Noyce MTF Geometry Lesson Study Group

Semester 1 Teaching – Learning Plan

December 9th, 2014

**Abstracting angle relationships to solve problems**

**Research Theme:**

To provide a learning experience for students that fosters the internalization of persistence and critical thinking.

**Context of lesson (prior and *subsequent* learning):** Before the lesson, frontload Tier I abstraction problems: Linear Pair, Complementary, Angle Bisector, Triangle Sum, Exterior, Isosceles, and Parallel Lines

**Relevant CCSS Mathematics Standards:**

Solve real-life and mathematical problems involving angle measure, area, surface area and volume.

7.G.B.5: Use facts about supplementary, complementary, vertical and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

**Relevant CCSS Mathematics Practices:**

#1 – make sense of problems and preserve in solving them; #2 – reason abstractly and quantitatively

**Data Collection Points**

Each person takes a quadrant of the room, looking specifically at:

* specific ways mathematical ideas are communicated
* questions asked between students (procedural vs. conceptual)

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**Lesson Plan**

*December 9th, 2013*

*Mar Vista High School*

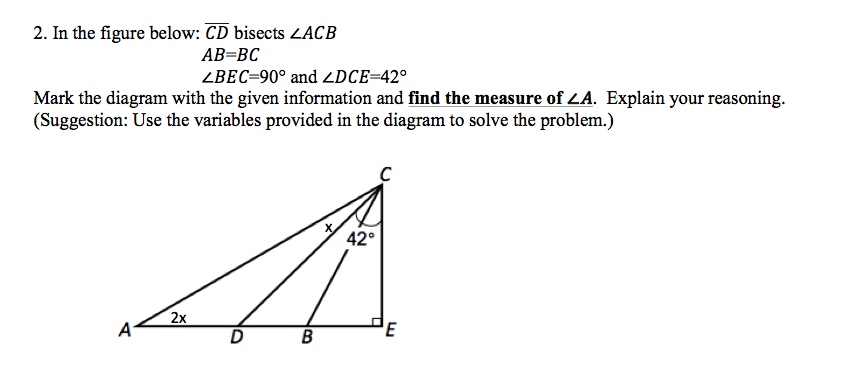
*Classroom of Chip Case*

*Morse High School*

*Classroom of Joseph Hyun*

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| **Activities** | **Anticipated Responses (Student/Teacher)** | **Points to Notice** |
| * (20mins) Level 1 Abstraction   + Joseph’s warm-up problems:   + #1: Ext Angle & Isosceles     - Step by step information     - Solution time     - Discuss Equation   + #2: Tri sum & bisector     - Give Complete Info     - Discuss Equation: Show student examples      * Level 2 Abstraction   + #3: Isosceles & Bisector     - Complete Info * (10mins) Level 3 PT | #1: “What does this statement tell you about the diagram?”   * Xy=xz   + Isosceles   + Angles Same   + Same Sides * Wxz=147   + Exterior angle   + Linear Pair * Solve   + With or without algebra   Did you use a variable? Did you write an equation? Could you do so now?  #2: “Read each statement, discuss what it means, and then solve the problem.”   * No response/give up * Not knowing how to use a bisector. Definition not leading to practice. * Where can you put x?   Did you use a variable? Did you write an equation? Could you do so now?  #3: “Read each statement, discuss what it means, define a variable, and then solve the problem.”   * Incorrect placement of variable * Multiple x, not the same * Different representations of x * Avoid abstraction * False assumptions | #1   * Language/Vocab * Specific Angles, which 2? * Content Specificity * Notation * Measurement in the correct place? * Ability to mark a diagram * Methods of solving: Alg/Numberic   #2   * Quality of explanations of meaning. * Expand on given info? * False assumptions * Who used and equation? Who did not? * Exemplary student work   #3   * Use of variable * Ability to set up an equation * Different strategies for solving. |

***Corresponding problems:***



**Data Collection Points**

Each person takes a quadrant of the room, looking specifically at:

* mathematical vocabulary use by students
* specific ways mathematical ideas are communicated
* questions asked between students (procedural vs. conceptual)
* success rate of abstraction & improvement