

Designing mathematics in lessons- Lesson Study

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◆ How does one learn teaching mathematics?

- ◆ What are the gaps in in-service teacher professional development?

◆ “Teaching is a cultural activity” (The teaching gap, Stigler and Hiebert, 1999)

Classroom patterns and Scripts

- ◆ <http://www.timssvideo.com>
- ◆ <https://www.youtube.com/watch?v=yqcPFJNhWyU>

Japanese Lesson

- ◆ Teacher gives a problem to the students to solve
- ◆ Student work on the problem and present their different solutions to whole class
- ◆ Teacher leads a discussion of the methods student invented and summarizes the lesson

History of Japanese teaching

- ◆ Lesson study as a practice of professional development
- ◆ Development over 100 years
- ◆ Focus on developing “Research lesson” to address student learning goals
- ◆ Continuous, collaborative PD

Lesson study goals

Students

Fostering student's problem-solving and responsibility for learning

Student engagement

Teachers

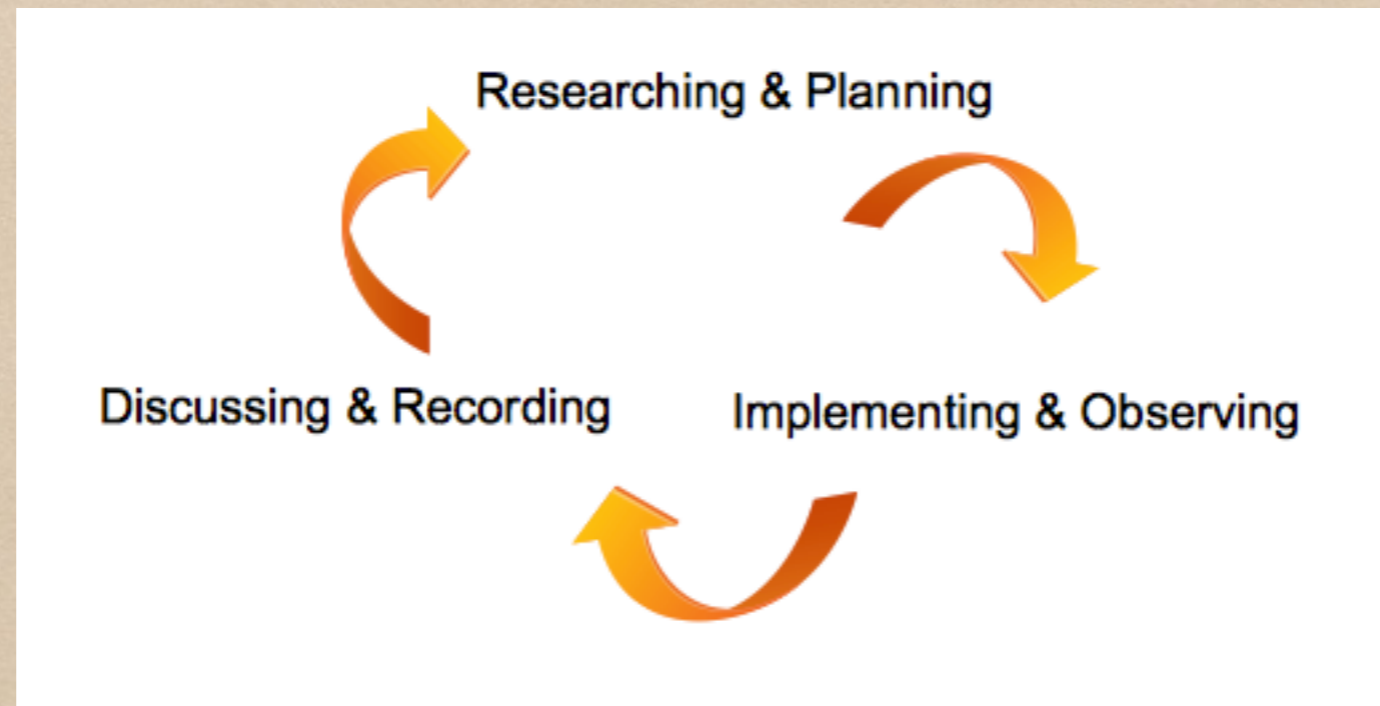
Encourage recording and sharing student's mathematical thinking

Note-taking, Blackboard Organization, Student Presentation

Maximizing learning for every student

Establishing a culture of collaboration (collegial dialogue and planning)

Research lesson



Lesson study Cycle

- Defining the Problem – Setting the Goal
- Planning the Lesson
- Teaching the Lesson
- Evaluating the Lesson and Reflecting on Its Effect
- Revising the Lesson
- Teaching the Revised Lesson
- Evaluating and Reflecting Again
- Sharing the Results

Exemplar 1

<https://www.youtube.com/watch?v=AkKtQeEQNhM>

Planning

- ◆ The problem- wording/ numbers
- ◆ Materials to be used
- ◆ anticipated solutions
- ◆ Questions and guidance by teacher
- ◆ How to use space on Blackboard
- ◆ Different parts of the lesson
- ◆ How to handle individual differences

Problem- 1st grade

- ◆ (Student name) collected..... Ginkgo leaves. Then he/ she drew pictures of his/her family on the leaves, one member on each leaf. How many leaves did not have pictures?

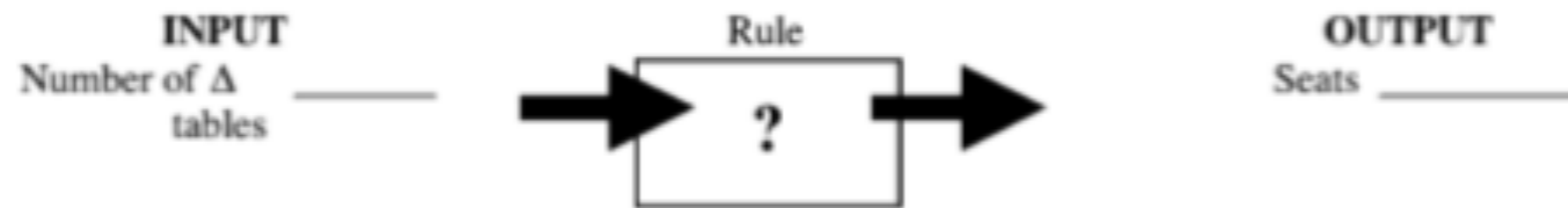
We have a long skinny room and triangle tables that we need to arrange in a row with their edges touching, as shown. Each side can hold one "seat," shown with a circle. Can patterns help us find an easy way to answer the question: How many seats fit around a row of triangle tables?



Fig. 2 Lesson problem and approximated board illustration

Triangle Rule Machine

Name _____



INPUT Number of Triangle Tables	OUTPUT Number of Seats
1	3
2	4
3	
4	
5	
6	
/ /	
/ /	

Implementation

- ◆ Tr: Can pattern help us to find the easy way to answer - how many seats?
- ◆ Students filled the worksheet
- ◆ Few students were able to explain the pattern

Post lesson reflection

- ◆ Worksheet were done correctly through rote memorisation
- ◆ Few students were able to describe or explain the plus two pattern

Changes after post lesson discussion

- ◆ Eliminated the worksheet
- ◆ Give students narrow strips with number of tables and blank to write the number of seats
- ◆ Numbers would not be sequential
- ◆ Make a group poster of their data
- ◆ Invite students on board to share their strategies

Revised lesson

- ◆ Student shared their different counting methods

- ◆ How can lesson study be used to build a community of teachers ?

◆ Thank You