Instructional Practices For Productive Math Talk

This document describes instructional move that help students engage the whole class and small group discussions. These moves keep everyone accountable. You may want to print this document so you can refer to it throughout the course.

The teacher's role is to facilitate discussions and model how to actively listen and learn from the student(s) who are sharing. It is a time to learn how students are thinking, making connections and/or asking questions, and to do that, teachers need to listen to students more and say less.

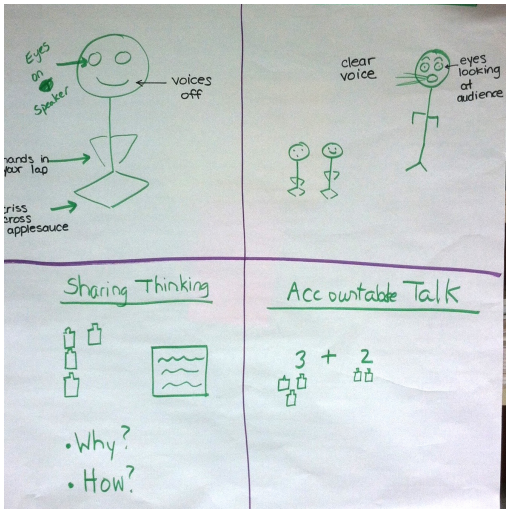
Teachers can keep the class accountable by using productive talk moves during whole class discussion, small group discussion, or when students work in pairs.

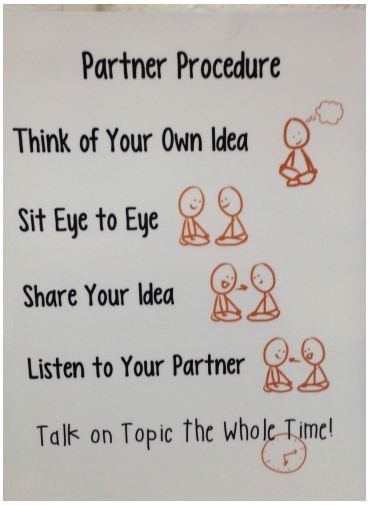
Setting Math Talk Norms and Expectations

Students need support as they engage in math talk. This can be accomplished by planning time during a lesson for the class to discuss, model and reflect on …

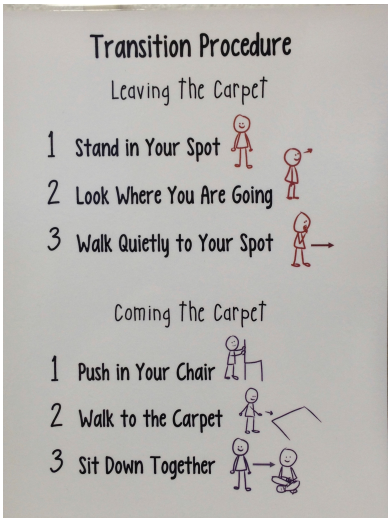
- …what productive math talk looks like and sounds like when students work in pairs, small groups and as a whole group.
- …ways to actively listen and add to others' ideas
- …how to respectfully disagree with a solution and justify why
- …questions and statements that focus on the mathematics while playing a game or sharing a strategy

Visual displays such as a chart listing productive math talk norms and discussion sentence stems support students. Referring to and discussing norms and expectations regularly throughout the school year also helps students. How teachers develop and then maintain a culture for productive talk will vary across grades, change throughout the year and even from one year to another.





Seating Arrangements for Whole Class Discussions



A variety of seating arrangements for class discussions can work, as long as there are clear expectations connected to them. In some classrooms, students gather on a rug for class meeting to launch and end a lesson. Students work alone, in pairs or small groups at tables or desks, and sometimes on a floor space depending on the focus of the lesson. Students may transition from one workspace to another several times during a lesson. When they understand what to do and where to be, their transitions will take less time out of instruction time.

During whole group discussion students should sit so they are focused and can hear. If there are representations that students need to use or see during the discussion, they must be large enough and clear enough for everyone to see. Technology, such as document readers, is a useful tool to share strategies and display work during whole group discussion.

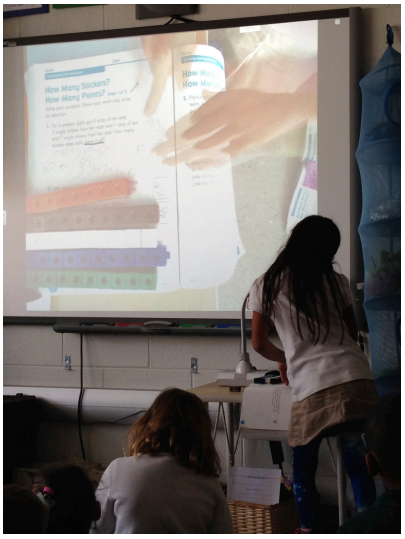
The meeting space needs to be large enough for the whole class. Teachers may assign students places to sit. Sometimes students sit wherever they want in a circle as long as they can see the teacher and all the other students. Sitting next to classmates that enable them to focus on the discussion is key. While some students can pay attention while sitting on the floor, others do better in a chair.

Model the Math

Students demonstrate their thinking with concrete and visual models or story contexts to illustrate how they solved a problem or to illustrate a particular strategy.

Visual models help other students make connections as they listen to the student who is sharing. They might use:

- tools to show their thinking (number line, hundred's chart…)
- manipulatives (linking cubes, pattern blocks, tiles)
- representations arrays, ten-frames, strips of stickers)
- contexts (stories)



Hand Signals

Engage the whole class by using hand signals such as thumbs up (close to their chest so you can see, rather than hands and thumbs up waving in the air) and 'I agree' or 'me too" to indicate they used the same strategy or they agree that the strategy shared works. These signals help students focus without being distracted or shut down by waving hands. Hand signals are a quick formative assessment of letting you know where students are at that moment.

- Thumbs up if you agree or disagree with____
- Think about one thing you learned today. Put your thumb up when you have an idea.
- Thumbs up if you understand, sideways if you are still thinking, or thumbs down if you do not understand or are confused.
- Who used the same strategy as _____?

 I agree I understand	 I am not sure I understand some	 I disagree I do not understand	 Me too I used the same strategy

Wait Time

- give students think time before they are expected to share an idea or answer a question with a partner or the whole group
- allow students process time before asking a new question
- wait before jumping in when a student pauses as s/he shares a solution or makes connections to another student's work

Turn-and-Talk

- students talk to a neighbor about a specific topic for a few minutes before opening the discussion to the whole class, or in the midst of a discussion
- students to share what they discussed
- after students turn-and-talk, ask for volunteers to share what their partner shared or what they learned form their partner

Think, Pair, Share

- Students think or solve a problem alone
- Students discuss their thinking/work with another person
- Students share their solutions / thinking with small group (perhaps a group of 4) or in a whole class discussion

Rephrase (Revoice, Repeat)

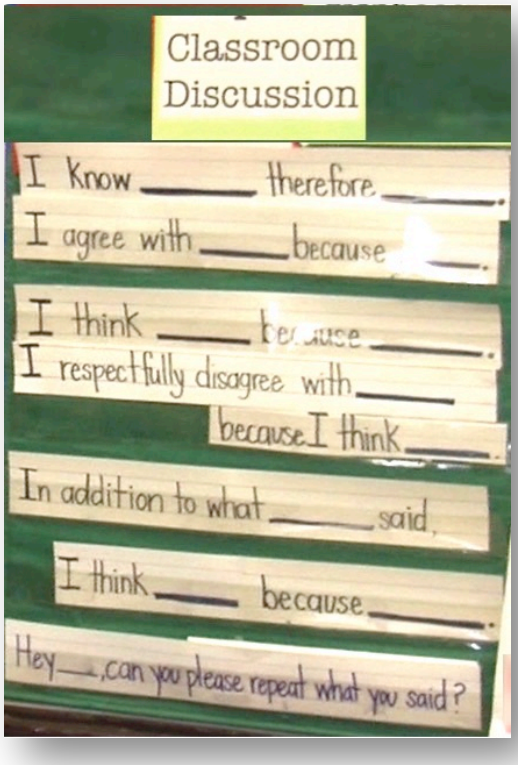
Students are more likely to internalize a strategy if they hear it described in more than one way and with different contexts and models. Sharing what someone else has said also makes students accountable for understanding other students' approaches. After a student has shared in a discussion ask another student to retell the strategy in his/her own words.

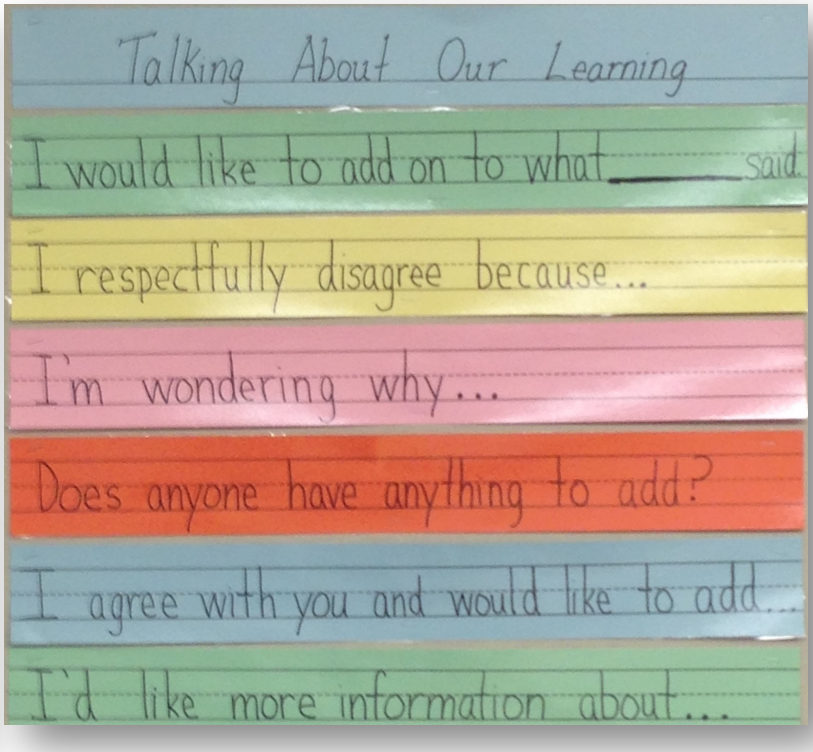
Whenever possible allow the students to rephrase. Occasionally, the teacher might rephrase what a student or a group of students have shared to emphasize or refocus the discussion for the whole class. This move needs to be used sparingly to model how to rephrase.

Sentence Stems for Discussion / Game Prompts / Reflections

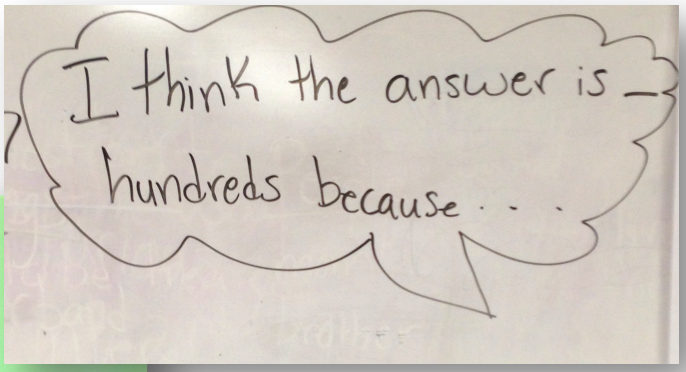
Post sentence stems for students to use during the discussion, to use as they play a game or to reflect on learning at the end of a lesson.

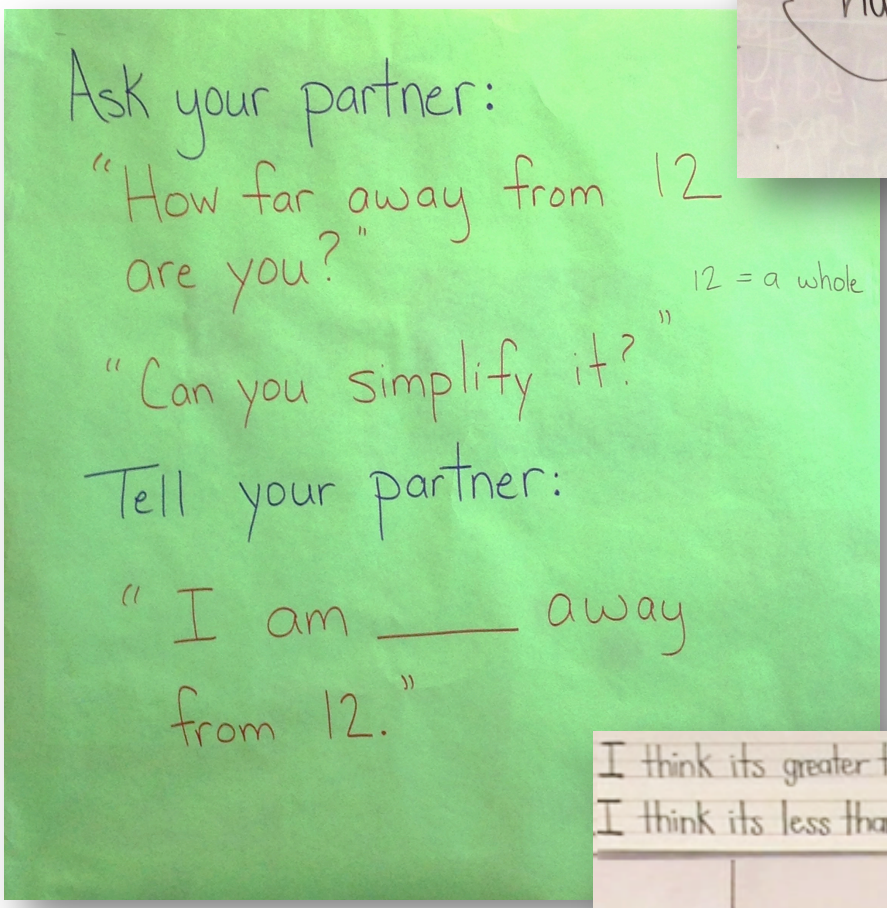
- **Math Discussion Stems**
  - I agree with ____ because _____. I think _____.
  - I'd like to add to what _____ said. I noticed _____.
  - I respectfully disagree with _____ because _____.
  - I think the answer is _____ because _____.

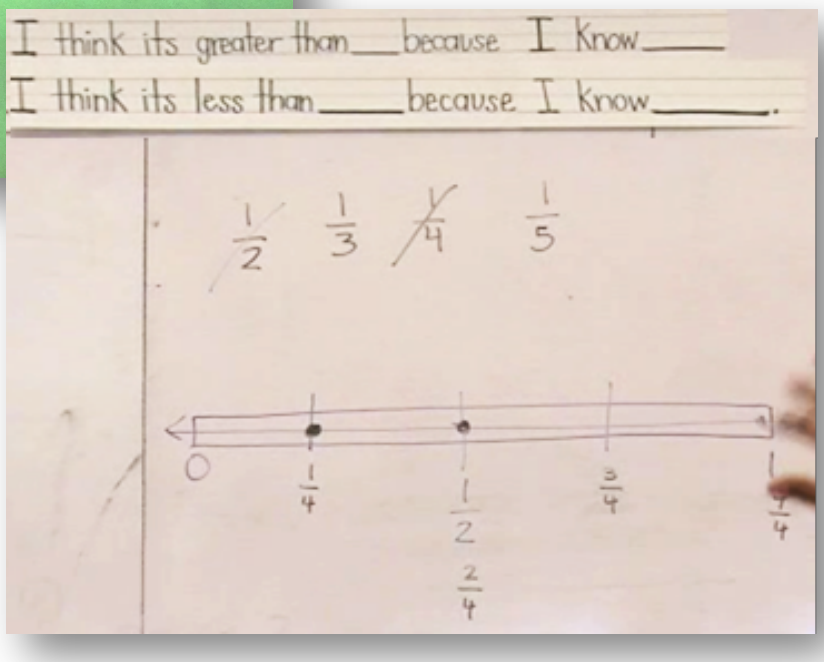




- **Sentence Stems for a Specific Game**

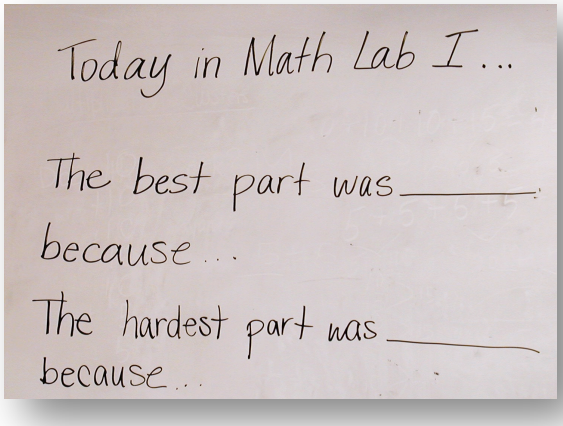






Reflection (verbal or in writing)

- **Quick Write**



Quick writes can happen at any point of a lesson to assess what students know about a topic before launching the lesson or at the end of a lesson to get a sense how the students are doing.

Pose a question for students to write about in their math notebook on a Post-It or index card before discussing as a group. Once students have had a chance to write ask a few students to share their reflection with the whole class or with a table partner, depending on the purpose of the Quick Write.

Exit or entrance cards assess…

… a new unit of study, e.g.,

- Write all you know about fractions.
- What is a polygon?
- Who is correct. Justify your answer.
- _____ says _____ and _____ says _____. Who is correct?
- How is _____ the same/different from _____?

… what students learned while working with a partner, during a class share or after they've played a game. Use reflective question.

- What challenged you most today?
- Share how your group worked together today? How can your group improve?
- How did you participate in your group (with your partner) today?
- What pleases you about how you worked during math workshop today?
- Students respond to statements like "Today in math. I…"

…discovered	…heard	…realized
…didn't understand	…learned	…said
…discovered	…noticed	…thought