



# COUNTERING TEACHING THROUGH TELLING WITH 4 INCLUSIVE MATH INSTRUCTION STRATEGIES

By: Tara Trudo

Picture this - a teacher stands at the front of the room. Their back is to you and they are writing an addition problem on the board:  $24 + 37$ . They tell you to do what they are doing. "First, we line up the tens, then we line up the ones." You copy down the numbers, the symbols, the formula. You write what they write. You do what they do. The day ends and you can do what they do - but you have not developed your mathematical understanding. You have not flexed your own problem-solving muscles. When you are asked to show your thinking or explain your answer - you're silent. You learned to copy, to regurgitate, to mimic, but not to develop your own mathematical understanding. We call this method "do it like me."

Many of us were taught in a "do it like me" style of teaching, where a teacher modeled what to do by telling us how to do it, and then we copied them 30 times. And, maybe we saw a story problem at the end that was exactly what we've been doing 30 times, so we never had to read it - we just did it. This method does not help our students grow into independent problem solvers.

We need to move away from "do it like me" teaching because math should not be a gatekeeper, keeping people out of opportunities. As a full-time facilitator for All Learners Network (ALN), I have the benefit of working with many different teachers every week, and I hear so many stories from teachers about how their experiences as a math student has locked them out of other opportunities.

One teacher told me "I always wanted to be a nurse, but in fifth grade my teacher told me that I wasn't good at math, so I couldn't be a nurse." We don't get to decide that when kids are in fifth grade. Instead, we need math to be an opportunity gateway for



them. We need it to create opportunities for all students. We need to make sure that all students have access to high-quality grade-level math instruction.

The National Assessment of Educational Progress (NAEP) has only 25% of students as proficient in math in high school. And the overwhelming majority of those students are white, middle-class students who look like their teachers. We create an equity problem when we say “Do it like me.”

All Learners Network's mission is to cultivate a community of educators who promote math, equity, and inclusion for all students. All means all. When we say all, we fully and completely mean all. We mean all students can learn math. And - we also believe that all teachers can become great math teachers.

What can we do instead of “do it like me” teaching?

We fully embrace teaching through inquiry. Teaching kids step-by-step procedures and then asking them to replicate our thinking creates equity issues in the classroom and keeps kids from developing a deep conceptual understanding of big mathematical ideas. I will share four strategies that can be used during your main lesson to increase access and inclusion for all kids.

The four strategies we will explore are:

- Problem Introduction Protocol
- Visualization
- Leave off or cover up the numbers/question
- Three Act Tasks

### **Problem Introduction Protocol (PIP)**

The Problem Introduction Protocol was developed by a group of teachers using a rapid cycle of inquiry. The group of teachers all had the same issue - word problems were really hard for their students. So they gathered together to discuss solutions and strategies and came up with this protocol. It is a strategy and a tool that we have used in lots of different classrooms.

It works really, really well to give more kids access.

The full protocol can be accessed here and we will spend some time reviewing each step of the protocol. First, we read the problem to the students. The second thing we do is read it chorally. After we've read it together, we say, what is a word that might be tricky for someone? We used to say, what's a word that's tricky for you? And then changed it to “what's a word that might be tricky for someone?.” Because often it is easier for students



to talk about a word that might be tricky for someone else than it is to talk about a word that might be tricky for them.

Once we have addressed all of the words that might be tricky - I ask them the question, what are we trying to figure out? My goal here is for every student to be able to say, I'm trying to figure out how many cookies each guest gets or I'm trying to figure out how many inches I need to move to the left. What are we trying to figure out?

Then I say, what would an answer to that look like? Here I am getting at estimation as well as units. We have all heard the teacher say, well, they didn't label their answer. Sometimes kids don't know the label to put on their answer. Discussing it ahead of time with their classmates helps them think about the situation before getting into operating.

The last step before I send kids out to work is brainstorming strategies. When I'm asking them to brainstorm strategies, I am not trying to put my opinion about which strategy they should try front and center. So whatever a kid says for a strategy, I am going record it and say, "you could try that." I say it even if it's a strategy that I don't think will work. I'm going to say "you could try that" and record it. And then, as kids get working, I can go check in with that student and see how it's going. When strategies are recorded like this, it gives kids something to start from.

## Visualization

The second strategy that helps us move away from teaching through telling is getting kids to visualize. When we take a few minutes to either have students build part of the problem or imagine part of the problem or visualize or act it out, they get a lot more engagement from all kids.

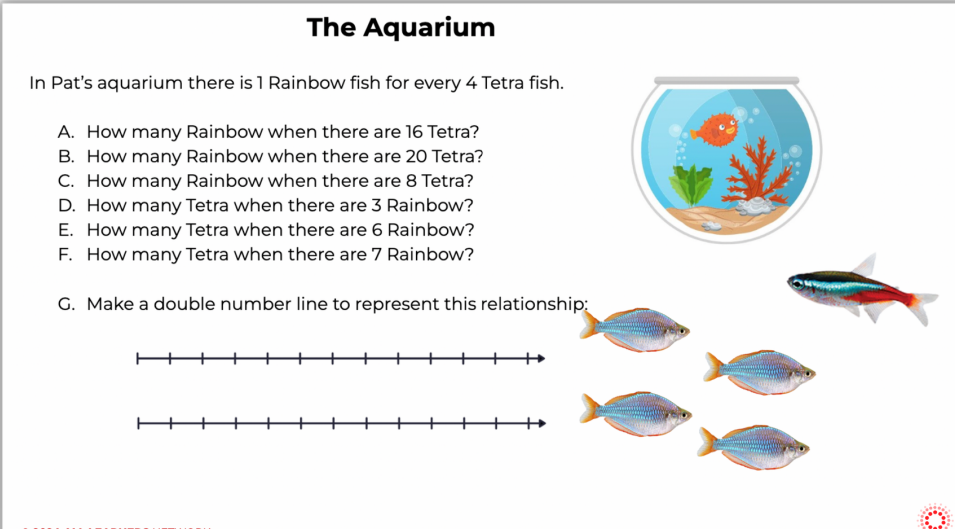
Let's take a look at visualization with this math problem:

**The Aquarium**

In Pat's aquarium there is 1 Rainbow fish for every 4 Tetra fish.

A. How many Rainbow when there are 16 Tetra?  
B. How many Rainbow when there are 20 Tetra?  
C. How many Rainbow when there are 8 Tetra?  
D. How many Tetra when there are 3 Rainbow?  
E. How many Tetra when there are 6 Rainbow?  
F. How many Tetra when there are 7 Rainbow?

G. Make a double number line to represent this relationship:



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It can be pretty overwhelming to think about all the different questions that are here and all the different words that are on the page. One way to start could be noticing with the students that in Pat's Aquarium there's one rainbow fish for every four tetra fish. And then - having kids draw that or build that with objects can really help give access to more kids.

Maybe you just give them that first part in Pat's aquarium. There, there is one rainbow fish for every four tetra fish. And maybe you say, build what that looks like or sketch what that looks like, or close your eyes and think about what that looks like.

Then we might just invite them to answer one small question like, I wonder if there are two rainbow fish, what would we see? I wonder if there were 12 tetra fish, what would it see? How would that change your picture? And by just getting kids to interact with that at a very concrete or representational level, it gives so many more kids access when we are ready for them to answer all these different questions about equivalent ratios.

### **Leave Off or Cover Up**

A lot of math programs have some great, rich story problems. Now, when we ask these to a diverse class of kids where there's lots of range in ability and experiences, what often happens is by the time I finish reading the question, there are some kids who already know the answer. And then - other kids who have no access or no way to get started. Leaving off part of the question or leaving off a number helps kids think about the situation without jumping in to do calculations.

Our goal is to create patient problem-solvers. And when kids can see all the information and already know how to do the math, it doesn't help us with that goal. These two moves are really, really powerful for giving access to more kids. And they're both things that do what I call cheap differentiation. We get asked by teachers all the time how to differentiate in Main Lesson. How can I give everyone access to a problem from a math program? Covering up part of the problem or leaving off a number is an easy way to give more kids access and they provide a level of differentiation that's hard to believe until you've tried it.

When leaving off a question, we can ask the students for what questions could be asked and chart their responses. We can ask them to choose a question and solve. If I wanted them to all to answer a specific question, I could say, "start with this question, see if you can figure out the answer. And then pick another question." I really like to chart these in a place where I can come back to them and where kids can come back to them during other parts of the math block, especially during menu time because they'll often still be super into it. And if kids are super into something, I wanna let them stay interested and engaged in that. Check out our recent workshop recording where we have examples of leaving off the question to get even more examples of differentiation and how one simple image can provide so many different entry points.




The other part of this strategy is to leave off a number or even all of the numbers. I will take a problem from a program and put a square or a rectangle over the number or numbers. And I use the problem introduction protocol to help kids make sense of the context. And sometimes I reveal the numbers after that. Other times I say, Hmm, what could that number be? And I collect some of their brainstormed ideas about what the number could be. Sometimes I pick the number and say try it with 12. Or I say, wow, you guys just had five different ideas. Pick the number, go off with your group and use the number that you think it should be and solve it. And if you finish, you can pick another number. This makes them incredibly excited to engage with math problems. Just by covering up a number, I can still use my program materials and give more kids access. And by giving more students access, I give more kids engagement and they just get so much more excited than having one answer and being done. Here is one example of a problem with a number blocked off:

### Sharing Cookies

Alice has 256 cookies to share equally between the guests at her party.

If  guests attend her party, how many cookies will they each get?

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### Three Act Tasks

Three Act Tasks flip the “i do, you do, we do” model on its head. Three Act Tasks force us to move away from teaching through telling and invites students to construct their own understanding of important mathematical ideas. Three Act Tasks start with an image or video and ask kids to notice, wonder, estimate and predict the question. The “you do” comes first. Then we move into a section we like to call y’all do. This is when kids ask for the additional information they need to solve the problem and work in collaborative groups to come to a solution. The final part we say is the “we do” where the teacher selects and sequences the groups that will share their thinking with the class and. After the class discusses the solutions and strategies, the answer is revealed, usually with another image or video.



Here are some of our favorite Three Act Tasks:

- K-5: <https://gfletchy.com/3-act-lessons/>
- K-8: <https://kristenacosta.com/3-acts/>
- High school: <https://whenmathhappens.com/3-act-math/>

There you have it - four inclusive strategies to help move away from “do it like me” instruction. For more information on this topic and even more examples, check out our recording of the workshop, Moving Beyond “Do It Like Me.”

**What Now?** Scan the QR code and scroll to the bottom of the post for links to next steps



1. Watch the recent workshop recording of Moving Beyond "Do It Like Me."
2. Review and try out the Problem Introduction Protocol.
3. Meet with our team to discuss bringing ALN into your school or district.

