What do we ‘no’?

A few stories about how we say ‘no’ and ‘yes’ to thinking in the math classroom

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Steve Weimar

The Math Forum @ Drexel
steve@mathforum.org
Story 1
Collaborating with a 9th grade algebra teacher

Review of linear relationships

• Student: “Constant rate of change. Y-intercept.”
• Teacher records: “Rate of change/slope. Y-intercept.”
• Student: “What about exponentials?”
• Teacher: “What about them?”
• Student: “Don’t they have a rate of change?”
• Teacher looks at me: “Well, n..”
• I jump in: “That’s a really interesting question. What are you noticing?”
• Student: “Well it’s changing, but it’s not constant”
And we’re off on a brief excursion into ever increasing rates of change and comparing curves to straight lines.

When the teacher tells this story she says: “you should have seen all the other kids turned around and enthralled by this conversation”
What was going on there?

- It began as a “knowing” moment.
- Thinking emerged through a crack in the knowing
- We came very close to saying ‘no’ to thinking
- “What are you noticing?” helped us refocus on thinking
Story 2

A 6\textsuperscript{th} grade teacher is using *Notice and Wonder*, the crown jewel of our strategies for engaging student thinking.

Over time students are starting to offer fewer and fewer noticings and wonderings.

Watching herself on video she notices that she is restating everything the students say.
She realized that she had changed the activity from student thinking to “how close can you get to the teacher’s words?”

The students may no longer even recognize their thinking in the language now being used.

We can say ‘no’ to thinking, even at the very moment we think we are saying ‘yes’
Story 3

Back to 9th grade and linear equations.

A group explains their answer to a problem trying to find an equation for the cost of taxi rides, but doesn’t display their calculations.

There are other answers in the class and they spend a long time trying to figure out who’s right.
Toward the end one student in the original group says he knew there was *something fishy* with their answer. When asked why, he points out that their equation doesn’t produce the values they were given.

We remind the class of several situations recently where *something fishy* led to the best thinking of the day.
They said: “oh, we should put a star down whenever we have a fishy thought… yeah starfishies”

Starfishies: a custom made tool for valuing and attending to thinking about discrepancies
Problem solving is a key and common place where we expect to focus on mathematical thinking, the Practices of the Common Core.

What does it look like when we say ‘yes’ to thinking in a way that develops the Practices?
How many bricks will it take to finish this square section of a walkway?
A student is stuck. “This problem is hard”
What might a ‘no’ response look like?

T: “What if you focused on just this corner?”

S: “You mean just count the bricks there? Then use that somehow?”

We ask a question but we really just offer our idea instead of asking about the student’s thinking.
A student is stuck. “This problem is hard”
What might a ‘yes’ response look like:

T: “What are some things that make this problem hard?”

S: “It’s not finished. There are so many different shapes. You don’t know how big it is. It will take forever to count. . . . Don’t you have a simpler problem?”
T: “Ah, so you would know what to do if it was simpler? What’s here that’s an example of a simpler problem you could figure out?”

S: “I can tell you how many bricks are in this corner . . . oh, wait, . . . .”

What I want here is to ask questions that follow on and are interested in the student’s thinking.
What students might take away from each:

1. *What if you focused on just this corner?*
   - The next time I get stuck I just need someone to point me to the right place to start

2. *What are some things that make this problem hard?*
   - The next time I get stuck I need to remember to ask myself what makes it hard and see if there are some simpler problems that might help
Story 4

I visit an 8th grade classroom in one of the lowest performing schools around.

They had recently been introduced to Notice and Wonder and I am sitting in a group that is really humming along, noticing and wondering all kinds of things.
I’m excited.

I: “Hey you guys are doing great. Looks like you might have some ways to start solving some problems!”

S: “Wait, we’re not done noticing and wondering yet.”
I can’t believe I just did that.
Later the teacher told me that they had somehow almost immediately realized that if they did a really good job of noticing and wondering, then they would have ideas about almost any problem coming out of this scenario.
Fortunately these students recognized a ‘no’ when they heard it and they owned a strategy that enabled them to say ‘yes’ to their thinking.