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