

## Math Problem Solving (MPSE) Course Syllabus

<u>Day</u>	<u>What</u>	<u>How</u>
<b><u>1</u></b>		
a.m.	Introductions, Honor Code, pre-assess, class rules	Diagnostic, name tags, Honor Code discussion, diagnostic
p.m.	Pattern Recognition - Codes	The difference between a code and a cipher. Working with ciphers (numerical substitution), Caesar's Cipher. Resource: <u>Top Secret: A Handbook of Codes, Ciphers, and Secret Writing</u> by Paul Janesco ( pages 27-28).
HW		Write a paragraph in Caesar's Cipher for someone else to solve tomorrow.
<u>Day</u>	<u>What</u>	<u>How</u>
<b><u>2</u></b>		
a.m.	Pattern recognition - Ciphers	Solve a classmate's Caesar's Cipher paragraph. Rosicrucian code- write a message to a friend and exchange messages. Resource: <u>Top Secret: A Handbook of Codes, Ciphers, and Secret Writing</u> by Paul Janesco (pages 27-28).
p.m.	Pattern recognitions – Cardano Grille	Modeling and independent practice with Cardano Grille. Resource: <u>Top Secret: A Handbook of Codes, Ciphers, and Secret Writing</u> by Paul Janesco (pages 27-28).
HW		Write a message to your teacher in Rosicrucian Code.
<u>Day</u>	<u>What</u>	<u>How</u>
<b><u>3</u></b>		
a.m.	Pattern recognition, making models	Arrays; how many arrays can you make with a given number. The Candy Box Lesson. Resource: <u>About Teaching Mathematics</u> by Marilyn Burns (page 197).

p.m.	Pattern recognition – making models extended	Learning about prime and composite numbers- how do arrays help you tell the difference. Using knowledge of arrays to make factor trees. How many different arrays can you make with a different number?
HW		Problems with arrays.
<b><u>Day</u></b> <b><u>4</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Pattern recognition	“How many ways can we line up?” activity, talk about factorials, read <u>Anno’s Mysterious Multiplying Jar</u> by Mitusmasa Anno. Make pictures to illustrate factorials and practice problems.
p.m.	Pattern recognition	“The Handshake Problem” Lesson. Resource: <u>About Teaching Mathematics</u> by Marilyn Burns (page 298). Make models to solve problem.
HW		“Find or Use a Pattern Worksheet” Resource: <u>Creative Problem Solving- Multiple Strategies for Finding the Same Answer</u> by Cindy Barden (page 320. Write an explanation about how you got your answer.
<b><u>Day</u></b> <b><u>5</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Pattern recognition	Division as the opposite of multiplication- model how pictures relate to division problems with remainders. Play “Leftovers from 20”. Resource: <u>About Teaching Mathematics</u> by Marilyn Burns.
p.m.	Pattern recognition –	Square numbers, Pascal’s Triangle, Prisoner’s Problem.
HW		None: weekend
<b><u>Day</u></b> <b><u>6</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Pattern Recognition-	Prisoner’s Problem reviewed, Triangle Numbers, Magic Square, Albrecht Durer’s Magic Square, making your own birthday square, solve a partners.

p.m.	Pattern Recognition	Number spiral and related activities. Resource: <u>Math Art: Projects and Activities</u> by Carolyn Ford Brunetto (page 75),
HW		Magic Square Extension Activity and Guess and Check Worksheet. Resource: "Resource: <u>Creative Problem Solving- Multiple Strategies for Finding the Same Answer</u> by Cindy Barden (page 28).
<b><u>Day</u></b> <b><u>7</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Guess and Check	Logic Problems "King Arthur's Problem" (page 102), "The Postage Stamp Problem" (page 134), and "How Many Sums" problem (page 131). Resource: <u>About Teaching Mathematics</u> by Marilyn Burns (Page 298). Fraction Quilts- How do I make 4 squares to show the same fraction? Resource: Resource: <u>Math Art: Projects and Activities</u> by Carolyn Ford Brunetto (page 75),
p.m.	Guess and Check	Magic Square Algebra Puzzles- Mathplayground.com (computer lab
HW		Finish fraction squares and the Big Number Quiz. Resource: <u>Go Figure, A Totally Cool Game about Numbers</u> by Johnny Ball (page 26-27).
<b><u>Day</u></b> <b><u>8</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Guess and Check	"Digit Place Value" game with tens and ones. Resource: <u>About Teaching Mathematics</u> by Marilyn Burns (page 176) Extend game to hundreds, tens, and ones.
p.m.	Methods of Problem Solving: using Tables, Lists, and Drawings.	Model all methods. Use "Decisions at the Deli" (page 40) to teach tree diagrams. Resource: <u>Creative Problem Solving- Multiple Strategies for Finding the Same Answer</u> by Cindy Barden.
HW		Do "Better and Better" (page 36) Resource: Do "Making Change" problem. Resource: <u>About Teaching Mathematics</u> by Marilyn Burns (page 130)

<b><u>Day</u></b> <b><u>9</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Probability	What is Probability” Circle Map. Probability book including activities including “Spinner Experiments,” “How Many Throws,” and “How Many Ways.” Resource: <u>About Teaching Mathematics</u> by Marilyn Burns (page 61)
p.m.	Probability continued	“Alphabetical Probability” <u>About Teaching Mathematics</u> by Marilyn Burns (pages 72-73). Write three sentences without using a common letter.
HW		Write a paragraph that does not use a certain letter
<b><u>Day</u></b> <b><u>10</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Introductions to Algebraic Concepts.	Introduction to algebraic expressions: order of operations (PEMDAS) and substituting the missing variable.
p.m.	Algebraic Concepts	Ordered pairs. Using knowledge of ordered pairs to plug in the missing number to enlarge a drawing of your hand.
HW		Bring a picture of your favorite cartoon.
<b><u>Day</u></b> <b><u>11</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Algebraic Concepts	Practice with ordered pairs. Finish enlarging your hand. Practice “cartooning” by using grids and knowledge of ordered pairs to copy a picture.
p.m.	Algebraic Concepts	Work on cartooning project. Practice making a grid over a cartoon with centimeter boxes.
HW		Make sure your carton is here by tomorrow. Finish all unfinished pieces of the project. Do variable substitution worksheet.

<b><u>Day</u></b> <b><u>12</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Algebraic Concepts	Learn how to enlarge your cartoon so it fits on a big piece of paper. Guided practice with Mickey Mouse. Start drawing the grid lines and enlarging your cartoon.
p.m.	Algebraic Concepts	Work on the cartooning project.
HW		Finish cartooning project and all areas by Friday. Problems with algebraic expressions.
<b><u>Day</u></b> <b><u>13</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Introduction to Algebra	Modeling, guided practice, and independent practice with mathematical properties: the identity property, the commutative property, and the distributive property, Simplifying algebraic expressions. Balancing the equation using Hands on Equations.
p.m.	Introduction to Algebra	More practice with equations. Relating equations to to the guess and check method of problem solving. Resource: <u>Creative Problem Solving- Multiple Strategies for Finding the Same Answer</u> by Cindy Barden (page 21).
HW		Problems with algebraic expressions.
<b><u>Day</u></b> <b><u>14</u></b>	<b><u>What</u></b>	<b><u>How</u></b>
a.m.	Application of Strategies	Math Jeopardy review game, diagnostic, and evaluations.
p.m.	Logic Problems and Puzzles	The Sudoku Challenge- solving sudoku logic puzzles
HW		Problems with algebraic expressions.

<u>Day</u> <b>15</b>	<u>What</u>	<u>Why</u>
a.m.	Logic Problems and Puzzles	Logic Problems that need tables. “Party Time” Problem and math mysteries. Resource: <u>40 Fabulous Math Mysteries Can’t Resist</u> by Martin Lee and Marsha Miller. “Mixed Up Identities” (page 25), “Mixed Up Winners” (page 36), and “In a Pickle (page 40).”
p.m.	Wrap-Up	Prepare for the parents and enjoy open house.