



Holyoke Public Schools Mathematics Curriculum Map Grade 2

How Many Floors? How Many Rooms?

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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 Floors? How Many Rooms? Probing Questions for Accountable Talk

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

How did you calculate how many rooms are in your building?

What strategy/strategies did you use to count your rooms?

What strategy did you use to figure out the mystery shape?

What is the relationship between these two different shapes?

What is a pattern?

What type of pattern is this?

What strategy did you use to extend your pattern?

Classroom Routines

Classroom Routines:

What Time Is It?: Sessions 1.3, 2.1, 2.4

Quick Images: Sessions: 1.1, 1.5, 2.2, 2.5

Toady's Number: Sessions: 1.2, 1.6, 2.3

How Many Pockets: Sessions: 1.4

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.

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:

- Explain what the numbers in a table represent in a constant ration situation (involving ratios 1:2, 1:3, 1:4, 1:5, 1:6)
- Complete and extend a table to match a situation involving a constant ratio
- Extend a repeating pattern and determine what element of the pattern will be in a particular position (e.g., the 16th position) if the pattern keeps going

Math Content Standards:

- (2.N.2) Identify and distinguish among multiple uses of numbers, including cardinal (to tell how many) and ordinal (to tell which one in an ordered list), and numbers as labels and as measurements.
- (2.N.5) Identify odd and even numbers and determine whether a set of objects has an odd or even number of elements.
- (2.P.1) Identify, reproduce, describe, extend, and create simple rhythmic, shape, size, number, color, and letter repeating patterns.
- (2.P.2) Identify different patterns on the hundreds chart.
- (2.P.3) Describe and create addition and subtraction number patterns, e.g., 1, 4, 7, 10...; or 25, 23, 21....
- (2.P.4) Skip count by twos, fives, and tens up to at least 50, starting at any number.
- (2.M.2) Tell time at quarter-hour intervals on analog and digital clocks using a.m. and p.m.
- (2.D.3) Formulate inferences (draw conclusions) and make educated guesses (conjectures) about a situation based on information gained from data.

Performance Standards:

M3a Uses linear patterns to solve problems

M3b Builds iterations of simple non-linear patterns

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 Floors? How Many Rooms?

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 5, M14, M15, M16, M17 from Resource Binder, “Resources Masters and Transparencies”

UNIT: HOW MANY FLOORS? HOW MANY ROOMS?

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 – representation, table, column, row, floor plan, triangle, hexagon, trapezoid</p> <p>Work Time – Student Sheets 1 – 35</p> <p>Journal Entries – *Maximum 5 minutes</p> <p>Inv. 1.1 What happens as your building grows as each floor is added on?</p> <p>Inv. 1.3 What strategy/strategies would you use to calculate how many rooms there are in a building with 5 floors and 3 rooms on each floors. Show your work.</p> <p>Inv. 1.5 What is the relationship between a rhombus and a triangle?</p> <p>Reflection – A building has 24 rooms. Draw at least 3 buildings. Explain the strategy/strategies you used to determine the number of rooms and the number of floors. Snap cubes can be 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>How did you calculate how many rooms are in your building?</i></p> <p><i>What strategy/strategies did you use to count your rooms?</i></p> <p><i>What strategy did you use to figure out the mystery shape?</i></p> <p><i>What is the relationship between these two different shapes?</i></p> <p><i>What is a pattern?</i></p> <p><i>What type of pattern is this?</i></p> <p><i>What strategy did you use to extend your pattern?</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: HOW MANY FLOORS? HOW MANY ROOMS?
Investigation 2 (2.1 – 2.5) DAYS: 6

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><i>Vocabulary</i> – repeating pattern, unit, even, odd, multiple</p> <p><i>Work Time</i> – Student Sheets 37-53</p> <p><i>Journal Entries</i> – *Maximum 5 minutes</p> <p>Inv. 2.1 What would the next three colors be in the following pattern: pink, blue, yellow, pink, blue, yellow, pink</p> <p>Inv. 2.3 In a red, blue, red, blue pattern, what would the color be of the 27th cube? Show all of your work.</p> <p>Inv. 2.4 In an AABBC pattern, what would be the 35th letter?</p> <p><i>Reflection</i> – Create your own ABC pattern. Identify what the 5th, 14th, and 21st member of the pattern. Explain your strategies to create the pattern and to identify the members.</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 did you calculate how many rooms are in your building?</i> <i>What strategy/strategies did you use to count your rooms?</i> <i>What strategy did you use to figure out the mystery shape?</i> <i>What is the relationship between these two different shapes?</i> <i>What is a pattern?</i> <i>What type of pattern is this?</i> <i>What strategy did you use to extend your pattern?</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 patterns. 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.**

The table below shows the amount of money in the nickel jar for the first 4 days. Fill out the rest of the table so it shows the amount of money in the nickel jar for the other days.

Day	Amount of Money
1	5¢
2	10¢
3	15¢
4	20¢
5	
6	
10	

On Day 4, there is _____¢ in the nickel jar.

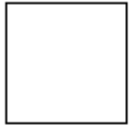
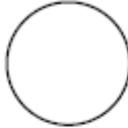

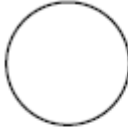

On Day _____, there is 10¢ in the nickel jar.

How did you figure out how much money is in the nickel jar on Day 10?

How much money will be in the nickel jar on Day 14?

Show how you figured this out.

Here is a shape pattern.







							
Square	Circle	Square	Circle	Square			
1	2	3	4	5	6	7	8

- 1.** If the pattern keeps going in the same way, what will the 11th shape be?

- 2.** What will the 16th shape be? _____

How did you figure out the 16th shape?

Here is another shape pattern.

							
Moon	Moon	Star	Moon	Moon	Star		
1	2	3	4	5	6	7	8

1. If the pattern keeps going in the same way, what will the 12th shape be?

2. What will the 16th shape be? _____

How did you figure out the 16th shape?

On-Demand Assessments

(To be filed in portfolio)

How Many Floors? How Many Rooms? 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 FLOORS? HOW MANY ROOMS?

On-Demand Assessments

GRADE: 2

<p>On-Demand Assessments (P)</p> <p><u>How Many Floors? How Many Rooms?</u> Investigations</p> <p>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.</p>	<p><u>Inv. 1:</u> Resource Binder: Session 1.4 M7*</p> <p><u>Inv. 2:</u> (No On Demand)*</p> <p>*Please refer to the section in the Teacher's Unit Guide entitled, "Professional Development" for examples of student work for each assessment.</p> <p><u>*Assessment Checklist should be kept with the tracking sheets.</u></p>
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Assessment Checklist: Understanding Tables

Can explain how the numbers in a row of the table are related	Can explain how they know how many rooms there are for a certain number of floors	Can explain how to figure out the number of rooms for 8 floors
Student		



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