



Holyoke Public Schools
Mathematics Curriculum Map
Grade 3

How Many Hundreds? How Many
Miles?

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Curriculum Maps

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.
 - o STUDENT MASTER – for project
5. INVESTIGATIONS:
 - o NOTEBOOK - includes: 3 Ring Binder, Bound Notebook, Portfolio
 - o ACCOUNTABLE TALK – using probing questions
5. ON-DEMAND ASSESSMENTS - to be done during teaching of unit.
 - o STUDENT MASTERS- for on-demand assessments.

Mathematics

Evidence of Learning Artifacts

Artifact	K - 1	2 - 5	6 - 8
<i>3 Ring Binder (3R)*</i>	<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>
<i>Marble Notebook (MNB)</i>	<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>
<i>Portfolio³ (P)</i>	<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

How Many Hundreds? How Many Miles? **Probing Questions for Accountable Talk**

As students progress through this unit, they should be asked the following questions to assess their knowledge about operations of addition and subtraction.

- *What is the relationship with the problems in the set?*
- *What strategies should you use for addition/subtraction problems?*
- *How did you use a number line to solve a problem?*
- *How did you keep track of all the parts of the problem?*
- *What strategy did you use for finding the difference between two numbers when you were comparing?*

Classroom Routines

Continue from previous units

Classroom Routines: What's the Temperature?

Ten-Minute Math: Guess My Rule

Ten-Minute Math: Counting Around the Class

Grade 3 begins Ten Minute Math activities. Ten Minute Math activities and Classroom Routines offer practice and review of key concepts at each grade level. After their initial introduction, these short activities, designed to take no longer than 10 minutes, support and balance the in-depth work of each curriculum unit.

Implementing Investigations in Grade 3: Please review pages 24 - 28 for 2 Ten Minute Math activities in this unit and pg. 40-42 for Classroom Routines: "What's the Temperature".

Additional Probing Questions for Accountable Talk

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

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

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

- Why are you using $< >$?
- What are the ways you could $< >$?
- 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 $< >$?
- 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 $< \dots >$ 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:

- Add multiples of 10 and 100 (up to 1,000) to and subtract them from any 3-digit number.
- Solve 3-digit addition problems using at least one strategy efficiently.
- Demonstrate fluency with subtraction problems related to the addition combinations to $10 + 10$ (the subtraction facts).
- Solve subtraction problems with 3-digit numbers using strategies that involve either subtracting a number in parts, adding up, or subtracting back.
- Demonstrate fluency with multiplication combinations with products up to 50

Math Content Standards:

- (3.N.10) Add and subtract (up to four-digit numbers) and multiply (up to two-digits number by a one-digit number) accurately and efficiently.
(3.P.2) Determine which symbol ($<$, $>$, or $=$) is appropriate for a given number sentence e.g., $7 \times 8 = ? 49 + 6$

Performance Standards:

- (M1a) Adds and subtracts whole numbers
(M1b) Demonstrates understanding of the base ten place value system and uses this knowledge to solve arithmetic tasks
(M1c) Estimates using landmark numbers

UNIT: How Many Hundreds? How Many Miles?

End-of-Unit Project

GRADE: 3

End-of-Unit Project (P)

Student work should be placed in
portfolio (P).

The project is the culminating
assessment which will allow students
to apply what they learned in the unit.

It is written in MCAS form to give
students the experience of answering
an open-response question.

End-of-Unit Assessment: Unit 8, M54-M55 from Resource Binder,
“Resources Masters and Transparencies”

UNIT: HOW MANY HUNDREDS? HOW MANY MILES?

Investigation 1 (1.1 – 1.5)

DAYS: 5

GRADE: 3

<p>Evidence of Learning Artifacts</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>(3R) – 3 ring binder; (MNB) – marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> –positive, negative, hundreds, multiple (3R)</p> <p><i>Work Time</i> – Student Sheets 1 – 19 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p>Inv. 1.1 What strategy did you use for subtracting?</p> <p>Inv. 1.2 What happens when the total number of negative cards is greater than the number of positive cards?</p> <p>Inv. 1.3 From your related subtraction problems, what was the relationship among the problems in the set?</p> <p>Inv. 1.4 No journal entry do to assessment.</p> <p><i>Reflection</i> – Explain how to use a number line to solve related problems (P)</p>
<p>Accountable Talk</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><i>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:</i></p> <p>How did you know that? How can you use ...? Can you show another way?</p> <p><i>These are some recommended questions that you might use. Others can be found be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</i></p>

UNIT: HOW MANY HUNDREDS? HOW MANY MILES?
Investigation 2 (2.1 – 2.5) DAYS: 5

GRADE: 3

<p>Evidence of Learning Artifacts</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>(3R) – 3 ring binder; (MNB) –marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> – equation, expression, equivalent, estimate, addend (3R)</p> <p><i>Work Time</i> – Student Sheets 21-37 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p style="padding-left: 20px;">Inv. 2.1 How can you tell that two addition expressions are equal to each other without solving the equation?</p> <p style="padding-left: 20px;">Inv. 2.2 How do starter problems help you solve more difficult problems?</p> <p style="padding-left: 20px;">Inv. 2.3 Explain how breaking apart numbers helps you solve addition problems?</p> <p style="padding-left: 20px;">Inv. 2.4 What strategy did you use to solve a multiple addend problem?</p> <p><i>Reflection</i> – $20+46+94=?$ Solve the problem in two different ways and explain your thinking. (P)</p>
<p>Accountable Talk</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><i>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:</i></p> <p style="padding-left: 40px;">How did you know...?</p> <p style="padding-left: 40px;">Can you solve the problem in a different way?</p> <p style="padding-left: 40px;">Does your answer make sense?</p> <p style="padding-left: 40px;">What was your strategy?</p> <p><i>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.</i></p>

UNIT: HOW MANY HUNDREDS? HOW MANY MILES?

Investigation 3 (3.1 – 3.9)

DAYS: 9

GRADE: 3

<p>Evidence of Learning Artifacts</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>(3R) – 3 ring binder; (MNB) –marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> – sum, difference, landmark, subtraction (3R)</p> <p><i>Work Time</i> – Student Sheets 38 - 69 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p>Inv. 3.1 How did you determine which pair had the largest sum?</p> <p>Inv. 3.2 How did using a landmark number help you solve a problem</p> <p>Inv. 3.3 No journal entry do to assessment</p> <p>Inv. 3.4 No journal entry do to assessment</p> <p>Inv. 3.5 Explain how a number line could show subtraction.</p> <p>Inv. 3.6 How did you keep track of your steps in problems with larger numbers?</p> <p>Inv. 3.7 How did you choose which strategy to use for each part of the problem?</p> <p>Inv. 3.8 How did you choose the numbers that you added?</p> <p><i>Reflection</i> – What strategies did you find most efficient for solving addition problems? What strategies did you find most efficient for solving subtraction problems? How are they similar? (P)</p>
<p>Accountable Talk</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><i>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:</i></p> <p>How did you know...?</p> <p>Can you solve the problem in a different way?</p> <p>Does your answer make sense?</p> <p>What was your strategy?</p> <p><i>These are some recommended questions that you might use. Others can be found be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</i></p>

End-of-Unit Project

Student work should be placed in **portfolio (P)**.

The project is the culminating assessment which will allow students to apply what they learned about operations of addition and subtraction. It is written in MCAS form to give students the experience of answering an open-response question.

On-Demand Assessments

(To be filed in portfolio)

How Many Hundreds? How Many Miles? Investigations

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.

UNIT: HOW MANY HUNDREDS? HOW MANY MILES?

On-Demand Assessments

GRADE: 3

On-Demand Assessments (P)

How Many Hundreds?
How Many Miles?
Investigations

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.

Inv. 1: Resource Binder: Session 1.9, M21 and M23*

Inv. 2: Resource Binder: Session 2.5, M40*

Inv. 3: Resource Binder: Session 3.3, M52*
Session 3.4, M53*

***Please refer to the section in the Teacher's Unit Guide entitled, "Professional Development" for examples of student work for each assessment.**

Name _____

Date _____



How Many Hundreds? How Many Miles?

Assessment: Multiplication Combinations

$8 \times 5 =$	$4 \times 7 =$	$3 \times 9 =$
$7 \times 3 =$	$3 \times 12 =$	$6 \times 4 =$
$9 \times 2 =$	$9 \times 4 =$	$7 \times 6 =$
$12 \times 4 =$	$5 \times 7 =$	$4 \times 4 =$
$3 \times 8 =$	$6 \times 6 =$	$5 \times 6 =$
$11 \times 3 =$	$8 \times 4 =$	$6 \times 3 =$
$8 \times 3 =$	$5 \times 10 =$	$8 \times 6 =$
$5 \times 9 =$	$3 \times 7 =$	$5 \times 8 =$
$2 \times 8 =$	$3 \times 3 =$	$7 \times 7 =$
$4 \times 3 =$	$2 \times 12 =$	$5 \times 5 =$



Assessment: Problems About *Capture from 300 to 600*

Suppose you are playing *Capture from 300 to 600*. For each problem, decide whether you can capture a chip using the cards shown. Write equations to explain your thinking. If you cannot capture a chip, how close can you get?

1. Your game piece is on 326. You have these 5 cards:

+200	-3	-30	-100	+50
------	----	-----	------	-----

Can you capture a chip on 575? If not, how close can you get?

2. Your game piece is on 497. You have these 5 cards:

+200	-100	-30	+40	-4
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Can you capture a chip on 403? If not, how close can you get?

Name _____

Date _____



How Many Hundreds? How Many Miles?

Assessment: Addition Strategies

Solve this problem in two ways. Show your solutions.

$$654 + 247 =$$

1. First way

2. Second way

M40

Unit 8

Session 2.5

Name _____

Date _____



How Many Hundreds? How Many Miles?

Assessment: Subtraction Strategies

Solve these problems. Show your solutions.

1. $287 - 115 =$

2. $436 - 348 =$

3. Nicholas had 507 animal stickers in his collection. He sold 375 of them. How many stickers did he have left?

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M52 Unit 8

Session 3.3

Name _____

Date _____

How Many Hundreds? How Many Miles?



Assessment: Subtraction Facts

$11 - 8 =$	$10 - 4 =$	$17 - 8 =$
$14 - 5 =$	$15 - 7 =$	$15 - 9 =$
$8 - 4 =$	$18 - 9 =$	$7 - 3 =$
$9 - 3 =$	$6 - 4 =$	$8 - 5 =$
$10 - 7 =$	$14 - 6 =$	$10 - 8 =$
$16 - 8 =$	$12 - 5 =$	$11 - 6 =$
$7 - 5 =$	$9 - 4 =$	$13 - 5 =$
$12 - 8 =$	$12 - 9 =$	$11 - 4 =$
$5 - 3 =$	$13 - 7 =$	$13 - 4 =$
$13 - 9 =$	$16 - 7 =$	$11 - 2 =$

Sessions 3.4, 3.5

Unit 8

M53



Holyoke Public Schools

2007 - 2008

Mathematics

Scoring Rubric

Score point 4:

The response shows a **comprehensive** understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It indicates that the student has **completed the task(s) correctly**, using mathematically sound procedures. It contains **clear, complete explanations** and/or **adequate work required**.

Score point 3:

The response shows a **general** understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It indicates that the student has **completed the task(s)**, using mathematically sound procedures. It contains **complete explanations** and/or **adequate work required**.

Score point 2:

The response shows a **basic** understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It addresses **most aspects of the task(s)**, using mathematically sound procedures. It may contain a correct solution but provides **incomplete procedures, reasoning and/or explanations**. It may reflect **some misunderstandings** of the underlying mathematical concepts and/or procedures.

Score point 1:

The response shows a **minimal** understanding of the mathematical concepts and/or procedures embodied in the task(s). It addresses **some elements of the task(s) correctly** but reaches an **inadequate solution and/or provides reasoning that is faulty or incomplete**. It exhibits **multiple flaws related to a misunderstanding of important aspects** of the task(s), **misuse** of mathematical procedures, or faulty mathematical reasoning. It reflects a **lack of essential understanding** of the underlying mathematical concepts. It may contain a correct numerical answer but the **required work is not provided**.

Score point 0:

The response is **completely incorrect, irrelevant, or incoherent**, or contains a correct response arrived at using an **obviously incorrect procedure**.

NOTES