOURCES FOR CALCULUS-BASED HIGH SCHOOL COURSES

Calculus	Advanced Mathematical Topics	Multivariable Calculus	Engineering Calculus	Differential Equations	History of Mathematics
Introductory Calculus	Park City Mathematics Institute: Differential Equations Learning Activities	Online Calculus Refresher Topics: Pick 3 topics that you need to review and create a presentation with detailed summary notes describing the details outlined at this site.	Park City Mathematics Institute: Differential Equations Learning Activities	Park City Mathematics Institute: Differential Equations Learning Activities	Read and summarize this article from Cornell University: Iterative methods for linear systems of equations: A brief historical journey
 WOULD YOU RATHER... Put \$3 in the bank and have it triple each week for 4 weeks? OR Put \$4 in the bank and have it quadruple each week for 3 weeks? Would You Rather? Series Problem	Read the content presented on this site. Create a multimedia presentation summarizing the key ideas presented and explain what you learned to someone else who have never learned the content.	Read the content presented on this site regarding The Dot Product and the Cross Product. Create a multimedia presentation summarizing the key ideas presented and explain what you learned to someone else who have never learned the content.	Differential Equations and Slope Fields Graphing Calculator Activity	Read the content presented on this site. Create a multimedia presentation summarizing the key ideas presented and explain what you learned to someone else who have never learned the content.	Read and summarize the Cardinality of Sets (Click HERE for more information)
Calculus Distance Learning Activities	The Racing Game: Probability and Combinatorics Activity	The Goblet Project Using a technology tool such as Mapel or Desmos, design a wine goblet that meets the following requirements: (1) To reduce the cost, the wineglass will be molded using a symmetric mold: therefore, the goblet must be a solid of revolution. (2) The goblet must hold 150 cm^3 of wine. (3) The goblet should not be easily tipped over. Therefore, the height H of the center of mass must be suitably related to the base radius R. It's required that H/R <= 3. (4) It requires no more than 150 cm^3 of glass to manufacture the wine goblet. (5) The stem thickness must be at least 1/4 cm at its thinnest point.	Which One Doesn't Belong and Why? 	Read the content presented here on Eigenvectors and Eigenvalues. http://tutorial.math.lamar.edu/Classes/DE/LA_Eigen.aspx Create a multimedia presentation summarizing the information you learned and explaining the concept to a classmate.	Read and summarize Gödel's Incompleteness Theorems

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RESOURCES FOR ALL OTHER HIGH SCHOOL COURSES

Foundations of Algebra	Technical College Readiness Mathematics	College Readiness Mathematics	Advanced Mathematical Decision Making	Mathematics of Finance	Mathematics of Industry and Government
Web-based Resources					
Foundations of Algebra modules in GADOE TRL Essential Toolkit (add Foundations of Algebra to the search bar and select the mathematics filter on the left)	Resources in TRL from Hall County	SREB College Readiness Mathematics Course	AMDM Resources in GADOE TRL Essential Toolkit (add AMDM to the search bar and select the mathematics filter on the left)	The Bean Game Budgeting Activity	Mathematics of Industry and Government Projects for Students (Choose 1 project to complete from this site.)
Learning About College Degrees and Lifetime Earnings (US Census Bureau Activity)	Looking at Numbers of Births using Line Graphs	College Algebra and Problem Solving	The Science of Uncertainty and Data	Virtual Stock Exchange Game (Create a free account to play)	Gamz, Inc. Marking Science
How Much Water Should You Be Drinking?	The Bean Game Budgeting Activity	Interactive Mathematics	Migel Chooses a College Simulation	Creating and Managing a Budget Activity	Decision Tree: Making a Decision with Impact
Order of Operations - Choose any 5 problems to complete. Check your answers using www.desmos.com/scientific	Clothesline Math - Slope Intercept: Compare and contrast the slopes and y-intercepts of three linear functions.	Desmos Learning Activities	Pizza Pi Activity	Stock Market Game Simulator (Sign Up to Play - FREE)	Latisha Develops an Investment Plan Activity
Using Fractions to Compare Amusement Parks by State	Desmos - Nana's Chocolate Milk Activity: Use double number lines and proportional reasoning to help Dan fix his chocolate milk mix-up. (Sign up for free to access the activity. Creation of Class Code required.)	Fat Chance: Probability from the Ground Up (Harvard University)	Interactive Mathematics	Learning How FAFSA Works Activity	Speedy Delivery Activity
Which Gasoline is the Cheapest?	Estimation 180 Numeracy Lessons	Illustrative Mathematics Lessons - Functions (Lessons 1 - 11)	Mocha Modeling: Starbucks Locations	Understanding Taxes: IRS Simulations	Migel Chooses a College Simulation
Desmos - Des-Farm Find part-to-whole ratios of plants on a farm and use these ratios to determine th eequivalent fraction, decimal or percent representation. (Sign up for free to access the activity. Creation of Class Code required.)	Estimation 180 Clothesline Mathematics Activities	Desmos Activity - Card Sort: Modeling (Linear, Quadratic, & Exponential)	Understanding Taxes: IRS Simulations	US Census Bureau Mathematics Learning Activities	Pizza Pi Activity

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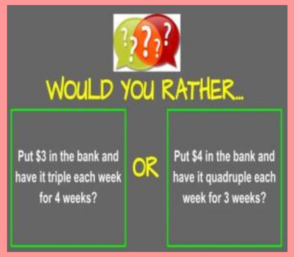
RESOURCES FOR ALL OTHER HIGH SCHOOL COURSES

Foundations of Algebra	Technical College Readiness Mathematics	College Readiness Mathematics	Advanced Mathematical Decision Making	Mathematics of Finance	Mathematics of Industry and Government
Hands-On and Kinesthetic Activities					
Monthly Data Plan Task (Yummy Math)	Open Middle Problems	Open Middle Problems	1996 Theme Essay: Mathematics and Decision Making - Read this article. Create a brochure or presentation that outlines the details of the presentation. Share at least 3 things that you learned related to mathematics and decision making	Financial Institutions Comparison Conclusions	Purchasing Collision Insurance Activity
Which One Doesn't Belong	Which One Doesn't Belong	Which One Doesn't Belong?	Visual Patterns	The Allowance Game (Iowa State University)	Frankfurther High: Hotdog Sales
Would You Rather Math Problems	Would You Rather Math Problems	Would You Rather Math Problems	Create a Careers in Mathematics brochure using the information provided at this website.	Would You Rather? Money Question  WOULD YOU RATHER... Put \$3 in the bank and have it triple each week for 4 weeks? OR Put \$4 in the bank and have it quadruple each week for 3 weeks?	1996 Theme Essay: Mathematics and Decision Making - Read this article. Create a brochure or presentation that outlines the details of the presentation. Share at least 3 things that you learned related to mathematics and decision making
Open Middle Problems	Using the vocabulary of domain, range, input, output, relation and function, explain the connection between each of these vocabulary terms and the real life experience described in the scenario below. Lin has a dogsitting business. She babysat three nights last week. One night she babysat for three hours and earned \$45. The next night she babysat two hours and earned \$30. On the third night she babysat five hours and earned \$75. She knows if she can babysit for 10 hours she will earn \$150.	Read this article. Create a multimedia presentation summarizing what you learned from the article and explain it to someone else using explicit details and citing evidence from the article.	Read this article. Create a multimedia presentation summarizing what you learned from the article and explain it to someone else using explicit details and citing evidence from the article.	Read this article. Create a multimedia presentation summarizing what you learned from the article and explain it to someone else using explicit details and citing evidence from the article.	Read this article. Create a multimedia presentation summarizing what you learned from the article and explain it to someone else using explicit details and citing evidence from the article.

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<table>
<tr><th colspan="6">RESOURCES FOR ALL OTHER HIGH SCHOOL COURSES</th></tr>
<tr><th>Foundations of Algebra</th><th>Technical College Readiness Mathematics</th><th>College Readiness Mathematics</th><th>Advanced Mathematical Decision Making</th><th>Mathematics of Finance</th><th>Mathematics of Industry and Government</th></tr>
<tr><th colspan="6">Hands-On and Kinesthetic Activities</th></tr>
<tr><td>Huge Key Lime Pie Task</td><td>Create a flipbook of a series of transformations. You will need 6 small pieces of paper. Ensure they're all the same size. Draw a scalene triangle on the first page. Translate each vertex of the triangle down 2 spaces and right 1 space. Repeat the procedure until all six pages have a triangle plotted on them. Stack the cards in order and flip through them to view the traveling triangle.</td><td>Find four positive integers a, b, c, and d such that the product abcd is equal to the sum of the squares, a^2 + b^2 + c^2 + d^2. Can you find a solution that: 1.) Uses the same number four times? 2.) Uses the same number three times? 3.) Uses the same number twice? 4.) Uses four different numbers?</td><td>Ice Cream Scoop Task</td><td>The Mint Instructional Resources</td><td>Linear Programming Activities - Share a detailed process and explanation to justify how you arrived at the solution</td></tr>
</table>

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Additional Web-Based Teacher Support Resources:

Free Math Apps for all Units

Site Name	Grade Level(s)/Course(s)	URL/Access Link
Math Open Ref	High School	https://www.mathopenref.com/
Pre-K Story Collections	PreK	https://www.mathlearningcenter.org/resources/lessons/pre-k-story-collections
Math Learning App	PreK - 5th	https://www.mathlearningcenter.org/resources/apps
Rio School District Remote Learning Activities	PreK - 8th	https://docs.google.com/document/d/1WCn5lhs5t0064HipqcgpUQNsugMTOFo3_aVJq00_07w/edit?usp=sharing
GPB- PBS Learning Media	PreK - 12th	https://gpb.pbslearningmedia.org/
Bedtime Math Stories	K - 5th	http://bedtimemath.org/fun-math-at-home/
Steve Wyborney Online Math Resources	K - 5th	https://stevewyborney.com/category/resources/
Same but Different Math	K - 8th	https://www.samebutdifferentmath.com/
US Census Bureau Mathematics Activities	K - 12th	https://www.census.gov/programs-surveys/sis/activities/math.html
Open Middle	K - 12th	https://www.openmiddle.com/
Would You Rather Math	K - 12th	http://www.wouldyourathermath.com/
YouCubed Tasks	K - 12th	https://www.youcubed.org/tasks/
Which One Doesn't Belong? Games and Activities	K - 12th	http://wodb.ca/
3-Act Tasks	K - 12th	https://teachers.wrdsb.ca/some7and8mathresources/resource-dashboard/3-act-tasks/
Visual Patterns	K - 12th	http://www.visualpatterns.org/
National Science Foundation	K - 12th	https://www.nsf.gov/news/classroom/mathematics.jsp
American Statistical Association	K - 12th	https://www.amstat.org/ASA/Education/K-12-Statistics-Education-Resources.aspx
NCTM Illuminations - Brain Teasers	K - High School	http://illuminations.nctm.org/BrainTeasers.aspx?id=4915
Illustrative Mathematics	K - High School	https://www.illustrativemathematics.org/free-resources/
Kaplinsky Lessons	K - High School	https://robertkaplinsky.com/lessons/
Estimation 180	K - High School	http://www.estimation180.com/
Same or Different Math Prompts	K - High School	https://samedifferentimages.wordpress.com/
Math Virtual File Cabinet	K - High School	https://teachers.wrdsb.ca/some7and8mathresources/
University of Cambridge Math Resources	K - High School	https://nrich.maths.org/frontpage
YouCubed Apps & Games	K - High School	https://www.youcubed.org/resource/apps-games/
National Council of Teachers of Mathematics	K - High School	https://www.nctm.org/freeresources/
Yummy Math	2nd - High School	https://www.yummymath.com/
Desmos Activities	3rd - 12th	https://teacher.desmos.com/
Math Talks	3rd - High School	http://www.mathtalks.net/
Clothesline Math Activities	4th - 8th	http://www.estimation180.com/clothesline.html
Figure This! Math Challenges	6th - 8th	https://figurethis.nctm.org/index.html
Open Up Resources	6th - 8th	https://access.openupresources.org/curricula/our6-8math
Calculation Nation	6th - 8th	http://calculationnation.nctm.org/
Math Worksheets (interactive)	6th - 8th	http://fawnnguyen.com/math-worksheets/
Geogebra Mathematics	4th - 12th	https://www.geogebra.org/t/math
Geogebra	Middle & High School	https://www.geogebra.org/materials
Geogebra Geometry	Middle & High School	http://www.geogebra.org/t/geometry
TI Activities	Middle & High School	https://education.ti.com/en/activities
Mathematics Assessment Project	6th - High School	https://www.map.mathshell.org/lessons.php
Mathalicious	6th - 12th	https://www.mathalicious.com/lessons/search?search%5Bquery%5D=general+triangles+trigonometry&commit=Search

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Statistics Teacher Lessons (STEW Activities) - AMA	6th - High School	https://www.statisticsteacher.org/category/stew-lesson-plan/
American Statistical Association	K - High School	https://thisisstatistics.org/digital-classroom-covid-19-social-distancing/
Core Math Tools (NCTM)	High School	https://www.nctm.org/coremathtools/
Math Online Resources	High School	https://sites.google.com/a/lusherschool.org/mrwhiteprecalc/home/fun
K-12 Choice Boards	K - 12th	https://www.google.com/url?q=https://apps.jefferson.kyschools.us/orchard/JCPS-Choice-Board-Portal?fbclid%3DIwAR12dTEytAqCGtP1UBJk_o5vHstF28KR8wfi2_wYDj0zzcLzZQEAVeBIbkA&sa=D&ust=1585236873356000&usg=AFQjCNFaWtNujx6SyTjLqmAjtUTUzavS7w
Mathematical Moments	K - 12th, Interdisciplinary	http://www.ams.org/publicoutreach/mathmoments/browsemoments?cat=all
TED	6th - 12th, Interdisciplinary	https://blog.ed.ted.com/2016/08/04/a-new-curated-digital-collection-of-videos-and-learning-resources-for-teachers-everywhere/
What's Going On In This Graph?	7th - 12th	https://www.amstat.org/ASA/Whats-Going-on-in-this-Graph.aspx
Daily Desmos	Middle & High School	http://dailydesmos.com/
Calculus resources YouCubed/ Stanford University Graduate School of Education	High School	https://www.youcubed.org/exploring-calculus/
Massachusetts Institute of Technology (MIT)	High School	https://ocw.mit.edu/high-school/mathematics/#hs-courses
Cut The Knot	High School	http://www.cut-the-knot.org/
Wolfram	Differential Equations	https://demonstrations.wolfram.com/topic.html?topic=Differential+Geometry&limit=20
Massachusetts Institute of Technology (MIT)	Advanced High School	https://ocw.mit.edu/courses/mathematics/

More Brain Break Resources:

Brain Breaks	All grades	https://brain-breaks.com/
Get Moving	All grades	https://www.eatsmartmovemorenc.com/wp-content/uploads/2019/08/Energizers_K-5_2015.pdf
Go Noodle	All grades	https://www.gonoodle.com/

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