



# Connecting Questioning to Our Learning Goals

Day #4

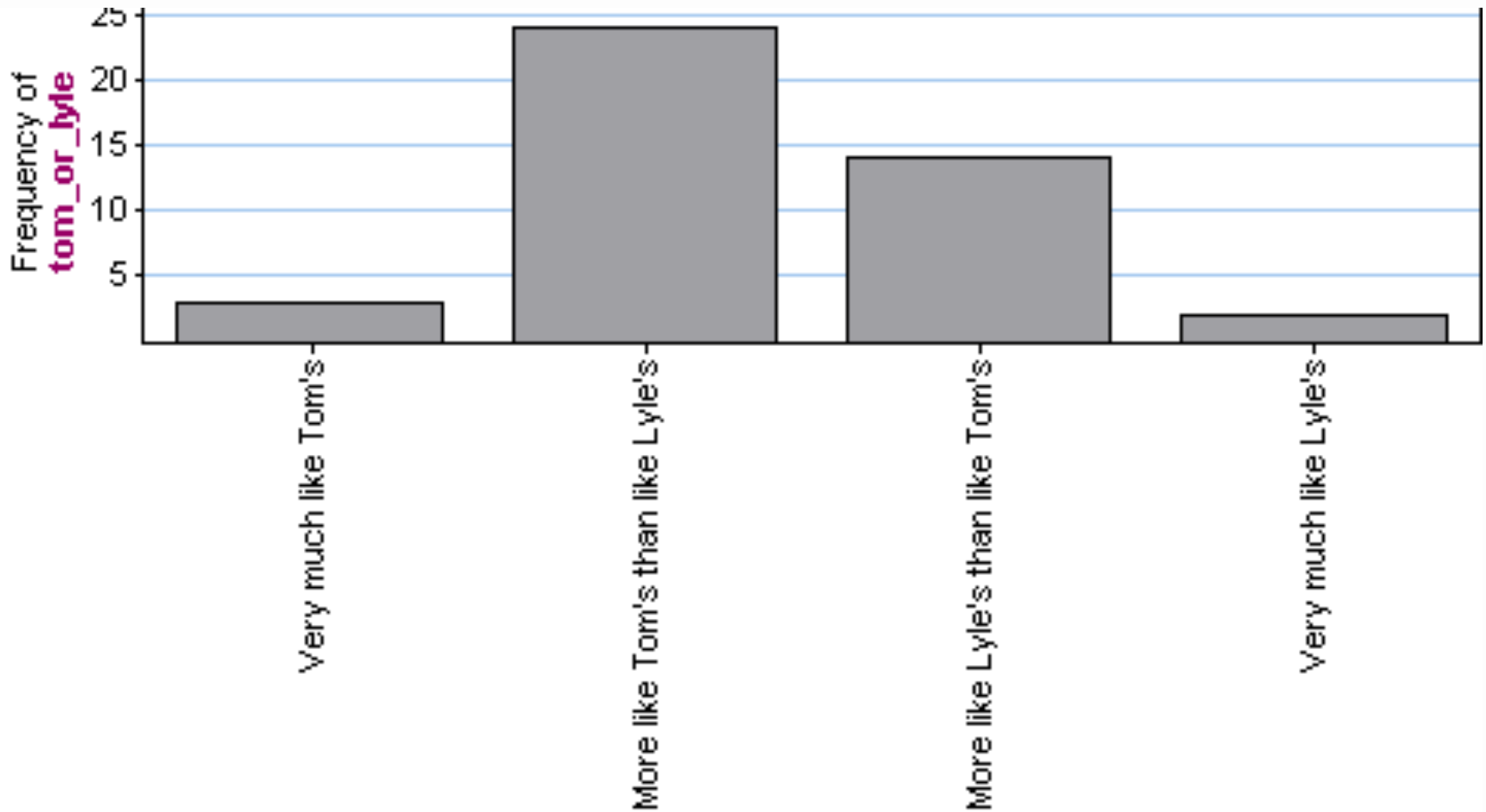


# Our Learning Goals for you!

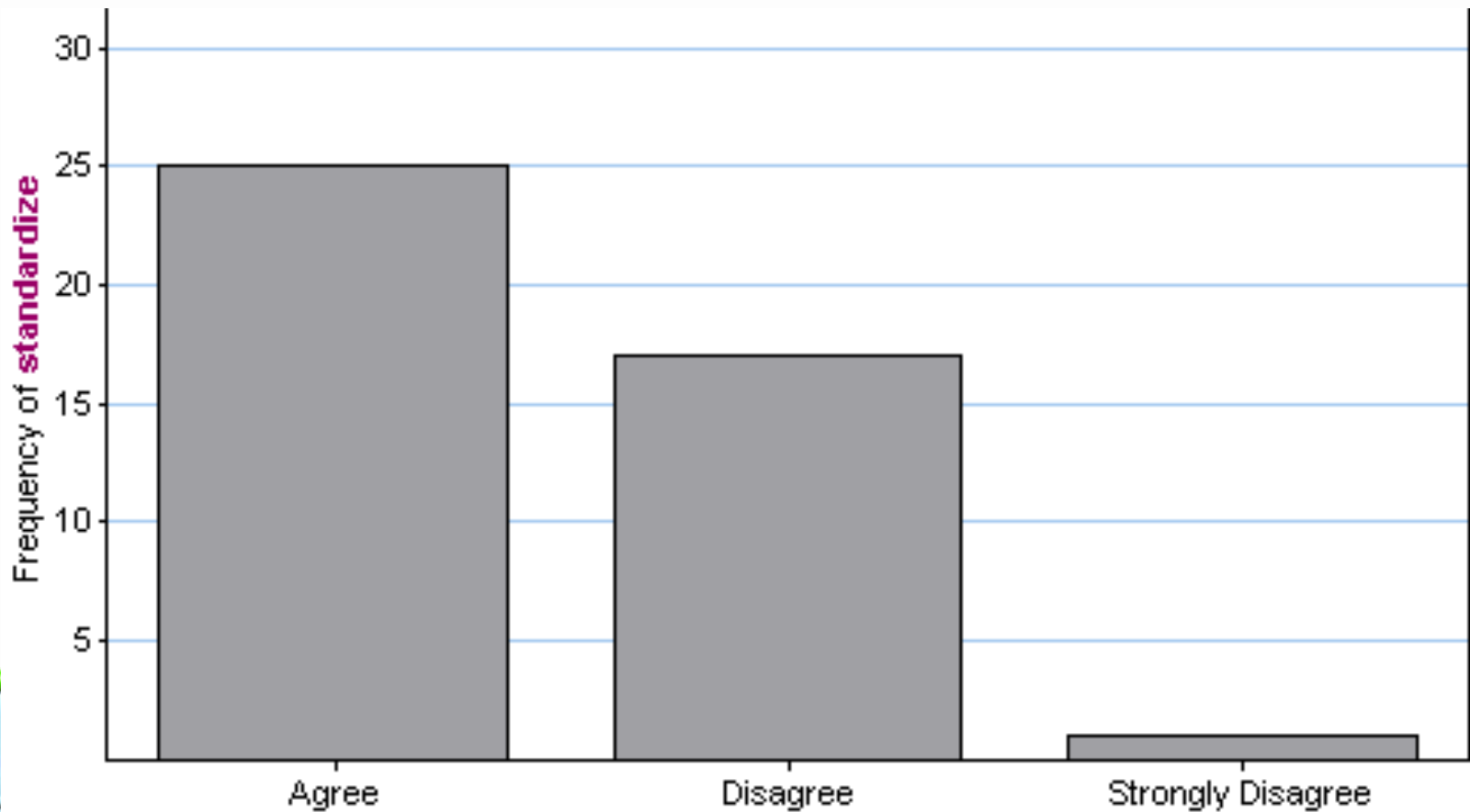
- Recognize that clear learning goals for students enable teachers to ask more effective questions.
- Explain the connections between questions and mathematical learning goals for students.



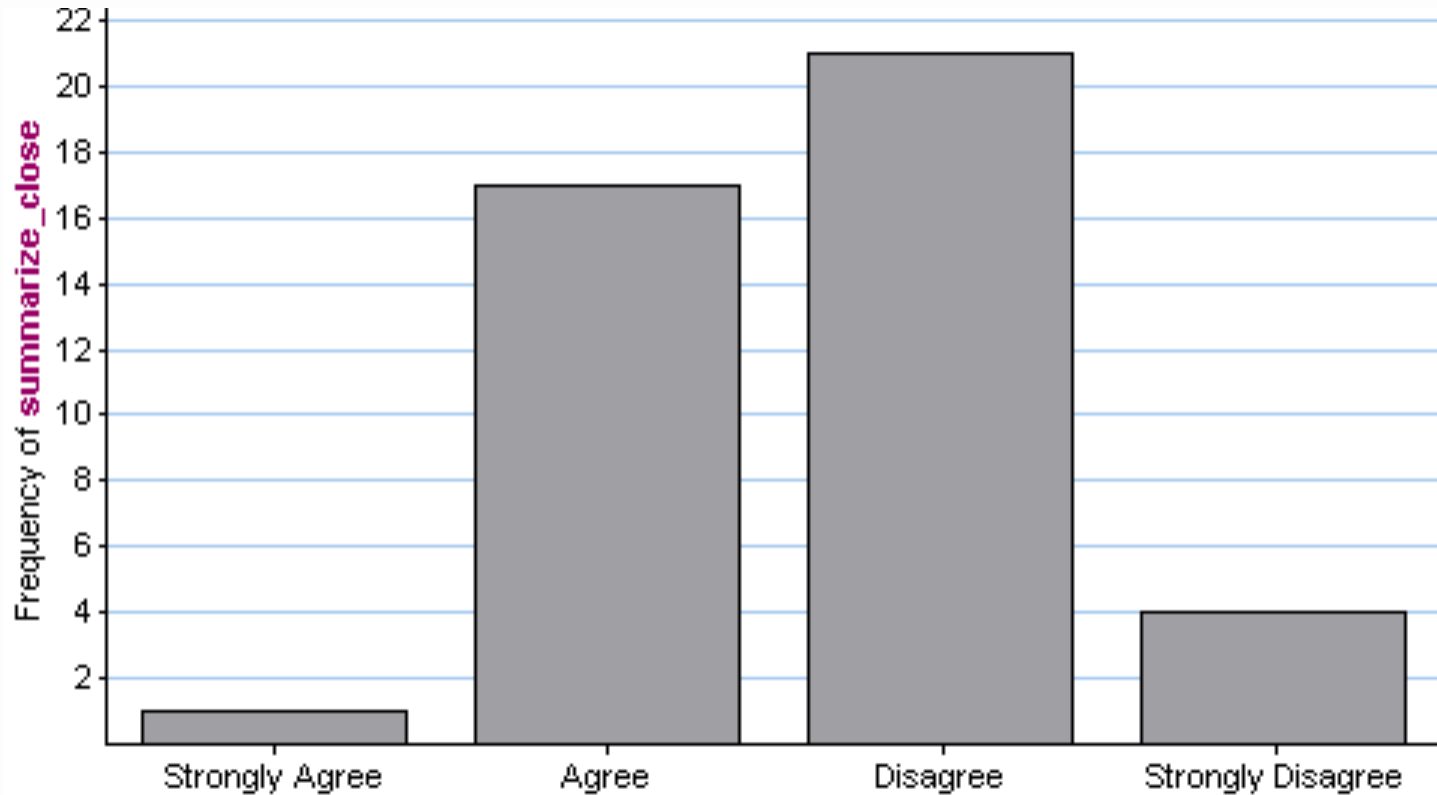
# Your Class: Tom or Lyle's ?



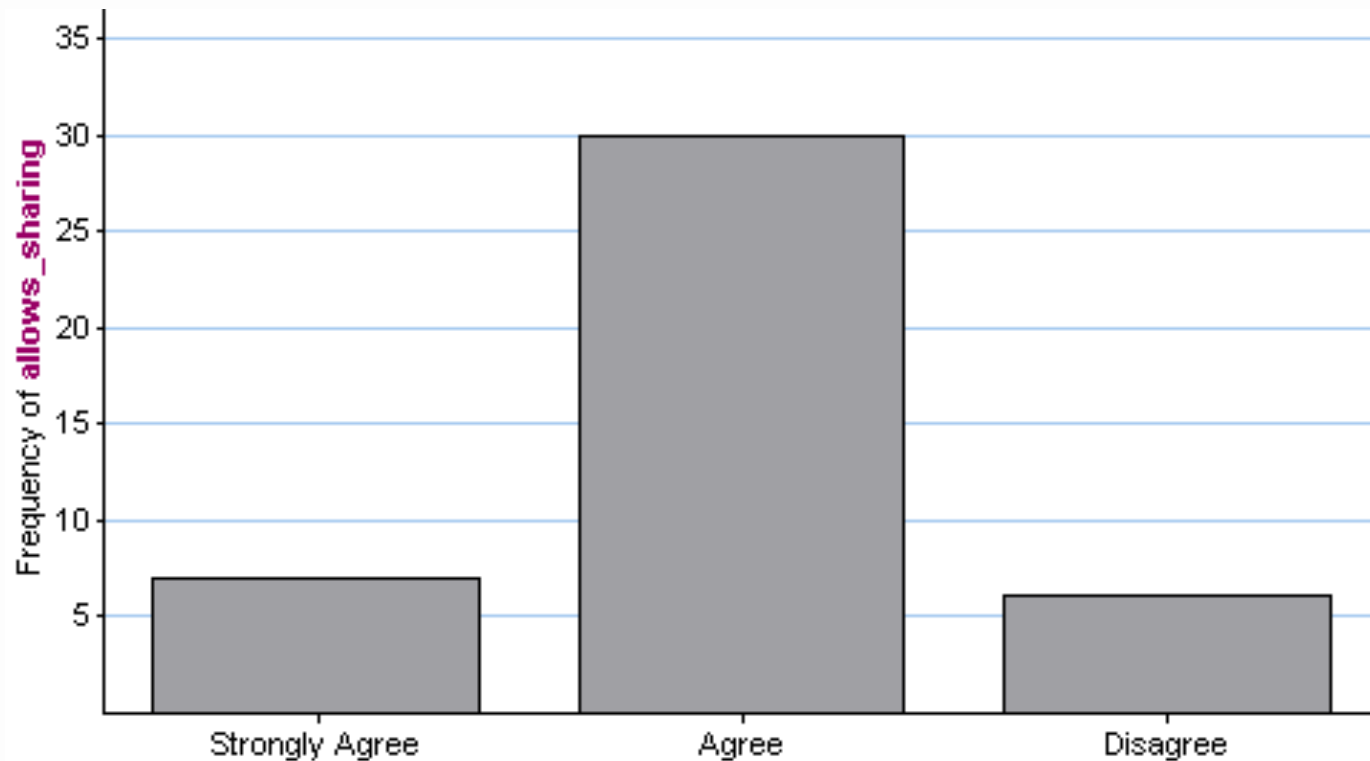
# My questions tend to standardize student thinking.



# My questions summarize/ close discussion



My questions invite student to decide what's “right/wrong reasoning.”



# Discussion: What did Lyle do to make his questions work?

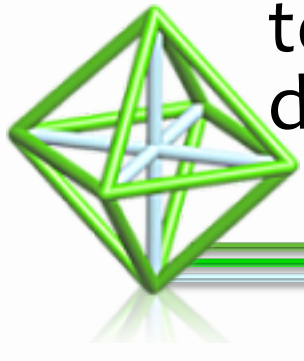
- *It takes a lot of careful work* to build this environment among students. It would be much easier to build if students were accustomed to working like this in all of their math education. However, it is still possible to build this environment within a single school year, *but it has to be done very deliberately.*





# Discussion: What did Lyle do to make his questions work?

- *Lyle appears to be aware there are multiple solutions, for which he may have planned,* so he is able to go with the teachable moments for students and ask questions/restate so students can move forward. Tom appears to have one solution in mind that he is working toward. Lyle's class works because of the established culture, *his preparation for several lines of student thought* and his ability to restate and refocus students in their discourse.



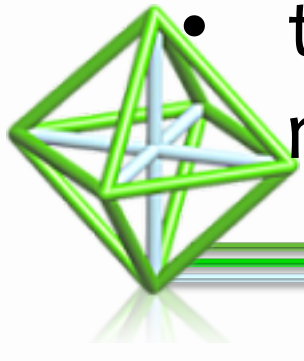
# Discussion: What did Lyle do to make his questions work?

I think that this does take planning on a teacher's part. *In lesson study you have to plan the questions that you are going to ask the students based on their anticipated answers.* I think this is a very important part of lesson planning. *Make sure that you understand the different approaches that might emerge* and plan for how to get the students on the right track.



# What we noticed:

- Lyle must have deeply understood the mathematics of the problem.
- Lyle's questions were designed for his learning goals:
  - to understand multiple ways to approach the problem, and
  - to justify their answers with clear reasoning.



# A Working Definition:

Effective mathematical learning goals:

- Have ***specific mathematical content*** (subject topic or mathematical practice)
- Describe something students will be able to do/know better

Stein, M., Engle, R., Smith, M., Hughes, E. (2008). *Orchestrating Productive Mathematical Discussions: Five Practices for Helping Teachers Move Beyond Show and Tell*. *Mathematical Thinking and Learning*. 10 (4). pp 313-340.

Lampert, M. et al. (2011). *Learning in from and for Teaching Practice (Core Principles and Practice)*. University of Michigan School of Education

<http://sitemaker.umich.edu/ltp/home>



# Handout #2

Look at the Handout. Which of these five statements fit our working definition?

- Work on this *ALONE* for 3-5 minutes
- Now, *PAIR UP* with one other person. Try to reach consensus. Justify.
- Group up at your table. Try to reach consensus. Justify.



# Presentation of correct answers:

- B and E fit.
- A, C, and D do not fit.
- Only B and E:
  1. Have *specific mathematical content* (A fails this) AND
  2. Describe what you want students to know or be able to do (C and D fail this).



# Video Analysis: Deborah Ball

Watch and speculate on her **mathematical learning goals.**

Jot down some particularly effective questions.



# Speculate for a few minutes:

Recall Mathematical Learning Goals:

- Are about a **specific mathematical content**
- Describe something students **will be able to do/know better.**





# From Deborah Ball:

1. Students will develop habits of searching out multiple solutions, establishing whether all solutions have been found.
2. Students will develop their ability to produce a mathematical explanation.
3. Students will better understand what mathematics means (explain solutions to teacher and to one another, listen to and critique and use other students' ideas, be accountable for their ideas).



# Handout #3

- At your table, name one other goal Deborah Ball may have had.

(This goal may not be mathematical; it may not be a learning goal for students)



- Write your fourth goal in the remaining box on handout #3, and leave space.
- Now, you and your tablemates will look through the transcript. For each of your four goals, find one or more questions that were asked in order to get closer to that goal.
- You will pass a “master list” to your facilitators when you are done.



So what is the

purpose of questioning

in Deborah Ball's third grade class?



# Homework

Read two articles:

- Black/Wiliam excerpt from “Working Inside the Black Box” (the section on QUESTIONING)
- Steven Reinhart, “Never Say Anything a Kid Can Say”

Identify one thing from each article (be specific) that will make you re-think your current practice in the classroom. Respond to the following Google Form: <http://bit.ly/2012week1>

Due Date: Sunday Afternoon, 4 pm

