Orange Public Schools

Office of Curriculum & Instruction
2019-2020 Mathematics Curriculum Guide

7th Grade Mathematics

Math in Focus - Unit 1: The Number System
September 9, 2019 – November 13, 2019

Board Approved: 1.14.2020

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From the Common Core State Standards:

In **Grade 7**, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

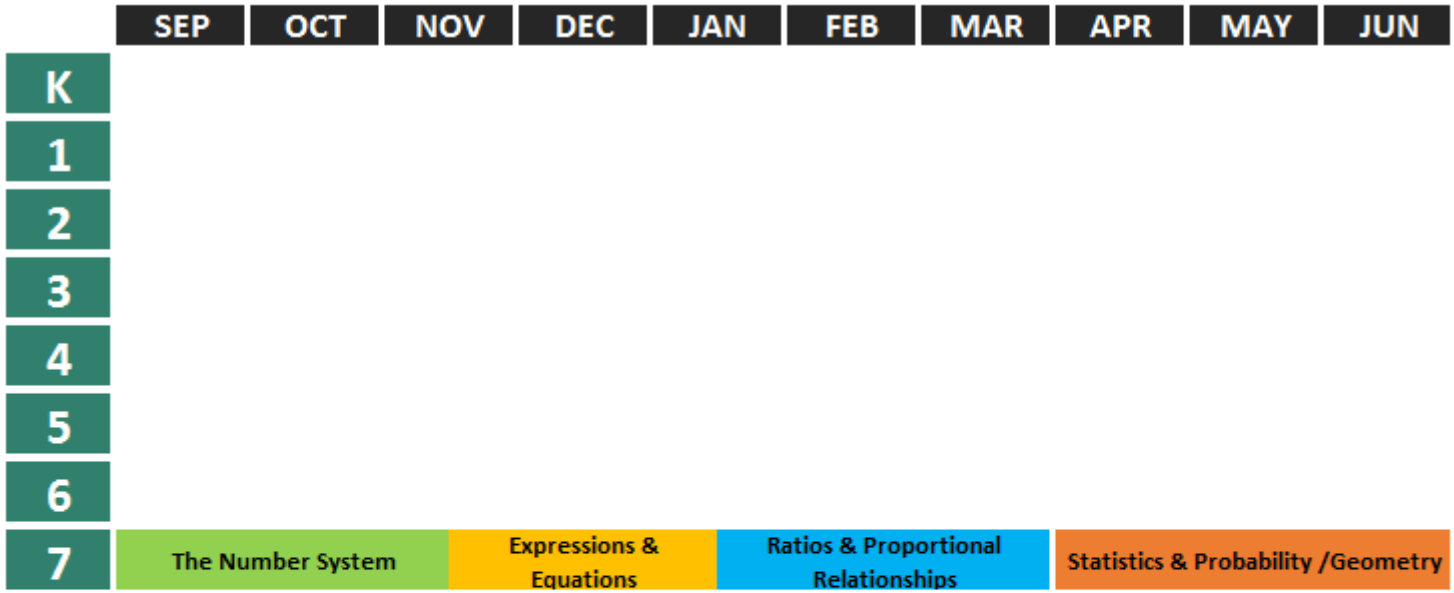
1. Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

2. 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.

3. 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 in Grade 8 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.

4. 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.

A STORY OF UNITS



The Number System: Operations with Rational Numbers

Expressions & Equations: Use properties of operations to generate equivalent fractions and solve real-life problems using numerical & algebraic expressions & equations

Ratios & Proportional Relationships: Analyze proportional relationships and use them to solve real-world and mathematical problems

Statistics & Probability / Geometry: Use random sampling, draw inferences, investigate chance processes, evaluate probability models, construct geometrical figures, and solve real-life problems.

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References

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

I. Unit Overview

Chapter 1: The Real Number System: In this chapter, students extend their knowledge of numbers (whole numbers, integers, fractions, and decimals) to irrational numbers. They identify the numbers that make up the set of rational numbers and those that make up the set of real numbers. They locate numbers from both sets on the number line.

Chapter 2: Rational Number Operations: In this chapter, students learn to add and subtract integers with the same sign and with different signs. They learn how to add integers to their opposites and how to subtract integers by adding their opposites. Students also learn to find the distance between two integers on a number line. Next, students learn to multiply and divide integers, and then to evaluate expressions that include any combination of operations. Students then extend their operation skills to rational numbers, including decimals and percents, and they use their new skills to solve real-world problems.

Essential Questions

- How can we predict that the sum of two numbers is positive, negative or zero?
- What is the difference between the opposite and the absolute value of a number?
- Which methods can be used to compute rational numbers?
- How do we add integers with different signs?
- How can concrete and pictorial models represent operations with integers?
- How can any difference a – b of two rational numbers be restated as an equivalent addition statement?
- How do we determine if the product or quotient of two numbers is positive or negative?

Enduring Understanding

- Numerical representations can be used to describe and compare the value of real-world quantities.
- Relationships exist between positive and negative integers.
- Applying number properties can simplify expressions.
- Absolute value is a numbers distance from zero.
- Understand additive inverse and that opposite quantities combine to make zero.
- Understand subtraction of integers as adding the additive inverse and apply this to real world situations.
- Understand that a rational number is the quotient of two integers.
- Operations can be used to solve problems and equations with both positive and negative numbers.
- Solving real-world problems involves using all properties of operations and all integer rules.

II. Pacing Guide

Activity	New Jersey State Learning Standards (NJSLS)	Estimated Time (Blocks)
Chapter 1 & 2 Pre-Test (MIF)	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	**1**
Chapter 1 Opener	7.NS.1; 7.NS.2d	1
1.1- Representing Rational Numbers on the Number Line	7.NS.1	2
1.2- Writing Rational Numbers as Decimals	7.NS.2d	3
1.3- Introducing Irrational Numbers	7.NS.1	1
1.4- Introducing the Real Number System	7.NS.2d	1
1.5- Introducing Significant Digits *Continue conversions using Long division *	7.NS.2d	2
Chapter 1 Wrap Up/ Review Lesson	7.NS.1; 7.NS.2d	1
Chapter 1 Test (MIF) *Optional*	7.NS.1; 7.NS.2d	1
Chapter 2 Transition Lesson	7.NS.1; 7.NS.2	1
Performance Task 1	7.NS.A.2d	**½**
2.1- Adding Integers	7.NS.1; 7.NS.1a	5
2.2- Subtracting Integers	7.NS.1; 7.NS.1c	3
Unit Review Lesson	7.NS.1	1
Unit 1 Assessment 1	7.NS.A.1	**1**
2.3- Multiplying and Dividing Integers	7.NS.2; 7.NS.2b	2
2.4- Operations with Integers	7.NS.3	1
2.5- Operations with Rational Numbers	7.NS.1d; 7.NS.2c; 7.NS.2a	3
2.6- Operations with Decimals	7.NS.1d; 7.NS.2c	3
Performance Task 2	7.NS.A.1	**1**
Chapter 2 Wrap Up/ Review Lesson	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	1
Chapter 2 Test (MIF) *Optional*	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	1
Unit Review Lesson	7.NS.A.2; 7.NS.A.3	2
Unit 1 Assessment 2	7.NS.A.2; 7.NS.A.3	**1**
Solidify Unit 1 Concepts / Project Based Learning		5
Total Time		**44½ Blocks**

Major Work Supporting Content Additional Content

III. Pacing Calendar

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

SEPTEMBER						
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**					

OCTOBER

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		

NOVEMBER

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 Assessment Evidence Statements

Type I Type II

NJSLS	Evidence Statement	Clarification	Math Practices	Calculator ?
7.NS.1a	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.	-	MP.5	No
7.NS.1b-1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative.	i) Tasks do not have a context. ii) Tasks are not limited to integers. iii) Tasks involve a number line. iv) Tasks do not require students to show in general that a number and its opposite have a sum of 0; for this aspect of 7.NS.1b-1, see 7.C.1.1 and 7.C.2.	MP.5 MP.7	No
7.NS.1b-2	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. b. Interpret sums of rational numbers by describing real-world contexts.	i) Tasks require students to produce or recognize real-world contexts that correspond to given sums of rational numbers. ii) Tasks are not limited to integers. iii) Tasks do not require students to show in general that a number and its opposite have a sum of 0; for this aspect of 7.NS.1b-1, see 7.C.1.1 and 7.C.2	MP.2 MP.3 MP.5	No

7.NS.1c-1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Apply this principle in real-world contexts.	i) Tasks may or may not have a context. ii) Tasks are not limited to integers. iii) Contextual tasks might, for example, require students to create or identify a situation described by a specific equation of the general form p – q = p + (–q) such as 3 – 5 = 3 + (–5). iv) Non-contextual tasks are not computation tasks but rather require students to demonstrate conceptual understanding, for example, by identifying a difference that is equivalent to a given difference. For example, given the difference –1/3 – (1/5 + 5/8), the student might be asked to recognize the equivalent expression –1/3 + –(1/5 + 5/8).	MP.2 MP.7 MP.5	No
7.NS.1d	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. d. Apply properties of operations as strategies to add and subtract rational numbers	i) Tasks do not have a context. ii) Tasks are not limited to integers. iii)Tasks may involve sums and differences of 2 or 3 rational numbers. iv)Tasks require students to demonstrate conceptual understanding, for example, by producing or recognizing an expression equivalent to a given sum or difference. For example, given the sum –8.1 + 7.4, the student might be asked to recognize or produce the equivalent expression –(8.1 – 7.4).	MP.7 MP.5	No
7.NS.2a-1	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers.	i) Tasks do not have a context. ii) Tasks require students to demonstrate conceptual understanding, for example by providing students with a numerical expression and requiring students to produce or recognize an equivalent expression using properties of operations. For example, given the expression (–3)(6 + –4 + –3), the student might be asked to recognize that the given expression is equivalent to (–3)(6 + –4) + (–3)(–3).	MP.7	No

7.NS.2a-2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Interpret products of rational numbers by describing real-world contexts.	-	MP.2 MP.4	No
7.NS.2b-1	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -(p/q) = (–p)/q =p/(–q).	i) Tasks do not have a context. ii) Tasks require students to demonstrate conceptual understanding, for example, by providing students with a numerical expression and requiring students to produce or recognize an equivalent expression.	MP.7	No
7.NS.2b-2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Interpret quotients of rational numbers by describing real-world contexts.	-	MP.2 MP.4	No
7.NS.2c	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers.	i) Tasks do not have a context. ii) Tasks are not limited to integers. iii) Tasks may involve products and quotients of 2 or 3 rational numbers. iv) Tasks require students to compute a product or quotient, or demonstrate conceptual understanding, for example, by producing or recognizing an expression equivalent to a given expression. For example, given the expression (−8)(6)/(−3), the student might be asked to recognize or produce the equivalent expression −(8/3)(−6).	MP.7	No
7.NS.3	3 Solve real-world and mathematical problems involving the four operations with rational numbers.	i) Tasks are one-step word problems. ii) Tasks sample equally between addition/subtraction and multiplication/division. iii) Tasks involve at least one negative number. iv) Tasks are not limited to integers.	MP.1 MP.4	No

7.C.1.1	Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills articulated in 7.NS.1 and 7.NS.2	i) Tasks should not require students to identify or name properties.	MP.1 MP.2 MP.3 MP.5 MP.6 MP.7	Yes
7.C.2	Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division. Content Scope: Knowledge and skills articulated in 7.NS.1 and 7.NS.2	-	MP.1 MP.2 MP.3 MP.5 MP.6 MP.7	Yes

V. Differentiated Instruction

Chapter 1

Assessment and Intervention

	ASSESSMENT	RtI STRUGGLING LEARNERS
DIAGNOSTIC	• Quick Check in Recall Prior Knowledge in Student Book A, pp. 3–6 • Chapter 1 Pre-Test in *Assessments*	• Skills 1–6 in *Transition Guide, Course 2*
ON-GOING	• Guided Practice • Lesson Check • Ticket Out the Door	• *Reteach* worksheets • *Extra Practice* worksheets • *Activity Book*, Chapter 1
END-OF-CHAPTER	• Chapter Review/Test • Chapter 1 Test in *Assessments* • ExamView® Assessment Suite CD-ROM Course 2	• *Reteach* worksheets

ELL ENGLISH LANGUAGE LEARNERS

Review the terms *rational*, *terminate*, and *irrational*.

Model Write the word *rational*. Underline the root *ratio*. Below that, write $0.25 = \frac{1}{4}$ and $0.333\ldots = 0.\overline{3} = \frac{1}{3}$. Write the word *irrational*. Underline the prefix *ir-*. Below that, write $\pi = 3.14159265\ldots$.

Say A *rational* number is a number you can write as a ratio. The decimal 0.25 *terminates*. It ends. 0.25 is a rational number. You can rewrite it as the ratio $\frac{1}{4}$. The decimal $0.\overline{3}$ does not terminate. It repeats. $0.\overline{3}$ is also a rational number. You can rewrite it as the ratio $\frac{1}{3}$. The prefix *ir-* means "not." An *irrational* number is a number that is *not* rational. You cannot rewrite an irrational number as a ratio. π is an irrational number. If you write π as a decimal, it does not terminate. It does not repeat.

For definitions, see Glossary, page 308, and Online Multi-Lingual Glossary.

ADVANCED LEARNERS

- Students can use a simple rule to determine whether a rational number in the form of a fraction will terminate or repeat when it is rewritten as a decimal. Explain that in order for a fraction to be rewritten as a terminating decimal, it must be possible to rewrite the fraction so that its denominator is a power of ten (10, 100, 1,000, etc.). If a fraction has a denominator that cannot be multiplied by a whole number to yield a power of ten, its decimal form will be repeating.
- Give students the following fractions: $\frac{5}{8}$, $\frac{4}{7}$, $\frac{5}{9}$, and $\frac{11}{16}$. Ask them to use the rule to decide whether each decimal will terminate or repeat and, if it terminates, to name the least power of 10 that the fraction's denominator can be rewritten as. *(Terminate, 1,000; Repeat; Repeat; Terminate, 10,000)*

To provide additional challenges use:

- *Enrichment*, Chapter 1
- Student Book A, Brain@Work problem

Chapter 2

Assessment and Intervention

	ASSESSMENT	RtI STRUGGLING LEARNERS
DIAGNOSTIC	• Quick Check in Recall Prior Knowledge in Student Book A, pp. 53–57 • Chapter 2 Pre-Test in *Assessments*	• Skills 7–15 in *Transition Guide, Course 2*
ON-GOING	• Guided Practice • Lesson Check • Ticket Out the Door	• *Reteach* worksheets • *Extra Practice* worksheets, Chapters 1–2 Cumulative Practice worksheets • *Activity Book*, Chapter 2
END-OF-CHAPTER	• Chapter Review/Test • Chapter 2 Test, Chapters 1–2 Benchmark Test in *Assessments* • ExamView® Assessment Suite CD-ROM Course 2	• *Reteach* worksheets

ELL ENGLISH LANGUAGE LEARNERS

Review the terms *zero pair* and *additive inverse*.

Model Write the following equations on the board: $1 + (-1) = 0$, $2 + (-2) = [1 + (-1)] + [1 + (-1)] = 0$.

Say A pairing of integers 1 and −1, whose sum is 0, is called a *zero pair*. 1 and −1 are a zero pair. 2 and −2 have two zero pairs.

Say −1 is the opposite of 1. Another name for opposite is *additive inverse*. −1 is the additive inverse of 1. 1 is the additive inverse of −1. We call −1 the *additive inverse* of 1 because when you *add* −1 to 1, the sum is 0. When you add a number to its additive inverse, the sum must be zero. −4 is the additive inverse of 4. 4 is the additive inverse of −4.

Model Write 3, −6, 9, −12, and 100 on the board. Have students name the additive inverse of each integer.

For definitions, see Glossary, page 308, and Online Multi-Lingual Glossary.

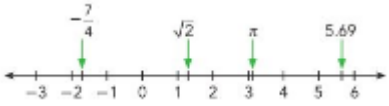
ADVANCED LEARNERS

- Students can use integer operations to compare the highest and lowest temperatures on different planets in the solar system. Have students do research to identify the highest and lowest temperatures on various planets. Once they have compiled their data, ask them to use integer operations to find a range of temperatures for each planet they researched. Have students create posters to share their data.
- You may want to suggest that students use a double bar graph to display their temperature data. Students can use a vertical axis for temperatures above and below 0°C (or 0°F).

To provide additional challenges use:

- *Enrichment*, Chapter 2
- Student Book A, Brain@Work problem

VI. Vocabulary

Term	Definition
Chapter 1	
Approximate	Close to the actual value of a number. The numbers 1.4, 1.41, and 1.4142 are approximate values of the square root of 2.
Irrational Number	A number that cannot be written as *m/n* where m and n are integers with n being a nonzero integer
Negative Integers	The set of integers to the left of 0 on a number line: …, –4, –3, –2, –1. Examples: –5, –17, and –98 are negative integers
Negative Fractions	A set of fractions to the left of 0 on a number line. Examples: $-\frac{1}{2}$ and $-\frac{13}{5}$ are negative fractions
Opposites	Two numbers that are the same distance from 0 but are on opposite sides of 0 on the number line. 0 is its own opposite. Example: 2 and –2 are opposites
Positive Integers	The set of integers to the right of 0 on a number line: 1, 2, 3, 4, … Examples: 2, 10, and 51 are positive integers
Precise	A word describing the level of detail a measuring tool can measure.
Rational Number	A number that can be written as *m/n* where m and n are integers with n being a nonzero integer.
Real Number	A set of numbers that consists of rational and irrational numbers
Real Number Line	A number line containing all real numbers. 
Repeating Decimal	A decimal that has a group of one or more digits that repeat endlessly. Examples: 0.111…, 0.030303…, and 0.16333… are repeating decimals.
Set of Integers	The set of negative integers, 0, and positive integers: …, -4, -3, -2, -1, 0, 1, 2, 3, 4, …
Significant Digits	The digits that are certain and the digit that is estimated in a number.
Terminating Decimal	A decimal that has a finite number of nonzero decimal places. Examples: 0.5, 0.28, and 0.75 are terminating decimals
Chapter 2	
additive inverse	The additive inverse of a number x is the number that, when added to x, yields zero. Example: 2 and -2 are additive inverses.
zero pair	A pairing of the integers 1 and -1, whose sum is 0
complex fraction	A fraction in which the numerator, the denominator, or both the numerator and the denominator contain a fraction.
least common denominator	The common multiple of the denominators of two or more fractions that has the least value.

VII. Assessment Framework

Unit 1 Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Chapter 1 Pretest (Beginning of Unit) *Math in Focus*	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	½ Block	Individual	Yes (No Weight)
Chapter 2 Pretest (After Chapter 1) *Math in Focus*	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	½ Block	Individual	Yes (No Weight)
Unit 1 Assessment 1 (After Chapter 1) *District Assessment*	7.NS.A.1	½ Block	Individual	Yes
Unit 1 Assessment 2 (Conclusion of Unit) *District Assessment*	7.NS.A.2; 7.NS.A.3	½ Block	Individual	Yes
Chapter 1 Test (Optional) *Math in Focus*	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	½ Block	Individual	Yes, if administered
Chapter 2 Test (Optional) *Math in Focus*	7.NS.A.1; 7.NS.A.2; 7.NS.A.3	½ Block	Individual	Yes, if administered
Grade 7 Interim Assessment 1 (Early November) *District Assessment*	7.NS.A.1a; 7.NS.A.1b; 7.NS.A.1c; 7.NS.A.1d; 7.NS.A.2a; 7.NS.A.2b	1 Block	Individual	Yes

Unit 1 Performance Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Unit 1 Performance Task 1 (Late September) *Decimal Expansion of Fractions*	7.NS.A.2	1 Block	Individual	Yes; Rubric
Unit 1 Performance Task 2 (Mid October) *Distances Between Houses*	7.NS.A.1	1 Block	Individual w/ Interview Opportunity	Yes; Rubric
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*

Name _____ Block _____ Date _____

Decimal Expansion of Fractions (NJSLS 7.NS.A.2d)

Sarah learned that in order to change a fraction to a decimal, she can use the standard division algorithm and divide the numerator by the denominator. She noticed that for some fractions, like $\frac{1}{4}$ and $\frac{1}{100}$ the algorithm terminates at the hundredths place. For other fractions, like $\frac{1}{8}$, she needed to go to the thousandths place before the remainder disappears. For other fractions, like $\frac{1}{3}$ and $\frac{1}{6}$, the decimal does not terminate. Sarah wonders which fractions have terminating decimals and how she can tell how many decimal places they have.

a. Convert each of the following fractions to decimals to help Sarah look for patterns with her decimal conversions:

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{10}, \frac{1}{12}, \frac{1}{15}.$$

b. Which fractions on the list have terminating decimals (decimals that eventually end in 0's)? What do the denominators have in common?

c. Which fractions on the list have repeating decimals? What do the denominators have in common?

d. Which fractions $\frac{p}{q}$ (in reduced form) do you think have terminating decimal representations? Which do you think have repeating decimal representations?

7th Grade Decimal Expansion of Fractions Task – Rubric Name: _____ Date: _____

NJSLS: 7.NS.A.2d Type:_____ Teacher: _____

Task Description	• 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. • Clearly constructs and communicates a complete response by ➢ using a logical approach based on a conjecture and/or stated assumptions ➢ providing an efficient and logical progression of steps ➢ using grade-level vocabulary, symbols, and labels ➢ providing a justification of a conclusion with minor computational error ➢ evaluating, interpreting and critiquing the validity and efficiency of others' responses				
Command Level Description	***Level 5:*** ***Distinguished Command*** Perform the task items accurately or with minor computation errors.	***Level 4:*** ***Strong Command*** Perform the task items with some non-conceptual errors	***Level 3:*** ***Moderate Command*** Perform the task items with minor conceptual errors and some computation errors.	***Level 2:*** ***Partial Command*** Perform the task items with some errors on both math concept and computation.	***Level 1:*** ***No Command*** Perform the task items with serious errors on both math concept and computation.
Score range	*13-15 pts*	*10-12 pts*	*6-9 pts*	*3-5 pts*	*0-2 pts*
Task Score & PLD Assigned					

Decimal Expansion of Fraction – Scoring Guide **NAME: _____**

#	Answer	Scoring
Part A	$\frac{1}{2} = 0.5$ | $\frac{1}{3} = 0.\overline{3}$ | $\frac{1}{4} = 0.25$ | $\frac{1}{5} = 0.2$ | $\frac{1}{6} = 0.1\overline{6}$ | $\frac{1}{10} = 0.1$ | $\frac{1}{12} = 0.08\overline{3}$ | $\frac{1}{15} = 0.0\overline{6}$. The long division process on the most difficult of these fractions, 1/12, is shown below: $12\overline{)1.0000}$ = 0.0833 0.96 0.040 0.036 0.0040 0.0036 0.0004 ***Notice that the remainder after subtracting 8 x 12(hundredths) is the same as the remainder after subtracting 3 x 12(thousandths), namely 4. This means that the 3 in the decimal repeats: we continue to take away 3 groups of 12 and the remainder is always 4. Those fractions which repeat can be found the same way as 1/12. **	1 points: 1 point for each correct conversion. **8 TOTAL POINTS**
Part B	The following fractions when converted result in terminating decimals: ½, ¼, 1/5, and 1/10. Taking ¼ as an example, we can see where the terminating decimal comes from by observing that 4 is a factor of 100: specifically we use the fact that 4 x 25= 100. $\frac{1}{4} = \frac{1 \times 25}{4 \times 25} = \frac{25}{100} = 0.25$ All of the denominators of the four fractions are factors of 100 and can be converted in the same way.	2 points: 1 point for the correct list of fractions and 1 point for explaining why each decimal terminates. **2 TOTAL POINTS**
Part C	The fractions with repeating decimals on the list are : 1/3, 1/6, 1/12, and 1/15. Each of these fractions has a prime factor different from 2 or 5 in the denominator: 3, 6, 12, and 15 have a prime factor of 3. Unlike in the case of part (b), multiplying by a power of 10 will never result in a whole number here because a factor of 3 will always remain in the denominator. This means that the decimals do not terminate.	2 points: 1 point for the correct list of fractions and 1 point for explaining why each decimal repeats. **2 TOTAL POINTS**
Part D	The examples studied here indicate that the pattern of a decimal expansion is determined by the denominator (though different numerators should be tried to see if the 1 in the numerator of all of these fractions plays an important role). When the only prime factors of the denominator are 2 and 5 the decimal terminates. When the denominator has a prime factor other than 2 or 5 the decimal eventually repeats. More work would be necessary to see if this always holds: this would mean looking at more fractions with different numerators and denominators and eventually thinking carefully about the division algorithm. ****This is a sample response. Answers may vary****	3 points: 2 points for correct explanation and 1 point for providing an example **3 TOTAL POINTS**

Name _____ Block _____ Date _____

Distances Between Houses (NJSLS 7.NS.A.1)

Aakash, Bao Ying, Chris, and Donna all live on the same street as their school, which runs from east to west.

- Aakash lives $5\frac{1}{2}$ blocks to the west.
- Bao Ying lives $4\frac{1}{4}$ blocks to the east.
- Chris lives $2\frac{3}{4}$ blocks to the west.
- Donna lives $6\frac{1}{2}$ blocks to the east.

a. Draw a picture that represents the positions of their houses along the street.

b. Find how far is each house from every other house?

c. Represent the relative position of the houses on a number line, with the school at zero, points to the west represented by negative numbers, and points to the east represented by positive numbers.

d. How can you see the answers to part (b) on the number line? Using the numbers (some of which are positive and some negative) that label the positions of houses on the number line, represent these distances using sums or differences.

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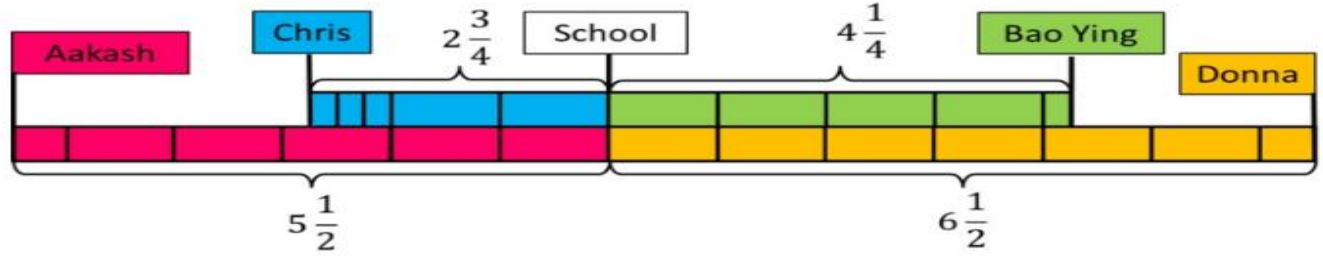
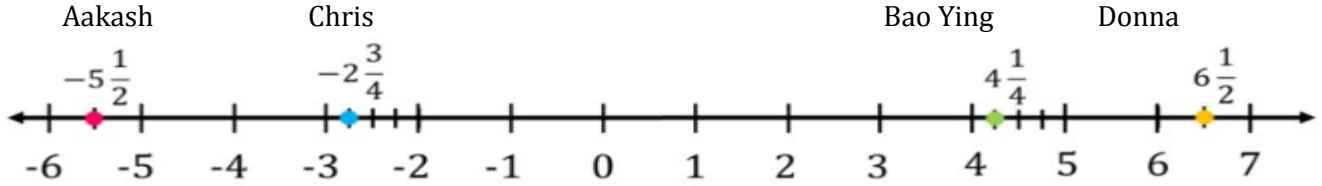
7th Grade Distances Between Houses Task – Rubric Name: _____ Date: _____

NJSLS: 7.NS.A.1 Type:_____ Teacher: _____

Task Description	• 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. • Clearly constructs and communicates a complete response by ➢ using a logical approach based on a conjecture and/or stated assumptions ➢ providing an efficient and logical progression of steps ➢ using grade-level vocabulary, symbols, and labels ➢ providing a justification of a conclusion with minor computational error ➢ evaluating, interpreting and critiquing the validity and efficiency of others' responses				
Command Level Description	***Level 5:*** ***Distinguished Command*** Perform the task items accurately or with minor computation errors.	***Level 4:*** ***Strong Command*** Perform the task item with some non-conceptual errors	***Level 3:*** ***Moderate Command*** Perform the task items with minor conceptual errors and some computation errors.	***Level 2:*** ***Partial Command*** Perform the task items with some errors on both math concept and computation.	***Level 1:*** **No Command** Perform the task items with serious errors on both math concept and computation.
Score range	*27-31 pts*	*19-26 pts*	*13-18 pts*	*6-12 pts*	*0-5 pts*
Task Score & PLD Assigned					

Distances Between Houses – Scoring Guide **NAME: _____**

#	Answer	Scoring
Part A	 **** There are many ways to draw a picture that represents this situation	2 points: 1 point for the correct location away from the school and 1 point for the correct distance representation (correct fraction representation) **8 TOTAL POINTS**
Part B	<table><tr><th></th><th>Bao Ying</th><th>Chris</th><th>Donna</th></tr><tr><td>Aakash</td><td>$9\frac{3}{4}$</td><td>$2\frac{3}{4}$</td><td>12</td></tr><tr><td>Bao Ying</td><td></td><td>7</td><td>$2\frac{1}{4}$</td></tr><tr><td>Chris</td><td></td><td></td><td>$9\frac{1}{4}$</td></tr></table>	2 points: 1 point for the correct answer and 1 point for showing work **12 TOTAL POINTS**
Part C		2 points: 1 point for the correct location away from the school and 1 point for the correct distance representation (correct fraction representation) **8 TOTAL POINTS**
Part D	The distance between the houses is represented by the distance between the points that correspond to the houses on the number line. This can be computed by subtracting the numbers that represent the position of the house relative to the school. For example, to find the distance between Bao Ying and Chris, we subtract – 2 ¾ from 4 ¼ . We can communicate this more clearly by labeling the distance between the points with the difference of the numbers on the number line.	3 points: 2 points for correct explanation and 1 point for using an example **3 TOTAL POINTS**

IX. 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.

X. 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

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/