



Holyoke Public Schools
Grade 7
Accentuate the Negative

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CURRICULUM MAPS OUTLINE

Map Goals:

1. To ensure that students are exposed to a rigorous curriculum in every school and every grade.
2. To have consistent instruction and assessment district wide.
3. To prepare students for the MCAS test.
4. To explain what is expected to be covered in each CMP or Investigations Unit.

Expectations:

The district's expectation is for students to successfully meet the Massachusetts Mathematics Standards. In order to help facilitate this, teachers are required to follow the curriculum maps. The successful implementation of these maps requires teachers to thoroughly read each lesson in the TE and work through the project and problems in the map and the text prior to planning their lessons. Work should be kept in the binder with the curriculum map. Working through the math is an essential part of lesson planning, as it helps the teacher to better understand the concept being taught and the students' possible misunderstandings.

Feedback To Students:

Feedback needs to happen daily in the classroom. There are many ways to give feedback. Conferencing, observations, questions asked during your opening, work time and closing are all forms of feedback.

Map Components:

1. GENERAL PROBING QUESTIONS
2. UNIT SPECIFIC PROBING QUESTIONS
3. GOALS OF UNIT, CONTENT STANDARDS, & PERFORMANCE STANDARDS
4. PROJECT- to be done at end of unit and kept in the portfolio.
5. STUDENT MASTER – for project
6. INVESTIGATIONS
7. NOTEBOOK - includes: 3 Ring Binder, Bound Notebook, Portfolio
8. ACCOUNTABLE TALK – using probing questions
9. ON DEMAND ASSESSMENTS - to be done during teaching of unit.
10. STUDENT MASTERS- for on-demand assessments.

Mathematics Evidence of Learning Artifacts

Artifact	K - 1	2 – 5	6 - 8
3 Ring Binder (3R)*	<ul style="list-style-type: none"> ○ Student Work¹ 	<ul style="list-style-type: none"> ○ Vocabulary ○ Student sheets¹ <p style="text-align: center;"><u>All work should be dated and listed by investigation</u></p>	<ul style="list-style-type: none"> ○ Math books ○ Vocabulary ○ Core Problems¹ ○ Lab sheets <p style="text-align: center;"><u>All work should be dated and listed by investigation</u></p>
Marble Notebook (MNB)	<ul style="list-style-type: none"> ○ Journal entries² 	<ul style="list-style-type: none"> ○ Table of Contents ○ Problem of the day ○ Journal entries ○ Class work <p style="text-align: center;"><u>All work should be dated and listed by investigation in the Table of Contents</u></p>	<ul style="list-style-type: none"> ○ Table of Contents ○ Work time ○ Journal entries <p style="text-align: center;"><u>All work should be dated and listed by investigation in the Table of Contents</u></p>
Portfolio³ (P)	<ul style="list-style-type: none"> ○ On-demand tasks ○ Projects ○ Teacher anecdotal notes 	<ul style="list-style-type: none"> ○ On-demand tasks ○ Reflections ○ Projects <p style="text-align: center;"><u>All work should be dated and listed by investigation</u></p>	<ul style="list-style-type: none"> ○ On-demand tasks ○ Reflections ○ Projects <p style="text-align: center;"><u>All work should be dated and listed by investigation</u></p>

* Folders may be used in place of binders for these grade levels

¹ Send home at the end of each unit

² Use grade level math journals

³ All documents should be kept for the entire year

Accountable Talk

Probing Assessment Questions

As students progress through this unit, they should be asked the following questions to assess their specific knowledge of the unit.

- *How do positive and negative numbers help in describing the situation?*
- *What will addition subtraction, multiplication, or division of positive and negative numbers tell about the problem?*
- *What model(s) for positive and negative numbers would help in showing the relationships in the problem situation?*
- *How can you tell which number is bigger?*
- *Where is that number located on a number line?*
- *How could that number be represented on a chip board?*
- *Does your answer make sense?*
- *Should the answer be positive, negative, or zero?*

Probing Questions – Teacher’s Role

The teacher’s role in probing for understanding is to ask questions that will:

- *Clarify student understanding*
- *Get at the objective of the lesson*
- *Go deeper into the mathematics*
- *Uncover misconceptions and misunderstandings*
- *Compare and contrast*

Probing Questions – Student’s Role

The students’ role is to be an active participant by:

- *Explaining their strategies*
- *Asking clarifying questions to teacher and other students*
- *Being active listeners*
- *Using the language of mathematics*

Probing Questions - Suggestions

When probing for understanding the teacher and students can use one or more of these suggested questions:

- *Why are you using $< \quad >$?*
- *What are the ways you could $< \quad >$?*
- *What else do you know?*
- *How do you know that?*
- *Can you show that?*
- *What convention did you use here?*
- *What can you do if you do not know?*
- *What standard does this work apply to?*
- *Is this always true?*
- *How does this connect to other mathematics we have learned?*
- *What is the same and what are the differences between $< \quad >$?*
- *Can you back that up?*
- *Where is the math in your sketch?*
- *What does the answer mean?*
- *Does the answer make sense?*
- *Could you have used another operation to solve this task?*
- *Can you give examples?*
- *Can you say it another way?*

- *What's the math?*
- *Tell me about the task in your own words?*
- *What are you trying to find?*
- *How did you make your estimate?*
- *Will your answer be an over-estimate or an under-estimate? Why?*
- *I noticed that you used <...> to help you understand the task. Can you show us what you did and tell us how it helped you?*
- *Where do you see < > in your <model, diagram, number line, chart, etc.>?*
- *How can we see < > in your <model, diagram, number line, chart, etc.>?*
- *You have used a representation that is different from others that I've seen. Can you show us your <model, diagram, number line, chart, etc.>, and tell us how it helped you?*
- *How did you decide to solve the task? Why did you choose that method?*
- *Did you try any method that didn't work?*
- *Tell us what you tried.*
- *Why didn't it work?*
- *Would it ever work?*

Goals, Content Standards, & Performance Standards

Unit Goals:

- *Use appropriate notation to indicate positive and negative numbers.*
- *Locate rational numbers (positive and negative fractions and decimals and zero) on a number line.*
- *Compare and order rational numbers.*
- *Understand the relationship between a positive or negative number and its opposite (additive inverse).*
- *Develop algorithms for adding, subtracting, multiplying, and dividing positive and negative numbers.*
- *Write mathematics sentences to show relationships.*
- *Write and use related fact families for addition/subtraction and multiplication/division to solve simple equations with missing facts.*
- *Use parentheses and order of operations to make computational sequences clear.*
- *Understand and use the Commutative Property for addition and multiplication of positive and negative numbers.*
- *Apply the Distributive Property with positive and negative numbers to simplify expressions and solve problems.*
- *Use positive and negative numbers to graph in four quadrants and to model and answer questions about applied settings.*

Math Content Standards:

- *7.N.1 Compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents.*
- *7.N.4 Demonstrate an understanding of absolute value, e.g., $|-3| = |3| = 3$.*
- *7.N.5 Apply the rules of positive integer exponents to the solution of problems. Extend the Order of Operations to include positive integer exponents.*
- *7.N.7 Estimate and compute with fractions (including simplification of fractions), integers, decimals, and percents (including those greater than 100 and less than 1).*
- *7.N.9 Select and use appropriate operations—addition, subtraction, multiplication, division, and positive integer exponents—to solve problems with rational numbers (including negatives).*

Performance Standards:

- *(M1b) Uses and understands the inverse relationships between addition and subtraction, multiplication and division.*
- *(M1d) Is familiar with properties of operations (e.g., commutative and associative) short of formal statements.*
- *(M6a) Computes accurately with arithmetic operations on rational numbers.*
- *(M6b) Knows and uses the correct order of operations for arithmetic computations.*

Investigation 1: Extending the Number System

<p><u>Objectives</u> Investigations 1.1 – 1.4</p>	<p><u>Pacing:</u> 5 days</p>
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></p> <p>Journal and Reflection questions should be posted and referred to at the beginning of the appropriate <i>Investigation</i>.</p> <p>Journal and Reflection entries need to be done in class as part of the closure and assessment</p>	<p><u>Vocabulary</u>²: Appendix 2, Investigation 1</p> <hr/> <p><u>Core Problems</u>²: Accentuate the Negative, Investigation 1 ACE Problems: #6-8, 48; 9-19; 20-29; 36, 37</p> <hr/> <p><u>Work Time</u>¹: Accentuate the Negative, Problems 1.1-1.4</p> <hr/> <p><u>Journal Entries</u>¹: Appendix 3, Inv 1.1,1.2,1.3, 1.4</p> <hr/> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 1</p> <hr/> <p><u>Mathematical Reflection</u>³: Appendix 4, MMR1:</p>
<p style="text-align: center;"><i>Accountable Talk</i></p> <p>To promote learning, explore solutions, and justify reasoning, conversations between students and students or students and teacher must be accountable – accountable to the learning community, to the mathematics discipline, and to rigorous thinking.</p>	<p>As a result of this Investigation, students should be able to talk and manipulate the vocabulary of the Investigation in response to this type of question:</p> <ul style="list-style-type: none"> ○ Which model did you use to solve the problem? ○ How did you decide which number was bigger? ○ How can you write a number sentence to represent the situation? ○ <p>These are some recommended questions that you might use. Others can be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</p>

1 Marble Note Book
2.3 Ring Binder
3. Portfolio

Investigation 2: Adding and Subtracting Integers

<p><u>Objectives</u> Investigations 2.1 – 2.5</p>	<p><u>Pacing:</u> 6 days</p>
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></p> <p>Journal and Reflection questions should be posted and referred to at the beginning of the appropriate <i>Investigation</i>.</p> <p>Journal and Reflection entries need to be done in class as part of the closure and assessment</p>	<p><u>Vocabulary</u>²: Appendix 2, Investigation 2</p> <p><u>Core Problems</u>²: Accentuate the Negative , Investigation 2 ACE Problems: #1, 2; 6, 7; 10, 11; 17-22, 24-26; 27, 29, 42</p> <p><u>Work Time</u>¹: Accentuate the Negative, Problems 2.1 – 2.5</p> <p><u>Journal Entries</u>¹: Appendix 3, Inv 2.1 – 2.5</p> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 2</p> <p><u>Mathematical Reflection</u>³ Appendix 4, MMR2:</p>
<p style="text-align: center;"><i>Accountable Talk</i></p> <p>To promote learning, explore solutions, and justify reasoning, conversations between students and students or students and teacher must be accountable – accountable to the learning community, to the mathematics discipline, and to rigorous thinking.</p>	<p>As a result of this Investigation, students should be able to talk and manipulate the vocabulary of the Investigation in response to this type of question:</p> <p style="padding-left: 40px;">What model did you use to solve the problem? How do you know if the solution will be positive or negative? How could you model this problem using chips? Using a number line? What are the signs of coordinates of a point that will fall in Quadrant I, II, III, or IV?</p> <p>These are some recommended questions that you might use. Others can be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</p>

1. Marble Note Book
- 2.3 Ring Binder
3. Portfolio

Investigation 3: Multiplying and Dividing Integers

Objectives Investigations 3.1 – 3.4	Pacing: 5 days
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></p> <p>Journal and Reflection questions should be posted and referred to at the beginning of the appropriate <i>Investigation</i>.</p> <p>Journal and Reflection entries need to be done in class as part of the closure and assessment</p>	<p><u>Vocabulary</u>²: Appendix 2, Investigation 3</p>
	<p><u>Core Problems</u>²: Accentuate the Negative, Investigation 3 ACE Problems: #2, 3; 4-6; 7, 8, 33; 12-17, 18j-r, 19, 20, 29</p>
	<p><u>Work Time</u>¹: Accentuate the Negative, Problems 3.1 – 3.4</p>
	<p><u>Journal Entries</u>¹: Appendix 3, Inv 3.1 – 3.4</p>
	<p><u>On Demand Tasks</u>³: Appendix 5, Investigation 3</p>
	<p><u>Mathematical Reflection</u>³ Appendix 4, MMR3:</p>
<p style="text-align: center;"><i>Accountable Talk</i></p> <p>To promote learning, explore solutions, and justify reasoning, conversations between students and students or students and teacher must be accountable – accountable to the learning community, to the mathematics discipline, and to rigorous thinking.</p>	<p>As a result of this Investigation, students should be able to talk and manipulate the vocabulary of the Investigation in response to this type of question:</p> <p style="padding-left: 40px;">Is your answer reasonable? Does your answer fit the patterns you noticed? How are multiplication and division related? How are multiplication and addition related?</p> <p>These are some recommended questions that you might use. Others can be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</p>

1. Marble Note Book
- 2.3 Ring Binder
3. Portfolio

Investigation 4: Properties of Operations

Objectives Investigation 4.1 – 4.3	Pacing: 5 days
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></p> <p>Journal and Reflection questions should be posted and referred to at the beginning of the appropriate <i>Investigation</i>.</p> <p>Journal and Reflection entries need to be done in class as part of the closure and assessment</p>	<p><u>Vocabulary</u>²: Appendix 2, Investigation 4</p>
	<p><u>Core Problems</u>²: Accentuate the Negative, Investigation 4 ACE Problems: #2, 8-16; 4; 6</p>
	<p><u>Work Time</u>¹: Accentuate the Negative, Problem 4.1 – 4.3</p>
	<p><u>Journal Entries</u>¹: Appendix 3, Inv 4.1 – 4.3</p>
	<p><u>On Demand Tasks</u>³: Appendix 5, Investigation 4</p>
	<p><u>Mathematical Reflection</u>³ Appendix 4, MMR4:</p>
<p style="text-align: center;"><i>Accountable Talk</i></p> <p>To promote learning, explore solutions, and justify reasoning, conversations between students and students or students and teacher must be accountable – accountable to the learning community, to the mathematics discipline, and to rigorous thinking.</p>	<p>As a result of this Investigation, students should be able to talk and manipulate the vocabulary of the Investigation in response to this type of question:</p> <ul style="list-style-type: none"> ○ Why do we have an order of operations? ○ Which form of an expression seems most useful in a given situation—factored or expanded? Why? ○ What is the importance of parentheses in an expression? ○ How can you use parentheses to change the value of an expression? <p>These are some recommended questions that you might use. Others can be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</p>

1. Marble Note Book

2.3 Ring Binder

3. Portfolio

Appendix 1 Unit Project

<p style="text-align: center;"><i>Project</i>¹</p> <p>Student work should be placed in portfolio</p>	<p>The project is the culminating assessment, which will allow students to apply what they learned about the use of integers. It is written in MCAS form to give students the experience of answering an open-response question.</p> <p>The unit project is called ‘The Number Line and the student handout for the project can be found in Appendix 1</p>
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1. portfolio

Unit Project Scoring Guide

Score	Description
<u>4</u>	The response demonstrates an exemplary understanding of the mathematical concepts involving integers that underlie the task.
<u>3</u>	The response demonstrates good understanding of the mathematical concepts involving integers that underlie the task. Although there is significant evidence that the student was able to work with the concepts involved, some aspect of the response is flawed.
<u>2</u>	The response contains fair evidence of understanding some of the mathematical concepts involving integers that underlie the task. While some aspects of the task are completed correctly, others are not.
<u>1</u>	The response contains only minimal evidence of understanding the mathematical concepts involving integers that underlie the task..
<u>0</u>	The response contains insufficient evidence of understanding the mathematical concepts involving integers that underlie the task to merit any points.

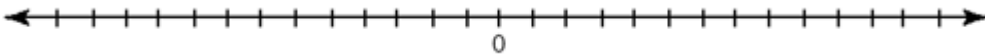
NAME: _____

DATE: _____

Accentuate the Negative Project: The Number Line

- *BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.*
- *Show all work (diagrams, tables, and computations) on your answer sheet.*
- *If you do the work in your head, explain in writing how you did the work.*

Use the number line below to answer the question.



- a. Draw a number line like the one above. Correctly position the following set of integers beneath the marks on your number line.

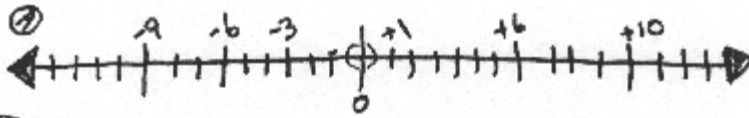
+10, -3, +6, +1, -9, -6

- b. Explain why you decided where to place -3 on your number line.
c. Which number is greater: -10 or +3? Explain your answer.

Which number is greater: -3 or -6? Explain your answer.

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Student Work: Question 10- Score Point 4



② I drew the numberline and made 13 little lines on the numberline. And I put -3 on the third line to the left from zero.

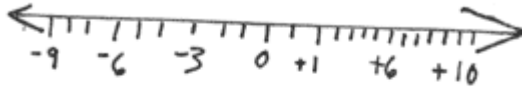
③ +3 is greater than -10, -10 is below zero and +3 is above zero. Therefore +3 is greater.

④ -3 is greater than -6, -3 is higher in the numberline. In other words it is closer to zero, on the negative side, than -6. Therefore -3 is greater than -6.

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Student Work: Question 10- Score Point 3

a.



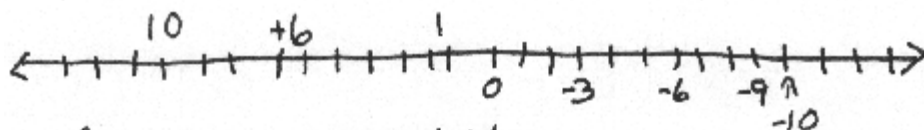
b. I counted back 3 from zero

c. +3 because just by looking at the + symbol you can tell its greater.

d. -3 because -6 is farthest away from 0.

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Student Work: Question 10- Score Point 2



b. I knew were to put the 3 because everything on the right side of the 0 is - what ever number and it just goes like you would count from 0 - when it stops say to -20°

c. +3 is greater cause it is higher than -10 cause 10 is below zero and +3 is above zero.

d. -3, -3 is because it is on - and if you look at the line above then the -3 is higher then the -10 or 8 just look at the line to answer the question.

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Student Work: Question 10- Score Point 1

I choose to put it next to
the ZERO because it's the
smallest negative number.
A positive 3 is bigger
because a negative -10
means you don't have 10
there both the same

Appendix 2 Vocabulary

Investigation 1:

- – *negative numbers, positive numbers, opposites, integers, rational numbers, absolute value, notation, additive inverse*

Investigation 2:

- *algorithm, Commutative Property, absolute value, Quadrants I, II, III, IV*

Investigation 3:

- *none*

Investigation 4:

- – *order of operations, Distributive Property, Commutative Property, Associative Property, (factored form, expanded form)*

Appendix 3 Journal Entries

Investigation 1:

Investigation 1.1:

Draw a number line, circle +5 and -3, and find the difference between them. Explain.

Investigation 1.2:

Draw a number line and locate the following numbers and their opposites: +7, -3.8, $1\frac{1}{2}$, $-4\frac{3}{4}$, and -2.

Investigation 1.3:

Find two numbers so that both numbers are less than 10 AND the distance between the numbers on a number line is 14.

Investigation 1.4:

Show three combinations of chips that give a value of 17.

Investigation 2:

Investigation 2.1

How do you know if the solution to an addition problem will be positive or negative? Show at least two examples.

Investigation 2.2

Use a chip board to compute $-7 + (-8)$ and $-7 - (+8)$. Compare your answers.

Investigation 2.3

What do you know about the relationship between addition and subtraction of integers?

Investigation 2.4

Write the fact family for $-4 + -3 = -7$ and make chip boards to show that each member of the family is correct.

Investigation 2.5

How do you know the quadrant in which a point will fall? Give an example.

Investigation 3

Investigation 3.1

How are multiplication and addition related? Give an example of a multiplication problem and re-write it as an addition problem.

Investigation 3.2

What patterns did you notice in this problem?

Investigation 3.3

Give an algorithm for multiplication and division of integers.

Investigation 3.4

Is it better to go first or second? Why? If you go second, what is the best move? Why?

Investigation 4

Investigation 4.1

Why do we need an order of operations? Solve $7 + 8(2)$ and explain why the order of operations is important.

Investigation 4.2

A rectangle measures $(3 + 6)$ by $(2 + 8)$. Draw the rectangle and write two equations that give its area.

Investigation 4.3

Using the Distributive Property, write $4(10 - 4)$ in expanded form.

Using the Distributive Property, write $(3 * 8) - (3 * 2)$ in factored form.

Appendix 4 Reflections

MMR1

How do you decide which of two numbers is greater when (a) both numbers are positive (b) both numbers are negative and (c) one number is positive and one number is negative?

MMR2

What procedure(s) will find the sum $a + b$ of two numbers where a and b represent any integer?

What procedure(s) will find the difference $a - b$ of two numbers where a and b represent any integer? [Note to teachers: students may show this using number lines or chip boards; it is not necessary that they describe an algorithm as long as their method is valid.]

MMR3

How do you find the product of two numbers when (a) both are positive? (b) one is positive and one is negative? (c) both are negative? (d) one is zero?

How do you find the quotient of two numbers when (a) both are positive? (b) one is positive and one is negative? (c) both are negative? (d) the numerator is zero?

MMR4

What is the order of operations? Why is it important to understand? Give an example of an equation where the use of parentheses changes the result of the computation.

Appendix 5 On Demand Tasks

CMP2: Accentuate the Negative

<p><i>On-Demand Tasks</i></p> <p><u><i>Additional Practice & Skills</i></u> <u><i>Workbook</i></u></p> <p><u><i>Assessment Resources</i></u></p> <p>In class individualized On-Demand tasks assess knowledge of mathematical facts, operations, concepts, and skills, and their efficient application to problem solving. The results of these different forms of assessment provide rich profiles of students' achievements in mathematics and serve as the basis for identifying curricula and instructional approaches to best develop their talents.</p>	<p><u><i>After Inv. 1</i></u> <u><i>Assessment Resources</i></u> p. 64 #1</p> <p><u><i>After Inv. 2</i></u> ACE Questions p. 33 #8</p> <p><u><i>After Inv. 3</i></u> ACE Questions p. 52 #18a-i</p> <p><u><i>After Inv. 4</i></u> <u><i>Additional Practice & Skills</i></u> p. 79 #2a-d and p. 82 # 11, 12</p>
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HPS Mathematics Scoring Rubric

Score	Description
<u>4</u>	The response shows a <u>comprehensive</u> understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It indicates that the student has <u>completed the task(s)</u> correctly, using mathematically sound procedures. It contains <u>clear, complete explanations</u> and/or <u>adequate work required</u> .
<u>3</u>	The response shows a <u>general</u> understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It indicates that the student has <u>completed the task(s)</u> , using mathematically sound procedures. It contains <u>complete explanations</u> and/or <u>adequate work required</u> .
<u>2</u>	The response shows a <u>basic</u> understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It addresses <u>most aspects of the task(s)</u> , using mathematically sound procedures. It may contain a correct solution but provides <u>incomplete procedures, reasoning and/or explanations</u> . It may reflect <u>some misunderstandings</u> of the underlying mathematical concepts and/or procedures.
<u>1</u>	The response shows a <u>minimal</u> understanding of the mathematical concepts and/or procedures embodied in the task(s). It addresses <u>some elements of the task(s)</u> correctly but reaches an <u>inadequate solution and/or provides reasoning that is faulty or incomplete</u> . It exhibits <u>multiple flaws related to a misunderstanding of important aspects</u> of the task(s), misuse of mathematical procedures, or faulty mathematical reasoning. It reflects a <u>lack of essential understanding</u> of the underlying mathematical concepts. It may contain a correct numerical answer but <u>the required work is not provided</u> .
<u>0</u>	The response is <u>completely incorrect, irrelevant, or incoherent</u> , or contains a correct response arrived at using an <u>obviously incorrect procedure</u> .

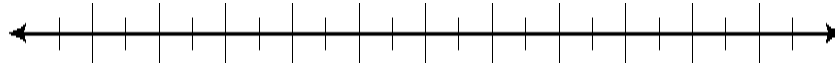
NAME: _____

DATE: _____

Investigation 1

- *BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.*
- *Show all work (diagrams, tables, and computations) on your answer sheet.*
- *If you do the work in your head, explain in writing how you did the work.*

Construct a number line using the line below. Locate the numbers in parts (a)–(d) on your number line.



- a. -8
- b. 0
- c. $\frac{1}{3}$
- d. 2
- e. Locate and label the opposite of each number in parts (a)–(d).
- f. Compute $-8 + 6$. Show your work.

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Investigation 2

- *BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.*
- *Show all work (diagrams, tables, and computations) on your answer sheet.*
- *If you do the work in your head, explain in writing how you did the work.*

8. Find each value.

a. $+50 + -35$

b. $+50 - -20$

c. $-19 - +11$

d. $-30 - +50$

e. $-35 + -15$

f. $+12 + -18$

)

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Investigation 3

- *BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.*
- *Show all work (diagrams, tables, and computations) on your answer sheet.*
- *If you do the work in your head, explain in writing how you did the work.*

18. Use the algorithms you developed to find each value. Show your work.

a. $12 \cdot 9$

b. $5 \times (-25)$

c. $-220 \div (-50)$

d. $48 \div (-6)$

e. $-63 \div 9$

f. $\frac{2}{-3} \times \left(-\frac{4}{5}\right)$

g. $\frac{-99}{33}$

h. $-2.7 \div (-0.3)$

i. -36×5)

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Investigation 4

- *BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.*
- *Show all work (diagrams, tables, and computations) on your answer sheet.*
- *If you do the work in your head, explain in writing how you did the work.*

2. Find the correct result for each of the following.

a. $-5 \times 7 + 10 \div 2$

b. $(2 + 4)^2 \times 5 - 2$

c. $3\frac{2}{5} \times 2\frac{1}{2} - 5^3 + 10$

d. $6 \times (3 - 5)^2 + 8$

Multiply each expression.

11. $6(h - 4)$

12. $(p + 3)5$

)

NOTES