



Holyoke Public Schools Mathematics Curriculum Map Grade K

Measuring and Counting

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-Project Preview.....	9
Investigations 1-4.....	10
End-of-Unit Project.....	14
On-Demand Assessments.....	16
HPS Mathematics Scoring Rubric.....	20

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 (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 (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>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

Measuring and Counting Probing Questions for Accountable Talk

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

- *How did you know that?*
- *Can you show another way?*
- *What would happen if?*
- *Explain what methods/strategies you tried?*

Classroom Routines

Attendance: *Sessions: 1.1, 1.5, 2.4, 3.3, 3.7*

Calendar: *Sessions: 1.2, 2.1, 2.5, 3.4, 3.6*

Today's Question: *Sessions: 1.3, 2.2, 3.1, 3.4*

Patterns on the Pocket: *Sessions: 1.4, 2.3, 3.2*

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 outside of math class, occur in a regular rotation every 4-5 days, and support and balance the in-depth work of each curriculum unit.

Implementing Investigations in Grade K: Please review pages 22-29, for 4 Classroom Routines in this unit.

Measuring and Counting: See tan box at the bottom of the page at the beginning of each session for specific questions for Classroom Routines.

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:

- Measure the length of an object by lining up multiple units
- Count a set of up to 15 objects
- Figure out what is one more or one fewer than a number

Math Content Standards:

- (K.N.1) Count by ones to at least 20
- (K.N.2) Match quantities up to 10 with numerals and words
- (K.N.4) Compare sets of up to at least 10 concrete objects using appropriate language and order numbers
- (K.N.6) Identify U.S. coins by name, **penny**
- (K.N.7) Use objects and drawings to model and solve related addition and subtraction problems to ten
- (K.N.8) Estimate the number of objects in a group and verify results
- (K.M.1) Recognize and compare the attributes of **length**, volume/capacity, weight, area, and time using appropriate language
- (K M.3) Use nonstandard units of measurement

Performance Standards:

- (M1a) Adds, joins things together, increases: Subtracts, takes away, compares
- (M1b) Demonstrates understanding of the base ten number system
- (M1d) Describes and compares qualities
- (M3d) Uses symbols to stand for any number, measured quantity, or object with concrete materials
- (M2g) Uses basic ways of estimating
- (M2i) Uses formal and informal units to estimate and measure weight, **length**, area, volume and time

UNIT: Measuring and Counting

End-of-Unit Project

GRADE: K

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.

Session 4.7 Pg.157-161

Resource Binder: Unit 4 M25, for the cover.

Children will create a “**My Favorite Arrangement Book**” (5-10).

- Use plain paper for each arrangement, colored one inch by one inch paper squares to represent color tiles.
- Child labels the number of squares being used on each page.
- Child will describe the arrangement with numbers and record it. (____+____)

UNIT: MEASURING AND COUNTING
Investigation 1 (1.1 – 1.5) DAYS: 5

GRADE: K

<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> – length, long, measure, longest, shortest</p> <p><i>Work Time</i> – Student Sheets 26-29</p> <p><i>Journal Entries</i> –</p> <p style="padding-left: 40px;">Inv. 1.2 Trace your foot/shoe and measure its length using cubes. Count and record the numeral.</p> <p><i>Reflection</i> – When you measured your shoes with the sticks, were there more or fewer sticks than when you measured with cubes? Why do you think this was?</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;"><i>What strategy did you use to measure length using cubes? Using craft sticks?</i> <i>How do you count and keep track of number of cubes/craft sticks to measure?</i> <i>How do you record your measurement?</i> <i>What do you do when a length is not close to a whole number of cubes/craft sticks?</i> <i>How can you figure out what shoe is longer/shorter, longest/shortest?</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: MEASURING AND COUNTING
Investigation 2 (2.1 – 2.5) DAYS: 5

GRADE: K

<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> – penny, dot cube, more, less, image(s)</p> <p><i>Work Time</i> – Student Sheets 30-33</p> <p><i>Journal Entries</i> – Inv. 2.1 Each child has no more than 10/12/ 20 cubes on a plate/container. Child grabs 2 small handfuls of cubes and records how many are altogether using pictures and numerals.</p> <p><i>Reflection</i> – I had 2 pennies and Mom gave me 4 pennies. How many do I have altogether? Use pictures, numbers and/or words to describe the strategy you used.</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 do you use to count accurately?</i> <i>How can you record how many cubes you grabbed in two handfuls?</i> <i>How can you compare two numbers to see which is more, less or equal?</i> <i>What strategy do you use to find out how many altogether?</i> <i>How many do you have to add to your number to have ten?</i> <i>When combining two numbers, how do you count on from one number to figure out how many are altogether?</i> <i>When playing quick image, what strategy did you use to remember how many were in the Ten-Frame?</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: MEASURING AND COUNTING
Investigation 3 (3.1 – 3.7) DAYS: 7

GRADE: K

<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 – teddy bear counters, more, fewer, plus, minus, add, remove, compare, larger, total, combining, removing</p> <p>Work Time – Student Sheets 34-36</p> <p>Journal Entries –</p> <p style="padding-left: 40px;">Inv. 3.3 If I start with the number 7 what is one more, and one fewer than this number? Show your thinking using pictures, numbers, and/or words.</p> <p>Reflection – There are 8 teddy bears playing and 3 go home. How many are left playing? Use pictures, numbers and/or words to describe the strategy you used.</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;"><i>What strategy do you use to figure out how many are in all?</i> <i>What strategy do you use to figure out how many are left?</i> <i>When do you count on? Why?</i> <i>When do you count back? Why?</i> <i>When playing Double Compare, how do you combine the 2 quantities? How do you know which total is larger?</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 ditto strict mathematics guide.</i></p>

UNIT: MEASURING AND COUNTING
Investigation 4 (4.1 – 4.9) DAYS: 9

GRADE: K

<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> – arrangement</p> <p><i>Work Time</i> – Student Sheets 37-41</p> <p><i>Journal Entries</i> –</p> <p style="padding-left: 40px;">Inv. 4.2 Make your favorite arrangement of 6 tiles and record/glue 6 paper squares to show this. All 6 tiles must touch each other. How do you know that you have 6 tiles? Explain your thinking using pictures, numbers, and/or words.</p> <p><i>Reflection</i> – Make two different arrangements using 10 tiles. How do you know that you have 10 tiles? Write a number sentence that would match each of your arrangements.</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;"><i>How many ways can you arrange six tiles or (5-10) that touch each other? Describe your arrangement? What strategy do you use to remember an arrangement (5-10) and then build it? When problem solving, explain your solution strategy (combining and separating). How do you figure out the number of red and yellow counters altogether?</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 measuring lengths and counting. It is written in MCAS form to give students the experience of answering an open-response question.

NAME: _____

DATE: _____

End-of-Unit Project

Measuring and Counting

- **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.**

Session 4.7 Pg.157-161

Resource Binder: Unit 4 M25, for the cover.

Children will create a **“My Favorite Arrangement Book” (5-10)**.

- Use plain paper for each arrangement, colored one inch by one inch paper squares to represent color tiles.
- Child labels the number of squares being used on each page.
- Child will describe the arrangement with numbers and record it. (____ + ____).

On-Demand Assessments

(To be filed in portfolio)

Measuring and Counting 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: MEASURING AND COUNTING

On-Demand Assessments

GRADE: K

On-Demand Assessments (P)

Measuring and Counting 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: Sessions 1.1-1-5, Assessment Checklist Unit4 M3*

Inv. 2: Resource Binder: Sessions 2.1-2.5, Assessment Checklist Unit4 M15*

Inv. 3: Resource Binder: Sessions 3.3-3.7, Assessment Checklist Unit4 M 22*

Inv.4: Resource Binder: Sessions 4.8-4.9, Assessment Checklist Unit 4 M3*

Sessions 4.8-4.9, Assessment Checklist Unit4 M15*

Sessions 4.8-4.9, Assessment Checklist Unit4 M22*

*Assessment Checklists should be kept with tracking sheets.

Assessment Checklist: Measuring Lengths



Student	Measures the length of the object	Lines up units the length of the object	Accurately counts the number of units used	Notes

Sessions 1.1, 1.2, 1.3, 1.4, 1.5, 4.8, 4.9

Unit 4

M3



Assessment Checklist: Counting

Student	Knows the names of the numbers in order	Counts each object once and only once	Has a system for keeping track	Double-checks	Notes

Sessions 2.1, 2.2, 2.3, 2.4, 2.5, 4.8, 4.9

Unit 4

M15



Assessment Checklist: One More, One Fewer

Student	Figures out one more than a number	Figures out one less than a number



Unit 4

Sessions 3.3, 3.4, 3.5, 3.6, 3.7, 4.8, 4.9

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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