



Holyoke Public Schools Mathematics Curriculum Map Grade 2

Stickers, Number Strings, and Story Problems

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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

Stickers, Number Strings, and 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 problem situations that involve addition and subtraction.

What strategy did you use?

What pattern/s do you notice?

How many different addition combinations can you make for ... ?

How can you use doubling to solve this problem?

Does the order of the numbers matter when you are adding? Subtracting?

What do you know and what do you not know about this problem?

How is addition and subtraction similar? Different?

Is this number even or odd? How do you know?

Classroom Routines

Classroom Routines:

Quick Images- Sessions 1.2, 1.6, 2.2, 2.3, 3.3, 4.1

What Time Is It? - Sessions 1.5, 2.3, 2.5, 2.7, 3.2, 3.6, 4.2

Today's Number- Sessions 1.1, 1.3, 2.1, 2.6, 3.4, 3.5, 3.7, 4.3, 4.4, 4.6

How Many Pockets? - Sessions 1.4, 3.1, 4.5

Classroom Routines occur at regular intervals, perhaps during morning meeting, or at another convenient time. These short activities, designed to take no longer than **10 minutes**, support and balance the in depth work of each curriculum unit. After their first introduction in a math session, **they are intended for use outside of math time**. Some teachers use them to bring the whole class together just before or after lunch or recess or at the beginning or end of the day.

Implementing Investigations in Grade 2: Please review page 25- 40 for Classroom Routines.

Stickers, Number Strings, And Story Problems

HPS-7

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:

- Use known combinations to add several number in any order
- Interpret and solve subtraction (removal) and unknown change story problems with totals to 45
- Define even and odd numbers in terms of groups of two or two equal groups
- Recognize and identify coins and their values
- Count on or break apart numbers to add two or more numbers up to a total of 45
- Interpret and solve problems about the number of tens and ones in a quantity
- Demonstrate fluency with addition combinations: near-doules

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.5) Identify odd and even numbers and determine whether a set of objects has an odd or even number of elements.

(2.N.6) Identify the value of all U.S. coins, and \$1, \$5, \$10, and \$20 bills. Find the value of a collection of coins and dollar bills and different ways to represent an amount of money up to \$5. Use appropriate notation, e.g., 69¢, \$1.35.

(2.N.7) Demonstrate an understanding of various meanings of addition and subtraction, e.g., addition 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 ten) and related subtraction facts, and use them to solve problems.

(2.P.2) Identify different patterns on the hundreds chart.

(2.P.4) Skip count by twos, fives, and tens up to at least 50, starting at any number.

(2.P.5) Construct and solve open sentences that have variables, e.g., $\square + 7 = 10$.

(2.P.7) Describe functions related to trading, including coin trades and measurement trades, e.g., five pennies make one nickel or four cups make one quart.

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: Stickers, Number Strings, and Story Problems

End-of-Unit Project

GRADE: 2

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, M39, M40, M41 from Resource Binder, “Resources Masters and Transparencies”

UNIT: STICKERS, NUMBER STRINGS, AND STORY PROBLEMS

Investigation 1 (1.1 – 1.6)

DAYS: 7

GRADE: 2

<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 – order, total, addend, doubles, near-doubles, doubles plus or minus 1, calculator, count on, doubles combinations</p> <p>Work Time – Student Sheets 1-17</p> <p>Journal Entries – *Maximum 5 minutes</p> <p>Inv. 1.1 Is adding $(3+1+5)$ the same as $(5+1+3)$? How do you know?</p> <p>Inv. 1.2 Name at least 2 number combinations that you used when adding number strings?</p> <p>Inv. 1.4 What two strategies did you use when playing <i>Close to 20</i>?</p> <p>Reflection – Create two near doubles combinations problems. Solve and explain your thinking.</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><i>What strategy did you use?</i></p> <p><i>What pattern/s do you notice?</i></p> <p><i>How many different addition combinations can you make for ...?</i></p> <p><i>How can you use doubling to solve this problem?</i></p> <p><i>Does the order of the numbers matter when you are adding? Subtracting?</i></p> <p><i>What do you know and what do you not know about this problem?</i></p> <p><i>How is addition and subtraction similar? Different?</i></p> <p><i>Is this number even or odd? How do you know?</i></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: STICKERS, NUMBER STRINGS, AND STORY PROBLEMS

Investigation 2 (2.1 – 2.7)

DAYS: 8

GRADE: 2

<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 – count all, add tens and ones, count back, addition, subtraction, equation</p> <p>Work Time – Student Sheets 19-41</p> <p>Journal Entries – *Maximum 5 minutes</p> <p>Inv. 2.2 Is (8-4) the same as (4-8)? How do you know?</p> <p>Inv. 2.4 Write an equation for this story problem: Jose had 25 crackers. He got hungry and ate some. When he counted again, he had 16 crackers left. How many crackers did he eat?</p> <p>Inv. 2.5 Describe two strategies you used when playing the game <i>Cover Up</i>.</p> <p>Reflection – Solve (35-14) and (14+21) What is the same and what is different between these two problems?</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><i>What strategy did you use?</i></p> <p><i>What pattern/s do you notice?</i></p> <p><i>How many different addition combinations can you make for ...?</i></p> <p><i>How can you use doubling to solve this problem?</i></p> <p><i>Does the order of the numbers matter when you are adding? Subtracting?</i></p> <p><i>What do you know and what do you not know about this problem?</i></p> <p><i>How is addition and subtraction similar? Different?</i></p> <p><i>Is this number even or odd? How do you know?</i></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: STICKERS, NUMBER STRINGS, AND STORY PROBLEMS

Investigation 3 (3.1 – 3.7)

DAYS: 8

GRADE: 2

<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 – equal groups, even, odd, counting by 5’s, counting by 10’s, nickel, penny, quarter, dime, tally marks</p> <p>Work Time – Student Sheets 42-62</p> <p>Journal Entries – *Maximum 5 minutes</p> <p>Inv. 3.2 If there are 27 children in Mr. Santos’ class could everyone have a partner? How do you know?</p> <p>Inv. 3.4 How would you figure out how many total fingers the students had in any class in our school?</p> <p>Inv. 3.6 Describe two strategies you and your partner used to count the objects in the counting bag?</p> <p>Reflection – List two even and two odd numbers. How do you know that they are even or odd?</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><i>What strategy did you use?</i> <i>What pattern/s do you notice?</i> <i>How many different addition combinations can you make for ... ?</i> <i>How can you use doubling to solve this problem?</i> <i>Does the order of the numbers matter when you are adding? Subtracting?</i> <i>What do you know and what do you not know about this problem?</i> <i>How is addition and subtraction similar? Different?</i> <i>Is this number even or odd? How do you know?</i></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: STICKERS, NUMBER STRINGS, AND STORY PROBLEMS

Investigation 4 (4.1 – 4.6)

DAYS: 7

GRADE: 2

<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 – grouping by 2's, (5s, 10s), 2-digit number, plus 10 combinations, tens, ones, tens place, ones place</p> <p>Work Time – Student Sheets 63-79</p> <p>Journal Entries – *Maximum 5 minutes</p> <p>Inv. 4.1 What did you notice when you grouped your cubes by 10s?</p> <p>Inv. 4.5 What happens when you add 10 to any single digit number? What is the largest digit that you can have in the ones place?</p> <p>Reflection – Show all the possible strip and single sticker combinations for the number 37. Organize your information in a table.</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><i>What strategy did you use?</i></p> <p><i>What pattern/s do you notice?</i></p> <p><i>How many different addition combinations can you make for ... ?</i></p> <p><i>How can you use doubling to solve this problem?</i></p> <p><i>Does the order of the numbers matter when you are adding? Subtracting?</i></p> <p><i>What do you know and what do you not know about this problem?</i></p> <p><i>How is addition and subtraction similar? Different?</i></p> <p><i>Is this number even or odd? How do you know?</i></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 story problems. 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.**

1. On Monday, there was a bicycle race in the park. There were 25 children and 18 adults in the race. How many people were in the race?

2. If 10 pencils fit in a box, how many boxes can you fill with 58 pencils? How many pencils will be left over?

Near-Doubles Combinations

$4 + 5 = \underline{\quad}$

$8 + 9 = \underline{\quad}$

$3 + 4 = \underline{\quad}$

$7 + 6 = \underline{\quad}$

$4 + 3 = \underline{\quad}$

$8 + 7 = \underline{\quad}$

$5 + 4 = \underline{\quad}$

$6 + 5 = \underline{\quad}$

$6 + 7 = \underline{\quad}$

$5 + 6 = \underline{\quad}$

$7 + 8 = \underline{\quad}$

$9 + 8 = \underline{\quad}$

On-Demand Assessments

(To be filed in portfolio)

Stickers, Number Strings, and 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: STICKERS, NUMBER STRINGS, AND STORY PROBLEMS

On-Demand Assessments

GRADE: 2

On-Demand Assessments (P)

Stickers, Number Strings, and 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 1.6 M17*

Inv. 2: Resource Binder: Session 2.7, M420*

Inv. 3: Resource Binder: Session 3.3 , M23

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

Name _____

Date _____



Stickers, Number Strings, and Story Problems

Assessment: Number Strings

Use combinations that you know to solve these problems.

Show your work.

1.

$$6 + 3 + 4 + 6 =$$

2.

$$7 + 5 + 9 + 3 + 5 =$$

3.

$$9 + 6 + 7 + 1 =$$

4.

$$6 + 8 + 6 + 7 =$$

Name _____

Date _____



Stickers, Number Strings, and Story Problems

Assessment: Story Problems

Solve the problems. Show your work.

1. A teacher has 25 new pencils. She gives out 14 pencils. How many pencils does she have left?



2. Sally had a bunch of 22 balloons. She let go of some by mistake, and they flew away. She still has 17 balloons in her hand. How many balloons flew away?



Name _____

Date _____



Stickers, Number Strings, and Story Problems

Assessment: Even or Odd?

Read each question. Record your thinking.

1. Is 26 even or odd? Explain how you know.

2. Is 29 even or odd? Explain how you know.



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 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