



Holyoke Public Schools

Grade 6

Covering and Surrounding

Table of Contents

HOLYOKE PUBLIC SCHOOLS	ERROR! BOOKMARK NOT DEFINED.
CURRICULUM MAPS OUTLINE	6
Map Goals:	6
Expectations:	6
Feedback To Students:	6
Map Components:	6
MATHEMATICS EVIDENCE OF LEARNING ARTIFACTS	7
ACCOUNTABLE TALK	8
Probing Assessment Questions	8
Probing Questions – Teacher’s Role	8
Probing Questions – Student’s Role	9
Probing Questions – Suggestions	9
GOALS, CONTENT STANDARDS, & PERFORMANCE STANDARDS	11
Unit Goals:	11
Math Content Standards:	11
Performance Standards:	12
INVESTIGATION 1: DESIGNING BUMPER CARS	13
INVESTIGATION 2: CHANGING AREA, CHANGING PERIMETER	14

INVESTIGATION 3: MEASURING TRIANGLES	15
INVESTIGATION 4: MEASURING PARALLELOGRAMS.....	16
INVESTIGATION 5: MEASURING IRREGULAR SHAPES AND CIRCLES	17
APPENDIX 1 UNIT PROJECT	18
Unit Project Scoring Guide	18
Project Title:“ A City Park”	19
Student Work: Question #27 - Score Point 4.....	20
Student Work: Question #27 - Score Point 3.....	21
Student Work: Question #27 - Score Point 2.....	22
Student Work: Question #27 - Score Point 1.....	23
APPENDIX 2 VOCABULARY	24
Investigation 1:	24
Investigation 2:	24
Investigation 3:	24
Investigation 4:	24
Investigation 5:	24
APPENDIX 3 JOURNAL ENTRIES.....	25
Investigation 1:	25
Investigation 2:	25

Investigation 3.....	25
Investigation 4.....	26
Investigation 5.....	26
APPENDIX 4 REFLECTIONS	28
MMR1	28
MMR2	28
MMR3	28
MMR4	28
MMR5	28
APPENDIX 5 ON DEMAND TASKS	29
HPS Mathematics Scoring Rubric.....	30
Investigation 1.....	31
Investigation 2.....	32
Investigation 3.....	33
Investigation 4.....	34
Investigation 5.....	35
NOTES	36

Curriculum Maps Outline

Map 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.
5. STUDENT MASTER – for project
6. INVESTIGATIONS
7. NOTEBOOK - includes: 3 Ring Binder, Bound Notebook, Portfolio
8. ACCOUNTABLE TALK – using probing questions
9. ON DEMAND ASSESSMENTS - to be done during teaching of unit.
10. STUDENT MASTERS- for on-demand assessments.

Mathematics Evidence of Learning Artifacts

Artifact	K - 1	2 – 5	6 - 8
3 Ring Binder (3R)*	<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>
Marble Notebook (MNB)	<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>
Portfolio³ (P)	<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

Accountable Talk

Probing Assessment Questions

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

- *What attributes of the shape are important to measure?*
- *How do you know whether area or perimeter is involved?*
- *How are these measurements different from each other?*
- *What are we finding when we find area?*
- *What are we finding when we find perimeter?*
- *What relationships involving area or perimeter, or both, will help solve the problem?*
- *How can you find the area and perimeter of an irregular shape?*

Probing Questions – Teacher’s Role

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*

Probing Questions – Student’s Role

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*

Probing Questions – Suggestions

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:

- *Use area and relate area to covering a figure*
- *Use perimeter and relate perimeter to surrounding a figure*
- *Analyze what it means to measure area and perimeter*
- *Develop strategies for finding areas and perimeters of rectangular and non-rectangular shapes*
- *Discover relationships between perimeter and area including that each can vary while the other stays fixed*
- *Analyze how the area of a triangle and the area of a parallelogram are related to the area of a rectangle*
- *Develop formulas and procedures, stated in words and/or symbols, for finding areas and perimeters of rectangles, parallelogram, triangles and circles*
- *Develop techniques for estimating the area and perimeter of an irregular figure*
- *Recognize situations in which measuring perimeter or area will help answer practical questions*

Math Content Standards:

- *6.M.1) Apply the concepts of perimeter and area to the solution of problems. Apply formulas where appropriate.*
- *(6.M.2) Identify, measure, describe, classify, and construct various angles, triangles and quadrilaterals.*
- *(6.M.4) Find areas of triangles and parallelograms. Recognize that shapes with the same number of sides but different appearances can have the same area. Develop strategies to find the area of more complex shapes.*
- *(6.M.5) Identify, measure, and describe circles and the relationships of the radius, diameter, circumference, and area (e.g., $d = 2r$; $Pi = \text{circumference divided by } d$) and use the concepts to solve problems.*

Performance Standards:

- *(M2a) Is familiar with assorted two- and three-dimensional objects including squares, triangles, other polygons, circles, cubes, rectangular prisms, pyramids, spheres, and cylinders.*
- *(M2d) Determines and understands length, area, and volume (as well as the differences among these measurements) including perimeter and surface area; uses units, square units, and cubic units of measure correctly; computes areas of rectangles, triangles and circles; computes volume of prisms*
- *(M5a) Formulates and solves a variety of meaningful problems*
- *Extracts pertinent information from situations and figures out what additional information is needed*

Investigation 1: Designing Bumper Cars

<p><u>Objectives</u> Investigations 1.1 – 1.3</p>	<p><u>Pacing:</u> 4 days</p>
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></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><u>Vocabulary</u>²: Appendix 2, Investigation 1</p> <hr/> <p><u>Core Problems</u>²: Covering and Surrounding, Investigation 1 ACE Problems: :#2- 5, 7, 9-15, 28, 16-21, 31</p> <hr/> <p><u>Work Time</u>¹: Covering and Surrounding, Problems 1.1 – 1.3)</p> <hr/> <p><u>Journal Entries</u>¹: Appendix 3, Inv 1.1,1.2,1.3</p> <hr/> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 1</p> <hr/> <p><u>Mathematical Reflection</u>³ Appendix 4, MMR1:</p>
<p style="text-align: center;"><i>Accountable Talk</i></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>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:</p> <ul style="list-style-type: none"> ○ How can you use area to help you find the perimeter? ○ Can you show another way to find the area...perimeter? ○ Will your strategy always work? <p>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.</p>

1. Marble Note Book
2.3 Ring Binder
3. Portfolio

Investigation 2: Changing Area, Changing Perimeter

<p><u>Objectives</u> Investigations 2.1 – 2.4</p>	<p><u>Pacing:</u> 5 days</p>
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></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><u>Vocabulary</u>²: Appendix 2, Investigation 2</p> <p><u>Core Problems</u>²: Covering and Surrounding , Investigation 2 ACE Problems: # 1,2,7,8,13-15,26</p> <p><u>Work Time</u>¹: Covering and Surrounding, Problems 2.1 – 2.4</p> <p><u>Journal Entries</u>¹: Appendix 3, Inv #2.1, 2.2, 2.3, 2.4</p> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 2</p> <p><u>Mathematical Reflection</u>³ Appendix 4, MMR2:</p>
<p style="text-align: center;"><i>Accountable Talk</i></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>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:</p> <ul style="list-style-type: none"> ○ What are you trying to find when we are discussing maximum area...perimeter? ○ Does your answer make sense? ○ Can you draw a diagram? <p>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.</p>

1. Marble Note Book
2.3 Ring Binder
3. Portfolio

Investigation 3: Measuring Triangles

<p><u>Objectives</u> Investigations 3.1 – 3.4</p>	<p><u>Pacing:</u> 6 days</p>
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></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><u>Vocabulary</u>²: Appendix 2, Investigation 3</p> <p><u>Core Problems</u>²: Covering and Surrounding, Investigation 3 ACE Problems: replace with pg and question #s</p> <p><u>Work Time</u>¹: Covering and Surrounding, Problems 3.1 – 3.4</p> <p><u>Journal Entries</u>¹: Appendix 3, Inv 3.1, 3.2, 3.3, 3.4</p> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 3</p> <p><u>Mathematical Reflection</u>³ Appendix 4, MMR3:</p>
<p style="text-align: center;"><i>Accountable Talk</i></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>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:</p> <ul style="list-style-type: none"> ○ What is your strategy? ○ How could you check that ... is correct? ○ Could you begin with a different step? ○ Does make sense given the information in the problem? <p>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.</p>

1. *Marble Note Book*
2.3 *Ring Binder*
3. *Portfolio*

Investigation 4: Measuring Parallelograms

<p><u>Objectives</u> Investigation 4.1 – 4.4</p>	<p><u>Pacing:</u> 6 day</p>
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></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><u>Vocabulary</u>²: Appendix 2, Investigation 4</p> <p><u>Core Problems</u>²: Covering and Surrounding, Investigation 4 ACE Problems: #1-8, 9-17, 22-37, 36</p> <p><u>Work Time</u>¹: Covering and Surrounding, Problem #4.1 – 4.4</p> <p><u>Journal Entries</u>¹: Appendix 3, Inv #4.1, 4.2, 4.3, 4.4</p> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 4</p> <p><u>Mathematical Reflection</u>³: Appendix 4, MMR4:</p>
<p style="text-align: center;"><i>Accountable Talk</i></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>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:</p> <ul style="list-style-type: none"> ○ Is there another way to write? ○ Does help you find the answer? <p>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.</p>

1. *Marble Note Book*
2.3 *Ring Binder*
3. *Portfolio*

Investigation 5: Measuring Irregular Shapes and Circles

Objectives Investigations 5.1-5.4	Pacing: 6 days
<p style="text-align: center;"><i>Evidence of Learning Artifacts</i></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><u>Vocabulary</u>²: Appendix 2, Investigation 5</p>
	<p><u>Core Problems</u>²: Covering and Surrounding, Investigation 5 ACE Problems: replace with pg and question #s</p>
	<p><u>Work Time</u>¹: Covering and Surrounding, Problem 5.1-5.4</p>
	<p><u>Journal Entries</u>¹: Appendix 3, Inv #5.1, 5.2, 5.3, 5.4</p>
	<p><u>On Demand Tasks</u>³: Appendix 5, Investigation 5</p>
	<p><u>Mathematical Reflection</u>³ Appendix 4, MMR5:</p>
<p style="text-align: center;"><i>Accountable Talk</i></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>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:</p> <ul style="list-style-type: none"> ○ How did you decide to? ○ How does this connect to other math we have learned? <p>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.</p>

1. Marble Note Book

2.3 Ring Binder

3. Portfolio

Appendix 1 Unit Project

<p style="text-align: center;"><i>Project</i>¹</p> <p>Student work should be placed in portfolio</p>	<p>The project is the culminating assessment, which will allow students to apply what they learned about the use of 2-dimensional measurement. It is written in MCAS form to give students the experience of answering an open-response question.</p> <p>The unit project is called ‘A City Park’ and the student handout for the project can be found in Appendix 1</p>
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1. portfolio

Unit Project Scoring Guide

Score	Description
<u>4</u>	The student response demonstrates an exemplary understanding of the Measurement concepts involved in applying perimeter and area to the solution of problems, using formulas where appropriate. The student determines the area of a square, the area of a circle within the square, and the area of the complex shape represented by the difference between the square and the circle; then the student uses the result to solve a real-world problem.
<u>3</u>	The student response demonstrates a good understanding of the Measurement concepts involved in applying perimeter and area to the solution of problems, using formulas where appropriate. Although there is significant evidence that the student recognizes and applies the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points.
<u>2</u>	The student response demonstrates a fair understanding of the Measurement concepts involved in applying perimeter and area to the solution of problems, using formulas where appropriate. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
<u>1</u>	The student response demonstrates a minimal understanding of the Measurement concepts involved in applying perimeter and area to the solution of problems, using formulas where appropriate.
<u>0</u>	The student response contains insufficient evidence of an understanding of the Measurement concepts involved in applying perimeter and area to the solution of problems, using formulas where appropriate, to merit any points.

NAME: _____

DATE: _____

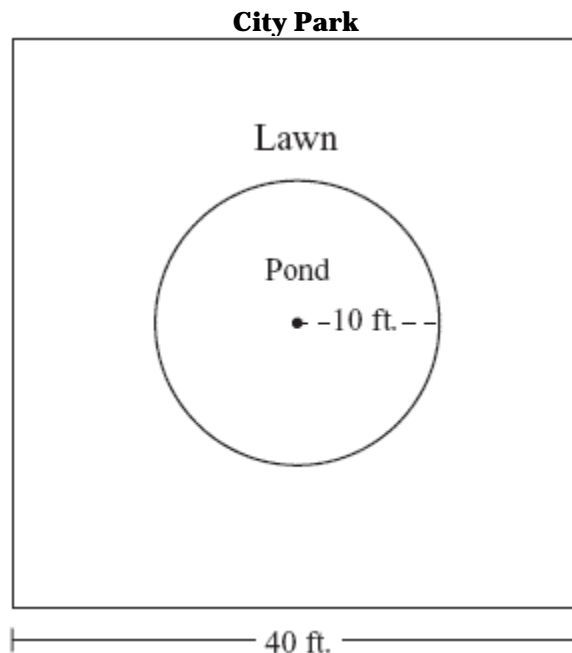
Project Title: “A City Park”

- 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.

A city park is in the shape of a square, with each side measuring 40 feet.

- a. What is the area, in square feet, of the city park? Show or explain how you got your answer.

The city has decided to put a pond in the shape of a circle in the center of the park. The circle will have a radius of 10 feet, as shown in the diagram below. The remaining portion of the park will be a lawn.



- b. What is the approximate area, in square feet, of the circle? Show your work. (Use 3.14 for π .)
- c. A landscaper plans to fertilize the lawn of the park. What is the approximate area, in square feet, of the lawn of the park? Show or explain how you got your answer.
- d. One bag of GrowFast fertilizer can fertilize 50 square feet. How many bags of GrowFast will the landscaper need in order to fertilize the lawn of the park? Show or explain how you got your answer.

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2006 MCAS Grade 6 Mathematics

Student Work: Question #27 - Score Point 4

a.
$$\begin{array}{r} 40 \\ \times 40 \\ \hline 1600 \text{ ft}^2 \end{array}$$

b.
$$\begin{aligned} A &= \pi r^2 \\ A &= 3.14 \times 10^2 \\ A &= 3.14 \times 100 \\ A &= 314 \text{ ft}^2 \end{aligned}$$

$$\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array} \quad \begin{array}{r} 3.14 \\ \times 100 \\ \hline 314.00 \end{array}$$

c.
$$\begin{array}{r} 59 \\ 1600 \\ - 314 \\ \hline 1286 \text{ ft}^2 \end{array}$$

d.
$$\begin{array}{r} 25.72 \rightarrow 26 \text{ bags} \\ 50 \overline{) 1286.00} \\ \underline{100} \\ 286 \\ \underline{250} \\ 360 \\ \underline{350} \\ 100 \end{array}$$

2006 MCAS Grade 6 Mathematics

Student Work: Question #27 - Score Point 3

a. 1,600 ft.²

I multiplied 40×40 and got 1,600² feet.

b. 985.96 ft.²

$$\begin{array}{r} 3.14 \\ \times 10 \\ \hline 000 \\ 314 \\ \hline 31.40 \end{array} \qquad \begin{array}{r} 11 \\ 31.4 \\ \times 31.4 \\ \hline 1256 \\ 314 \\ \hline 985.96 \end{array}$$

c. 614,04 ft.²

$$\begin{array}{r} 15,229 \\ 614,04 \\ - 985.96 \text{ pond} \\ \hline 614.04 \end{array}$$

d. 13 bags. (12.28)

$$\begin{array}{r} 12.28 \\ 50 \overline{) 614.04} \\ \underline{50} \\ 114 \\ \underline{100} \\ 140 \\ \underline{100} \\ 404 \\ \underline{400} \\ 4 \end{array} \quad \text{I rounded my answer to 13 bags.}$$

2006 MCAS Grade 6 Mathematics

Student Work: Question #27 - Score Point 2

A. The area of the park is 1,600 because you multiply base * high and it will give you the answer.

B. The area of the circle is 3.14 because you multiply 10×3.14 and it gives me 3.14.

C. IF they fertilize the lawn it would be 100.

D. maybe 5 large bags of fertilizer can make the length of the park 50 square feet.

2006 MCAS Grade 6 Mathematics

Student Work: Question #27 - Score Point 1

A. The area of the park is 1,600 because you multiply base * high and it will give you the answer.

B. The area of the circle is 3.14 because you multiply 10×3.14 and it gives me 3.14.

C. IF they fertilize the lawn it would be 000.

D. maybe 5 large bags of fertilizer can make the length of the park 50 square feet.

Appendix 2 Vocabulary

Investigation 1:

- *area, perimeter, dimensions*

Investigation 2:

- *fixed area, maximum area, minimum area*

Investigation 3:

- *base, height, congruent, constraints*

Investigation 4:

- *diagonal, parallelogram, trapezoid*

Investigation 5:

- *center, diameter, radius, circumference, Pi, perpendicular*

Appendix 3 Journal Entries

Investigation 1:

Investigation 1.1:

- What are you actually counting when you measure area?
- What are you actually counting when you measure perimeter?
- How are these measurements different from each other?

Investigation 1.2:

In the designs of the same floor area, which design costs the most? Which design costs the least? What is causing the difference in cost? Explain why

Investigation 1.3:

Describe 2 ways to find the area and perimeter of a 2 X 6 rectangle.

Investigation 2:

Investigation 2.1

What shape will give you the maximum area? Why?

Investigation 2.2

What shape will give you the maximum perimeter? Why?

Investigation 2.3

Why does the 1m-by-11m rectangle have a smaller area than the 6m-by-6m rectangle?

Investigation 2.4

When you add a tile it increases the area by 1 square foot. Will the perimeter increase too? Explain.

Investigation 3

Investigation 3.1

How could you write a rule to find the area of a triangle?

Investigation 3.2

How can there be 3 different ways to find the same area of a triangle?

Investigation 3.3

How can triangles have the same base and height as well as the same area, even though they look different?

Investigation 3.4

What kinds of constraints make drawing a triangle easy? What kinds of constraints make drawing a triangle difficult?

Investigation 4

Investigation 4.1

How could I write this method for finding perimeter of a parallelogram as a rule with symbols?

Investigation 4.2

How did you use b and h to write a rule for finding the area of a parallelogram?

Investigation 4.3

Draw and label the base, height, and side lengths of a parallelogram.

Investigation 4.4

How do you decide if the question is about area or perimeter?

Investigation 5

Investigation 5.1

Explain the strategies you used to find the area..

Investigation 5.2

What patterns did you find when you compared the circumference and area?

Investigation 5.3

Explain the relationship between the radius and the area.

Investigation 5.4

If I know the area of a circle, how can I find the radius?

Appendix 4 Reflections

MMR1

Is it possible for 2 shapes to have the same area but different perimeters? Explain your answer using words and drawings.

MMR2

- a. Of all rectangles with whole-number dimensions that have a given perimeter, how would you describe the one that has the least area?
- b. Of all rectangles with whole-number dimensions that have a given perimeter, how would you describe the one that has the greatest area?

MMR3

Describe an efficient way to find the area of a triangle. Be sure to mention the measurements you would need to make and how you would use them to find the area. Explain why your method works.

MMR4

How is finding the area of a parallelogram similar to finding the area of a triangle and the area of a rectangle?

MMR5

Describe how you can find the circumference of a circle by measuring its diameter?

Appendix 5 On Demand Tasks

CMP2: Covering and Surrounding

On-Demand Tasks:

Additional Practice & Skills Workbook

Assessment Resources

Student Book (ACE Questions)

MCAS Released Questions from prior years

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.

[After Inv. 1](#)

ACE #1, pg. 10

[After Inv. 2](#)

MCAS 2006 Question #11 pg 285

[After Inv. 3](#)

ACE #11 pg. 46

[After Inv. 4](#)

MCAS 2006 Question #37 pg. 2

[After Inv. 5](#)

ACE #27 pg. 83

HPS Mathematics Scoring Rubric

Score	Description
<u>4</u>	The response shows a <u>comprehensive</u> understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It indicates that the student has <u>completed the task(s)</u> correctly, using mathematically sound procedures. It contains <u>clear, complete explanations</u> and/or <u>adequate work required</u> .
<u>3</u>	The response shows a <u>general</u> understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It indicates that the student has <u>completed the task(s)</u> , using mathematically sound procedures. It contains <u>complete explanations</u> and/or <u>adequate work required</u> .
<u>2</u>	The response shows a <u>basic</u> understanding of the mathematical concept(s) and/or procedures embodied in the task(s). It addresses <u>most aspects of the task(s)</u> , using mathematically sound procedures. It may contain a correct solution but provides <u>incomplete procedures, reasoning and/or explanations</u> . It may reflect <u>some misunderstandings</u> of the underlying mathematical concepts and/or procedures.
<u>1</u>	The response shows a <u>minimal</u> understanding of the mathematical concepts and/or procedures embodied in the task(s). It addresses <u>some elements of the task(s)</u> correctly but reaches an <u>inadequate solution and/or provides reasoning that is faulty or incomplete</u> . It exhibits <u>multiple flaws related to a misunderstanding of important aspects</u> of the task(s), misuse of mathematical procedures, or faulty mathematical reasoning. It reflects a <u>lack of essential understanding</u> of the underlying mathematical concepts. It may contain a correct numerical answer but <u>the required work is not provided</u> .
<u>0</u>	The response is <u>completely incorrect, irrelevant, or incoherent</u> , or contains a correct response arrived at using an <u>obviously incorrect procedure</u> .

NAME: _____

DATE: _____

Investigation 1

- *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.*

Coney Island Park wants a bumper-car ride with 24 square meters of floor space and 22 meters of rail section.

- a. Sketch some floor plans for this request.
- b. Describe the bumper-car ride in terms of its area and perimeter. Report what each measure tells you about the ride.

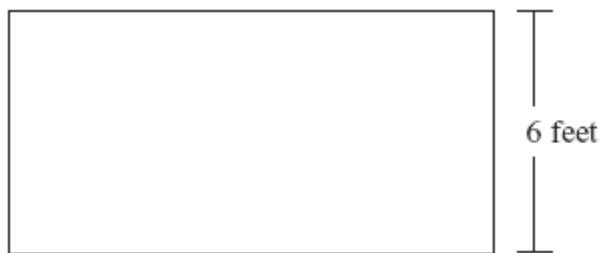
NAME:

DATE:

Investigation 2

- *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.*

A rectangle has a width of 6 feet, as shown below.



The perimeter of the rectangle is 34 feet. What is the length, in feet, of the rectangle?

NAME: _____

DATE: _____

Investigation 3

- *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.*

Melissa was finding the area of a triangle when she wrote:

$$\text{Area} = \frac{1}{2} \times 3 \times 4\frac{1}{2}$$

- a. Make a sketch of the triangle she might have been working with.
- b. What is the area of the triangle?

NAME: _____

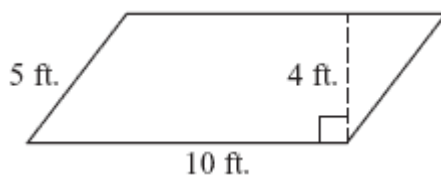
DATE: _____

Investigation 4

- *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.*
-

(MCAS 2006 Question #27)

A parallelogram has the dimensions shown below.



What is the area of the parallelogram?

- A. 100 sq. ft.
- B. 50 sq. ft.
- C. 40 sq. ft.
- D. 30 sq. ft.

NAME: _____

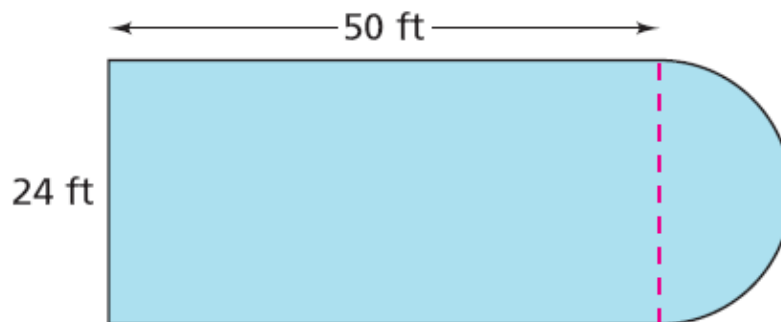
DATE: _____

Investigation 5

- *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.*

(ACE #27 PG 83)

- 27.** The swimming pool below is a rectangle with a semicircle at one end. What are the area and perimeter of the pool?



NOTES