



Holyoke Public Schools Mathematics Curriculum Map Grade K

Make a Shape, Build a Block

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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: 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

Make a Shape, Build a Block **Probing Questions for Accountable Talk**

As students progress through this unit, they should be asked the following questions to assess their knowledge about 2-D and 3-D shapes, their characteristics and attributes and the relationship between them.

- *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, 3.7*

Today's Question: *Sessions: 1.2, 1.6, 2.4, 3.2, 3.6*

Patterns on the Pocket: *Sessions: 1.4, 2.2, 2.6, 3.4, 3.8*

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.

Make a Shape, Build a Block: 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:

- Describe the overall size, shape, function, and/or feature of familiar 2-D and 3-D shapes
- Construct 2-D and 3-D shapes
- Make 2-D and 3-D shapes by combining shapes

Math Content Standards:

- (K.G.1) Name, describe, sort, and draw 2-D shapes
- (K.G.2) Describe attributes of 2-D shapes
- (K.G.3) Name and compare 3-D shapes
- (K.G.4) Identify positions of objects in space and use appropriate language to describe and compare relative positions

Performance Standards:

- (M2d) Uses many geometric figures and identifies the figures by their properties
- (M2e) Solves problems by showing relationships between and among figures such as flips, slides, and rotations

UNIT: Make a Shape, Build a Block

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 3.7

Student Activity Book: Unit 5 pages 45-46.

Children will create a “**My 3-D Shape Hunt Book**”.

- Teacher will model the ritual of a Shape Hunt by displaying photos of several items or real objects found in the classroom or school
- Teacher will review shape vocabulary necessary for the Shape Hunt
- Teacher will review use of the student sheet, Unit 5 pages 45-46 with students
- Teacher and small groups of children will explore a classroom, school building or magazines to find 3-D objects
- Child will use student sheet to record and label the 3-D objects found in the hunt
- Cut apart student sheet to make the “**My 3-D Shape Hunt Book**”

UNIT: MAKE A SHAPE, BUILD A BLOCK

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>Vocabulary – rectangle, square, circle, curved, straight, sides, round, corners, points, corners, triangle, geoboard, 2-D, two-dimensional</p> <p>Work Time – Student Sheet 42</p> <p>Journal Entries –</p> <p>Inv. 1.3 Student draws/traces 2-D shapes, circle, square, triangle, rectangle, oval and rhombus and labels them.</p> <p>Reflection – Draw and label two shapes that have straight sides, and draw and label two shapes that have curved sides.</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 the attributes of the 2-D shapes, (size, orientation, number of sides, round, curve, straight sides, corner, points)?</i></p> <p><i>What can you add to a given shape to make it into a picture?</i></p> <p><i>How can you describe pattern blocks?</i></p> <p><i>Can you substitute some pattern blocks for others? (2 trapezoids =hexagon)</i></p> <p><i>Describe why changing a shapes orientation (upside down, sideways) does not change the shape’s name?</i></p> <p><i>What strategy do you use to accurately record your pattern block picture?</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: MAKE A SHAPE, BUILD A BLOCK
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> – pattern block, cube, hexagon, rhombus, trapezoid</p> <p><i>Work Time</i> – Student Sheets 43-44</p> <p><i>Journal Entries</i> – Inv. 2.1 Trace 3 hexagons. Use paper pattern blocks to show 3 different ways to fill in a hexagon.</p> <p><i>Reflection</i> – Resource Binder Unit 5 pages M34-M42, teacher’s choice of page for each student. Child builds pattern block puzzle and records how many of each pattern block was used in the puzzle.</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 fill in a pattern block puzzle?</i> <i>Demonstrate a different way you can fill in a pattern block puzzle?</i> <i>Our Mural: What shapes do you see? Which shape is used the most? Least? How many (name shape) are on the mural?</i> <i>How many different shapes are used?</i> <i>How many different pattern blocks can you use to make (fill in) a hexagon?</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: MAKE A SHAPE, BUILD A BLOCK

Investigation 3 (3.1 – 3.8)

DAYS: 8

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 – 3-D, three dimensional, sphere, cone, same, different, face, side, matching, cylinder, cube, rectangular prism</p> <p>Work Time – Student Sheets 45-51</p> <p>Journal Entries –</p> <p>Inv. 3.1 Write the word sphere and draw something that has a sphere shape. Write the word cone and draw something that has a cone shape.</p> <p>Reflection – Record one similarity and one difference between 2-D and 3-D shapes by using pictures numbers, and/or words.</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 attributes do you see in a given 3-D shape? Find something with that 3-D shape?</i></p> <p><i>What strategy did you use to copy accurately a cube construction?</i></p> <p><i>What attributes do you see in a given geoblock?</i></p> <p><i>What strategy do you use to match the faces of two geoblocks?</i></p> <p><i>Demonstrate how you can combine two or more geoblocks to make an equivalent 3-D geoblock.</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 2-D and 3-D shapes, their characteristics and attributes and the relationship between them. It is written in MCAS form to give students the experience of answering an open-response question.

NAME: _____

DATE: _____

End-of-Unit Project

Make a Shape, Build a Block

- **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 3.7

Student Activity Book: Unit 5 pages 45-46.

Children will create a **“My 3-D Shape Hunt Book”**.

- Teacher will model the ritual of a Shape Hunt by displaying photos of several items or real objects found in the classroom or school.
- Teacher will review shape vocabulary necessary for the Shape Hunt.
- Teacher will review use of the student sheet, Unit 5 pages 45-46 with students.
- Teacher and small groups of children will explore a classroom, school building or magazines to find 3-D objects.
- Child will use student sheet to record and label the 3-D objects found in the hunt.
- Cut apart student sheet to make the **“My 3-D Shape Hunt Book”**.

On-Demand Assessments

(To be filed in portfolio)

Make a Shape, Build a Block 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: MAKE A SHAPE, BUILD A BLOCK

On-Demand Assessments

GRADE: K

On-Demand Assessments (P)

Make a Shape, Build a Block 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, Assessment Checklist Unit 5 M7*
Resource Binder: Session 1.4-1.5, Assessment Checklist Unit 5 M10*
- Inv. 2:** Binder Resource: Sessions 2.1, Assessment Checklist Unit 5 M7*
Binder Resource: Sessions 2.2, Assessment Checklist Unit 5 M30*
- Inv. 3:** Resource Binder Sessions 3.1,3.7,3.8, Assessment Checklist Unit 5 M7*
Resource Binder Sessions 3.4,3.7,3.8, Assessment Checklist Unit 5 M10*
Resource Binder Sessions 3.7-3.8, Assessment Checklist Unit 5 M 30*

*Assessment Checklists should be kept with tracking sheets.

Assessment Checklist: Describing Shapes



Student	Describes . . .			Features
	Size	Shape	Function	

Sessions 1.1, 2.1, 3.1, 3.7, 3.8

Assessment Checklist: Constructing 2-D and 3-D Shapes



Student	2-D Clay Shapes	Shapes on the Geoboard	3-D Clay Shapes



Assessment Checklist: Constructing (and Decomposing) 2-D and 3-D Shapes

M30 Unit 5

Student	Pattern Block Puzzles	Fill the Hexagons	Build-a-Block

Sessions 2.2, 3.7, 3.8

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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