(https://www.paemst.org/)

Rewarding & Inspiring
Great Teaching
Since 1983

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the nation's highest honors for teachers of mathematics and science (including computer science). Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education.

Since 1983, more than 4,700 teachers have been recognized for their contributions in the classroom and to their profession. If you know great teachers, nominate them to join this prestigious network of professionals.

NOMINATIONS ARE NOW OPEN

This year's awards will honor mathematics and science (including computer science) teachers working in grades 7-12. Nominations close on **April 1, 2017**.

Nominate A Teacher (/nomination/nominate)

APPLICATIONS ARE NOW OPEN

Applications for mathematics and science teachers of grades 7-12 are now open. Applications must be completed by **May 1, 2017**.

THE BAY SCHOOL OF SAN FRANCISCO

Mathematics Department
The Bay School of San Francisco

35 Keyes Avenue, San Francisco, CA 94129-0610 ⁘ Tel (415) 561-5800 ext. 169 ⁘ Fax (415) 561-5808
www.bayschoolsf.org

Job Announcement

Position: **Mathematics Teacher Grades 9-12**
Term: Full-Time beginning 2017-2018 school year
Location: San Francisco, California 94129
Salary: Commensurate with experience. Strong benefits package.
Open: Until Filled

School Description

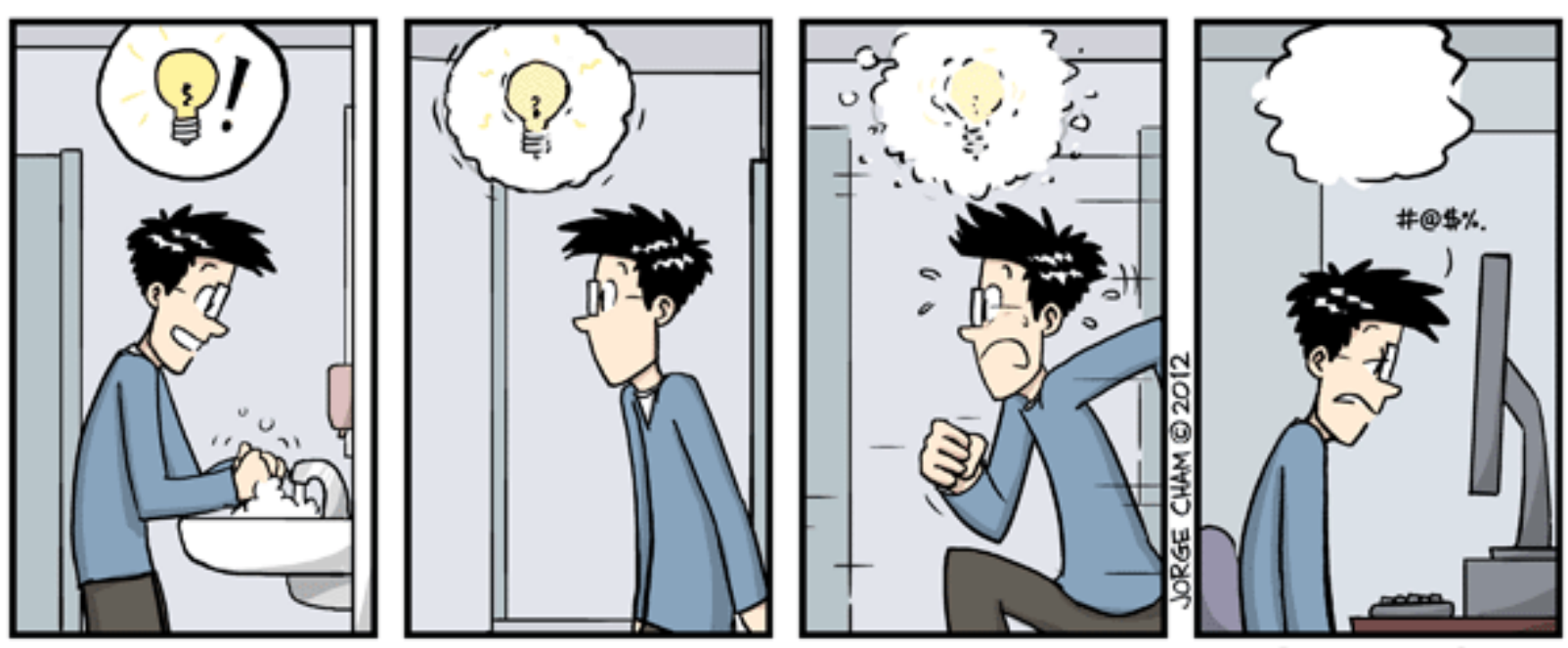
Located in the Presidio of San Francisco, The Bay School is an independent, college preparatory high school committed to providing its students with a challenging, innovative curriculum and a collaborative, supportive community. Our flexible, open-minded staff and faculty members ("staffulty") foster and model curiosity, critical thinking, intentionality, good humor, and respect for diversity. As co-builders of a young high school, they contribute to a positive community. Our campus also serves as headquarters for the CATDC (California Teachers Development Collaborative).

Job Description

We are seeking an energetic, experienced and highly collaborative mathematics teacher to teach three courses among other responsibilities. Each class meets for eighty minutes four times a week in a rotating schedule. The mathematics curriculum is integrated and problem-based. In addition to class preparation and classroom teaching, the instructor is responsible for:

- curricular development and alignment
- design of skills-based formative and summative assessments
- timely grading
- regular communication with the student, parents, and advisor regarding the student's progress
- one-on-one student tutorial as needed
- weekly faculty and course team meetings

Reflecting on Practice: Implementing Worthwhile Tasks



Session 1: What makes a worthwhile mathematical task?

- Opportunity for discussion
- Cognitive demand
- Mathematical goal

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

- Open-ended tasks
- Dekker & Querrelle – give right/wrong solutions & ask for classification
- Jeopardy – give solution and students pose task
- Grouping mathematical ideas

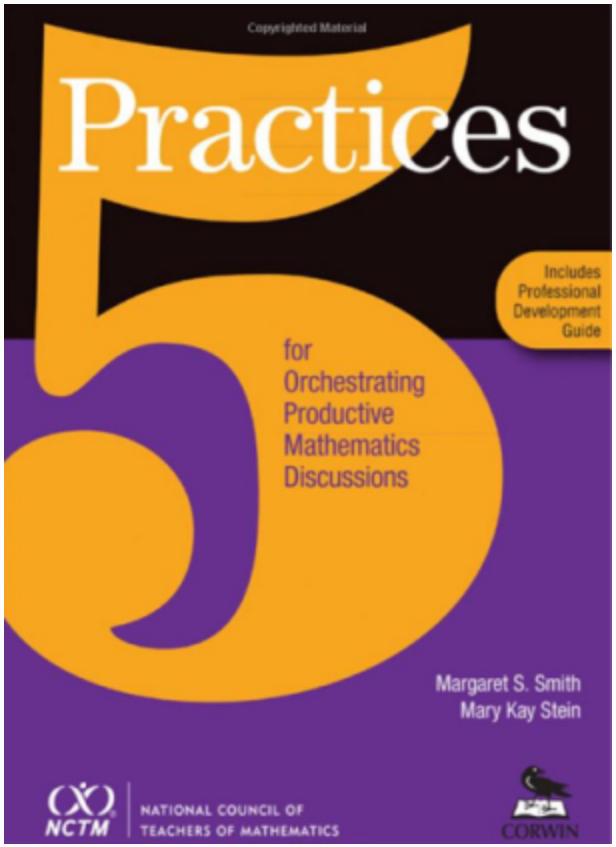
Session 3: Implementation

Becky & Genevieve's activity

- What answers do you expect to see? **(Anticipating)**
- What are students doing? **(Monitoring)**
- What responses are worth discussing? **(Selecting)**
- How will you sequence responses? **(Sequencing)**
- What is the mathematical punchline? **(Connecting)**

The 5 Practices

- Anticipate
- Monitor
- Select
- Sequence
- Connect



Smith & Stein, 2011

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:

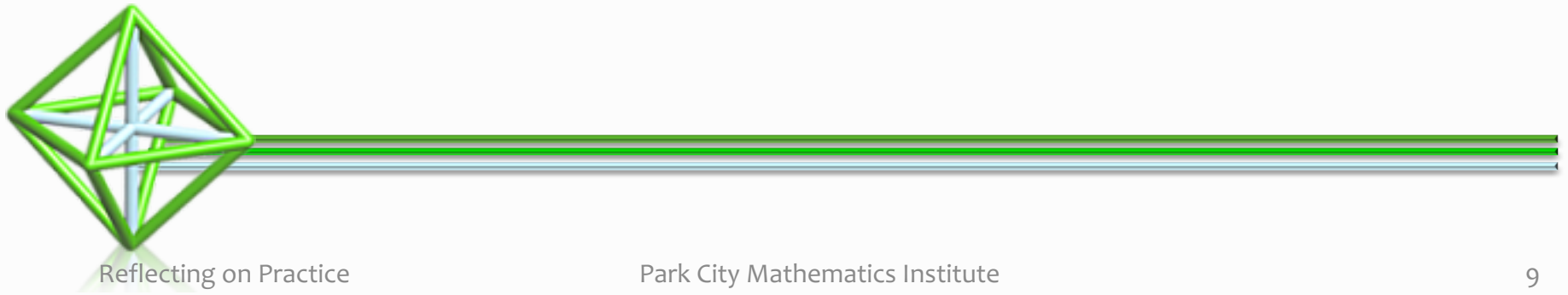
What things had the teacher done to prepare for the lesson?

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

(US 8th grade TIMSS video)

We watched the video below from 1:46-5:44

http://timssvideo.com/58



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?"

(http://timssvideo.com/58
US 8th grade TIMSS video)

TIMMS Graphing Linear Equations

- 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.

http://timssvideo.com/58

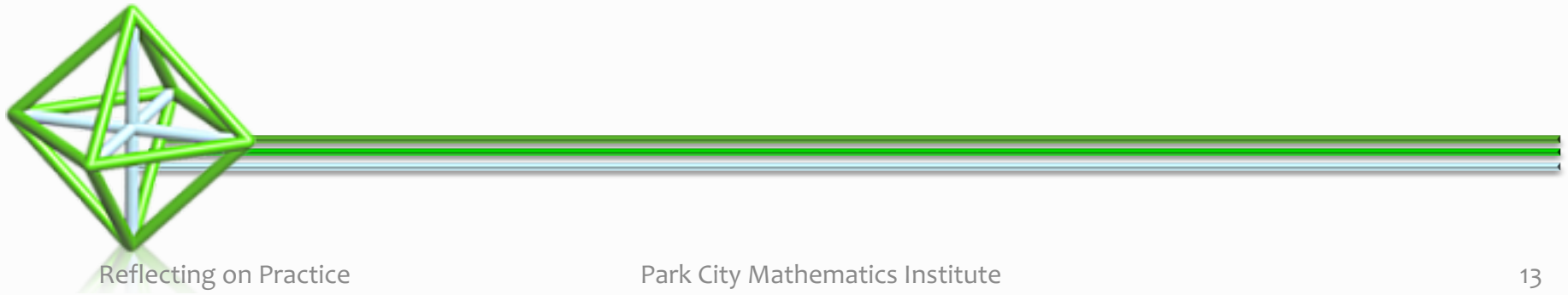
It has been one month since Ichiro's mother has entered the hospital. He has decided to say a prayer with his smaller brother at a local temple every morning so that she will be well soon.

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

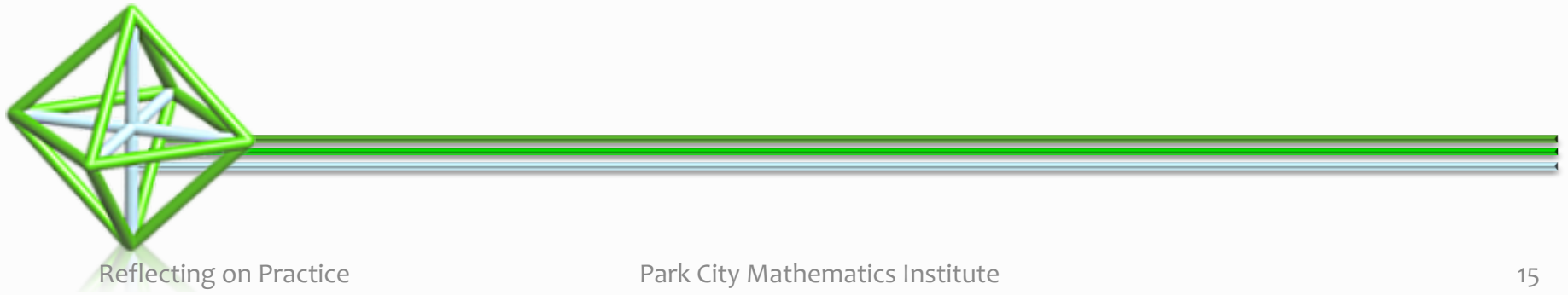
As you watch, think about the question:

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

Japanese 8th grade video

We watched the video below

http://timssvideo.com/58



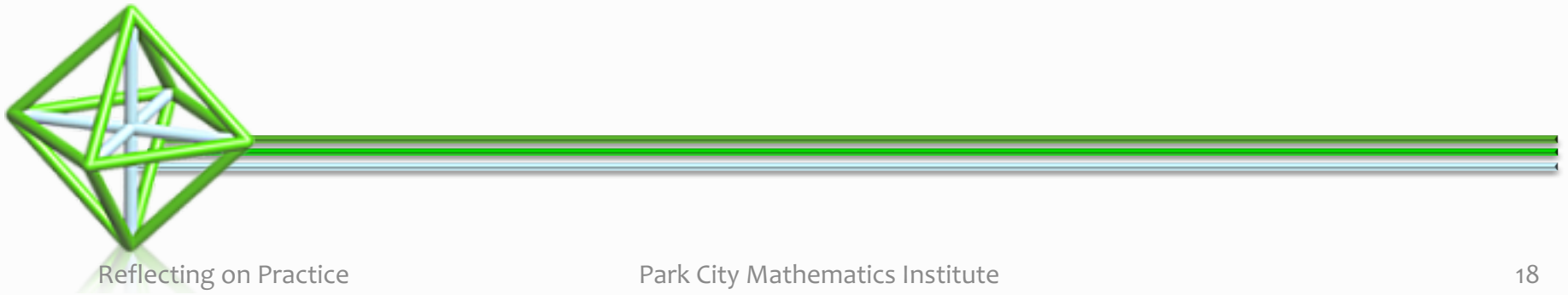
Ichiro's Mother

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

Japanese 8th grade video

Cal's favorite Japanese word

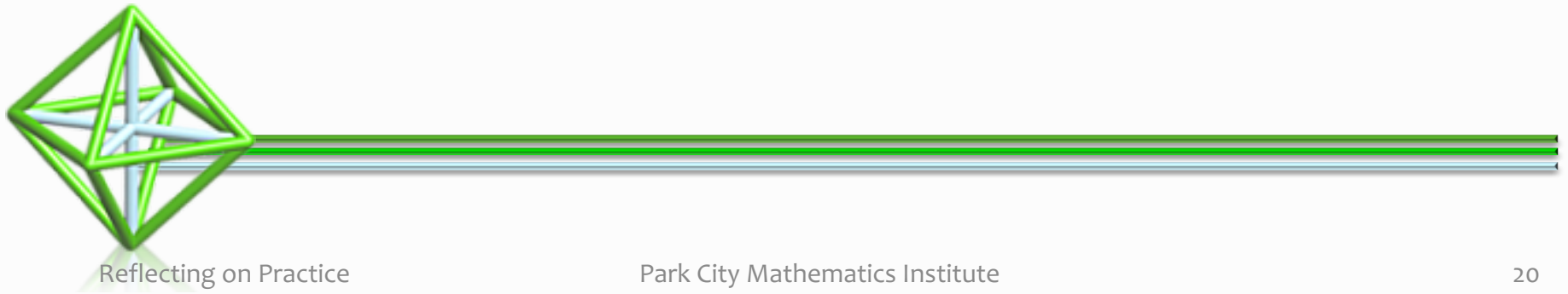
- Blake Petersen from BYU
  - Doing the Sequencing/Connecting from Smith/Stein
- Kikan-Shido: "Between Desks Instruction"
- A term from Japanese lesson-study, describing the teacher's walking around the room, predominantly monitoring or guiding student activity – the teacher makes *intentional* choices to speak or interact with students.



Participation quiz (PCMI, 2011)

- High school algebra class working on factoring. They are being graded on how well they work together on the task not on right answers.
- You have expectations about the way discussions should happen in your classroom. Do your students know what they are?
- As you watch, what norms are being established to encourage discussion?

- What explicit norms does the teacher set for student discussion?
- What level math talk is going on in the class
- What things does the teacher do to promote math talk?



Sociomathematical Norms
Talking about the math

- **Explanations** consist of mathematical arguments not simply procedural summaries of the steps taken to solve the problem.
- **Errors** offer opportunities to reconceptualize a problem and explore contradictions and alternative strategies.
- **Mathematical thinking** involves understanding relations among multiple strategies.
- **Collaborative** work involves individual accountability and reaching consensus through mathematical argumentation (Kazemi, 1998).

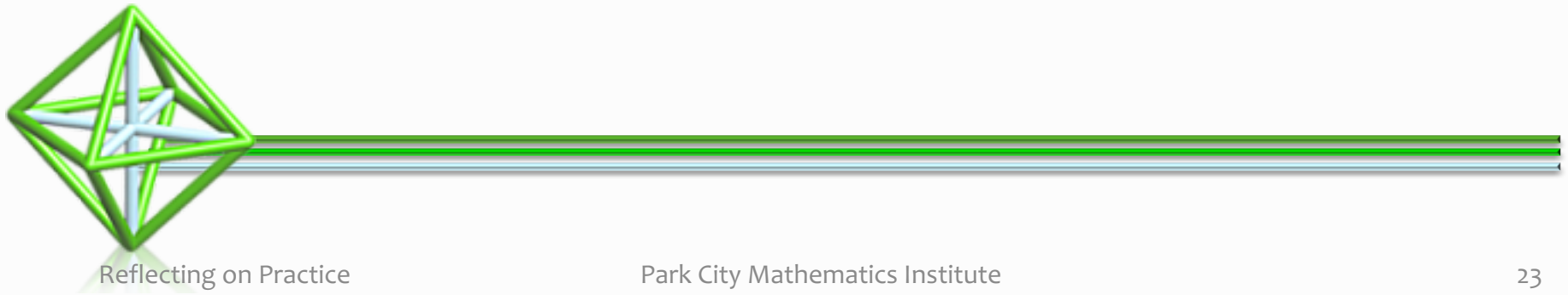
Norms for students working together

- Take turns
- Listen to others ideas
- Disagree with ideas not people
- Be respectful
- Helping is not the same as giving answers
- Confusion is part of learning
- Say your “becauses”
- “I can’t do that yet?”

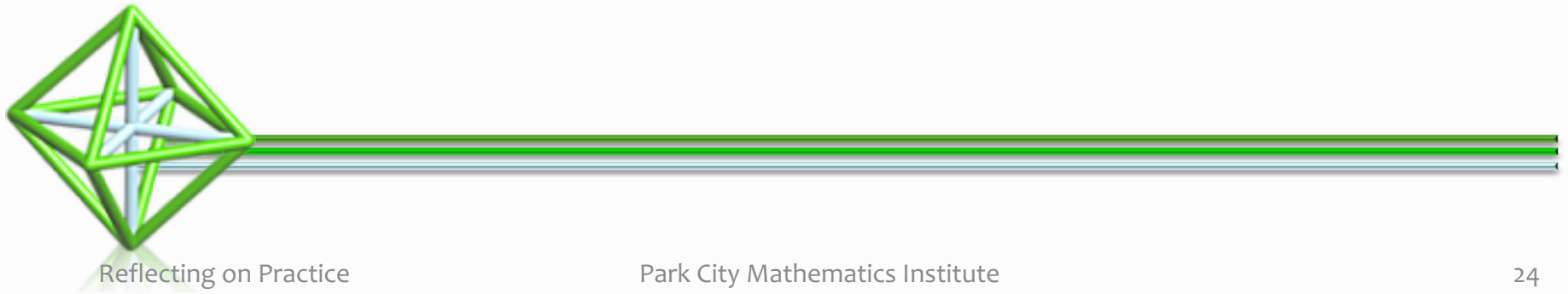
Horn, 2012

Getting ready

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



Successful implementation of worthwhile tasks does not just happen by chance



References

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