



Holyoke Public Schools Mathematics Curriculum Map Grade 5

How Many People? How Many
Teams?

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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

How Many People? How Many Teams? **Probing Questions for Accountable Talk**

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

- *How can you tell if two multiplication or division expressions are equivalent?*
- *What strategies can you use to form equivalent expressions?*
- *How do you determine your first step in a division problem?*
- *What strategies can you use for solving multi-step problems?*
- *What are some of the most useful strategies for multiplication and division?*
- *How can you be sure your problem is expressed in clear and concise notation?*

Ten-Minute Math

Ten-Minute Math: Session 1.1, 3.1, Estimation and Number Sense

Ten-Minute Math: Session 2.1, Number Puzzles

Ten-Minute Math activities 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 5: Please review pages 24, 28 -32, for 2 Ten-Minute Math activities 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?

How Many People? How Many Teams?

HPS-7

Goals, Content Standards, & Performance Standards

Unit Goals:

- Explain why doubling one factor in a multiplication expression ($a \times b$) and dividing the other by 2 results in an equivalent expression
- Solve multiplication problems efficiently
- Solve division problems efficiently

Math Content Standards:

(5.N.9) Solve problems involving multiplication and division of whole numbers

(5.N.10) Demonstrate an understanding of how parentheses affect expressions involving addition, subtraction, and multiplication, and use that understanding to solve problems.

(5.P.3) Use the properties of equality to solve problems with whole numbers

Performance Standards:

(M1a) Adds, subtracts, multiplies, and divides whole numbers, with and without calculators; that is:

- multiplies using repeated addition, counting by multiples, combines things that come in groups, makes arrays, uses area models
- divides by putting things into groups, sharing equally
- analyzes problem situations and contexts in order to figure out when to add, subtract, multiply, and divide.
- Solves arithmetic problems by relating addition, subtraction, multiplication, and division to one another

(M3c) Uses the understanding that an equality relationship between two quantities remains the same as long as the same change is made to both quantities.

UNIT: How Many People? How Many Teams?

End-of-Unit Project

GRADE: 5

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.

One case of juice contains 24 cans of juice.

- a. If there are 840 cans of juice in the cafeteria, how many cases of juice are there? Explain your thinking.
- b. After a day of school, there are 600 cans of juice left. How many cases of juice is that? If each case of juice cost \$33.00, how much will it cost to replace the juice that was used?
- c. Imagine the cases of juice contain as many cans as you want. What are some different combinations that would give you 840 cans of juice? Find at least 5 different combinations.

UNIT: How Many People? How Many Teams?
Investigation 1 (1.1 – 1.4) DAYS: 5

GRADE: 5

<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>(3R) – 3 ring binder; (MNB) – marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> – equivalent, doubling halving, tripling, thirthing (3R)</p> <p><i>Work Time</i> – Student Sheets 1-12 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p>Inv. 1.1 None, due to assessment</p> <p>Inv. 1.2 How can you tell that 2×9 and 6×3 are equal?</p> <p>Inv. 1.3 What strategies can you use to find equivalent expressions?</p> <p>Inv. 1.4 How did you find your equivalent division expression?</p> <p><i>Reflection</i> – Find as many different ways to make this equation true: $50 \times 22 = \underline{\quad} \times \underline{\quad}$ Explain how you know your expressions are equivalent (P)</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 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 be found at the beginning of the map and on the probing question sheet in the district mathematics guide.</i></p>

UNIT: How Many People? How Many Groups
Investigation 2 (2.1 – 2.4) DAYS: 8

GRADE: 5

<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>(3R) – 3 ring binder; (MNB) –marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> – algorithm (3R)</p> <p><i>Work Time</i> – Student Sheets 13-26 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p>Inv. 2.1 Show your strategy for solving 35×118.</p> <p>Inv. 2.2 What makes a reasonable estimate when multiplying two and three digit numbers?</p> <p>Inv. 2.3 How does the multiplication algorithm compare to your strategy for multiplying two digit numbers? Explain.</p> <p>Inv. 2.4 None, due to assessment</p> <p><i>Reflection</i> – Solve 221×56 using two different strategies. One strategy must be the U.S. Algorithm. Explain your thinking for each strategy. (P)</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...?</p> <p>Can you solve the problem in a different way?</p> <p>Does your answer make sense?</p> <p>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: How Many People? How Many Teams?
Investigation 3 (3.1 – 3.7) DAYS: 8

GRADE: 5

<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>(3R) – 3 ring binder; (MNB) –marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> – divisor, dividend, quotient(3R)</p> <p><i>Work Time</i> – Student Sheet. 27 - 51 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p>Inv. 3.1 Show and explain your strategy for solving 324 divided by 14.</p> <p>Inv. 3.2 When recording your solutions why is important to be clear and concise? Support your answer with two reasons.</p> <p>Inv. 3.3 How did you decide what your first step would be when dividing?</p> <p>Inv. 3.4 How did the first step you chose for each problem lead to your next steps?</p> <p>Inv. 3.5 How did you decide how many packages of erasers you had to buy?</p> <p>Inv. 3.6 How can estimation help you to solve your problems?</p> <p>Inv. 3.7 None, due to assessment</p> <p><i>Reflection</i> – Solve $498 \div 9$ two different ways. Explain your solutions using clear and concise notation. (P)</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...?</p> <p>Can you solve the problem in a different way?</p> <p>Does your answer make sense?</p> <p>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: How Many People? How Many Teams?
Investigation 4 (4.1 – 4.5) DAYS: 6

GRADE: 5

<p style="text-align: center;">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>(3R) – 3 ring binder; (MNB) –marble notebook; (P) – portfolio</p> <p><i>Vocabulary</i> – (3R)</p> <p><i>Work Time</i> – Student Activity Book pgs. 52-71 (3R)</p> <p><i>Journal Entries</i> – (MNB) *Maximum 5 minutes</p> <p>Inv. 4.1 What is the relationship between multiplication and division?</p> <p>Inv. 4.2 What different strategies did you use for solving the field day problems?</p> <p>Inv. 4.3 How do you determine what information is important to use in a word problem?</p> <p>Inv. 4.4 How can you check a division problem? Is it the same process when you have a remainder? Explain.</p> <p>Inv. 4.5 None, due to assessment</p> <p><i>Reflection</i> – Vicky needs 500 paper plates. There are 16 plates in a bag. How many bags should she buy? How much will she spend if each bag of plates costs \$6.00? Explain your thinking.(P)</p>
<p style="text-align: center;">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...?</p> <p style="padding-left: 40px;">Can you solve the problem in a different way?</p> <p style="padding-left: 40px;">Does your answer make sense?</p> <p style="padding-left: 40px;">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 multiplication and division. 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.**

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- b. After a day of school, there are 600 cans of juice left. How many cases of juice is that? If each case of juice cost \$33.00, how much will it cost to replace the juice that was used?
- c. Imagine the cases of juice contain as many cans as you want. What are some different combinations that would give you 840 cans of juice? Find at least 5 different combinations.

On-Demand Assessments

(To be filed in portfolio)

How Many People? How Many Teams? 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 People? How Many Teams?

On-Demand Assessments

GRADE: 5

On-Demand Assessments (P)

How Many People? How Many Teams?
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 1.1, M15**

Inv. 2: Resource Binder: Session 2.4, M25**

Inv. 3: Resource Binder: Session 3.7 M29*

Inv. 4: Resource Binder: Session 4.5 M31-32*

*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.**



Holyoke Public Schools

2007 - 2008

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