Discourse Moves for Fostering Confident Math Learners

We ALL speak math

North Carolina Collaborative for Mathematics Learning www.nc2ml.org

Waiting

What is it?

Providing students with the time to process the teacher's questions and think about their responses. This includes waiting after a student responds to allow for others to process that response and react to it.

Why do we use it?

Waiting after posing a question (i.e., using "wait time") helps students make sense of what they hear / see and decide what to do next. It provides space for reflection and consideration and is critical to productive and powerful discourse. Waiting communicates that you (and the class) have patience. A lesser-known form of waiting involves waiting after a student responds. When this second form of waiting is added, students' responses can become more complex, and students may be more likely to respond directly to their peers' contributions. Wait time encourages broader participation, while also holds students accountable for thinking and doing math.

When Using Wait Time...

Teachers are...

- providing time for students to process a question or response
- letting students know that pausing to think before responding is valued

Students are...

- learning to reflect on their thinking asking for more time to think if it is needed
- learning to be patient with others

Take your time Jill

I'll give you some time to think about that.

[pause without speaking]

I want you to think about this individually, without saying anything yet.

How does the sample size related to the standard error?

[wait 3 secs] Emily? [wait 3 secs] "The larger the sample size, the larger the standard error" [wait 3 secs] "No wait, the smaller the standard error."

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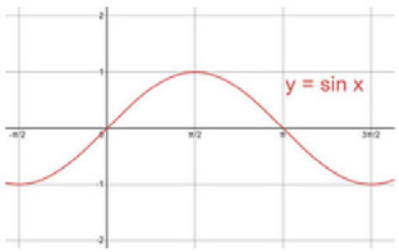
Discourse Move: Waiting

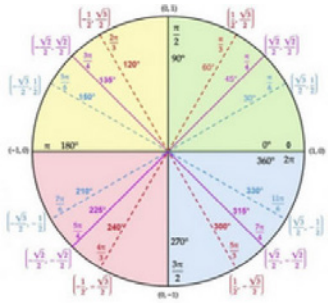
Wait time gives students ownership over math, allowing them time to process questions and think about responses.

How do we use it?

If you are new to providing wait time, try this: When you ask a question, pausing for at least 5 seconds allows all students time to process and think about their responses. Prompt students with statements like “I want you to think about this individually before we share” or “I’ll give you some time to think about that” to encourage them to reflect on their thinking and learn to be patient with each other.

An Example of Waiting in Action





Scenario: Imagine students have been provided the two graphs at the right and asked: What are sin (π/2) and sin (π/4)? How do you know?

Teacher: Take about 10 seconds to think about your answer before we share. (silently counts slowly to ten) Ok, would anyone like to share?

Student 1: I think sin (π/2) is 1 and sin (π/4) is about 0.6 or so – because those are the y-coordinates on the graph on the left.

Teacher: Thanks Student 1. **Other ideas? (silently counts slowly to five).** You can just shout ’em out.

Student 2: I agree with sin (π/2), but I think sin (π/4) is √2(2)/2. I looked at the y-coordinate of the π/4 angle on the unit circle to figure out the exact sine.

Teacher: That is interesting, Student 1 and Student 2 used different representations to determine the values of sin (π/2) and sin (π/4). **Let’s take a moment to think about their strategies. (silently counts to five) Does using different representations matter? (counts to five)**

Things to Remember

- Students who are quick to respond can inhibit others from responding. Be explicit that every student needs time to think before responding. This distributes the student voice and power throughout the classroom.
- Waiting is going to be awkward at first, and that’s okay!
- Support your multilingual learners and exceptional students by explicitly giving time for the student to process the question then formalize a response.
- Remember not to speak during your wait time.

Questions to Consider with Colleagues

1. What strategy do you use to gauge when you’ve waited long enough without having to count in your head? (i.e., taking a drink from a water bottle, walking around the room, etc.)?
2. If students are still struggling to respond after ample wait time, one strategy is to use a “turn and talk”. What are some other strategies?
3. How do you see using wait time relating to the Standards of Mathematical Practice? Consider SMP 7 and 8 specifically.

Note: This resource is being co-designed by the NC math education community. We welcome feedback to inform its refinement at https://forms.gle/8PBWGsvqJQzcdtCF8 Check the website (nc2ml.org/high-school-teachers) for the most up to date resources.