

Englewood Public School District

Mathematics

Grade 7

First Marking Period

Unit – The Real Number System

Overview: During this unit, students will learn about the real number system, rational number operations, and algebraic expressions.

Time Frame: Chapter 1 (skip 1.3 & 1.4) – 10 days, Chapter 2 – 22 days, Chapter 3 (3.2 & 3.2) – 6 days

Enduring Understandings:

Real numbers are represented as points on an infinite line and are used to count, measure, estimate, or approximate quantities.

The operations of addition, subtraction, multiplication, and division can be applied to rational numbers, including negative numbers.

Algebraic expressions containing rational numbers and several variables can be simplified, expanded, or factored to write equivalent expressions.

Essential Questions:

How can a number line be used to demonstrate how opposite quantities combine to make 0.

How is a rational number converted to a decimal?

How can a number line be used to demonstrate the properties and processes of addition and subtraction of rational numbers?

How can the previously learned properties of multiplication and division be extended to multiplication and division of rational numbers?

How can the four operations with rational numbers be used to solve real-world and mathematical problems which may include complex fractions?

How can the properties of operations be used to transform linear expressions?

Standards	Topics and Objectives	Activities	Resources	Assessments
Chapter 1 (Skip 1.3 & 1.4)				
7.NS.A.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to	Topics	<u>7.NS.A.1 Comparing Freezing Points</u>	SE-7A: 2-25; 38-51	Unit 1 Benchmark Assessments: Common Formative Assessment Exact Path
	Representing rational numbers on the number line, writing rational numbers as decimals and introducing significant digits.	<u>7.NS.A.2 Why is a Negative Times a Negative Always Positive</u>	My HRW - Online access to all Math in Focus materials and Virtual Manipulatives	
	Twenty-First Century Themes and Skills include:	<u>7.NS.A.2d Equivalent fractions approach to non-repeating decimals</u>	Math in Focus Teacher Resource Tools Math in Focus Performance	

<p>make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</p> <p>b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>	<ul style="list-style-type: none"> • <u>Creativity and Innovation</u> • <u>Critical Thinking and Problem Solving</u> • <u>Communication and Collaboration</u> <p>Objectives</p> <p>The students will be able to:</p> <ul style="list-style-type: none"> • Find absolute values of rational numbers. • Express numbers in m/n form. • Locate rational numbers on the number line. • Write rational numbers as terminating or repeating decimals using long division. • Compare rational number on the number line. • Introduce rules to identify significant digits in a given number. • Determine if trailing zeros of an integer is significant. • Round integers and decimals to a specified number of significant digits. • Reinforce, consolidate and extend chapter skills and concepts. 	<p><u>7.NS.A.2d Repeating decimal as approximation</u></p> <p>Math Playground http://www.mathplayground.com/</p> <p>Math Fact Practice http://www.playkidsgames.com/games/mathfact/mathfact.htm</p> <p>Grades 6-8 Math Fluency Support https://www.engageny.org/resource/mathematics-fluency-support-grades-6-8</p> <p>Brain Genie http://braingenie.ck12.org/</p> <p>Math Game Time http://www.mathgametime.com/</p> <p>Everything you need to know about math journals: https://thecornerstoneforteachers.com/math-journals/ (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)</p> <p>Rational numbers activities: https://www.teacherspayteachers.com/Browse/Search:rational%20number%20</p>	<p>Task</p> <p>Technology Resources</p> <ul style="list-style-type: none"> • Math in Focus eBooks • Math in Focus Teacher Resources CD • Interactive Whiteboard lessons • Virtual Manipulatives • Online Professional Development Videos <p>North Carolina Dept of Ed. Wikispaces: http://maccss.ncdpi.wikispaces.net/Middle+School</p> <p>Math Goodies – Math Lessons http://www.mathgoodies.com/</p> <p>Standards Solution Lessons:</p> <ul style="list-style-type: none"> • PARCC Lesson 7: Type I- Selected Response-Sort by Category • CCSS Lesson Plan: Using Distance to Discover Absolute Value • CCSS Lesson Plan: Converting Fractions to Decimals <p>7th grade assessments, interactive, videos, games, lessons, homework: https://www.opened.com/search?area=mathematics&grade=7&offset=0&resource_type=interactive-assessment</p>	<p>Summative Assessments:</p> <p>Math in Focus Assessments</p> <p>SE/TE: pp. 49, 50–51, Items: 1–16, 25–29</p> <p>Assessments Course 2:</p> <p>Chapter 1 Test A pp. 3–5, Items: 1–13, 16;</p> <p>Test B pp. 6–8, Items: 1–12, 15–16</p> <p>ExamView® Assessment Suite CD-ROM Course 2</p> <p>Formative Assessments:</p> <p>Exit Ticket Out the Door</p> <p>Math journal (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)</p> <p>Multiple choice / short answer assessments (CRP8)</p> <p>Mini quizzes – assess just one topic, or what was done within 1 or 2 days (CRP8)</p> <p>Alternative Assessments:</p> <p>Learning centers: each learning center focuses on a different type of problem (CRP8)</p>
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Mathematical Practices
MP.2, MP.3, MP.4,
MP.5, MP.6, MP.7

activities/Grade-
Level/Seventh/Price-
Range/Free
(NJSLSA.W2,
NJSLSA.R1)

**Absolute value – taking
a deeper look:**

<https://betterlesson.com/lesson/437463/absolute-value-taking-a-deeper-look>
(NJSLSA.W2,
NJSLSA.R1)

**Integers and absolute
value worksheet:**

<https://scoutingweb.com/wp-content/uploads/2018/06/absolute-value-worksheet.pdf>
(CRP2, CRP4, CRP8)

**Absolute value lesson /
activity:**

<https://www.eduplace.com/math/mathsteps/7/b/7.absolute.ideas.html>
(NJSLSA.W2,
NJSLSA.R1)

**Intro to significant digits
video:**

<https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic->

(CRP2, CRP4, CRP8,
8.1.8.A.1)

**7th grade worksheets,
games, lessons, activities:**

<https://www.education.com/resources/math/middle-school/>
(CRP2, CRP4, CRP8,
8.1.8.A.1)

**7th grade common core
worksheets:**

<https://www.ixl.com/math/grade-7>
(CRP2, CRP4, CRP8)

**Khan Academy – videos,
lessons, assessments**
www.khanacademy.org
(8.1.8.A.1)

In groups, create posters
illustrating the main
objectives of the unit
(RH.6-8.7)(9.2.8.B.3)

Create a dictionary
defining and illustrating
vocabulary terms
(RH.6-8.7)

significant-figures-
tutorial/v/significant-
figures
(8.1.8.A.1, CRP2)

Rules for significant digits video:

<https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/v/more-on-significant-figures>
(8.1.8.A.1, CRP2)

Adding and subtracting significant digits video:

<https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/v/addition-and-subtraction-with-significant-figures>
(8.1.8.A.1, CRP2)

Multiplying and dividing significant digits video:

<https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/v/multiplying-and-dividing-with-significant-figures>

(8.1.8.A.1, CRP2)

Practicing with significant figures:

https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/e/significant_figures_1

(CRP2, CRP4, CRP8)

Racing for significant figures game:

<https://www.carolina.com/teacher-resources/Interactive/significant-figures-game/tr10849.tr>

(8.1.8.A.1)

Additional texts:

www.newsela.com
www.readworks.org
www.commonlit.org

Chapter 2

7.NS.A.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

Topics

Adding integers, subtracting integers, multiplying and dividing integers. Operations with rational numbers.

Twenty-First Century Themes

Math Playground

<http://www.mathplayground.com/>

Math Fact Practice

<http://www.playkidsgames.com/games/mathfact/mathfact.htm>

SE-7A: 52-127

My HRW - Online access to all Math in Focus materials and Virtual Manipulatives

Math in Focus **Teacher Resource Tools**

Summative Assessments:

Math in Focus Assessments

SE/TE: pp. 123, 124–125, 126–127

Assessments Course 2:

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.

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

c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

d. Apply properties of operations as strategies to add and subtract rational numbers.

7.NS.A.2. 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,

and Skills include:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

Objectives

The students will be able to:

- Add integers with the same sign.
- Add integers to their opposites.
- Add integers with different signs.
- Subtract integers by adding their opposites.
- Find the distance between two integers on a number line.
- Multiply and divide integers.
- Use addition, subtraction, multiplication and division with integers.
- Add and subtract rational numbers.
- Multiply and divide rational numbers.
- Add and subtract decimals.
- Multiply and divide numbers in decimal or percent form.
- Reinforce, consolidate and extend chapter skills and concepts.

Grades 6-8 Math Fluency Support

<https://www.engageny.org/resource/mathematics-fluency-support-grades-6-8>

Brain Genie

<http://braingenie.ck12.org/>

Math Game Time

<http://www.mathgametime.com/>

Everything you need to know about math journals:

<https://thecornerstoneforteachers.com/math-journals/> (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)

Operations with integers activities (can be used with math journals too):

<https://www.teacherspayteachers.com/Browse/Search:integer%20operations%20activity/Grade-Level/Seventh/Price-Range/Free> (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1, CRP2, CRP4)

Use algebra-tiles to illustrate operations:

Math in Focus Performance Task

Technology Resources

- Math in Focus eBooks
- Math in Focus Teacher Resources CD
- Interactive Whiteboard lessons
- Virtual Manipulatives
- Online Professional Development Videos

North Carolina Dept of Ed. Wikispaces:

<http://maccss.ncdpi.wikispaces.net/Middle+School>

Math Goodies – Math Lessons

<http://www.mathgoodies.com/>

Standards Solution Lessons:

- **PARCC Lesson 15:** Practice Type I items – The Number System domain.
- **PARCC Lesson 13:** PBA- Introduction-Justification and Modeling
- **PARCC Lesson 16:** Performance Based Assessment
- **CCSS Lesson Plan:** Adding and Subtracting Integers
- **CCSS Lesson Plan:** Applying Properties of Operations
- **CCSS Lesson Plan:**

Chapter 2
Test A pp. 11–13;
Test B pp. 14–16

Assessments Course 2:
Benchmark Test A
pp. 17–22;
Benchmark Test B
pp. 23–28

ExamView® Assessment Suite CD-ROM Course 2

Formative Assessments:
Math journal
(NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)

Exit Ticket Out the Door

Multiple choice / short answer assessments (CRP8)

Mini quizzes – assess just one topic, or what was done within 1 or 2 days (CRP8)

Alternative Assessments:
Learning centers: each learning center focuses on a different type of problem (CRP8)

In groups, create posters illustrating the main objectives of the unit

<p>particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>7.NS.A.3. Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)</p> <p><i>Mathematical Practices</i> MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8</p>		<p>https://technology.cpm.org/general/tiles/</p> <p>Alge-tiles activity: http://thewessens.net/ClassroomApps/subindex.html?id=algebratiles&topic=models&path=Models</p> <p>Additional texts: www.newsela.com www.readworks.org www.commonlit.org</p>	<p>Multiplying Integers</p> <ul style="list-style-type: none"> • CCSS Lesson Plan: Rational Number Problems • CCSS Lesson Plan: Rational Quotients of Integers • CCSS Prescriptive Lesson Plan: Adding and Subtracting Negative Numbers • CCSS Prescriptive Lesson Plan: Multiplying and Dividing Rational Numbers • CCSS Prescriptive Lesson Plan: Solving Real-World Problems with Rational Numbers 	<p>(RH.6-8.7))(9.2.8.B.3)</p> <p>Create a dictionary defining and illustrating vocabulary terms (RH.6-8.7)</p>
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Chapter 3 (3.1 and 3.2)				
<p>7.EE.A.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p>	<p>Topics</p> <p>Adding and subtracting algebraic terms.</p>	<p>Math Playground http://www.mathplayground.com/</p> <p>Math Fact Practice</p>	<p>SE-7A: 128-144</p> <p>My HRW - Online access to all Math in Focus materials and Virtual Manipulatives</p>	<p>Summative Assessments:</p> <p>Math in Focus Assessments</p> <p>ExamView® Assessment</p>

Mathematical Practices
MP.1, MP.2, **MP.3**, **MP.4**
MP.5, MP.6, **MP.7**, **MP.8**

Twenty-First Century Themes and Skills include:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

Objectives

The students will be able to:

- Represent algebraic expressions using bar models.
- Simplify algebraic expressions with decimal and fractional coefficients by adding like terms.

<http://www.playkidsgames.com/games/mathfact/mathfact.htm>

Grades 6-8 Math Fluency Support

<https://www.engageny.org/resource/mathematics-fluency-support-grades-6-8>

Brain Genie

<http://braingenie.ck12.org/>

Math Game Time

<http://www.mathgametime.com/>

Everything you need to know about math journals:

<https://thecornerstoneforteachers.com/math-journals/>
(NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)

Use alge-tiles to illustrate operations:

<https://technology.cpm.org/general/tiles/>

Algebra-tiles activity:

<http://thewessens.net/ClassroomApps/subindex.html?id=algebratiles&topic=models&path=Models>

Walk the plank game (word problems):

<http://www.algebra4childr>

Math in Focus Teacher Resource Tools

Math in Focus Performance Task

Technology Resources

- Math in Focus eBooks
- Math in Focus Teacher Resources CD
- Interactive Whiteboard lessons
- Virtual Manipulatives
- Online Professional Development Videos

North Carolina Dept of Ed.

Wikispaces:

<http://maccss.ncdpi.wikispaces.net/Middle+School>

Math Goodies – Math Lessons

<http://www.mathgoodies.com/>

Algebraic expressions unit:

<https://www.geneseocsd.org/Page/1213>

(CRP2, CRP4, CRP8,)

7th grade assessments, interactive, videos, games, lessons, homework:

https://www.opened.com/search?area=mathematics&grade=7&offset=0&resource_type=interactive-assessment
(CRP2, CRP4, CRP8,)

Suite CD-ROM Course 2

Note:

Assessment will be administered at the end of Chapter 3.

Formative Assessments:

Math journal
(NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)

Exit Ticket Out the Door

Multiple choice / short answer assessments

Alternative Assessments:

Learning centers: each learning center focuses on a different type of problem

In groups, create posters illustrating the main objectives of the unit (RH.6-8.7))(9.2.8.B.3)

[en.com/Games/games-2/Algebraic-expressions/plank-algebraic_expressions.html](http://www.algebra4children.com/Games/games-2/Algebraic-expressions/plank-algebraic_expressions.html)

Soccer game:

http://www.algebra4children.com/Games/games-2/Algebraic-expressions/football-algebraic_expressions.html

Additional texts:

www.newsela.com
www.readworks.org
www.commonlit.org

7th grade worksheets, games, lessons, activities:
<https://www.education.com/resources/math/middle-school/>
(CRP2, CRP4, CRP8)

7th grade common core worksheets:
<https://www.ixl.com/math/grade-7>
(CRP2, CRP4, CRP8)

Khan Academy – videos, lessons, assessments
www.khanacademy.org

Key Vocabulary:

Chapter 1:

opposites, set of integers, positive integers, negative integers, negative fractions, rational numbers, terminating decimal, repeating decimal, significant digits, precise

Chapter 2:

additive inverse, zero pair, complex fraction, least common denominator

NJ Learning Standards Vocabulary:

7.NS.A.1, 2, & 3

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
rational numbers, integers, additive inverse

7.EE.A.1 & 2

Use properties of operations to generate equivalent expressions.
coefficients, like terms, distributive property, factor

Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered. Additional staff should be included so all students can fully participate in the standards associated with this curriculum.

ELL/ESL students: Students will be supported according to the recommendations for “can do’s” as outlined by WIDA - https://www.wida.us/standards/CAN_DOs/

Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure. Student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time will be made available with a certified instructor to aid students in reaching the standards.

Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges.

English Language Learners:	Special Education:	At-Risk:	Gifted and Talented:
<ul style="list-style-type: none"> • Use of algebra-tiles when needed • Use of number line when needed • Teaching modeling • Peer modeling • Word walls • Give directions in small steps and in as few words as possible • Provide visual aids • Group similar problems together • Repeat directions when necessary • Provide a vocabulary list with definitions 	<ul style="list-style-type: none"> • Use of algebra-tiles when needed • Use of number line when needed • Utilize modifications & accommodations delineated in the students’ IEP • Work with paraprofessional • Work with a partner • Shorten assignments to focus on mastery or key concepts • Maintain adequate space between desks • Keep workspaces clear of unrelated materials • Provide fewer problems to attain passing grades • Tape a number line to the student’s desk • Create a math journal that they can use during class, on assignments and (if 	<ul style="list-style-type: none"> • Use of algebra-tiles when needed • Use of number line when needed • Use visual demonstrations, illustrations and models • Give directions / instructions verbally and in simple written format • Peer support • Increased one – on – one time • Teachers may modify instructions by modeling what the student is expected to do • Instructions may be printed out in large print and hung up for the students to see during the time of the lesson • Review behavior expectations and make 	<ul style="list-style-type: none"> • Allow students to complete an independent project as an alternative test Inquiry based instruction • Independent study • Higher order thinking skills • Adjusting the pace of the lessons • Real world scenarios • Student driven instruction

	teacher allows) on assessments <ul style="list-style-type: none"> • Provide extra time to complete a task when needed • Provide definitions of different graphs / charts with illustrations • Allow tests to be taken in a separate room • Allow students to use a calculator when appropriate • Divide test into small sections of similar questions or problems 	adjustments <ul style="list-style-type: none"> • Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments • Allow students to complete an independent project as an alternative test 	
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Interdisciplinary Connections: ELA

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

NJSLSA.L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking

Integration of Technology Standards NJSLS:

8.1.8.A.1: Demonstrate knowledge of a real world problem using digital tools.

21st Century Standards

9.2.8.B.3: Evaluate communication, collaboration and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Career Ready Practices:

CRP2: Apply appropriate academic and technical skills

CRP4: Communicate clearly and effectively and with reason

CRP6: Demonstrate creativity and innovation

CRP8: Utilize critical thinking to make sense of problems and persevere in solving them

History / Social Studies:

RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos or maps) with other information in print and digital texts

Major **Supporting** **Additional** (Identified by PARCC Model Content Frameworks)