Orange Public Schools

Office of Curriculum & Instruction

2019-2020 Mathematics Curriculum Guide

7th Grade Mathematics (Accelerated)

Math in Focus - Unit 4: Geometry –

Creating, Comparing & Analyzing Geometric Figures

April 20, 2019 – June 22, 2020

Board Approved: 1.14.2020

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From the New Jersey Student Learning Standards:

Traditional Pathway Accelerated 7th Grade

In **Accelerated 7th Grade,** instructional time should focus on four critical areas: (1) Rational Numbers and Exponents; (2) Proportionality and Linear Relationships; (3) Introduction to Sampling Inference; (4) Creating, Comparing, and Analyzing Geometric Figures

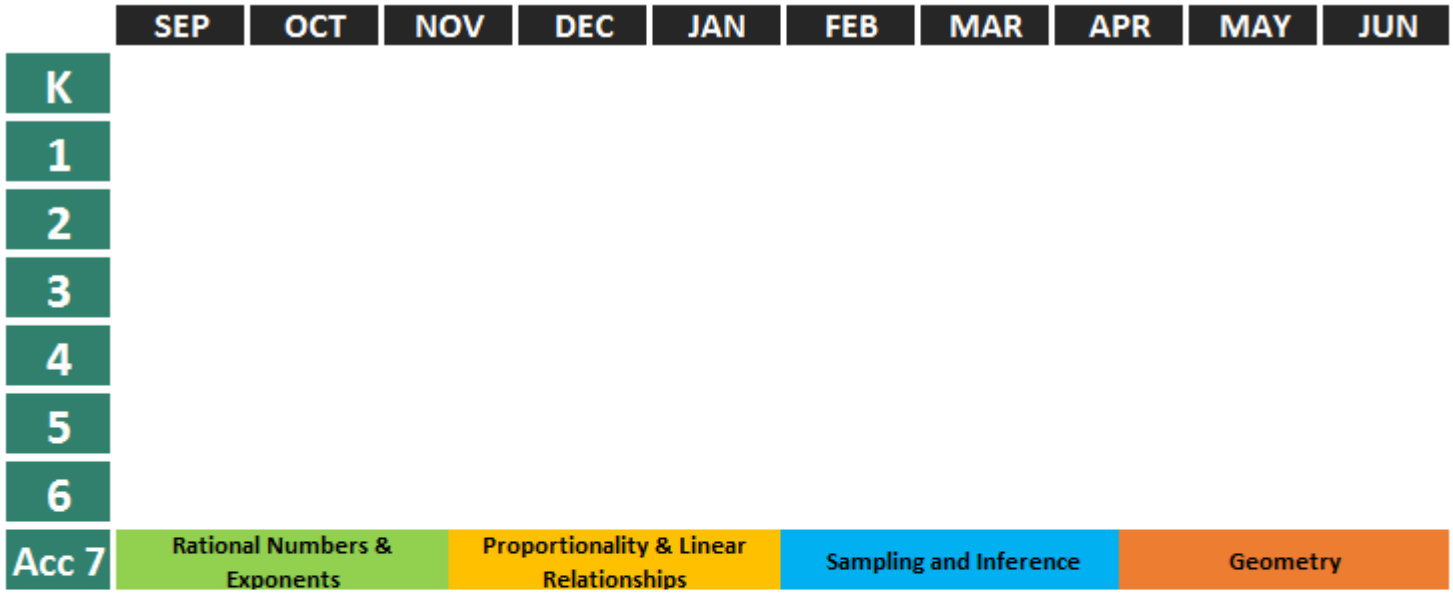
1. Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. They extend their mastery of the properties of operations to develop an understanding of integer exponents, and to work with numbers written in scientific notation.

2. Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y= mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount $m \times A$. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation.

3. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences

4. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity, they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross sections. They solve real- world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

A STORY OF UNITS



Rational Numbers and Exponents: Operations with rational numbers, learn of irrational numbers, expressions and equations work with radical and integer exponents

Proportionality and Linear Relationships: Analyze proportional relationships, generate equivalent expressions using properties of operations, and understand connections between proportional relationships and

Sampling and Inference: Use random sampling, draw inferences, investigate chance processes, develop, use, and evaluate probability models

Geometry: construct geometrical figures, understand congruence and similarity using physical models, and solve real-life problems involving angle measure, area, surface area and volume

Table of Contents

References

"Math in Focus" *Houghton Mifflin Harcourt.* 2015 <https://my.hrw.com>

I. Unit Overview

Chapter 6: In this chapter, students explore and apply the properties of complementary angles, supplementary angles, adjacent angles, angles on a line, angles at a point, vertical angles, pairs of angles formed by parallel lines and a transversal, as well as interior and exterior angles of a triangle. Students use algebra throughout the chapter to solve geometric problems involving angle measures. As they apply the angle sum properties, students write algebraic equations and solve them in order to identify unknown angle measures. When angle measures are related by a given ratio, students use bar models and the unitary method to identify the angle measures. In this chapter, students encounter a number of bedrock concepts of geometry. In many cases, they are led to discover a property through observation.

Chapter 7: In this chapter, students learn to construct angle bisectors and perpendicular bisectors, and also explore the conditions that determine whether a triangle with a given set of dimensions is unique or not. The formal constructions they perform serve as an introduction to deductive reasoning skills they will further develop in later geometry courses.

Chapter 8: In this chapter, students learn to identify cylinders, cones, and pyramids, both as solids and from their nets. Students also learn to identify the shapes of certain cross sections of those solids. Students' work with solids is limited to right prisms, cylinders, pyramids, and cones. Right solids have a central axis that is perpendicular to the base. Students learn to predict the shapes of cross sections formed when planes intersect prisms, cylinders, cones, pyramids, and spheres. These explorations can be especially appealing to visual learners. More importantly, they enable students to develop formulas for finding the volumes of solid.

Essential Questions

- What 2-D figure results from slicing 3-D figures? (cones, spheres, or cylinders)
- How do you find the surface area and volume of a 3D figure?
- What is the total number of degrees in supplementary and complementary angles?
- What is the relationship between vertical and adjacent angles?
- How would the volume and surface area be affected when dimensions of a figure are doubled and/or triple?
- How are the (angles), (lengths), or (figures) changing?
- How are they staying the same?
- How is _____ related to ____?
- What happens when an object is dilated?
- How could an object be transformed to enlarge or reduce its size?
- How can you determine the distance between two points in a coordinate plane?

Enduring Understanding

- Solve problems involving the area and circumference of a circle and surface area of three-dimensional objects.
- Reason about relationships among two - dimensional figures using scale drawings and informal geometric constructions, which will lead to gaining familiarity with the relationships between angles formed by intersecting lines. Work with three-dimensional figures, relating them to two- dimensional figures by examining cross-sections.
- Solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.
- Apply their understanding of the effect of geometric transformation(s) on a figure or shape.
- Describe how two figures or shapes are congruent or similar.
- Create or identify a sequence of transformations that lead to congruent or similar figures.
- Analyze the relationship between angles measures (triangle sum; parallel lines cut by a transversal; impact of a geometric transformation).
- Prove the Pythagorean Theorem, use to determine the distance between two coordinate points, and apply to real world situations

II. Pacing Guide

Activity	New Jersey State Learning Standards (NJSLS)	Estimated Time
Grade 7 MIF Chapter 6 -8 Pretest	7.G.1, 7.G.2, 7.G.5	1 Block
Grade 7 Chapter 6 (MIF) Lesson 1-4	7.G.2, 7.G.5	14 Blocks
Grade 7 Chapter 7 (MIF) Lesson 1-5	7.G.1, 7.G.2	15 Blocks
Grade 7 Chapter 8 (MIF) Lesson 1-5	7.G.5	11 Blocks
Unit 4 Performance Task 1	7.G.1	½ Block
Unit 4 Assessment 1 *(Optional)*	7.G.1, 7.G.2, 7.G.3	½ Block
Grade 7 Module 6 Topic B (EngageNY) Lesson 5-15	7.G.2	8 Blocks
Grade 8 Module 2 (EngageNY) Lesson 1-11	8.G.1, 8.G.2	8 Blocks
Grade 8 Module 3 (EngageNY) Lesson 1-7	8.G.3	6 Blocks
Unit 4 Assessment 2 *(Optional)*	8.G.1, 8.G.2, 8.G.3	1 Block
Unit 3 Performance Task 2	7.G.2	½ Block
Total Time		**64 Blocks**

Major Work Supporting Content Additional Contents

III. Pacing Calendar

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide)*.

APRIL						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
			1	**2**	**3**	**4**
5	**6**	**7**	**8**	**9**	**10**	**11**
12	**13**	**14**	**15**	**16**	**17**	**18**
19	**20**	**21**	**22**	**23**	**24**	**25**
26	**27**	**28**	**29**	**30**		

MAY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

JUNE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

IV. NJSLA Assessments Evidence Statements

NJSLS	Evidence Statement	Clarification	Math Practices	Calculator?
7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale	i) Tasks may or may not have context	2, 5	Yes
7.G.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	i i) Tasks do not have a context. ii) Most of tasks should focus on the drawing component of this evidence statement.	3,5,6	Yes
7.G.3	Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	i) Tasks have "thin context" or no context	5	Yes
7.G.4-1	Know the formulas for the area and circumference of a circle and use them to solve problems	i) Tasks may or may not have context. ii) Tasks may require answers to be written in terms of π.	4,5	Yes
7.G. 4-2	Give an informal derivation of the relationship between the circumference and area of a circle	i) Tasks require students to identify or produce a logical conclusion about the relationship between the circumference and the area of a circle.	2,5	Yes
7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	i) Tasks may or may not have context. ii) Tasks involving writing or solving an equation should not go beyond the equation types described in 7.EE.4a. [px +q = r and p(x + q) = r where p, q, and r are specific rational numbers.]	5,6	Yes
7.G.6	Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	i) Tasks may involve <, >, ≤ or ≥.	1,5	Yes
8.G.1.a	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length.	i) Tasks may or may not have context	MP. 3 MP. 5 MP. 8	No
8.G.1.b	Verify experimentally the properties of rotations, reflections, and translations: b. Angles are taken to angles of the same measure.	i) Tasks may or may not have context	MP. 3 MP. 5 MP. 8	No
8.G.1.c	Verify experimentally the properties of rotations, reflections, and translations: c. Parallel lines are taken to parallel lines.	i) Tasks may or may not have context	MP. 3 MP. 5 MP. 8	No
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	i) Tasks do not have a context. ii) Figures may be drawn in the coordinate plane, but do not include the use of coordinates. iii) Tasks require students to make connections between congruence and transformations.	MP. 2 MP. 7	No

8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two dimensional figures using coordinates.	i) Tasks have "thin context" to no context. ii) Tasks require the use of coordinates in the coordinate plane. iii) For items involving dilations, tasks must state center of dilation. iv) Centers of dilation can be the origin, the center of the original shape or the vertices of the original shape.	MP. 2 MP. 3 MP. 5	No

V. Differentiated Instruction

Chapter 6

Assessment and Intervention

	ASSESSMENT	RtI STRUGGLING LEARNERS
DIAGNOSTIC	• Quick Check in Recall Prior Knowledge in Student Book B, pp. 3–4 • Chapter 6 Pre-Test in *Assessments*	• Skills 32–33 in *Transition Guide, Course 2*
ON-GOING	• Guided Practice • Lesson Check • Ticket Out the Door	• *Reteach* worksheets • *Extra Practice* worksheets • *Activity Book*, Chapter 6
END-OF-CHAPTER	• Chapter Review/Test • Chapter 6 Test in *Assessments* • ExamView® Assessment Suite CD-ROM Course 2	• *Reteach* worksheets

ELL ENGLISH LANGUAGE LEARNERS

Review the terms *interior* and *exterior*.

Say The *interior* is the inside of something. (Place a pencil inside a plastic bag.) The pencil is in the *interior* of the bag. The *exterior* is the outside of something. (Take the pencil out of the bag and hold it next to it.) The pencil is in the *exterior* of the bag.

Model Draw a number of polygons. Have volunteers shade the interiors red and the exteriors yellow. Draw a pair of parallel lines.

Say Look at the parallel lines. The *interior* is the area between the lines. (Have a volunteer shade the area between the lines red.) The *exterior* is the area outside the lines. (Have a volunteer shade the area outside the lines yellow.)

Model Draw a pair of parallel lines crossed by a transversal. Have volunteers shade the interior angles red and the exterior angles yellow.

For definitions, see Glossary, page 321, and Online Multi-Lingual Glossary.

ADVANCED LEARNERS

- In this chapter, students learn a number of properties of certain angle pairs created when two parallel lines are crossed by a transversal intersecting the parallel lines at points *A* and *B*. Challenge students to use the properties they have learned in order to prove that two lines are parallel.
- Draw a pair of lines that could be parallel, crossed by a transversal. Number each angle formed. Specify that one pair of corresponding angles is congruent. Have students write a proof that shows the two lines are parallel.
- As needed, provide direction for students, such as suggesting that they consider what would happen if the lines were *not* parallel. That is, the two supposedly parallel lines intersect at a point *C*. Then, using supplementary angles, students can show the sum of the measures of the interior angles of triangle *ABC* is greater than 180°, which is impossible. Hence, the two lines must be parallel.
- This makes a nice introduction to indirect proofs for your advanced learners.

To provide additional challenges use:

- *Enrichment*, Chapter 6
- Student Book B, Brain@Work problem

Chapter 7

Assessment and Intervention

	ASSESSMENT	RtI STRUGGLING LEARNERS
DIAGNOSTIC	• Quick Check in Recall Prior Knowledge in Student Book B, pp. 63–68 • Chapter 7 Pre-Test in *Assessments*	• Skills 34–39 in *Transition Guide, Course 2*
ON-GOING	• Guided Practice • Lesson Check • Ticket Out the Door	• *Reteach* worksheets • *Extra Practice* worksheets • *Activity Book*, Chapter 7
END-OF-CHAPTER	• Chapter Review/Test • Chapter 7 Test in *Assessments* • ExamView® Assessment Suite CD-ROM Course 2	• *Reteach* worksheets

ELL ENGLISH LANGUAGE LEARNERS

Review the terms *construct, midpoint,* and *equidistant.*

Say When you *construct* something you make it. You build it. You can construct a house of wood. You can construct a toy airplane of paper. You can construct an angle bisector with a compass and a straightedge. A thing you construct is called a *construction.*

Model Draw a line segment *AB*. Draw its perpendicular bisector.

Say The middle point of a line segment is called the *midpoint. (Mark the midpoint, C.)* The midpoint, *C,* divides $\overline{AB}$ into two equal parts. *(Indicate the equal parts and write AC = CB.)* The distance from *A* to the midpoint, *C,* is the same as the distance from *B* to the midpoint, C. The midpoint is an equal distance from both ends of the segment. We say the midpoint is *equidistant* from both ends of the segment.

For definitions, see Glossary, page 321, and Online Multi-Lingual Glossary.

ADVANCED LEARNERS

- Students can explore scale factors when a figure is enlarged and/or reduced repeatedly. Ask them to solve the following problem.

  A photo has side lengths of 8 in. and 10 in. It is enlarged to three times its original size. Then the enlargement is reduced to half its size. What is the final size of the photo? *(12 in. by 15 in.)* What scale factor relates the final photo to the original? $\left(\frac{3}{2}\right)$
- As needed, provide direction for students, such as suggesting they sketch each version of the photo.
- Finally, ask students to state a rule for finding the scale factor that compares an original figure to a version that has been reduced and/or enlarged multiple times. *(The scale factor that compares the original figure to the final figure is the product of all the individual scale factors.)*

To provide additional challenges use:

- *Enrichment*, Chapter 7
- Student Book B, Brain@Work problem

Chapter 8

Assessment and Intervention

	ASSESSMENT	RtI STRUGGLING LEARNERS
DIAGNOSTIC	• Quick Check in Recall Prior Knowledge in Student Book B, pp. 121–123 • Chapter 8 Pre-Test in *Assessments*	• Skills 40–43 in *Transition Guide, Course 2*
ON-GOING	• Guided Practice • Lesson Check • Ticket Out the Door	• *Reteach* worksheets • *Extra Practice* worksheets, Chapters 8–10 Cumulative Practice worksheets • *Activity Book*, Chapter 8
END-OF-CHAPTER	• Chapter Review/Test • Chapter 8 Test, Chapters 8–10 Benchmark Test in *Assessments* • ExamView® Assessment Suite CD-ROM Course 2	• *Reteach* worksheets

ELL ENGLISH LANGUAGE LEARNERS

Review the terms *height*, *lateral surface*, and *slant height*.

Model Draw a right circular cone and a right square pyramid.

Say The *height* of a solid is how tall it is. On a cone or pyramid, the height is the distance from the base to the vertex. (Draw heights.) The height forms a right angle with the base. (Add right angle symbols.)

Model The sides of a solid are called its *lateral surface*. (Indicate lateral surfaces of cone and pyramid.) The word *lateral* means "side." The word *slant* means "sloping." On a cone, the *slant height* is the distance from the vertex to any point on the circumference of the base. (Draw slant height.) On a pyramid, the slant height is the distance from the vertex to the center point of any side of the base. (Draw slant height.)

For definitions, see Glossary, page 321, and Online Multi-Lingual Glossary.

ADVANCED LEARNERS

- Pairs of students can brainstorm a process for using water to determine the volume of an irregularly shaped object. Give each pair a small irregular stone. Point out that its shape makes it impossible to use regular solids to determine its volume mathematically. Ask students to devise a procedure for using water to find the volume of the stone.
- Students are being asked to "discover" the displacement method of measuring volume. As needed, provide direction for students, such as telling them to look back at exercise 6 in Practice 8.4 for a hint (the conversion factor).
- Students' procedures should involve the following steps: pouring water into a graduated cylinder; noting its volume; submerging the stone in the cylinder; noting the combined volume; finding the difference of the two measurements converting milliliters to cubic centimeters.

To provide additional challenges use:

- *Enrichment*, Chapter 8
- Student Book B, Brain@Work problem

Pacing

If pacing is a challenge, consider the following modifications and omissions. Depending on students' strengths, consider consolidating Lessons 5 and 6. In Lesson 5, omit Problem 1 of the Concept Development, and move directly into renaming with the algorithm after Problem 2. Use the Problem Set from Lesson 6 for independent student practice. Consider consolidating Lessons 7 and 8 as well. Ask students to estimate the product beginning with the Concept Development of Lesson 7, and then use the Problem Set from Lesson 8 for student practice. Similarly, Lessons 11 and 12 can also be consolidated. Use estimation from the outset, and have students practice with the Problem Set from Lesson 12.

It is not recommended to omit any lessons from Topic D as it is a foundation for work later in the year. Students convert measurement units from small to large and from large to small using multiplication. This significantly expedites their understanding of and fluency with conversion and fraction multiplication as the year continues. In Lesson 14, students multiply whole numbers by unit fractions, which they learned to do in Grade 4 Module 5. If necessary, consider moving the fluency activity, "Multiply Unit Fractions," from Lesson 14 to Topic C to provide a few extra days of practice prior to beginning Lesson 14.

Scaffolds

The Common Core State Standards for Mathematics require that "all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post school lives." The writers of A Story of Units agree and feel strongly that accommodations cannot be just an extra set of resources for particular students. Instead, scaffolding must be folded into the curriculum in such a way that it is part of its very DNA. Said another way, faithful adherence to the modules IS the primary scaffolding tool.

See *III. The Common Core Approach to Differentiating Instruction (Pg. 14)* for additional information.

Use the links below for support with specific groups of learners.

Scaffolds for English Language Learners (Pg. 16-17)

Scaffolds for Students with Disabilities (Pg. 17-18)

Scaffolds for Students Performing Below Grade Level (Pg. 19)

Scaffolds for Students Performing Above Grade Level (Pg. 20)

Scaffolding Instruction for English Language Learners: A Resource Guide for Mathematics

VI. Vocabulary

Term	Definition
Adjacent Angles	Two angles that share a common vertex and side, but have no common interior points.
Alternate Exterior Angles	The pairs of angles on opposite sides of the transversal for two lines, but outside the two lines.
Alternate Interior Angles	The pairs of angles on opposite sides of the transversal for two lines, but inside the two lines.
Complementary Angles	Two angles whose angle measures total 90º.
Congruent Angles	Two or more angles that have the same angle measure.
Corresponding Angles	The pairs of angles on the same side of the transversal for two lines and on the same side of the given lines.
Bisect	To divide into two equal parts
Bisector	A ray that divides an angle into two angles with equal measures.
Included Angle	The angle in a triangle formed by two given angles.
Included Side	The side in a triangle that is common to two given angles.
Midpoint	The point on a line segment that is equidistant from both endpoints.
Perpendicular Bisector	A line that bisects a line segment and is perpendicular to it.
Cone	A solid with a circular base, a curved surface, and one vertex.
Cross Section	A figure formed by the intersection of a solid figure and a plane.
Cylinder	A solid with a curved surface and two parallel bases that are congruent circles.
Hemisphere	Half of a sphere.
Lateral Surface	The curved surface of a cone or cylinder.
Plane	A flat surface that extends infinitely in two dimensions.
Slant Height of Cone	The distance from the vertex to any point on the circumference of the base.
Slant Height of Pyramid	In a regular pyramid, it is the distance from the vertex to the midpoint of any edge of the base.

VII. Assessment Framework

Unit 4 Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Grade 7 Chapter 6-8 Pretest *Math in Focus*	7.G.1, 7.G.2, 7.G.5	½ Block	Individual	Yes (No Weight)
Unit 4 Assessment 1 (After Math in Focus Ch. 8) *District Assessment - Optional*	7.G.1, 7.G.2, 7.G.3	½ Block	Individual	Yes, if administered
Unit 4 Assessment 2 (After EngageNY Gr. 8 Module 3) *District Assessment - Optional*	8.G.1, 8.G.2, 8.G.3	1 Block	Individual	Yes, if administered
Grade 7 Chapter 6 Test (Optional) *Math in Focus*	7.G.2, 7.G.5	½ Block	Individual	Yes, if administered
Grade 7 Chapter 7 Test (Optional) *Math in Focus*	7.G.1, 7.G.2	½ Block	Individual	Yes, if administered
Grade 7 Chapter 8 Test (Optional) *Math in Focus*	7.G.5	½ Block	Individual	Yes, if administered
Mid- Module Assessment Gr. 7 Module 6 (Optional) *EngageNY*	7.G.2	Teacher Discretion	Teacher Discretion	Optional
Mid- Module Assessment Gr. 8 Module 2 (Optional) *EngageNY*	8.G.1, 8.G.2	Teacher Discretion	Teacher Discretion	Optional
Mid- Module Assessment Gr. 8 Module 3 (Optional) *EngageNY*	8.G.3	Teacher Discretion	Teacher Discretion	Optional
Acc Gr 7 Interim Assessment 4 (Early June) *District Assessment*	7.G.1, 7.G.2, 7.SP.1, 7.SP.2	1 Block	Individual	Yes

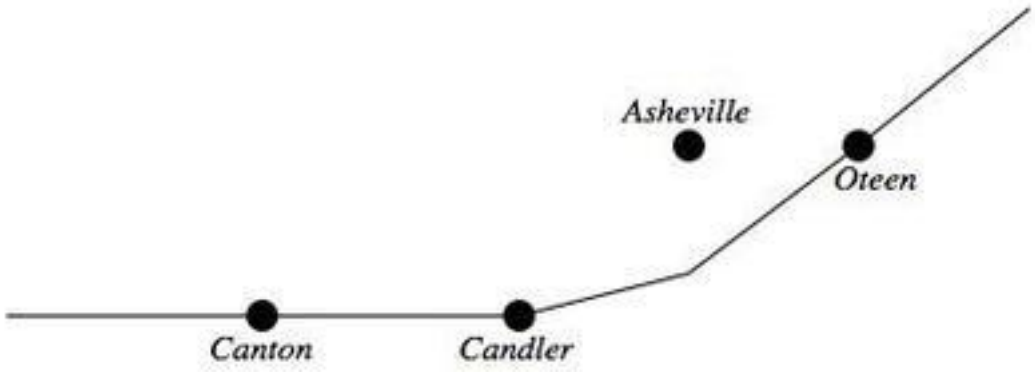
Unit 4 Performance Assessment / PBL Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Unit 4 Performance Task 1 (Mid-December) *Map Distance*	7.G.1	½ Block	Individual w/ Interview Opportunity	Yes; Rubric
Unit 4 Performance Task 2 (Late January) *Ladybug*	7.G.2	½ Block	Individual w/ Interview Opportunity	Yes: rubric
Unit 4 Performance Task Option 1 (optional)	7.G.1	Teacher Discretion	Teacher Discretion	Yes, if administered
Extended Constructed Response (ECR)* (click here for access)	Dependent on unit of study & month of administration	Up to 30 minutes	Individual	Yes; Rubric

* Use the following links to access ECR protocol and district assessment scoring documents:

- *Assessment & Data in Mathematics Bulletin*
- *Extended Constructed Response Protocol*

Map Distance (NJSLS 7.G.A.1)

On the map below, ¼ inch represents one mile. Candler, Candor, and Oteen are three cities on the map.



a. If the distance between the real towns of Candler and Canton is 9 miles, how far apart are Canton and Candler on the map?

b. If Candler and Oteen are 3½ inches apart on the map, what is the actual distance between Candler and Oteen in miles?

Unit 4 Performance Task 1 PLD Rubric

SOLUTION

A) A distance of nine miles means 9 quarter inches on the map. This is 9 × ¼ = 9/4 Or 2¼ inches between Candler and Canton on the map.

B) To find this, we divide: 3 ½ ÷ ¼ = 7/2 × 4/1 = 14 So, there are 14 miles between Chandler and Oteen.

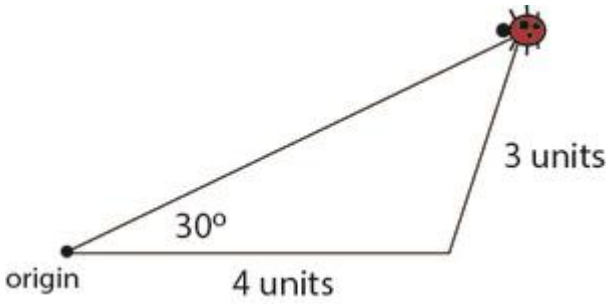
Level 5: Distinguished Command	**Level 4: Strong Command**	**Level 3: Moderate Command**	**Level 2: Partial Command**	**Level 1: No Command**
Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including: • a logical approach based on a conjecture and/or stated assumptions • a logical and complete progression of steps • complete justification of a conclusion with	Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including: • a logical approach based on a conjecture and/or stated assumptions • a logical and complete progression of steps • complete justification of a conclusionwith minor conceptual error	Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including: • a logical, but incomplete, progression of steps • minor calculation errors • partial justification of a conclusion • a logical, but incomplete, progression of steps	Constructs and communicates an incomplete response based on concrete referents provided in the prompt such as: diagrams, number line diagrams or coordinate plane diagrams, which may include: • a faulty approach based on a conjecture and/or stated assumptions • An illogical and Incomplete progression of steps • major calculation errors • partial justification of a conclusion	The student shows no work or justification.

Name _____ Block _____ Date _____

Ladybug (7.G.A.2)

Starting at the origin, a ladybug walked 4 units east. Then she walked a distance of 3 units in an unknown direction. At that time she was 30 degrees to the north of her original walking direction.

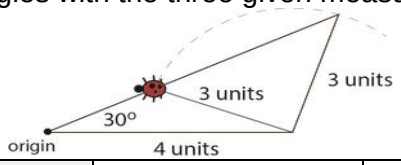
The diagram shows one possibility for the ladybug's final location. Find a different final location that is also consistent with the given information, and draw the ladybug there.



Unit 4 Performance Task 2 PLD Rubric

SOLUTION

Like the first diagram, this one shows a ladybug that has walked 4 units east from the origin point, and then a distance of 3 more units, ending at a point 30 degrees north of east. The diagram shows that there are two non-congruent triangles with the three given measures.



Level 5: Distinguished Command	**Level 4: Strong Command**	**Level 3: Moderate Command**	**Level 2: Partial Command**	**Level 1: No Command**
Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including: • a logical approach based on a conjecture and/or stated assumptions • a logical and complete progression of steps • complete justification of a conclusion with minor computational error	Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including: • a logical approach based on a conjecture and/or stated assumptions • a logical and complete progression of steps • complete justification of a conclusion with minor conceptual error	Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including: • a logical, but incomplete, progression of steps • minor calculation errors • partial justification of a conclusion • a logical, but incomplete, progression of steps	Constructs and communicates an incomplete response based on concrete referents provided in the prompt such as: diagrams, number line diagrams or coordinate plane diagrams, which may include: • a faulty approach based on a conjecture and/or stated assumptions • An illogical and Incomplete progression of steps • majr calculation errors • partial justification of a conclusion	The student shows no work or justification.

Unit 4 Performance Task Option 1

Floor Plan (7.G.A.1)

Mariko has an 80:1 scale-drawing of the floor plan of her house. On the floor plan, the dimensions of her rectangular living room are 1 7/8 inches by 2 1/2 inches.

What is the area of her real living room in square feet?

x. Modifications

Special Education/ 504:	English Language Learners:
-Adhere to all modifications and health concerns stated in each IEP. -Give students a MENU options, allowing students to pick assignments from different levels based on difficulty. -Accommodate Instructional Strategies: reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), handouts, definition list with visuals, extended time -Allow students to demonstrate understanding of a problem by drawing the picture of the answer and then explaining the reasoning orally and/or writing , such as Read-Draw-Write -Provide breaks between tasks, use positive reinforcement, use proximity -Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum by using manipulatives -Implement supports for students with disabilities (click here) - Make use of strategies imbedded within lessons -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 17-18) - Strategies for students with 504 plans	- Use manipulatives to promote conceptual understanding and enhance vocabulary usage - Provide graphic representations, gestures, drawings, equations, realia, and pictures during all segments of instruction - During i-Ready lessons, click on “Español” to hear specific words in Spanish - Utilize graphic organizers which are concrete, pictorial ways of constructing knowledge and organizing information - Use sentence frames and questioning strategies so that students will explain their thinking/ process of how to solve word problems - Utilize program translations (if available) for L1/ L2 students - Reword questions in simpler language - Make use of the ELL Mathematical Language Routines (click here for additional information) -Scaffolding instruction for ELL Learners -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 16-17)
Gifted and Talented:	**Students at Risk for Failure:**
- Elevated contextual complexity - Inquiry based or open ended assignments and projects - More time to study concepts with greater depth - Promote the synthesis of concepts and making real world connections - Provide students with enrichment practice that are imbedded in the curriculum such as: ● Application / Conceptual Development ● Are you ready for more? - Provide opportunities for math competitions - Alternative instruction pathways available - Common Core Approach to Differentiate Instruction: Students with Disabilities (pg. 20)	- Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum - Modify Instructional Strategies, reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), inclusion of more visuals and manipulatives, Peer Support - Constant parental/ guardian contact - Provide academic contracts to students & guardians - Create an interactive notebook with samples, key vocabulary words, student goals/ objectives. - Plan to address students at risk in your learning tasks, instructions, and directions. Anticipate where the needs will be, then address them prior to lessons. -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 19)

21st Century Life and Career Skills:

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

https://www.state.nj.us/education/cccs/2014/career/9.pdf

- **CRP1**. Act as a responsible and contributing citizen and employee.
- **CRP2**. Apply appropriate academic and technical skills.
- **CRP3**. Attend to personal health and financial well-being.
- **CRP4**. Communicate clearly and effectively and with reason.
- **CRP5**. Consider the environmental, social and economic impacts of decisions.
- **CRP6**. Demonstrate creativity and innovation.
- **CRP7**. Employ valid and reliable research strategies.
- **CRP8**. Utilize critical thinking to make sense of problems and persevere in solving them.
- **CRP9**. Model integrity, ethical leadership and effective management.
- **CRP10**. Plan education and career paths aligned to personal goals.
- **CRP11**. Use technology to enhance productivity.
- **CRP12**. Work productively in teams while using cultural global competence.

Students are given an opportunity to communicate with peers effectively, clearly, and with the use of technical language. They are encouraged to reason through experiences that promote critical thinking and emphasize the importance of perseverance. Students are exposed to various mediums of technology, such as digital learning, calculators, and educational websites.

Technology Standards:

All students will be prepared to meet the challenge of a dynamic global society in which they participate, contribute, achieve, and flourish through universal access to people, information, and ideas.
https://www.state.nj.us/education/cccs/2014/tech/

8.1 Educational Technology:

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

A. **Technology Operations and Concepts:** Students demonstrate a sound understanding of technology concepts, systems and operations.
B. **Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
C. **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
D. **Digital Citizenship:** Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
E. **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use of information.
F. **Critical thinking, problem solving, and decision making:** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

A. **The Nature of Technology: Creativity and Innovation-** Technology systems impact every aspect of the world in which we live.
B. **Technology and Society:** Knowledge and understanding of human, cultural, and societal values are fundamental when designing technological systems and products in the global society.
C. **Design:** The design process is a systematic approach to solving problems.
D. **Abilities in a Technological World:** The designed world in a product of a design process that provides the means to convert resources into products and systems.
E. **Computational Thinking: Programming-** Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Connections:	
English Language Arts:	
L.7.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
SL.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.

XI. Core Instruction & Supplemental Resources

Core Instruction

MATH IN FOCUS v. 2015
(HOUGHTON MIFFLIN HARCOURT)

GRADE	TEACHER RESOURCES	STUDENT RESOURCES
2-5	• **Teacher Edition (A & B)** • Implementation Guide • Assessment Package • Enrichment Bundle • Extra Practice Guide • Transition Guides • Reteaching Guide • Home -to- School Connection Book • Online Teacher Technology Kit • Fact Fluency • Online Interactive Whiteboard Lessons	• Student Texts (A & B) • Student Workbooks • Online Student Technology Kit • Student Interactivities
6-7	• **Teacher Edition (A & B)** • Implementation Guide • Assessment Package • Enrichment Bundle • Extra Practice Guide • Transition Guides • Reteaching Guide • Home -to- School Connection Book • Online Teacher Technology Kit	• Student Texts (A & B) • Online Student Interactive Manipulatives

ENGAGE NY v. 2015
(GREAT MINDS)

GRADE	TEACHER RESOURCES	STUDENT RESOURCES
6 (v. 2015)	• **Teacher Edition: Module 1-6**	• Student Material Set: Module 1-6
7	• **Teacher Edition: Module 1-6**	• Student Material Set: Module 1-6
8	• **Teacher Edition: Module 1-7**	• Student Material Set: Module 1-7

5 Practices for Orchestrating Productive Mathematics Discussions

Anticipate

Consider how students might mathematically interpret a problem, the array of strategies—both correct and incorrect—that they might use to tackle it, and how those strategies and interpretations might relate to the mathematical concepts, representations, procedures, and practices that you would like the students to learn.

- Solve the problem yourself first. If possible work with colleagues.
- Ask yourself the following questions:
  - What strategies have students used in the past?
  - What representations are students most likely to use?
  - What incorrect or unproductive strategies are students likely to try?
  - What things might get in the way of students being able to engage with the problem? How can you remove those barriers?
  - What questions will you ask those who struggle?

Monitor

Pay close attention to students' mathematical thinking and solution strategies as they work on the task.

- Create a list of strategies the students may produce.
- Circulate the room. Watch and listen to students as they work.
- If any students use strategies you anticipated, write their name or group number on your list.
- Ask questions that will help students make their thinking visible.
- Ask questions that will help students clarify their thinking.
- Press students to consider aspects of the task to which they need to attend.

Select

Select particular students to share their work with the rest of the class to get specific mathematics into the open for discussion. The selection of particular students and their solutions is guided by the previously anticipated strategies and your assessment of how each approach will contribute to that goal.

- Based on the previously anticipated strategies and the mathematical goal of the activity, decide which student strategies to highlight.
- Select students who will share their work with the class.

Sequence

Make purposeful choices about the order in which students' work is shared to maximize the chances of achieving the mathematical goals for the discussion.

- Based on the mathematical goal, decide on the purpose for the sequence of work. For example: least efficient to most efficient, concrete to abstract, misconceptions to conceptions, or building representations.
- Decide in which order students will present their work.

Connect

Help students draw connections between their solutions and other students' solutions as well as the key mathematical ideas in the lesson. Help students to make judgments about the consequences of different approaches for the range of problems that can be solved, one's likely accuracy and efficiency in solving them, and the kinds of mathematical patterns that can be most easily discerned. Know where you want the discussion to "land" and make choices that are likely to get you there. If necessary, you may have to demonstrate an approach that students didn't come up with themselves.

- As students share, ask questions to elicit and clarify student thinking.
- After each student shares, ask questions to connect it to previously shared work or ask a student to summarize what another student said in their own words.
- Ask students to compare and contrast strategies or representations during the discussion.
- If students did not come up with an approach that you need them to see in order for the discussion to "land," demonstrate this approach and connect it to the work that students did.

IDEAL MATH BLOCK

Whole Group Instruction	55min	INSTRUCTION (Grades 3 – 8) Daily Routine: Mathematical Content or Language Routine (7 – 10 min) Anchor Task: Anticipate, Monitor, Select, Sequence, Connect Tech Integration: Digital applets embedded within lessons designed to enhance student learning Collaborative Work* Guided Learning/Guided Practice Independent Work (Demonstration of Student Thinking) Additional Activities / Let's Practice		
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 30 min	STATION 1: Focus on current Grade Level Content STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 & 4 (Problem Solving and Application) TOOLS/RESOURCES Practice Problems Extra Practice/Enrichment Are you ready for more? Put Your Thinking Cap On	STATION 2: Focus on Student Needs TECH STATION Independent TECH INTEGRATION iReady - *i-Ready* delivers online lessons driven by student data to provide tailored instruction that meets students where they are in their learning trajectory. Dreambox (ELL) – Adaptive online learning platform.	TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies TARGETED INSTRUCTION 4 – 5 Students TOOLS/ RESOURCES Homework Manipulatives Reteach Workbook Transition Guide *all students seen in 2 weeks
Closure	5 min	INSTRUCTION Exit Ticket (Demonstration of Student Thinking) TOOLS/RESOURCES Notebooks or Exit Ticket Slips		

* Promotes discourse and collaboration

Supplemental Resources

Achieve the Core

Tasks - https://achievethecore.org/category/416/mathematics-tasks

Coherence Map - https://achievethecore.org/page/1118/coherence-map

Embarc

https://embarc.online/

Engage NY

https://www.engageny.org/ccss-library/?f%5B0%5D=field_subject%253Aparents_all%3A13601

iReady Digital Platform

https://login.i-ready.com/

Math in Focus

https://my.hrw.com/

Illustrative Mathematics

Content Standard Tasks - https://tasks.illustrativemathematics.org/content-standards

Practice Standard Tasks - https://tasks.illustrativemathematics.org/practice-standards

Open Up Resources - https://access.openupresources.org/sign_in

iM Additional Resources - https://bit.ly/imshare

Khan Academy

https://www.khanacademy.org/math/illustrative-math

NJDOE Digital Item Library

https://nj.digitalitemlibrary.com/home?subject=Math

Ready Teacher Toolbox

https://teacher-toolbox.com/