Reflecting on Practice: Implementing Worthwhile Tasks

Unit 1: What makes a worthwhile mathematical task?

- Mathematical goal
- Opportunity for discussion
- Critical thinking – cognitive demand

Unit 2: How do we adapt tasks to make them more meaningful?

- Use carefully chosen student thinking about a standard task – Dekker & Querelle
- Jeopardy – give solution and students pose task
- Sorting task

Unit 3: Implementation

Graphing Linear Equations (US TIMSS video)

Using a pencil and the large piece of graph paper, graph the following linear equations:

1) $y = \frac{2}{3}x + 8$
2) $y = \frac{3}{5}x - 10$
3) $y = 3x + 7$
4) $y = \frac{1}{4}x - 4$
5) $y = x - 5$

After these five equations are graphed, check with me before proceeding.

Now, graph the next five equations

6) $y = -\frac{5}{3}x + 8$
7) $y = -4x - 1$
8) $y = -\frac{1}{3}x + 12$
9) $y = -\frac{3}{2}x + 14$
10) $y = -x + 3$

Answer the questions on the next page

Page 2

1) What is similar about linear equations 1 through 5?
2) What is similar about linear equations 6 through 10?
3) Which line goes up the fastest?
4) Which line goes down the fastest?
5) What do you notice about the intersection between equation 1 and 9?
6) What do you notice about the intersection between equation 2 and 6?
7) What do you notice about the intersection between equation 3 and 8?
8) What do you notice about the intersection between equation 4 and 7?
9) What do you notice about the intersection between equation 5 and 10?
10) Are any of the lines parallel to one another? If not, why do you think so?

Graphing Linear Equations

As you watch, think about the question:

What evidence do you see that students are ready or not ready to do the task?

(US 8th grade TIMSS video)

Graphing linear equations

- "What things had the teacher done to prepare for the lesson?"

- "Were the students ready to do the task? What is your evidence?"

(US 8th grade TIMSS video)

TIMMS Graphing Linear Equations

Use the transcript to answer the following questions.

- What do students need to know to do this task?
- Was there evidence they lacked one or more of these pieces of knowledge?
- What questions or other checks could have elicit this evidence?

Discuss your answers at your table.

Individual Write/Round Robin Share

What are the things you need to think about when you are planning to implement a task in your classroom?

It has been one month since Ichiro's mother has entered the hospital. He has decided to say a prayer with his smaller brother at a local temple every morning so that she will be well soon. There are 18 10-yen coins in Ichiro's wallet and just 22 five-yen coins in his smaller brother's wallet. They have decided every time to take one coin from each of them, and put them in the offertory box, and continue their prayers until either wallet becomes empty. One day after they were done with their prayers, when they looked into each other's wallets, the smaller brother's amount of money was greater than Ichiro's. How many days has it been since they started praying?

Ichiro's Mother

What planning/anticipating do you need to do before you would give this to your students?

Ichiro's Mother

As you watch, think about the question:

What do you think the teacher planned for in preparing the lesson?

Japanese 8th grade video

Ichiro's Mother

Were you surprised by what you saw?

Japanese 8th grade video

Ichiro's Mother

Were you surprised by what you saw?

What do you think the teacher planned for in preparing the lesson?

Japanese 8th grade video

Getting ready

Implementing tasks so that they work takes **planning**.

Getting ready

Implementing tasks so that they work takes **planning**.

What things do you need to think about when you are planning to implement a task in your classroom ?

Insights

Before Instruction:

Thinking about the Lesson

Horn, I.S. (2012). *Strength in Numbers: Collaborative Learning in Secondary Mathematics.* Reston, VA: National Council of Teachers of Mathematics. Pp. 64-66

Orchestrating the Discourse

Five Practices for Orchestrating Productive Mathematics Discussions

Smith, M. S. & Stein, M. K. (2011). Five Practices for Orchestrating Productive Mathematics Discussions. Reston, VA: National Council of Teachers of Mathematics.

References

- Graphing Linear Equations Video: US1
  http://timssvideo.com/videos/mathematics/United%20States
- Solving Inequalities Video: JP3
  http://timssvideo.com/49