



Holyoke Public Schools Mathematics Curriculum Map Grade 1

Solving Story Problems

Table of Contents

Curriculum Map Outline.....	4
Mathematic Evidence of Learning Artifacts.....	5
Probing Questions for Accountable Talk.....	6
Additional Probing Questions.....	7
Goals, Content Standards, & Performance Standards.....	8
End-of-Unit Project Preview.....	9
Investigations 1-4.....	10
End-of-Unit Project.....	14
On-Demand Assessments.....	17
HPS Mathematics Scoring Rubric.....	23

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: folder, 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>folder</i> <i>(F)*</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</i> <i>(MJ)</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>Portfolio</i> ³ <i>(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

Solving Story Problems Probing Questions for Accountable Talk

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

How did you know to add?

How did you know to subtract?

What is the relationship between these numbers/operations?

Would you predict there would be more or fewer?

Classroom Routines

Continue from unit 1 and 2

Start With/Get To

Quick Images

Morning Meeting

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 1: Please review pages 24-38 for the 3 routines in this unit.

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:

- Find at least 5 combinations of 2 addends for a number up to 15.
- Combine 2 small quantities.
- Interpret (retell the action and sequence) and solve addition and subtraction story problems.
- Subtract one small quantity from another.
- Represent numbers by using equivalent expressions.
- Count a setoff 40 – 50 objects.
- Rote count, read, and write numbers to 65.

Math Content Standards:

- (2.N.1) Name and write (in numerals) whole numbers to 1000, identify the place values of the digits, and order the numbers.
- (2.N.4) Compare whole numbers using terms and symbols, e.g. less than, greater than, and equal to ($>$ = $<$).
- (2.N.7) Demonstrate an understanding of various meanings of addition and subtraction, e.g., as combination, (plus, combined with, more); subtraction as comparison (how much less, how much more), equalizing (how many more are needed to make these equal), and separation (how much remaining).
- (2.N.8) Understand and use the inverse relationship between addition and subtraction (e.g., $8 + 6 = 14$ is equivalent to $14 - 6 = 8$ and is also equivalent to $14 - 8 = 6$) to solve problems and check solutions.
- (2.N.9) Know addition facts (addends to 120) and related subtraction facts, and use them to solve problems.
- (2.P.1) Identify, reproduce, describe, extend, and create simple rhythmic, shape, size, number, color, and letter repeating patterns.
- (2.P.2) Use symbol and letter variables (e.g., \square , x) to represent unknowns or quantities that vary in expressions and in equations or inequalities, (mathematical sentences that include $>$ = $<$).
- (2.P.5) Construct and solve open sentences that have variables, e.g., $\square + 7 = 10$.
- (2.P.6) Write number sentences using $+$, $-$, $>$, $<$, $=$ to represent mathematical relationships in everyday situations.
- (2.M.1) Identify parts of the day (morning, afternoon, and evening), days of the week, and months of the year. Identify dates using a calendar.
- (2.D.1) Use interviews, surveys, and observations to gather data about themselves and their surroundings.
- (2.D.2) Organize, classify, represent, and interpret data using tallies, charts, tables, bar graphs, pictographs, and venn diagrams; interpret the representations.

Performance Standards:

- (M1b) Uses and understand the inverse relationship between addition and subtraction
- (M1g) Orders numbers with $<$ and $>$ relationships and by location on a number line.

UNIT: Solving Story Problems

End-of-Unit Project

GRADE: 1

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 3, M46 & M47 - Resource Binder, “Resources Masters and Transparencies”

UNIT: SOLVING STORY PROBLEMS
Investigation 1 (1.1 – 1.9) DAYS: 10

GRADE: 1

<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>Vocabulary – Number line, combination, plus, add, equals, counting on, sum, more, fewer, equal sign, addends, difference, total, addition, subtraction</p> <p>Work Time – Student Sheets 1 – 18</p> <p>Journal Entries –</p> <p style="padding-left: 40px;">Inv. 1.4 Describe your strategy for finding all the pairs of addends that add up to 10. How do you know when you have them all?</p> <p style="padding-left: 40px;">Inv. 1.7 Explain how you can use the strategy of “counting on” to add.</p> <p>Reflection – Write an addition story problem. Solve the problem and show the equation for the problem.</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 that? How can you use ...? Can you show another way? What convention did you use?</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: SOLVING STORY PROBLEMS
Investigation 2 (2.1 – 2.3) DAYS: 4

GRADE: 1

<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>Vocabulary –subtract, take away, more than, les than, counting backward, minus sign, subtraction sign</p> <p>Work Time – Student Sheets 19 - 26</p> <p>Journal Entries – Inv. 2.3 Explain the strategy you used to solve a subtraction problem.</p> <p>Reflection – Write a subtraction story problem. Solve and then show the equation for the story problem.</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...? Can you solve the problem in a different way? Does your answer make sense? 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>

UNIT: SOLVING STORY PROBLEMS
Investigation 3 (3.1 – 3.5) DAYS: 5

GRADE: 1

<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><i>Vocabulary</i> – greater than, less than, digit, ($>$, $<$, $=$)</p> <p><i>Work Time</i> – Student Sheets 27 - 38</p> <p><i>Journal Entries</i> – Inv. 3.4 Describe a strategy for figuring out “Today’s Number”.</p> <p><i>Reflection</i> –Describe at least 2 strategies for solving addition problems (counting all, counting on, using a number relationship they know).</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...? Can you solve the problem in a different way? Does your answer make sense? 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: SOLVING STORY PROBLEMS
Investigation 4 (4.1 – 4.8) DAYS: 8

GRADE: 1

<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><i>Vocabulary</i> – Hundred chart, pattern</p> <p><i>Work Time</i> – Student Sheets 39 -50</p> <p><i>Journal Entries</i> – Inv. 4.4 Describe the patterns you see on the 100 chart.</p> <p><i>Reflection</i> - Explain your strategy for finding missing numbers on the hundred chart.</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...? Can you solve the problem in a different way? Does your answer make sense? 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>

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

NAME: _____

DATE: _____

End-of-Unit Project

- **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.**

Solve the problem. Show your work.

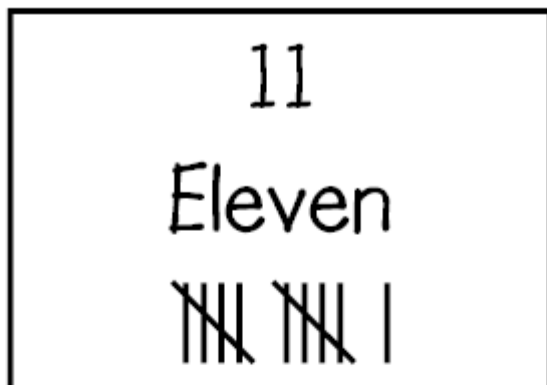
Max had 15 buttons.

He gave 9 to his friends.



How many buttons does Max have now?

Today's Number is 11.



Find 5 ways or more to make Today's Number.
Show the ways.

A large empty rectangular box with a black border, intended for students to write their solutions for finding 5 ways or more to make the number 11.

On-Demand Assessments

(To be filed in portfolio)

Solving Story Problems 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: SOLVING STORY PROBLEMS

On-Demand Assessments

GRADE: 1

On-Demand Assessments (P)

Solving Story Problems 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 M25**

Inv. 2: None

Inv. 3: Resource Binder: Session 3.5 M38**

Inv. 4: Assessment Checklist - Session 4.2 M39*

Assessment 4.7 M45**

*Assessment Checklists should be kept with tracking sheets.

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

Name _____

Date _____

Solving Story Problems



Assessment:

Eleven Fruits: How Many of Each?



Solve the problem. Show your work.

I have 11 fruits.

Some are apples. Some are bananas.

How many of each could I have?

How many apples? How many bananas?



Find as many combinations as you can.

Name _____

Date _____



Solving Story Problems

Assessment: How Many Books?

Solve the problem. Show your work.

Our class library has 8 books about frogs.
Mr. B gave us 5 more.
How many books about frogs do we
have now?



© Pearson Education 1



Assessment Checklist: Covering and Counting

Student	Knows the number names and order (Rote Sequence)	Counts each object once and only once (1:1)	Has a system for keeping track	Double checks	Accurately counts 40 to 50 objects

Name _____

Date _____



Solving Story Problems

Assessment: Counting Strips

Write the missing numbers on these counting strips.

9
10
11

36
37
38

57
58
59



Holyoke Public Schools

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 mathematical 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 mathematical 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