

## ENCOURAGING COMMUNICATION IN MATHEMATICS CLASS

The mathematical thinking of many students is aided by hearing what their peers are thinking. Putting thoughts into words pushes students to refine and make public their thinking. Teachers can spot student misunderstandings much more easily when they are revealed by a discussion instead of remaining unspoken.

When students engage in respectful *mathematical conversation* about concepts, procedures, problem solving, and justification they deepen their own understanding as they clarify their own thinking and learning. Mathematical conversations can be effective in supporting ELL students' language learning so they gain greater understanding of the mathematics.

Mathematical conversations are productive during partner talk, small group discussions, and whole class discussions. The teacher will need to model respectively listening and speaking behavior if students have not previously engaged in mathematical conversations and periodically teachers may need to refresh students understanding of the expectations during mathematical conversations.

Classroom Moves to Encourage Mathematical Conversation	Purpose	Observed
Teacher restates a student's reasoning.	For the purpose of clarifying and advancing student thinking. This also allows more think time for all students. It also allows the teacher to introduce vocabulary that may help students express their thinking more precisely.	"So I hear you saying that 210 is the same amount as 21 tens."
Student revoices another student's reasoning.	To make sense themselves and to advance the other students' reasoning and understanding.	"Can you repeat what Marcus just said using your own words?"
A student justifies or proves someone else's reasoning.	Using justification or proof to allow for respectful discussion of ideas.	"Can you explain why you think Sarah's thinking will work for this problem?"
A student builds on the group's reasoning.	For the purpose of making connections between ideas and for extending another student's idea.	"Can someone add on to what has been said so far?"
Wait time employed by teacher and students.	For the purpose of allowing think time before speaking. This must be in place to support the other classroom moves to encourage mathematical conversations.	Teachers and students waiting 5-7 seconds to allow the person to think before they begin talking.

Ideas adapted from, Chapin, S., O'Connor, C. & Anderson, N. (2009). *Classroom Discussions Using Math Talks to Help Students Learn, Grades 1-6, Second Edition*. Sausalito, CA: Math Solutions Publications.

# MATHEMATICAL CONVERSATIONS CLASSROOM OBSERVATION TOOL

<b>Classroom Moves to Encourage Mathematical Conversation</b>	<b>Student Behavior Observed</b>	<b>Teacher Behavior Observed</b>
Teacher restates a student's reasoning.		
Student revoices another student's reasoning.		
A student justifies or proves someone else's reasoning.		
A student builds on the group's reasoning.		
Wait time employed by teacher and students.		