



Holyoke Public Schools

Grade 7

What Do You Expect?

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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
<i>3 Ring Binder</i> <i>(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</i> <i>(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>Portfolio</i> ³ <i>(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

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 are the possible outcomes for the event(s) in this situation?*
- *Are those outcomes equally likely?*
- *Is this a fair or unfair situation?*
- *Can I compute the theoretical probabilities or do I conduct an experiment?*
- *How can I determine the probability of the outcome of one event followed by a second event?*
- *How can I use expected value to help me make decisions?*

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 $< \quad >$?*
- *What are the ways you could $< \quad >$?*
- *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 $< \quad >$?*
- *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 $< \quad >$ in your $<$ model, diagram, number line, chart, etc. $>$?*
- *How can we see $< \quad >$ 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:

- *Interpret experimental and theoretical probabilities and the relationship between them.*
- *Distinguish between equally likely and non-equally likely outcomes.*
- *Review strategies for identifying possible outcomes and analyzing probabilities, such as using lists or tree diagrams.*
- *Determine if a game is fair or unfair.*
- *Analyze situations that involve two stages (or two actions)*
- *Use area models to analyze situations that involve two states.*
- *Determine the expected value of a probability situation.*
- *Analyze situations that involve binomial outcomes.*
- *Use probability and expected value to make decision.*

Math Content Standards:

- *7D3 – Use tree diagrams, tables, organized lists, and area models to compute probabilities for simple compound events, e.g., multiple coin tosses or rolls of number cubes.*

Performance Standards:

- *M 4g Formulates hypotheses to answer a question and used data to test hypotheses.*
- *M 4h Represents and determines probability as a fraction of a set of equally likely outcomes; recognizes equally likely outcomes, and constructs sample spaces (including those described by numerical combinations and permutations).*

Investigation 1: Evaluating Games of Chance

<p><u>Objectives</u> Investigations 1.1 – 1.3</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 1</p> <p><u>Core Problems</u>²: What Do You Expect?, Investigation 1 ACE Problems# 1, 2, 10, 11, 12, 15,</p> <p><u>Work Time</u>¹: What Do You Expect?, Problems 1.1 – 1.3</p> <p><u>Journal Entries</u>¹: Appendix 3, Inv 1.1, 1.2, 1.3</p> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 1</p> <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 did you know that? ○ How can you use ...? ○ Can you show another way? ○ What convention did you use? <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: Analyzing Situations Using an Area Model

Objectives Investigations 2.1 – 2.3	Pacing: 4 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 2</p>
	<p><u>Core Problems</u>²: What Do You Expect? , Investigation 2 ACE Problems: pgs. 27 – 36 #'s 2, 3, 6 – 9</p>
	<p><u>Work Time</u>¹: What Do You Expect?, Problems 2.1 – 2.3</p>
	<p><u>Journal Entries</u>¹: Appendix 3, Inv 2.1, 2.2, 2.3</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"> ○ Does the situation ask for experimental or theoretical probability? ○ How can you justify...? ○ Are the events equally likely in this situation? ○ Can you draw me 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: Expected Value

Objectives Investigations 3.1 -3.3	Pacing: 5 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 3</p>
	<p><u>Core Problems</u>²: What Do You Expect?, Investigation 3 ACE Problems: # 1, 2, 4, 8 pg 43</p>
	<p><u>Work Time</u>¹: What Do You Expect?, Problems 3.1 – 3.3</p>
	<p><u>Journal Entries</u>¹: Appendix 3, Inv 3.1, 3.2, 3.3</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? ○ Does this situation involve two stages? ○ In this situation is it more useful to use an area model or a tree diagram? ○ 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: Binomial Outcomes

<p><u>Objectives</u> Investigation 4.1 – 4.3</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 4</p> <hr/> <p><u>Core Problems</u>²: What Do You Expect?, Investigation 4 ACE Problems: #11, 3-8, 10</p> <hr/> <p><u>Work Time</u>¹: What Do You Expect?, Problem 4.1 – 4.3</p> <hr/> <p><u>Journal Entries</u>¹: Appendix 3, Inv 4.1, 4.2, 4.3</p> <hr/> <p><u>On Demand Tasks</u>³: Appendix 5, Investigation 4</p> <hr/> <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 a way to write? ○ Does this situation involve binomial outcomes? ○ In this situation is it more useful to use an area model or a tree 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*

Appendix 1 Unit Project

<p><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 algebraic notation and reasoning. It is written in MCAS form to give students the experience of answering an open-response question.</p> <p>The unit project is called ‘Exercise Program’ 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
4	The response shows a comprehensive understanding of how to find the total number of outcomes for a situation and calculate the probability of simple compound events.
3	The response shows a general understanding of how to find the total number of outcomes for a situation and calculate the probability of simple compound events.
2	The response shows a basic understanding of probability.
1	The response shows a minimal understanding of probability.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

NAME: _____

DATE: _____

Playing a Cube Game

- *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.*

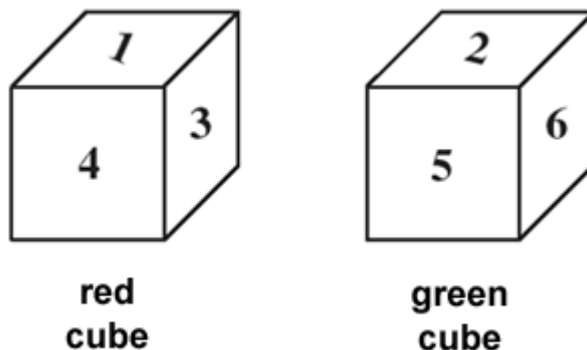
Lionel and Tracy are playing a game using two six-sided number cubes. The faces of each cube are numbered as shown below.



Lionel has a red cube and Tracy has a green cube. To play the game they both roll their cubes at the same time.

- The numbers that show face up when the cubes stop rolling are used to make a fraction.
- The number on the red cube is used for the numerator and the number on the green cube is used for the denominator.

For example, the results shown below would make the fraction $\frac{1}{2}$



- Lionel wins 1 point if the fraction formed has a value less than one.
 - Tracy wins 1 point if the fraction has a value greater than one.
 - No one gets a point if the fraction is equal to one.
- Make a list or a table in your Student Answer Booklet of all of the fractions possible from rolling 1 red and 1 green cube. How many total different fractions are there?
 - If Lionel (red cube) rolls a 3, what is the probability that Tracy (green cube) wins 1 point? Show your work or explain how you obtained your answer.

Using your table, what is the probability of each player winning a point on a given turn? Do you think this game is fair to both players? Show your work or explain how you obtained your

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Student Work: Question #22# - Score Point 4

$\frac{1}{1}$	$\frac{1}{2} L$	$\frac{1}{3} L$	$\frac{1}{4} L$	$\frac{1}{5} L$	$\frac{1}{6} L$	36 different Fractions	
$\frac{2}{1} T$	$\frac{2}{2}$	$\frac{2}{3} L$	$\frac{2}{4} L$	$\frac{2}{5} L$	$\frac{2}{6} L$		
$\frac{3}{1} T$	$\frac{3}{2} T$	$\frac{3}{3}$	$\frac{3}{4} L$	$\frac{3}{5} L$	$\frac{3}{6} L$		
$\frac{4}{1} T$	$\frac{4}{2} T$	$\frac{4}{3} T$	$\frac{4}{4}$	$\frac{4}{5} L$	$\frac{4}{6} L$		tie = blank
$\frac{5}{1} T$	$\frac{5}{2} T$	$\frac{5}{3} T$	$\frac{5}{4} T$	$\frac{5}{5}$	$\frac{5}{6} L$		T = Tracy wins
$\frac{6}{1} T$	$\frac{6}{2} T$	$\frac{6}{3} T$	$\frac{6}{4} T$	$\frac{6}{5} T$	$\frac{6}{6}$		L = Lionel wins

Possibilities $\frac{3}{1} \frac{3}{2} \frac{3}{3} \frac{3}{4} \frac{3}{5} \frac{3}{6}$

Winner T T tie L L L

$$\frac{2}{6} = \left(\frac{1}{3}\right)$$

$$\frac{15}{36} \text{ Tracy wins} = \frac{5}{12}$$

$$\frac{15}{36} \text{ Lionel wins} = \frac{5}{12}$$

$$\frac{6}{36} \text{ Tie} = \frac{1}{6}$$

It is a fair game.
The probabilities
are equal.

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Student Work: Question #22 - Score Point 3

A. for the number 2 there are 6 possible fractions. That is the same as for all the numbers on the dice (there are six). That means there are 36 possible fractions

B. Possible combinations -

$\frac{3}{1}$	$\frac{3}{2}$	$\frac{3}{3}$	$\frac{3}{4}$	$\frac{3}{5}$	$\frac{3}{6}$	$\frac{2}{6} = \frac{1}{3}$
71	71	71	<1	<1	<1	

Tracy has a $\frac{1}{3}$ chance to get one point if Lionel rolls a 3.

C. 15 possible fractions out of 36 are greater than 1. That means $\frac{5}{12}$ are >1 . I used my table 12 to figure that out.

This game is fair because both people can get $\frac{5}{12}$ chances to get a point. It would not be fair if 1 counted as a point.

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Student Work: Question #22# - Score Point 2

A.

1,1	2,4	4,1	5,4
1,2	2,5	4,2	5,5
1,3	2,6	4,3	5,6
1,4	3,1	4,4	6,1
1,5	3,2	4,5	6,2
1,6	3,3	4,6	6,3
2,1	3,4	5,1	6,4
2,2	3,5	5,2	6,5
2,3	3,6	5,3	6,6

} There are a total of 36 combinations

B. If Lionel rolls a (red) 3 there is a 50/50 chance that Tracy will win the point. This is true because it is half way between getting a six or one

I think this game is fair to both players, although Lionel is more likely to win. He has more chances of winning because there are a few more combinations in his favor.

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Student Work: Question #22 - Score Point 1

If some are rolling different colors, then there would be $\frac{1}{6}$ of different fractions. If Lionel rolls a 3, Tracy would roll she would probably get 1 out of 3 chances so it is very likely that she will get a point because she has several chances. The probability of each player winning a point on a given turn is 1 out of 6 chances. I think it is not fair to both players because even though you have a couple of chances you still have 1 out of 6. Since there is two people playing then it would be 1 out of 6 means that only one person can win because, they can't tie.

Appendix 2 Vocabulary

Investigation 1:

- *experimental probabilities, theoretical probabilities, outcome, fair game*

Investigation 2:

- *area model*

Investigation 3:

- *expected value*

Investigation 4:

- *binomial probability*

Appendix 3 Journal Entries

Investigation 1:

Investigation 1.1:

If the game were played 100 times, how many points would Player A expect to get? Explain how you arrived at your solution.

Investigation 1.2:

How would you determine if the game is a fair game?

Investigation 1.3:

How do the theoretical probabilities compare to the experimental probabilities we found from our class data?

Investigation 2:

Investigation 2.1

How can you use an area model to analyze the theoretical probabilities for two-stage outcomes?

Investigation 2.2

Look back at the simulation we used to find the experimental probabilities of ending in Cave A or B. We used a number cube. Could we have used a spinner? If so, how?

Investigation 2.3

How do we represent Emmanuel selecting a container with an area model?

Investigation 3

Investigation 3.1

Explain whether or not Nishi's situation is an event with equally likely outcomes. [use an area model]

Investigation 3.2

As the free throw shooters percentage goes up, what happens to the number of free throws the person hits? Why?

Investigation 3.3

What do the expected values tell you about a situation?

Investigation 4

Investigation 4.1

Does the expected value change if you increase the number of questions on the quiz? Why or why not?

Investigation 4.2

Are there other examples of a binomial situation? Explain why they are alike!

Investigation 4.3

Why is the probability of the Gazelles winning the same if the series ends in four, five, six or seven games?

Appendix 4 Reflections

MMR1

Compare experimental and theoretical probabilities. Describe some strategies you can use to find experimental probabilities. Describe some strategies you can use to find theoretical probabilities. [pg. 19 # 1a, 1b, 1c]

MMR2

Describe how you can use an area model to determine the probability of a situation that involves two actions. [pg. 37 # 2]

MMR3

Expected value is sometimes called the long-term average. Explain why this makes sense. [pg. 49 # 1]

MMR4

As you increase the number of actions for a binomial situation, what happens to the total number of times a coin is tossed, what happens to the total number of outcomes?

Appendix 5 On Demand Tasks

CMP2: What Do You Expect?

On-Demand Tasks

Additional Practice & Skills Workbook

Assessment Resources

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

Additional Practice and Skills pg144 #1-5

After Inv. 2

Additional Practice and Skills pg146 #2a-g

After Inv. 3

Assessment Resources Check-Up2 pg117 #1-3

After Inv. 4

Additional Practice and Skills pg153 #1-3

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.*
- Draw a tree diagram to show all possibilities.**
1. Today, the school's cafeteria is offering a choice of pizza or spaghetti. You can get milk or juice to drink. For dessert you can get pudding or an apple. You must take one of each choice.

2. A clothing store sells shirts in three sizes: small, medium, and large. The shirts come with buttons or with snaps. The colors available are blue or beige.

A computer store sells 4 models of a computer (m1, m2, m3, and m4). Each model can be fitted with 3 sizes of hard drive (A, B, and C).

3. Draw a tree diagram.

4. What is the probability of choosing a computer with a size C hard drive at random?
5. What is the probability of choosing a model 2 computer with a size A hard drive at random?

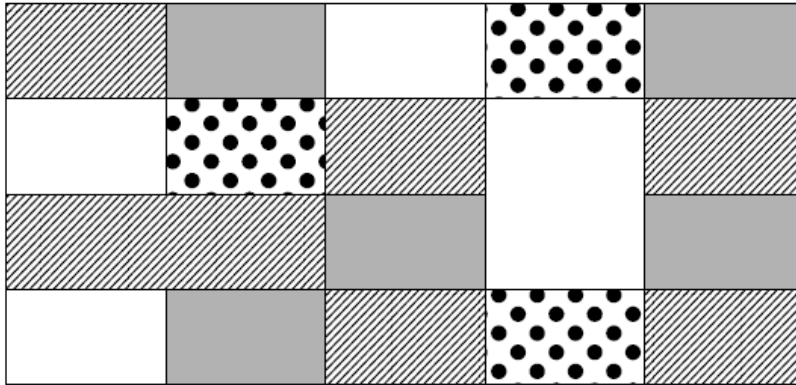
NAME:

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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.*

Irene randomly tosses a cube onto the grid below.



- a. What is the probability of the cube landing on a striped rectangle? Express your answer as a percent.
- b. What is the probability of the cube landing on a white rectangle? Express your answer as a percent.
- c. What is the probability of the cube landing on a gray rectangle? Express your answer as a percent.
- d. What is the probability of the cube landing on a dotted rectangle? Express your answer as a percent.
- e. What is the probability of the cube not landing on a white rectangle? Express your answer as a percent.
- f. What is the probability of the cube not landing on a striped rectangle? Express your answer as a percent.
- g. Irene proposed the following game: If the cube lands on a striped square or a dotted square, Irene wins; if the cube lands on a white square or a gray square, Irene's sister wins. Is this a fair game? Explain your reasoning.

NAME: _____

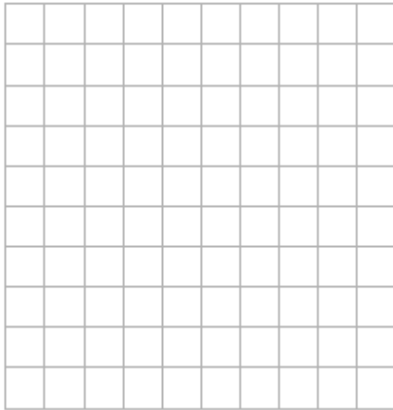
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Investigation 3

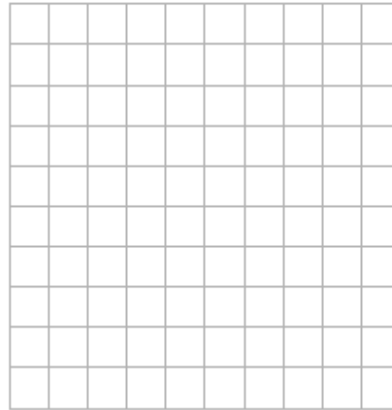
Maribeth makes 70% of her free throws when she is in a two-try free-throw situation. Her coach notices that she gets nervous in a one-and-one free-throw situation and only makes 50% of those free throws.

1. Construct an area model for each of Maribeth's free-throw situations.

Two-try Free-throw Situation



One-and-one Free-throw Situation



2. What is Maribeth's average number of points per situation for each type of free-throw situation?

3. Maribeth was fouled 50 times this season. Of these, 20 were two-try free-throw situations and 30 were one-and-one free-throw situations. How many points would you expect her to have scored for free throws this season?

NAME: _____

DATE: _____

Investigation 4

1. Kathy runs cross country and plays basketball and softball. For each sport, she received a uniform with a randomly assigned number between 0 and 99 printed on it.
 - a. What is the probability that all of Kathy's uniforms have odd numbers? Explain your reasoning.

 - b. What is the probability that all of Kathy's uniforms have even numbers?

 - c. What is the probability that one of Kathy's uniforms has an even number and the other two have odd numbers? Explain.

2. To play the Nickel Game, a player tosses two nickels at the same time. If both nickels land tails up, the player wins \$1. If both nickels land heads up, the player wins \$2. Otherwise, the player wins nothing.
 - a. If it costs \$1 to play the Nickel Game, how much could a player expect to win or lose if he or she plays the game 12 times? Explain.

 - b. At next year's carnival, the game committee wants to charge prices that will allow players to break even. How much should they charge to play the Nickel Game? Explain.

3. In the Ring Toss game, a player tosses a ring at a group of bottles. If the ring goes over a bottle, the player wins a prize. The attendant at the Ring Toss game tells Ben that his chances of winning are 50% because when Ben tosses a ring, it will either go over a bottle or it will not. Do you believe the attendant? Explain.

NOTES