NEW HANOVER COUNTY SCHOOLS

NHCS 8th Grade Math Scope & Sequence

Domain	Quarter 1	Quarter 2	Quarter 3	Quarter 4	EOG %
The Number System				NS.1, NS.2	See below
Statistics and Probability			SP.1, SP.2, SP.3, SP.4		16-20%
Expressions and Equations		EE.7, EE.8	EE.1, EE.3, EE.4	EE.2	(along with NS) 24-28%
Geometry	G.2, G.3, G.4, G.5	G.5	G.9	G.6, G.7, G.8	24-28%
Functions	F.4	F.4	F.1, F.2, F.3, F.5		28-32%
NC Check-In		District Created G.2, G.3, G.4, G.5, F.4	Check-In 1: EE.7, F.3, F.4, F.5, G.5	Check-In 2: EE.8, F.2, SP.1, SP.2, SP.3	
		NS.1 (incorporating NS.2), EE.1, EE.7, F.1, G.3			

Unit/Title	# of Days
Unit 8.0 - Beginning Year Activities, Week of Inspirational Math - Unit 1 Pre Assessment	5
Unit 8. 1 - Rigid Transformations and Congruence	19
Unit 8.2 - Dilations, Similarity, and Introducing Slope	19
Unit 8.3 - Proportional and Linear Relationships	20

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Unit 8.4 - Linear Equations and Linear Systems	20
Unit 8.5 - Functions and Volume	20
Unit 8.6 - Associations in Data	17
Unit 8.7 - Exponents and Scientific Notation	18
Unit 8.8 - Pythagorean Theorem and Irrational Numbers	18
EOG Review	
Total	**156**

***Note**: NDL = Non-Desmos Lesson*

Every Desmos resource is available in Spanish for ML learners. When opening the resource click the 3 dots and select "View PDF (Spanish)"

Unit 0 Beginning Year Activities, Week of Inspirational Math - Unit 1 Pre Assessment (~5 days)	
Unpacking and Standards	Introduction and meeting of students
Big Ideas	Getting to Know your students
Prior Learning	You could assess /review their integer and graphing points knowledge

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
	Week of Inspirational Math	The Week of Inspirational Maths (WIM) resources are free lessons and videos about math and mindset designed to inspire students. They are ideal for the first week of school, to get students excited for the year ahead, but can be used any time.		
	Getting to know you Desmos	This is intended to help you get to know your students and for them to get to know each other. It also gives students an opportunity to interact with Desmos tools in a non-math activity.		

	8.1 Readiness Check	The purpose of this Readiness Check is to understand what knowledge and skills students have about rigid transformations and congruence.		Complete the readiness check sometime before you begin Unit 1. This can be done all at once, or over a few days as a warmup.

Unit 1 Rigid Transformations and Congruence (~19 days)	
Unpacking and Standards	NC.8.G.2: Use transformations to define congruence. • Verify experimentally the properties of rotations, reflections, and translations that create congruent figures. • Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. NC.8.G.3: Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the x-axis and y-axis on two-dimensional figures using coordinates. NC.8.G.5: Use informal arguments to analyze angle relationships. • Recognize relationships between interior and exterior angles of a triangle. • Recognize the relationships between the angles created when parallel lines are cut by a transversal. • Recognize the angle-angle criterion for similarity of triangles. • Solve real-world and mathematical problems involving angles
Big Ideas	**Transformations (Lessons 1–6)** ● Describe and perform translations, rotations, and reflections on a grid. Defining Congruence (Lessons 7–9) ● Determine whether two figures are congruent using rigid transformations. **Applying Congruence (Lessons 10–12)** ● Use transformations to determine missing angle measurements and discover new angle relationships. Unit 1 Schoolnet Problems
Prior Learning	**Grades 3–6** ● Measuring angles ● Parallel lines ● Graphing points **Math 7** ● Sketching geometric shapes ● Angle relationships

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
		8.1 Readiness Check		
1.1	Transformers	I can describe how a figure moves and turns to get from one position to another.		This Pacman transformations (unvetted) desmos activity would be a good introduction to transformations prior to starting the unit. This lesson supports students in describing transformations using informal language, which will progress toward more precise language in upcoming lessons. If most students demonstrate a strong understanding of transformations in Problems 1 and 7 of the Readiness Check, this lesson may be omitted This lesson is designed for 35 minutes.
1.2	Spinning, Flipping, Sliding	I know the difference between translations, rotations, and reflections.	translation rotation reflection	This lesson has two parts: a Polygraph and a follow-up activity
1.3	Transformation Golf	I can decide which type of transformation will work to move one figure to another	clockwise counterclockwise pre-image image sequence of transformations transformation	
1.4	Moving Day	I can use the terms translation, rotation, and reflection to precisely describe transformations on a grid. I can use a grid to perform a translation, rotation, or reflection.		This lesson gives students an opportunity to extend their understanding of transformations to paper. If students show a strong understanding of describing and drawing transformations in earlier lessons, this lesson may be omitted. If omitted, be sure to discuss how to formally describe each type of transformation elsewhere in the unit.

				This lesson includes Teacher Presentation Screens
1.5	Getting Coordinated	I can apply transformations to points on a grid if I know their coordinates.	corresponding points	
1.6	Connecting the Dots	I can apply transformations to a polygon on a grid if I know the coordinates of its vertices.		Activity 1 includes a paper supplement.
NDL	Notes and Practice on Rigid Transformations	I can use the terms translation, rotation, and reflection to precisely describe transformations on a grid. I can use a grid to perform a translation, rotation, or reflection.		Teacher uses this day to give notes and practices translations, reflections and rotations appropriate for your class.
	Quiz 1	I can describe and perform translations, rotations, and reflections on a grid		You could give the Desmos Quiz or a teacher made quiz
1.7	Are They the Same?	I can determine whether or not two figures are congruent just by looking. Explain whether or not congruent corresponding sides is enough information to determine if polygons are congruent.	congruent	Activity 1 includes a paper supplement. Lesson 7-9 could be consolidated into one class period as these are not major work of the grade level standards.
1.8	No Bending, No Stretching	I can describe the effects of a rigid transformation on the lengths and angles of a polygon.	rigid transformations	The digital version includes a paper supplement. Lesson 7-9 could be consolidated into one class period as these are not major work of the grade level standards.
1.9	Are They Congruent?	I can decide whether or not two figures are congruent using rigid transformations. I understand whether or not congruent sides are enough to determine if two polygons are congruent.		Activity 1 includes a paper supplement. Lesson 7-9 could be consolidated into one class period as these are not major work of the grade level standards.

	Quiz 2	I can determine whether two figures are congruent using rigid transformations.		This could be used if you would like an additional assessment at this time.
	8.2 Readiness Check	The purpose of this Readiness Check is to understand what knowledge and skills students already have about positive and negative numbers, inequalities, and the coordinate plane.		
1.10	Transforming Angles	I can describe the effects of a rigid transformation on a pair of parallel lines. If I have a pair of vertical angles and know the angle measure of one of them, I can use vertical angles to determine missing angle measurements. I can identify congruent angles on two parallel lines cut by a transversal and use that to determine missing angle measurements.	transversal vertical angles	Note: You may need to explicitly emphasize the terms interior and exterior angles in this lesson, perhaps on the note taking page.
1.11	Tearing It Up	If I know two of the angle measures in a triangle, I can find the third angle measure.		Lessons 11 and 12 could be consolidated into one class period if students show a strong understanding of angle relationships in earlier lessons and in Problem 4 of the Readiness Check.
1.12	Puzzling It Out	I can explain using pictures why the sum of the angles in any triangle is 180 degrees.		Note: The relationship between the exterior and interior angles of triangles needs to be explicitly talked about here. Lessons 11 and 12 could be consolidated into one class period if students show a strong understanding of angle relationships in earlier lessons and in Problem 4 of the Readiness Check.
1.13	Tessellate	I can use rigid transformations to make interesting repeating patterns of figures.		This lesson gives students an opportunity to use their creativity to build and study complex patterns using the language of transformations. There is no new content

				introduced in this lesson. This could be utilized as an extension for early finishers or after an assessment. This lesson could span 1–2 class periods. This lesson includes a paper supplement.
NDL	Practice Day			
Unit 1	End Assessments			You could give the Desmos Assessment (A or B) or a teacher made test

Unit 2: Dilations, Similarity, and Introducing Slope(~19 Days)	
Unpacking and Standards	NC.8.G.2: Use transformations to define congruence. • Verify experimentally the properties of rotations, reflections, and translations that create congruent figures. • Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. • Given two congruent figures, describe a sequence that exhibits the congruence between them. NC.8.G.3: Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the x-axis and y-axis on two-dimensional figures using coordinates. NC.8.G.4: Use transformations to define similarity. •Verify experimentally the properties of dilations that create similar figures. • Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. • Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. NC.8.F.4: Analyze functions that model linear relationships. • Understand that a linear relationship can be generalized by $y = mx + b$. • Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (x, y) values or a graph. • Construct a graph of a linear relationship given an equation in slope-intercept form. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.
Big Ideas	**Dilations (Lessons 1–4)** ● Describe dilations in terms of their center of dilation and scale factor.

	● Apply dilations to figures on and off of a coordinate grid. **Similarity (Lessons 5–8)** ● Identify similar figures and properties of similar figures using transformations. **Slope (Lessons 9–10)** ● Explain slope in terms of similar triangles on the same line. ● Determine the slopes of lines. Unit 2 Schoolnet Problems
Prior Learning	**Math 7** ● Proportional relationships **Math 8, Unit 1** ● Rigid transformations ● Congruent figures

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
		8.2 Readiness Check		
2.1	Sketchy Dilations	I know what it means for two figures to be similar.		This lesson introduces students to concepts of dilation and similarity, which will be addressed in more depth in upcoming lessons. If most students demonstrate a strong understanding of dilations and similarity in Problem 7 of the Readiness Check, this lesson may be omitted.S
2.2	Dilation Mini Golf	I can identify the center and scale factor used in a dilation. I can apply a dilation to figures using a ruler.	dilation center of a dilation scale factor	Activity 3 includes a paper supplement. Note-the center of dilation must be around the origin, not around a certain point.
2.3	Match My Dilation	I can apply dilations to figures on a grid. I can describe the effect on an image when I use a scale factor that is greater than 1 , between 0 and 1 , or equal to 1 .		Note-this lesson has dilations around points other than the origin. You may want to skip this lesson.
NDL	Dilations on a grid	I can describe and apply dilations to polygons on a grid if I know the coordinates of the vertices and		Skip Desmos lessons 4-6 because NC standards focus on center of dilation around the origin and Desmos

		the center of dilation at the origin.		lessons include non-origin center of dilation. Supplemental Resource: Dilation Letter Activity These lessons could be used AFTER the NDL are completed, if time allows, Dilations on a Plane, Transformation Golf With Dilations Dilation Task Cards
NDL	Dilation sequences on a grid	I can describe and apply sequences of transformations on a grid.		Dilations on a grid
	Quiz 1	I can describe and apply dilations precisely in terms of their center of dilation and scale factor. I can apply dilations to figures on and off of a coordinate grid.		You could give the Desmos Quiz or a teacher made quiz
NDL	Proving congruence and similarity using sequences that include dilations	I can show that two figures are congruent or similar by applying a sequence of transformations.	Congruent Similar	Congruency and Dilations Dilation and Similarity
NDL	Practice with Sequences of Transformations that include dilations	I can show that two figures are congruent or similar by describing and applying a sequence of transformations.		Practice with many 8th grade standards Sequencing Task Cards
2.6	Social Scavenger Hunt	I can decide whether or not two polygons are similar based on their angle measures and side lengths. I can explain whether or not congruent corresponding angles are enough information to prove that two figures are similar.		This lesson could be used as enrichment (after similarity is clearly defined) for enrichment. This lesson includes Teacher Presentation Screens
2.7	Are Angles Enough?	I know whether or not two triangles are similar just by looking at their angle measures.		

2.8	Shadows	I can decide if two triangles are similar by looking at quotients of lengths of corresponding sides. I can figure out missing side lengths in pairs of similar triangles using the quotients of their side lengths.		This lesson supporters students in connecting similar triangles to slope in the next lesson. If students show a strong understanding working with similar triangles and proportional relationships in earlier lessons, this lesson may be omitted. If omitted, be sure to discuss how to determine missing side lengths in pairs of similar triangles using the quotients of their side lengths elsewhere in the unit.
	Quiz 2	Identify similar figures and properties of similar figures using transformations		You could give the Desmos Quiz or a teacher made quiz or skip this quiz
	8.3 Readiness Check	The purpose of this Readiness Check is to understand what knowledge and skills students already have about proportional relationships, the coordinate plane, and solving equations in context.		
2.9	Water Slide	I can show that all slope triangles on the same line are similar. I can figure out the slope of a line using slope triangles.	Slope	
2.10	Points on a Line	I can decide whether a point is on a line by finding quotients of horizontal and vertical distances.		This lesson extends students' work with slope by asking them to decide whether a point is on a line by finding quotients of horizontal and vertical distances. This lesson prepares students to work with linear equations in Unit 3.
NDL	Using Tables to find slope	I can determine the slope from a table.		Resource: Slope from a Table Reinforce zero slope and undefined slope
NDL	More practice with slope from tables and	I can determine the slope from two points.		Resource: Slope from a Table 2

	two points			
	Practice Day	Explain slope in terms of similar triangles on the same line and determine the slopes of lines.		
Unit 2	End Assessments			You could use the Desmos Assessments For A or B and supplement with teacher created questions for slope from tables

Unit 3: Proportional and Linear Relationships (~20 Days)	
Unpacking and Standards	NC.8.F.4 Analyze functions that model linear relationships. •Understand that a linear relationship can be generalized by $y = mx + b$. • Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (x, y) values or a graph. • Construct a graph of a linear relationship given an equation in slope-intercept form. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values. NC.8.EE.8: Analyze and solve a system of two linear equations in two variables in slope-intercept form. •Understand that solutions to a system of two linear equations correspond to the points of intersection of their graphs because the point of intersection satisfies both equations simultaneously. • Solve real-world and mathematical problems leading to systems of linear equations by graphing the equations. Solve simple cases by inspection.
Big Ideas	**Proportionality Revisited (Lessons 1–3)** ● Compare proportional relationships using their equations, tables, and graphs. **Slope-Intercept Form (Lessons 4–9)** ● Interpret the intercept and slope of the graph or equation of a linear relationship. **Solutions and Standard Form (Lessons 10–11)** ● Use the concept that a graph represents all solutions of an equation to solve problems. Unit 3 Schoolnet Problems
Prior Learning	**Math 6** ● Calculating unit rates **Math 7** ● Exploring proportional relationships **Math 8, Unit 2**

	● Calculating slope

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
8.3 Readiness Check				
3.1	Turtle Time Trials	I can graph a proportional relationship from a story. I can use the constant of proportionality to compare the pace of different turtles.		
3.2	Water Tank	I can graph a proportional relationship from an equation. I can tell when two graphs are of the same proportional relationship even if the scales are different.	rate of change	
3.3	Posters	I can compare proportional relationships represented in different ways.		This digital lesson includes an activity where students create visual displays. Supplemental Resource: Displaying Linear Functions 4 ways
3.4	Stacking Cups	I can find the rate of change of a linear relationship by figuring out the slope of the line representing the relationship.	linear relationship	
3.5	Flags	I can interpret the vertical intercept of a graph of a real-world situation. I can match graphs to the real-world situations they represent by identifying the slope and the vertical intercept. I can use patterns to write a linear equation to represent a situation.	vertical intercept	
3.6	Translations	I can explain where to find the slope and the vertical intercept in both an equation and its graph.		This lesson introduces the idea that any line in a plane can be considered a vertical translation of a line through the origin. If students show a strong

		I can write equations of lines using $y = mx + b$.		understanding of writing equations of lines in the coordinate plane in earlier lessons, this lesson may be omitted. If omitted, be sure to discuss how graphs of linear relationships can be interpreted as a translation of a graph of a proportional relationship.
3.7	Water Cooler	I can give an example of a situation that would have a negative slope when graphed. I can look at a graph and tell if the slope is positive or negative and explain how I know.		
3.8	Landing Planes	I can calculate positive and negative slopes given two points on the line. I can describe a line precisely enough that another student can draw it.		
3.9	Coin Capture	I can write equations of lines that have a positive or negative slope. I can write equations of vertical and horizontal lines.		
	8.3 Quiz			
	8.4 Readiness Check	The purpose of this Readiness Check is to understand what knowledge and skills students already have about the distributive property, combining like terms, and solving equations.		
Benchmark Window	County Benchmark 1	Units that will be assessed: Rigid Transformation and Congruence, Dilations, similarity and Introducing Slope, Linear Relationships		Window is from November 13th- 21st.
NDL	Practice graphing from an equation	I can write linear equations in order to reason about real-world situations.		Resource: Graphing from an Equation and points

NDL	Practice writing equations (y = mx + b) from graphs	I can write an equation using the slope formula from a given graph		Resource: Writing Equations from a Graph
NDL	Using Tables to find slope, intercept, and write equation (first set with y intercept, others without)	I can find slope, intercept, and write an equation using a given table.		Resource: Finding the Equation of a line from a Table
NDL	Writing equations given a point (not y intercept) and slope	I can write an equation when given a point and the slope.		
NDL	Writing equations given two points	I can write an equation when given two points.		
NDL	Additional practice writing equations with points and slope	I can write an equation when given a point and the slope. I can write an equation when given two points.		
NDL	Writing Equations from Scenarios	I can write a linear equation when given a word problem or scenario		Resource: Writing Equations from a Scenario
NDL	Is an ordered pair a solution/on the same line, given a table, graph or equation	I can determine if an ordered pair is a solution to a linear equation.	Solution to a linear equation	
NDL	Practice day/Desmos Calculator Day	I can use the Desmos Calculator to enter data and find the Slope and y intercept		Resource: Using the Desmos Calc to practice finding the Slope and y-intercept
Unit 3	End Assessment			You can use some of the Desmos Assessment but then supplement with teacher created questions as necessary

Unit 4: Linear Equations and Linear Systems (~20 Days)

Unpacking and Standards	NC.8.EE.7: Solve real-world and mathematical problems by writing and solving equations and inequalities in one variable. •Recognize linear equations in one variable as having one solution, infinitely many solutions, or no solutions. • Solve linear equations and inequalities including multi-step equations and inequalities with the same variable on both sides. NC.8.EE.8: Analyze and solve a system of two linear equations in two variables in slope-intercept form. •Understand that solutions to a system of two linear equations correspond to the points of intersection of their graphs because the point of intersection satisfies both equations simultaneously. • Solve real-world and mathematical problems leading to systems of linear equations by graphing the equations. Solve simple cases by inspection. NC.8.G.5 Use informal arguments to analyze angle relationships - Solving Equations • Recognize relationships between interior and exterior angles of a triangle. • Recognize the relationships between the angles created when parallel lines are cut by a transversal. • Recognize the angle-angle criterion for similarity of triangles. • Solve real-world and mathematical problems involving angles
Big Ideas	**Solving Linear Equations (Lessons 1–8)** ● Write and solve equations with variables on both sides of the equation (e.g., $3(x + 8) = 30 + x$). **Systems of Linear Equations (Lessons 9–14)** ● Use graphs and algebraic methods to solve systems of linear equations in two variables. Unit 4 Schoolnet Problems
Prior Learning	**Math 8, Unit 3** ● Writing linear equations, such as $y = 2x + 3$ ● Graphing equations ● Slope and y-intercept

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
		8.4 Readiness Check		
4.1	Number Machines	I can solve a number puzzle problem.		
4.2	Keep it Balanced	I can add or remove blocks from a hanger and keep the hanger balanced. I can represent balanced hangers with equations.		
4.3	Balanced Moves	I can add, subtract, multiply, or divide each side of an equation by the same expression to get a new equation with the same solution.		

4.4	More Balanced Moves	I can describe the relationship between an equation and its solution.		Paper and Pencil Lesson
4.5	Equation Roundtable	I can solve equations using multiple pathways.	term	Paper and Pencil Lesson
4.6	Strategic Solving	By thinking about the structure of an equation, I can avoid having a lot of steps and find an efficient method to get to a solution.	Constant term	Paper and pencil Lesson
4.7	All, Some or None	I can determine whether an equation has no solutions, one solution, or infinitely many solutions		
4.8	When are they the same?	I can use an expression or an equation to find when two things, like distance, are the same in a real-world situation.		
	Quiz 1			A student worksheet should be provided for the digital version. There is also a paper and pencil version.
NDL	Write and solve equations in context	I can write and solve an equation to represent a situation in the context of a real world problem.		Notes or Practice with Word Problems and equations with Variables on both sides
NDL	Triangles & Equations	I can write an equation to solve for a missing angle measure inside a triangle and exterior angles of a triangle. (there are Desmos lesson Unit 1, lessons 11 and 12- that are useful for these standards)	Isosceles	Guided Notes sheet for Interior angles of Triangle Guided Notes sheet for Exterior angles of Triangles
NDL	Angles & Equations	I can write an equation to solve for a missing angle measure in angles created by parallel lines cut by a transversal. (there are Desmos lesson Unit 1, lesson 10- is useful for these standards)	Transversal	Guide notes sheet for angles with parallel lines cut by a transversal Guided note sheet for angles with 2 transversals
NDL	Graphing and solving Inequalities	I can solve and graph one-variable inequality.		Guided Notes with Inequalities Intro to Inequalities Practice with Inequalities- Google Slides

NDL	Special inequalities	I can recognize special solutions when there is no solution or all real numbers.		Practice with Inequalities with Special Solutions
NDL	Applying Inequalities	I can write and solve an inequality to represent a problem in context (word problems).		
	8.5 Readiness Check	The purpose of this Readiness Check is to understand what knowledge and skills students already have about writing equations, substituting numbers for variables, and relationship between the area and radius of a circle.		
4.9	On or off the Line	I can identify and interpret points that satisfy two relationships at the same time using graphs.		
4.10	On Both Lines	I can use graphs to find an ordered pair that two real-world situations have in common.		Mostly Paper and Pencil- Students work together to create a poster from scenarios given in Desmos lesson
4.11	Make Them Balance	I understand that solving a system of equations means finding values of the variables that make both equations true at the same time. I know what the graph of a system of equations that has no solutions looks like.		This lesson **does not** have all of the equations in y=mx+b format. *May want to substitute with teacher created lesson that uses y=mx+b format which is NC Standards
4.12	Line Zapper	I can solve systems of equations using algebra.		* **Slide 8 is for acceleration**- one of the equations is not in y=mx+b. Make sure to pace it or skip this slide to not confuse students with standard form
4.13	All, Some, or None?	I can determine whether a system of equations has no solutions, one solution, or infinitely many solutions.		*This lesson gives some equations in standard form. I would either modify lesson to use all y=mx+b or use a teacher created lesson
NDL	Solving Systems of Equations	I can solve a system of equation when given two equations in y-mx+b format		Resource: Practice Solving Systems by graphing

Unit 4	End Assessment			**Problems 3, 5 and 7.2 have one equation in standard form, may want to alter them, or skip those slides in both forms**

Unit 5: Functions and Volume (~20 Days)	
Unpacking and Standards	NC.8.F.1 Understand that a function is a rule that assigns to each input exactly one output. NC.8.F.2 Compare properties of two linear functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). NC.8.F.3 Identify linear functions from tables, equations, and graphs. NC.8.F.5 Qualitatively analyze the functional relationship between two quantities. • Analyze a graph determining where the function is increasing or decreasing; linear or non-linear. • Sketch a graph that exhibits the qualitative features of a real-world function. NC.8.G.9 Understand how the formulas for the volumes of cones, cylinders, and spheres are related and use the relationship to solve real-world and mathematical problems.
Big Ideas	**Introduction to Functions (Lessons 1–4)** ● Determine whether or not graphs, tables, or rules represent functions. **Representing and Interpreting Functions (Lessons 5–9)** ● Create and interpret graphs of functions that represent stories. **Volume (Lessons 10–15)** ● Calculate and compare the volumes of cylinders, cones, and spheres. ● Use the relationships between height, radius, and volume to calculate missing dimensions. Unit 5 Schoolnet Problems
Prior Learning	**Math 7** ● Volume of prisms ● Area of circles **Math 8, Unit 3** ● Linear relationships

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
8.5 Readiness Check				
5.1	Turtle Crossing	I can make connections between scenarios and the graphs that represent them.		A paper version of this lesson is also available.

				This lesson supports students in making connections between scenarios and the graphs that represent them, which will be addressed in more depth in upcoming lessons, starting in Lesson 5. **If this lesson is omitted**, provide extra support for students as they interpret qualitative features of a function and interpret specific points in context in Lesson 5.
5.2	Guess My Rule	I can write rules when I know input-output pairs. I know that a function is a rule with exactly one output for each allowable input. I can identify rules that do and do not represent functions.	Function	Desmos card sort y=mx+b practice
5.3	Function or Not?	I can explain why a graph does or does not represent a function. I can use precise language to describe functions (e.g., "is a function of" or "determines").	Dependent variable Independent variable	Practice sheet with all types Recognizing functions problems in various forms. Function patterns activity
5.4	Window Frames	I can represent a function with an equation. I can name the independent and dependent variables for a function.		
	Quiz 5.1			Optional: There is a Preparation Worksheet designed to prepare students for the next section of lessons.
NDL	Linear or Nonlinear?	I can determine if a function is linear or nonlinear using a table, graph, or equation.	Linear Nonlinear	Resources
NDL	Compare and interpret two different functions	I can calculate the different rates of change of a linear function using a graph, and interpret the rates of change in context. I can compare and contrast different linear models of the same data.		Interpreting different features Resources Comparing Functions Comparing key features

5.5	The Tortoise and the Hare	I can explain the story told by the graph of a function. I can find and interpret points on the graph of a function. I can determine whether a function is increasing or decreasing based on whether its rate of change is positive or negative.		
5.6	Graphing Stories	I can draw the graph of a function that represents a real-world situation. I can explain that graphs can appear different depending on the variables chosen.		Math Story Problems
5.7	Feel the Burn	I can explain the strengths and weaknesses of different representations. I can compare inputs and outputs of functions that are represented in different ways.		Paper and pencil Lesson
5.8	Charge!	I can use data points to model a linear function. I can decide when a linear function is a good model for data and when it is not.		Paper and pencil Lesson This lesson includes Teacher Presentation Screens. This lesson supports students in modeling a linear function, which will be addressed in more depth in Unit 6. **This lesson could be omitted if** students show a strong understanding of functions in earlier lessons and time is spent in other lessons considering when it is reasonable to use a linear model for a set of data.
5.9	Piecing It Together	I can create graphs of non-linear functions with pieces of linear functions. I can calculate and interpret rates of change in context.		

	8.5 Practice Day 1	In this Practice Day, students practice what they've learned so far in this unit, with extra attention on topics from the more recent lessons.		Paper and pencil Lesson
	8.5 Quiz 2			Optional: There is a Preparation Worksheet designed to prepare students for the next section of lessons.
	8.6 Readiness Check	The purpose of this Readiness Check is to understand what knowledge and skills students already have about slope, linear equations, and bar graphs.		
5.10	Volume Lab	I recognize the following three-dimensional shapes: cylinder, cone, cube, and sphere. I can estimate the volumes of different solids.	Cone Cylinder Radius Sphere Volume	Activity 2 includes a Paper Supplement.
5.11	Cylinders	I can explain the parts of the formula for the volume of a cylinder. I can calculate the volume of a cylinder.		Thinking ahead, if you choose to omit lessons 12 and 14, be sure to discuss how changing one dimension of a cylinder would impact its volume as part of Lesson 11.
5.12	Scaling Cylinders	I can analyze the relationship between the height or radius of a cylinder and its volume. I can explain why the relationship between height and volume is linear but the relationship between radius and volume is not.		This lesson supports students in using functions to explore how changing a cylinder's radius or height impacts its volume. **If** students show a strong understanding working with volumes of cylinders in earlier lessons, this **lesson may be omitted**. If omitted, be sure to discuss how changing one dimension of a cylinder would impact its volume as part of Lesson 11.
5.13	Cones	I can explain the relationship between the volume of a cone and the volume of a cylinder. I can use the formula for the volume of a cone.		

5.14	Missing Dimensions	I can find missing information about a cylinder or cone if I know its volume and other information. I can compare and contrast strategies for finding information about a cone or cylinder.		Paper and pencil Lesson This lesson supports students in using functions to explore how changing a cylinder's radius or height impacts its volume. **If** students show a strong understanding working with volumes of cylinders in earlier lessons, **this lesson may be omitted**. If omitted, be sure to discuss how changing one dimension of a cylinder would impact its volume as part of Lesson 11.
5.15	Spheres	I can compare the volumes of a cone, a cylinder, a hemisphere, and a sphere. I can find the volume of a sphere when I know the radius or the diameter.		Activity 2 includes a Paper Supplement.
	8.5 Practice Day 2			Paper and pencil Lesson
	End Assessments			

Unit 6: Associations in Data (~17 Days)	
Unpacking and Standards	NC.8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. NC.8.SP.2 Model the relationship between bivariate quantitative data to: • Informally fit a straight line for a scatter plot that suggests a linear association. • Informally assess the model fit by judging the closeness of the data points to the line. NC.8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate quantitative data, interpreting the slope and y-intercept. NC.8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table.
Big Ideas	**Organizing Numerical Data (Lessons 1–2)** ● Examine different ways to organize bivariate data, including scatter plots. **Analyzing Numerical Data (Lessons 3–8)** ● Use scatter plots and fitted lines to analyze numerical data and identify associations.

	Categorical Data (Lessons 9–11) ● Use two-way tables and bar graphs to identify associations in categorical data. Unit 6 Schoolnet Problems
Prior Learning	**Grade 3** ● Drawing and interpreting bar graphs **Math 6** ● Plotting points in the coordinate plane ● Shape, center, spread, and outliers of data in one variable **Math 8, Unit 3** ● Linear relationships

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
		8.6 Readiness Check		
6.1	Click Battle	I can organize data to notice patterns more clearly. I can describe the advantages and disadvantages of organizing data in different ways.	Scatterplot	
6.2	Wing Span	I can compare and contrast two different ways to display data (a dot plot and a scatter plot). I can draw a scatter plot to represent data.		
6.3	Robots	I can describe the meaning of a point on a scatter plot in context.		
6.4	Dapper Cats	I can use a line of fit to predict values not in the data. I can identify outliers on a scatter plot.	Outlier	
	Practice Day			This is paper and pencil and the teacher has to print out task cards and decide how they want to work on this with their students, 3 options are given by Desmos

6.5	Fit Fights	I can draw a line to fit data in a scatter plot. I can describe features of a line that fits data well.		
6.6	Interpreting Slopes	I can explain whether data in a scatter plot has a positive association, a negative association, or neither. I can interpret the slope of a line fit to data in a real-world situation.	Positive association Negative Association	
6.7	Scatterplot City	I can use a scatter plot to decide if two variables have a linear association and make connections to what the data represents. I can pick out clusters in data and make connections to what the data represents.		
6.8	Animal Brains	I can create a scatter plot and draw a line to fit the data, and identify outliers that appear in the data. I can use associations between two variables to make predictions.		
	Readiness Check 8.7	The purpose of this Readiness Check is to understand what knowledge and skills students already have about place value, working with exponents, and equivalent fractions.		
	Practice Day 2			This is a paper and pencil lesson, it gives two options for teachers to decide how they want students to work individually or in pairs. The student sheets are in their workbook on pages 89-92

Benchmark Window	County Benchmark 2	Units that will be assessed: Linear Relationships, Linear Equations and Linear Systems, Functions and Volume		Window is from February 26th- March 8th
6.9	Tasty Fruit	I can identify and represent the same data in bar graphs and in two-way frequency tables.	two-way table	
6.10	Finding Associations	I can use relative frequencies in tables and in segmented bar graphs to decide if there is an association between two variables.	Segmented bar graph Relative frequency	
6.11	Federal Budgets	I can make relative frequency tables and segmented bar graphs from frequency tables. I can use a representation of data to decide if there is an association between two variables.		This is partial digital and does have a paper pencil portion. Students will create a poster in this activity so have supplies ready. There is a student worksheet to help with their planning of posters in the workbook on page 99.
	Practice Day 3	Students will practice skills from this unit		This is a paper and pencil activity
Unit 6	End Assessments	End of Unit Assessments		There are two versions and also paper and pencil version of the 2 assessments

Unit 7: Exponents and Scientific Notation (~18 days)	
Unpacking and Standards	NC.8.EE.1 Develop and apply the properties of integer exponents to generate equivalent numerical expressions. NC.8.EE.3 Use numbers expressed in scientific notation to estimate very large or very small quantities and to express how many times as much one is than the other. NC.8.EE.4 Perform multiplication and division with numbers expressed in scientific notation to solve real-world problems, including problems where both decimal and scientific notation are used.
Big Ideas	**Exponent Properties (Lessons 1–6)** ● Identify and create equivalent expressions involving positive, negative, and zero exponents. **Scientific Notation (Lessons 7–14)** ● Express and perform operations with very large or very small quantities using powers of 10 and scientific notation.

	Unit 7 Schoolnet Problems
Prior Learning	**Math 6** ● Operations with whole number exponents (e.g., using $V = s^3$)

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
		8.7 Readiness Check		
7.1	Circles	I can use exponents to describe repeated multiplication. I can explain the meaning of an expression with an exponent.	exponent	The purpose of this lesson is for students to recall using whole number exponents to represent repeated multiplication in preparation for upcoming lessons. If students show a strong understanding of using exponents in Problems 3 and 6 of the Readiness Check, this lesson may be omitted.
7.2	Combining Exponents	I can describe what it means for two expressions with exponents to be equivalent. I can create equivalent expressions with exponents.	base power of 10	
7.3	Power Pairs	I can explain why two expressions involving exponents are equivalent		This lesson supports students in developing fluency with identifying equivalent expressions using positive exponents. If students show a strong understanding identifying equivalent expressions with exponents in earlier lessons, this lesson may be omitted. If omitted, be sure to support students in justifying how they know expressions are equivalent elsewhere in the unit.
7.4	Rewriting Powers	I can divide expressions with exponents that have the same base. I can rewrite expressions with positive exponents as a single power.		
7.5	Zero and Negative Exponents	I can explain what it means for a number to be raised to a zero or a negative exponent.		

		I can determine if two expressions with positive, zero, and negative exponents are equivalent.		
7.6	Write a Rule	I can explain and use rules for properties of exponents		This paper lesson includes an activity where students create visual displays.
	Practice Day 1	Students will practice skills from this unit.		
	Quiz			Quiz covers lessons 1-6
	Readiness Check 8.8	The purpose of this Readiness Check is to understand what knowledge and skills students already have about distance in the coordinate plane, exponents, and converting between fractions and decimals.		
7.7	Scales and Weights	I can represent large and small numbers as multiples of powers of 10.		
7.8	Point Zapper	I can represent large and small numbers as multiples of powers of 10 using number lines.		
7.9	Use Your Powers	I can apply what I learned about powers of 10 to answer questions about real-world situations.		This digital lesson includes an activity where students create a visual display. This lesson gives students an opportunity to apply the concepts they learned about exponents to analyze a context in the world. If students show a strong understanding of working with powers of 10 in earlier lessons, this lesson may be omitted. If omitted, be sure to discuss how representing and working with numbers written in powers of 10 can empower us to better understand our world throughout the unit.
7.10	Solar System	I can tell whether or not a number is written in scientific notation.	scientific notation	

		I can rewrite a large or small number using scientific notation.		
7.11	Balance the Scale	I can use scientific notation and estimation to compare very large or very small numbers. I can multiply and divide numbers given in scientific notation.		
7.12	City Lights	I can add and subtract numbers given in scientific notation.		
7.13	Star Power	I can use scientific notation to compare different quantities and answer questions about real-world situations.		This lesson includes a digital supplement. This lesson gives students an opportunity to apply what they've learned about exponents and scientific notation to analyze and compare the net worth of different celebrities. There is no new content introduced in this lesson.
	Practice Day 2	Students will practice skills from this unit.		
Unit 7	End Assessments			There are two versions and also paper and pencil version of the 2 assessments

Unit 8: The Pythagorean Theorem and Irrational Numbers (~20 Days)	
Unpacking and Standards	NC.8.EE.2 Use square root and cube root symbols to: NC.8.NS.1 Understand that every number has a decimal expansion. Building upon the definition of a rational number, know that an irrational number is defined as a non-repeating, non- terminating decimal. NC.8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers and locate them approximately on a number line. Estimate the value of expressions involving: • Square roots and cube roots to the tenths. • π to the hundredths. NC.8.G.6 Explain the Pythagorean Theorem and its converse.

	NC.8.G.7 Apply the Pythagorean Theorem and its converse to solve real-world and mathematical problems. NC.8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
Big Ideas	**Square Roots and Cube Roots (Lessons 1–5)** ● Understand that square roots and cube roots represent the edge lengths of squares and cubes, and approximate their values. **The Pythagorean Theorem (Lessons 6–11)** ● Use the Pythagorean theorem and its converse to reason about right triangles and find unknown measurements. **Rational and Irrational Numbers (Lessons 12–14)** ● Determine fractions and decimal approximations for rational and irrational numbers. Unit 8 Schoolnet Problems
Prior Learning	**Math 6** ● Areas of parallelograms and triangles **Math 7** ● Operations with rational numbers ● Converting fractions to decimals using long division

LESSON	TITLE	LEARNING TARGET	VOCABULARY	ADDITIONAL RESOURCES/NOTES
8.1	Tilted Squares	I can calculate the area of a triangle. I can calculate the area of a tilted square on a grid by using methods like "decompose and rearrange" and "surround and subtract."		A paper version of this lesson is also available. The digital version requires a paper supplement.
8.2	From Squares to Roots	I can explain the meaning of square roots in terms of side length and area of a square. I can write the side length or the area of a square using square root notation (like $\sqrt{3}$.)	Square root	
8.3	Between Squares	I can approximate a square root as a decimal.		
8.4	Root Down	I can plot square roots on a number line. I can identify the two whole numbers a square root is between and explain why.		

8.5	Filling Cubes	I can explain the meaning of a cube root, like $\sqrt[3]{5}$, in terms of its edge length and volume. I can identify the two whole numbers a cube root is between and explain why.	Cube root	Students will need blank paper for part of this lesson
	Practice Day			There are two different practice activities, they are both paper and pencil. They are in the student workbook on pages 179-180 and 181-182
	Quiz Day			There is a paper pencil version also available.
8.6	The Pythagorean Theorem	I can explain what the Pythagorean theorem says.		There is a worksheet the students will need to have to complete slide 2. It is printed in the workbook on page 183
8.7	Pictures to Prove It	I can explain why the Pythagorean theorem is true for every right triangle. I can use the Pythagorean theorem to find unknown side lengths in right triangles.		There is a paper and pencil version of this assignment as well as digital, the digital version needs a paper supplement and it is on page 187-188 in workbook
Benchmark Window	County Benchmark 3	Units that will be assessed: Exponents and Scientific Notation and Pythagorean Theorem and Irrational Numbers		Window is from April 22nd to April 26th
8.8	Triangle Tracing Turtle	I can identify which side is the hypotenuse and which sides are the legs in a right triangle. I can use the Pythagorean theorem to find unknown side lengths in right triangles.	Legs Hypotenuse	
8.9	Make it Right	I can explain why it is true that if the side lengths of a triangle satisfy the equation $a^2 + b^2 = c^2$, then it must be a right triangle.		

		I can determine whether a triangle is a right triangle if I know its side lengths.		
8.10	Taco Truck	I can use the Pythagorean theorem to solve problems.		Blank paper would be helpful for the students to work out problems when needed
8.11	Pond Hopper	I can calculate the distance between two points in the coordinate plane. I can calculate the length of a diagonal line segment in the coordinate plane.		Graph paper for students make be helpful
	Practice Day 2			Workbook pages 204-207
8.12	Fractions to Decimals	I can write a fraction as either a repeating or a terminating decimal.		There is a paper and pencil version for this activity as well.
8.13	Decimals to Fractions	I can write a repeating decimal as a fraction. I understand that every number has a decimal expansion.		This lesson can be skipped if students have a good understanding of how to divide fractions to make decimals and can round to the nearest tenth and hundredth.
8.14	Hit the Target	I know what a rational number is and can give an example. I know what an irrational number is and can give an example.	Rational number Irrational number	
Unit 8	Assessments			There is a paper and pencil version available of both Form A and Form B. If you are giving your students the assessment on the computer they will need blank paper and graph paper to help with their calculations.

EOG Review			
Quick Checks	Short standards-based EOC-style questions	8.EE.7-Equations & Inequalities 8.EE.8-Systems of equations 8.F.2-Comparing functions 8.F.4-Analyze functions 8.G.5-Angle relationships 8.SP.3-Scatter plots	Answers