Holyoke Public Schools
Mathematics Curriculum Map
Grade K

How Many Do You Have?

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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.
    - 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
Folder (F)*	o Student Work[1]	o Vocabulary o Student sheets[1] ***All work should be dated and listed by investigation***	o Math books o Vocabulary o Core Problems[1] o Lab sheets ***All work should be dated and listed by investigation***
Marble Notebook (MJ)	o Journal entries[2]	o Table of Contents o Problem of the day o Journal entries o Class work ***All work should be dated and listed by investigation in the Table of Contents***	o Table of Contents o Work time o Journal entries ***All work should be dated and listed by investigation in the Table of Contents***
Portfolio[3] ***(P)***	o On-demand tasks o Projects o Teacher anecdotal notes	o On-demand tasks o Reflections o Projects ***All work should be dated and listed by investigation***	o On-demand tasks o Reflections o Projects ***All work should be dated and listed by investigation***

[*] *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 Do You Have?
Probing Questions for Accountable Talk

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

- *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, 1.4, 2.2, 2.6, 3.4, 4.1, 4.5*
Calendar: *Sessions: 1.3, 1.7, 2.4, 3.3, 3.6, 4.3*
Today's Question: *Sessions: 1.2, 1.6, 2.3, 3.1, 3.5, 4.2, 4.6*
Patterns on the Pocket: *Sessions: 1.5, 2.1, 2.5, 3.2, 3.7, 4.4*

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.

How Many Do You Have?: 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 <….> 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:

- Write the numbers to 10.
- Count a set of up to 20 objects.
- Combine two small quantities.

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.7) Use objects and drawings to model and solve related addition and subtraction problems to ten
(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

UNIT: How Many Do You Have?

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 4.5-4.6 Children will create a "**How Many in All"** book**.** ▪ Students will be assigned a collection of three problems to solve. ▪ The three problems will represent distinct problem types and will include: Solving problems by using combinations of numbers Solving problems by counting on Solving problems by counting back ▪ Students will document problem solving strategies for the given problems using pictures, numbers, and number sentence. **Problem #1- Record 4 different ways to make 7. Use pictures, numbers and number sentence.** **Problem #2- 6 children have green lollipops and 3 children have orange lollipops. How many lollipops are there in all?** **Problem #3- The clown had 7 balloons. 2 balloons popped. How many balloons does the clown have left?**

UNIT: HOW MANY DO YOU HAVE?
Investigation 1 (1.1 – 1.7) DAYS: 7

GRADE: K

Evidence of Learning Artifacts Journal and Reflection questions should be posted and referred to at the beginning of the appropriate *Investigation*. Journal and Reflection entries need to be done in class as part of the closure and assessment.	***Vocabulary*** – none ***Work Time –*** Student Sheets 52-55 ***Journal Entries*** – **Inv. 1.3** Record a 6 tile arrangement with each square having a side that touches another square's side . Describe/record your arrangement using numbers and addition notation. ***Reflection*** – Write at least two number sentences that make the number six. Describe the strategy you used to create them using pictures, numbers, and/or words.
Accountable Talk 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.	*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:* *Demonstrate a 6 then (5 and 7) tile arrangement with one whole side of each tile touching another whole side.* *Describe your arrangement. How can you use numbers and addition notation to record your arrangement?* *Demonstrate how many different 6 (7-10) tile arrangements are possible. What strategy can you use to find out?* *How can we record in numbers if all the two colored chips land with red (or yellow) side facing up?* *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.*

UNIT: HOW MANY DO YOU HAVE?
Investigation 2 (2.1 – 2.6) DAYS: 6

GRADE: K

Evidence of Learning Artifacts Journal and Reflection questions should be posted and referred to at the beginning of the appropriate *Investigation*. Journal and Reflection entries need to be done in class as part of the closure and assessment.	***Vocabulary*** – eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, length, measure, how long ***Work Time –*** Student Sheets 56-58 ***Journal Entries*** – **Inv. 2.2** Child chooses 1 of 4 Inventory Bags (9-12 items). Items in each should be able to be grouped by attribute (i.e. pencils, crayons, markers**).** Child will count (may group) and record how many are in the bag using pictures, numbers and/or (+) notation. ***Reflection*** – What strategy did you use when counting up a large set of objects. Use pictures, numbers and/ or words to describe your strategy.
Accountable Talk 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.	*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:* *What strategy do you use to find out the total number of pennies after new ones have been added? How do you count on?* *How do you know if a number is more or less than a number?* *What strategy do you use to count how many in your Inventory Bag? (organize objects, group objects)How do you show the results?* *How do you use cubes to measure the length of one of your body parts? How do you count and record your answer?* *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.*

UNIT: HOW MANY DO YOU HAVE?
Investigation 3 (3.1 – 3.7) DAYS: 7

GRADE: K

Evidence of Learning Artifacts Journal and Reflection questions should be posted and referred to at the beginning of the appropriate *Investigation*. Journal and Reflection entries need to be done in class as part of the closure and assessment.	***Vocabulary*** – more, add, plus, plus sign, combined, equal sign, equals, remove, minus ***Work Time –*** Student Sheets 59-65 ***Journal Entries*** – **Inv. 3.1 –** How did you figure out how many dots you had altogether when you played *Roll and Record 3?* Use pictures, numbers, and/or words to describe your strategy. ***Reflection*** – Maria was walking around the classroom and found 2 balls in the closet. Then, she found 4 balls under a table. How many balls did Maria find? Show your solution using pictures, numbers, and/or words.
Accountable Talk 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.	*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:* *Roll and Record Game- What strategy do you use to figure out how many dots altogether?* *How do you know if a story problem is about putting groups together or taking away part of a group?* *What clues in the story problem help you decide?* *What strategy do you use to solve and record a (+) or (-) story problem?(i.e. act out, look for clues, model with manipulatives, draw pictures, count, use words, numbers, and (+) or (-) notation, number sentence, or labeling).* *Double Compare Game-What strategy do you use to figure out which player has more?* *What strategy do you use to find out how many when you subtract/take away?* *On paper, how do you show take away/subtraction? (i.e. crossing out pictures)* *On paper, how do you show combining/altogether/addition? (i.e. adding pictures)* *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.*

UNIT: HOW MANY DO YOU HAVE?
Investigation 4 (4.1 – 4.6) DAYS: 6

GRADE: K

Evidence of Learning Artifacts Journal and Reflection questions should be posted and referred to at the beginning of the appropriate *Investigation*. Journal and Reflection entries need to be done in class as part of the closure and assessment.	***Vocabulary*** – equation, combination ***Work Time –*** Student Sheets 66-69 ***Journal Entries*** – **Inv. 4.1** I have 5 flowers in all. Some are red and some are purple. Draw 2 combinations of 5 flowers using red and purple. Write a number sentence to match each combination. ***Reflection*** – I have six crayons in all and some are yellow and some are green. Draw are least two combinations of yellow and green crayons that would equal six and write a number sentence that would match each combination.
Accountable Talk 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.	*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:* *Using crayons, what strategy do you use to find a way to solve the problem of finding a combination of 5? Demonstrate how many combinations of 5 there are.* *Toss the Chips Game-Demonstrate how to find different combinations of 6 using 2-colored chips.* *Total of Six Game-What strategy do you use to find a total of 6? Demonstrate how many different combinations of 6 there are.* *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.*

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 counting and quantity, comparison, and the operations of 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

How Many Do You Have?

- **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 4.5-4.6

Children will create a "**How Many in All"** book**.**

- Students will be assigned a collection of three problems to solve.
- The three problems will represent distinct problem types and will include:
  Solving problems by using combinations of numbers
  Solving problems by counting on
  Solving problems by counting back
- Students will document problem solving strategies for the given problems using pictures, numbers, and number sentence.

Problem #1- Record 4 different ways to make 7. Use pictures, numbers and number sentence.

Problem #2- 6 children have green lollipops and 3 children have orange lollipops. How many lollipops are there in all?

Problem #3- The clown had 7 balloons. 2 balloons popped. How many balloons does the clown have left?

On-Demand Assessments

(To be filed in portfolio)

How Many Do You Have?
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 DO YOU HAVE?

On-Demand Assessments

GRADE: K

On-Demand Assessments (P) How Many Do You Have? 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 1.3, Assessment Checklist Unit 6 M5* Resource Binder: Sessions 1.4, Assessment Checklist Unit 6 M6* ***Inv. 2:*** Resource Binder: Sessions 2.2, Assessment Checklist Unit 6 M6* Resource Binder: Sessions 2.6, Assessment Checklist Unit 6 M12* ***Inv. 3:*** Resource Binder: Sessions 3.1, Assessment Checklist Unit 6 M 5* Sessions 3.1, Assessment Checklist Unit 6 M12 * ***Inv.4:*** Resource Binder: Sessions 4.5-4.6, Assessment Checklist Unit 6 M5* Sessions 4.5-4.6, Assessment Checklist Unit 6 M6* Sessions 4.5-4.6, Assessment Checklist Unit 6 M12* *Assessment Checklists should be kept with tracking sheets.

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

M12

Assessment Checklist: Addition

Unit 6

Student	Notes

Sessions 2.6, 3.1, 4.5, 4.6

Assessment Checklist: Writing Numbers to 10

Student	Numeral										Notes
	1	2	3	4	5	6	7	8	9	10	

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