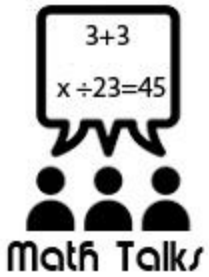
SFUSD Signature Strategy #1: Math Talks

What is this strategy?



A Math Talk is a pedagogical tool for building math thinking and academic discourse in a student-centered, teacher-led way. Math Talks should last for 10–15 minutes. They can be centered on any math topic. Math Talks work best, however, when the content is generally familiar to students up to their Zone of Proximal Development. They should not be used to introduce math content, but when a topic is new, a Math Talk can be an opportunity for informal assessment of student familiarity and background.

Why would I use this strategy?

Math Talks serve to further understanding of math content while addressing Standard for Mathematical Practice #3: *Construct viable arguments and critique the reasoning of others.* They give students the opportunity to develop flexibility and fluency with mental visualization and computation. They offer opportunities to revisit math topics as well as deepen understanding by sharing multiple ways of thinking about a concept or skill.

When do I use this strategy?

This strategy can be used at any time, but is often done at the beginning of a math class. Because it does not need to be focused on the lesson's content, the content of the Math Talk can vary according to the needs of students. Math Talks generally happen 2 or 3 times a week for 10–15 minutes each. In middle and high school, the Math Talk can replace the Do Now.

How do I use this strategy?

Teachers deliberately set up a safe environment where each child's thinking is valued.
Students practice making their thinking explicit.
Everyone practices understanding each other's thinking.

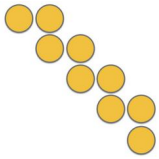
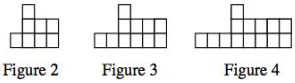
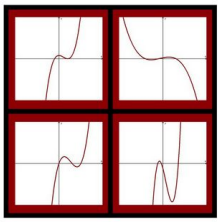
1. **Teacher presents the problem.**
   A problem is presented to the whole class or a small group. Computation problems are always presented horizontally (e.g., 43 + 35 =), to encourage mental strategies over reliance on algorithms.

2. **Students think about the problem.**
   Students are given time (1–2 minutes) to silently, mentally (no pencils or paper) think about the problem and try to find an answer. They signal quietly to the teacher (e.g., with a thumb up against their chest) when they have an answer.

3. **Students share their answers**.
   A few students volunteer to share their answers and the teacher records them on the board. Without judgment, the teacher records answers where all students can see. The teacher continues to take answers until all students' answers have been shared. Teacher can also ask the students to do a Turn-and-Talk with a partner before sharing answers.

4. **Students share their thinking.**
   Students share how they got their answers with a partner or with the larger group. Any student can provide an explanation to any answer on the board. Equity sticks can be used to ensure every student has an equal opportunity to share. The teacher records the student's name and thinking using words, numbers, and symbols. It is important to capture student thinking without writing down every word. The teacher and other students ask questions that help students express themselves, understand each other, and clarify their thinking to make sense of the problem and its solution(s). The expectation of multiple solution pathways is emphasized.

Sample Math Talks By Level

K-2	3-5	6-8	High School
Dot Talks 	How many dots do you see?  How did you see them?	Think of as many equivalent expressions as you can for **2x + 5x + 3 + 6**	Are any of the following equivalent to 1? Why or why not? $\frac{(t+3)}{(t+2)}$ $\frac{(t+3)}{(t-3)}$ $\frac{(t-3)}{(3-t)}$
How many triangles do you see? 	15 x 18	Always, Sometimes, or Never: **4p is greater than 9 + p**	How many tiles in figure 10?  Figure 2 Figure 3 Figure 4
Number Strings 12 + 12 12 + 13 13 + 13 13 + 14	Place ½ and 1 ½ on this number line 	Estimate what 32% of 647 is.	Which one doesn't belong? 

Share the "Why" with Students

Give the students the rationale behind the Math Talk. Let them know that they have great thinking that we can't see and this gives them a chance to share what's going on in their brains. This also gives everyone a chance to learn from each other lots of different ways we can think about a problem.

While Math Talks provide an important space for students to share different ways of thinking, teachers will often have a goal in mind and help bring out the important, grade-level mathematical understandings that arise during the Math Talk. The Math Talk Planning Tool on the SFUSD website (http://www.sfusdmath.org/math-talks-resources.html) can help teachers anticipate student responses and connect them to each other and to the target mathematics.

Initial Implementation

As you begin to implement Math Talks in your classroom, you will want to keep them simple. Your goal might be to have 2 or 3 students share their thinking, which you capture and record without much comment or questioning.

- Provide a safe environment.
- Start with easier problems so that students can learn the routine and to encourage wide participation.
- Present calculation problems horizontally.
- Provide quiet think time and a silent signal.
- Accept, respect, and consider all answers.
- Capture student thinking as faithfully as you can.
- Write the student's name so that you can refer to _____'s strategy.
- Develop your poker face. Respond neutrally to students' comments.

Developing Questions

As your and your students' familiarity with Math Talks grows, you can begin to ask more probing questions that help students to clarify their thinking and explain the steps they went through.

- Where did you get this number?
- How did you get this?
- Why did you do this operation?
- Do you mean this?
- Is this how you thought of it?
- So you are saying that…?

Adding Layers

- Ask students if they thought of the problem in the same or a different way. (This can be done verbally or with a signal. For example, students can pat their heads if they thought of it the same way.)
- Have students do a Turn-and-Talk. Use this strategy when many students want to talk and may not have a turn individually; when you want to generate more answers or discussion from students; or when students need time and practice articulating their math ideas and strategies before sharing with the whole group.
- Begin to ask questions that connect students thinking to each other:
  - What questions do you have for _____?
  - Who can paraphrase what _____ is saying?
  - Who can explain what _____ is thinking?
  - Do you agree or disagree with what they said? Can you explain why?
- Point out similarities and differences between different strategies.
- Ask students to point out similarities and differences between different strategies.

Further steps with Math Talks

As you become increasingly comfortable with using Math Talks, you will find yourself adjusting them and incorporating them into your pedagogical repertoire.

- Design new Math Talks based on issues that arise during math instruction.
- Design math instruction based on confusions that arise during Math Talks.
- Create class strategy posters that summarize the different strategies that your class is using in Math Talks.
- Simplify Math Talks when students have difficulty. Using smaller numbers can help students access a strategy that they can then apply to larger numbers.
- Offer more than one problem during a Math Talk and allow students to choose the one they want to solve. For example, 13 X 12 and 15 X 17 both get at multi-digit multiplication, but one uses numbers that may be easier for students to keep in their heads as they solve the problem mentally.

Further Resources

The SFUSD Math Department website has many more ideas and resources for Math Talks, including: how to design and plan for a Math Talk, how teachers use them, and ways to deepen and extend Math Talks. www.sfusdmath.org