



Holyoke Public Schools Mathematics Curriculum Map Grade K

Sorting and Surveys

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 1-3.....	10
End-of-Unit Project.....	13
On-Demand Assessments.....	15
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.
 - STUDENT MASTER – for project
5. INVESTIGATIONS:
 - NOTEBOOK - includes: Folder, Bound Notebook, Portfolio
 - ACCOUNTABLE TALK – using probing questions
5. ON-DEMAND ASSESSMENTS - to be done during teaching of unit.
 - 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 Problem ○ 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

Sorting and Surveys Probing Questions for Accountable Talk

As students progress through this unit, they should be asked the following questions to assess their knowledge about sorting, classifying and using data to solve a problem.

- *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, 2.3, 3.1, 3.5*

Calendar: *Sessions: 1.3, 2.1, 2.5, 3.3*

Today's Question: *Sessions: 1.2, 1.6, 2.4, 3.2*

Patterns on the Pocket: *Sessions: 1.4, 2.2, 2.6, 3.4*

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.

Sorting and Surveys: 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:

- Represent a set of data
- Use data to solve a problem
- Sort a set of objects according to their attributes

Math Content Standards:

- (K.N.1) Count by ones to at least 20
- (K.P.1) Identifies the attributes of objects for sorting and classifying
- (K.P.2) Sort and classify objects by color, shape, size, number and other properties
- (K.D.1) collect, sort organize, and draw conclusions about data using concrete objects, pictures, numbers and graphs

Performance Standards:

- (M1b) Demonstrates understanding of the base ten number system
- (M1d) Describes and compares qualities
- (M4a) Collects, organizes, and displays data
- (M4b) Analyzes data
- (M4c) Draws simple conclusions based on data
- (M4d) Makes conclusions based on data

UNIT: Sorting and Surveys

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.

Sessions 3.4-3.5
Student Activity Book: Unit 7 page 77

Children will create a “**Survey Book**” of 3 questions:

- Children create three surveys:
“**Do you like (child chooses a food)?**”
“**Do you like (child chooses a color)?**”
“**Do you like (child’s choice, i.e. season, TV show, center, toy)?**”
- Children will analyze data by answering these questions:
“**How many answered yes?** Label with a number.
“**How many answered no?** Label with a number.
“**What did you learn from your data**” (more, less).

UNIT: SORTING AND SURVEYS
Investigation 1 (1.1 – 1.6) DAYS: 6

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> – counting by 2’s, 2, 4, 6, 8...</p> <p><i>Work Time</i> – Student Sheets 70-74</p> <p><i>Journal Entries</i> – Inv. 1.5 What did you notice about the number of eyes in the class compared to the number of children?</p> <p><i>Reflection</i> – Resource Binder, Unit 7 M5. Pattern Block Grab. Child sorts, counts and records.</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>How can we count, accurately, the number of children in our class, making sure everyone is counted, even absent children?</i></p> <p><i>What strategy can you use to figure out how to count how many eyes are in our class?</i></p> <p><i>How can we represent this?</i></p> <p><i>Show how you count and represent your handful of blocks?</i></p> <p><i>What strategy do you use to figure out if there are enough chairs in our class for everyone?</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: SORTING AND SURVEYS
Investigation 2 (2.1 – 2.6) DAYS: 6

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> – attribute, comparing, same, different, describe</p> <p><i>Work Time</i> – Student Sheets 75-76</p> <p><i>Journal Entries</i> –</p> <p style="padding-left: 40px;">Inv. 2.4 Children work in pairs. Draw an attribute that is the same about you and your partner. Draw an attribute that is different about you and your partner. Label with same and different.</p> <p><i>Reflection</i> – Name someone in the class who has at least two of the same attributes as you. Draw and label what they are.</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>Describe what is the same or different about the self-portraits?</i></p> <p><i>What attributes can you use to sort them?</i></p> <p><i>Identify the different attributes of the attribute blocks. How can you match blocks by an attribute?</i></p> <p><i>How can we collect data that tells what our favorite lunch foods are?</i></p> <p><i>Show how you can collect more data by sorting our favorite foods? What does our class like most? Least?</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: SORTING AND SURVEYS
Investigation 3 (3.1 – 3.5) 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> – survey, data, response</p> <p><i>Work Time</i> – Student Sheets 77-78</p> <p><i>Journal Entries</i> –</p> <p style="padding-left: 40px;">Inv. 3.1 List 3 different ideas for a survey question. Use pictures and words to match.(i.e. a food, a color, child’s choice, a season, an activity, a pet) This is to go with Survey Question “Do you like....”</p> <p><i>Reflection</i> – Using pictures, numbers, and/or words, list two things that you learned about our class by using the surveys that you created.</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>Can you create a Survey Question (Do you like...?) that will collect data/information?</i></p> <p><i>How can you record the responses?</i></p> <p><i>What information does the survey tell you?</i></p> <p><i>What strategy can you use to solve the problem.... “How many children are here today?” given the number who are absent?</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 ditto strict 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 sorting, classifying and using data to solve a problem. It is written in MCAS form to give students the experience of answering an open-response question.

NAME: _____

DATE: _____

End-of-Unit Project

Sorting and Surveys

- **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.**

Sessions 3.4-3.5

Student Activity Book: Unit 7 page 77

Children will create a “**Survey Book**” of 3 questions.

- Children create three surveys:
 - “**Do you like (child chooses a food)?**”
 - “**Do you like (child chooses a color)?**”
 - “**Do you like (child’s choice, i.e. season, TV show, center, toy)?**”
- Children will analyze data by answering these questions:
 - “**How many answered yes?** Label with a number.
 - “**How many answered no?** Label with a number.
 - “**What did you learn from your data?**” (more, less).

On-Demand Assessments

(To be filed in portfolio)

Sorting and Surveys 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: SORTING AND SURVEYS

On-Demand Assessments

GRADE: K

On-Demand Assessments (P)

Sorting and Surveys 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 1.1-1.2 Assessment Checklist Unit 7 M3*
Resource Binder: Sessions 1.4, Assessment Checklist Unit 7 M4*
Resource Binder: Session 1.2 M5 Pattern Block Grab

Inv. 2: Resource Binder: Sessions 2.2-2.3, Assessment Checklist Unit 7 M8*

*Assessment Checklists should be kept with tracking sheets.



Assessment Checklist: Representations of Data

Student	Represents accurately the number of pieces of data	Represents data so that others can gather information from the representation	Notes: How do students represent the data? Do students organize the data in any way?



Assessment Checklist: Using Data to Solve Problems

M4

Unit 7

Session 1.4

Student	Identifies and represents data needed to solve the problem	Solves the problem accurately	Representation shows how the student solved the problem	Notes

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Assessment Checklist: Sorting



Student	Identifies attributes of an object	Names how two different objects are the same	Can group together objects that are the same according to one attribute	Notes



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