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| **MP.1: Make sense of problems and persevere in solving them.**  **(problem solving)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Analyzes information given * Looks for different ways to solve the problem (i.e. situation vs. solution) * Knows and uses different representations (i.e. equation vs. table or graph) and/or manipulative * Evaluates progress and changes plan if needed * Explains using both pictures and words * Makes connection to the way they solved the problem and how others solved the problem * Uses basic fact fluency or fact strategies | * Promotes visible thinking using pictures and equations * Gives time for students to discuss with others or class * Encourages students to keep trying and builds supportive math community * Uses explicit and precise language when using representations and definitions and expects students to do the same in their discussions * Helps students make connections between representations, equations, and student thinking * Engages students in metacognition * Models problem situation, not problem solution. |
| **MP.2: Reason abstractly and quantitatively.**  **(number sense)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer Task explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Makes sense of quantities and their relationship in problem situations * Recognizes that quantities can be represented in different ways * Uses numbers and words to make sense of a problem * Gives attention to the meaning of the numbers and knows which operation to choose * Performs operations flexibly, accurately, and efficiently * Uses multiple representations * Connects numbers, symbols or units to quantities * Justifies solutions * Makes connections to how they solved a problem and how others solved the problem * Reasons with attributes of geometric figures | * Promotes visible thinking using pictures and equations * Uses physical representations (manipulatives, drawings)   to model what happens to a variable when it changes and how that effects the other variable   * Gives time for students to discuss with others or class * Encourages students to keep trying * Uses explicit and precise language when using representations and definitions and expects students to be the same in their discussion * Builds a supportive math community * Helps make connections between representations, equations, student thinking, and content standard |

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| **MP.3: Construct viable arguments and critique the reasoning of others.**  **(math talk)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Communicates by using mathematical reasoning with objects, drawings, diagrams, equations … * Justifies solutions * Makes connections between their own thinking and that of others * Demonstrates actively listening by asking questions of others * Makes statements to prove or disprove concepts or presented ideas * Students understand different forms of reasoning (ie. deductive reasoning) and when to apply them * Uses accurate vocabulary | * Promotes math talk and the critiquing of presented solutions * Asks higher-order questions to facilitate discussion and presses for justification * Gives time for students to construct their own ideas before small or large group discussions * Expects students to be explicit and precise when using representations, definitions, and symbols * Builds a supportive math community * Helps make connections between the reasoning of students and content standard |
| **MP.4: Model with mathematics.**  **(representations and graphs)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Identifies important elements and quantities needed for a model * Describes relationships of models and equation * Chooses a representation * Applies formulas/equations * Uses models to draw conclusion * Explains why it is a good model for the problem * Recognizes and uses parts of a graph (i.e. title, labels, symbols, key) | * Expects students to justify their choice in models * Gives students opportunity to evaluate the appropriateness of their model and that of others * Helps make connections with the relationships between representation, equation, answer, student thinking, and content standard |

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| **MP.5: Use appropriate tools strategically.**  **(calculators, rulers, manipulative)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Uses mental computations fluently * Knows which tools are appropriate for the task * Knows when to use a tool * Understands and uses properties of operations * Uses estimation to find errors and check answer for reasonableness * Justifies tool selection | * Allows students to choose appropriate learning tools * Uses appropriate tools to represent, explore and deepen student understanding * Models how different representations are tools * Uses technology tools to deepen students’   understanding of a concept   * Helps make connections between tool, equation, student thinking, and content standard |
| **MP.6: Attend to precision.**  **(vocabulary, labeling, answers)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Uses appropriate math vocabulary * Uses clear definitions in discussion * Calculates accurately and efficiently * Explains their reasoning with accurate mathematical language * Uses proper unit labels with measuring * Uses appropriate labels when graphing and solving story problems * Determines when different levels of precision are needed and how precision affects results | * Communicates precisely using clear definitions * Emphasizes the importance of precise communication * Emphasizes the importance of precision of measurement * Helps make connections between vocabulary, student thinking, unit labels, calculations, and content standard |

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| **MP.7: Look for and make use of structure.**  **(how numbers and shapes are organized)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Recognizes that quantities can be represented in different ways * Uses properties of operations to make sense of problems * Recognizes how numbers and shapes are organized * Looks for patterns and structures in the number system * Justify strategy for basic facts * Uses models to prove equations * Recognize how symbols help represent relationships and can be applied to new situations | * Gives students time to discuss connections * Brings students back to the rule or properties being used * Helps students look for patterns and structures in the number system * Helps make connections between the structure used, equation, student thinking, and content standard * Helps make connections to real world |
| **MP #8: Look for and express regularity in repeated reasoning.**  **(number pattern)** | | |
| The Math Task: | The Student: | The Teacher: |
| * Is an interesting problem * Has more than one solution path which may be unpredictable * Creates discussion * Requires cognitive effort * Connects to real world * Relates to grade level CCSS * Builds student understanding of grade level standard * Leads students to look back and reflect on answer * Explicitly asks for justification or explanation   (from: Implementing Standards-Based Mathematics Instruction; Stein, Smith Henningsen & Silver,1998) | * Notices number patterns * Notices if calculations are repeated * Applies more efficient computation strategies using number patterns * Looks both for general methods and for shortcuts | * Encourages students to connect task to prior concepts taught * Helps make connections between pattern, equation, student thinking, and content standard |