

The Power of Voice: How to Empower and Engage Students (and still meet our goals!)

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Reflect and Discuss

When your students leave you at the end of the school year, what do you want them to think/know/feel/care about/be?

- ◆ Write your thoughts in the chat box.

What value might nurturing “student voice” add to learning mathematics?

“Too often, students go through math class thinking their main job is to produce correct answers. In other parts of life, however, success is not just about what we say but also how we respond to -- and build upon -- what others say.”

-- Ilana Horn

3.1 Getting Ready for a Pool Party

A Develop Understanding Task



CC BY Graham Richardson
<https://flic.kr/p/6kSQtT>

Sylvia has a small pool full of water that needs to be emptied and cleaned, then refilled for a pool party. During the process of getting the pool ready, Sylvia did all of the following activities, each during a different time interval.

Removed water with a single bucket	Filled the pool with a hose (same rate as emptying pool)
Drained water with a hose (same rate as filling pool)	Cleaned the empty pool
Sylvia and her two friends removed water with her three buckets	Took a break

- Mentally create an outline that sequentially orders the six activities.
- Use Desmos to work through task:
<https://student.desmos.com/join/4pn5kz>

SECONDARY MATH I // MODULE 3
FEATURES OF FUNCTIONS - 3.1

3.1 Getting Ready for a Pool Party

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To access the teacher version of the “Pool Party” Activity, use either of the following:

- <https://tinyurl.com/poolparty-desmos>
- <https://teacher.desmos.com/activitybuilder/custom/5f1b63817397c8270dfd1d4f>



Welcome to
**Pool Party (NCTM
100 Days PL)**

Sign in to come back to your work later:

Sign in with Google

or [Sign in with Desmos](#)

Next, save the activity to your account (so that you can “create a class code” and use with your students, or to modify the activity to better suit your goals):

1. Sign in to your account (or create a new account if you don’t already have one)
2. Look to the right of the activity’s title and click on the 3 vertical dots:


3. Select “**Copy and Edit**”
4. Now the Pool Party activity should be saved in your **Custom** collection (under “**Your Activities**”)

Pool Party (NCTM 100 Days PL) 

What value might nurturing “student voice” add to learning mathematics?

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- ◆ **How does this activity allow us to build upon what others “say”?**

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“Too often, students go through math class thinking their main job is to produce correct answers. In other parts of life, however, success is not just about what we say but also how we respond to -- and build upon -- what others say. Listening skills, considering other perspectives, and changing your mind graciously all help students to be more than just better math students.”

-- Ilana Horn

Promoting “student voice” is a vehicle for developing a positive mathematical identity

Mathematical Identity

- Identity refers to one’s beliefs about themselves as a mathematical learner.
- A student’s mathematical identity is informed by how they are asked to engage with math and how they perceive what it means to be successful in math.

Mathematical Agency

- Agency is our identity in action.
- A positive mathematical identity will manifest in curiosity, active participation, perseverance, and a growth mindset.

Instruction that develops a positive mathematical identity

Selecting tasks and designing learning that

- provide students with better access to the mathematics:
 - Using relevant contexts
 - Building upon students' intuition and allowing for multiple entry-points
 - Providing opportunities to dialogue with others
- enhance their understanding of the mathematics:
 - Making connections between multiple representations
 - Utilizing technology to represent their thinking
 - Conjecturing, questioning, defending, reflecting, revising

Instruction that develops a positive mathematical identity

Engaging students in ways that

- empower, rather than sort;
- relate to students' own strengths and experiences;
- are based on sense-making, not regurgitation; and
- utilize problem solving as a vehicle to explore mathematical ideas (not just to find answers to exercises).

Promoting mathematical identity and agency requires a shift in thinking

How can I teach my
kids to get the answer
to this problem?

vs.

How can I use this
problem to teach the
mathematics of this unit?

Student Voice, Positive Mathematical Identity, and Remote Learning (oh my!)

<https://student.desmos.com/join/4pn5kz>



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Days PL)**

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[Sign in with Google](#)

or [Sign in with Desmos](#)

[Continue without signing in](#)

Want to sign up for Desmos? [Create an account](#).

Let's share ideas

Please share any suggestions of tools, platforms, or protocols that have helped you to effectively promoting student voice and dialogue, PARTICULARLY IN A REMOTE LEARNING SETTING (either in live virtual sessions or asynchronous structures).

<https://tinyurl.com/nctm100-share>

Let's share ideas

Here's a summary of responses submitted by participants:

Nearpod-questions embedded in a video	Meta-cognition Logs via Google Classroom	Which One Doesn't Belong? (WODB)	Screen Castify for making flipped videos
Canvas chat	Flipgrid	explaineverything app	Smart Learning Suite
Classflow	Geogebra	Answer Garden	Virtual Manipulatives
classpad.net	Google Classroom	kahoot	Visual Patterns website
collaborative Google slides	Google Forms	Miro	Wakelet
Desmos	Graspable Math	Padlet	Mentimeter
discussion boards (e.g., LMS)	Zoom whiteboard	Pear Deck	Youcubed
EdPuzzle	Jamboard in Google	schoology	Zoom breakout rooms

Let's share ideas

Here's a summary of responses submitted by participants:

Discussion threads that require the student replies to at least two other students (Schoology). We only started the semester two days ago, so just getting them to talk to each online in the virtual classroom is a win. They don't have familiarity with forum settings.

GoFormative website allows me to assess my students and then I can choose to discuss responses from students or just talk about an anonymous student

Google slides - create a digital interactive notebook with your curriculum. Embed a shared google doc as a collaborative working space. ZOOM breakouts:

Flipgrid - make videos :) and YOUTUBE :)

Google Slides as a common workspace for WODB and other activities (see <https://www.youtube.com/watch?v=rqgm9yzKi7I> and https://www.youtube.com/watch?v=AQMFn4A_dc8 for examples)

I have structured virtual learning in a flipped classroom model so that class time can be used on problem solving activities like the one featured in this presentation.

I have used google sheets to take a survey to gauge public opinion.

Let's share ideas

Here's a summary of responses submitted by participants:

This year I created my syllabus on canva (feedback from students was that they don't even pay attention to my syllbus unless I go over it with them in person) to try and make it more student friendly. I'm also trying a Google Site this year (Google Classroom was hard to navigate for some) and then as one of their first activities I'm going to do a scavengar hunt as a way for them to explore my site and syllabus. Then, I emailed all the students to invite them to a Google Meet and so we could get to know each other, I could make sure they are ok, etc. But, also so we could create our class norms together and figure out the best way that we may reach the learning objectives of the course.

I know this is not new but screencastomatic really helps me in prerecording my lesson so I can focus on other stuff that might come up in this virtual classroom.

I use ALL of GSuites tools both synchronistically and a-synchronistically. Classroom, Meet, Jamboard, Docs, Slides, Sheets, Sites all help my students work independently and collaboratively to learn content and share what they learn.

I used a Google form to allow students to view different ways to solve systems of equations. thinking about student's positive identity I will add questions that ask why they chose their path? Simplk12 taught me how to create the form.

I was using just Illuminate and Google Classroom. I have learned Flipgrid, Google Forms, Quizizz, Kahoot, and now Desmos.

Use the chat for every member response - enter it but don't send until I say gives me a white board equivalent.

A one on one Google meets session. Private comments through Google Classroom. Privacy is important to my students.

Ask students to explain their answers. If they make mistakes, encourage them to reflect on their learning and how they can fix it for next time.

Back to the Beginning

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Thank you for joining our pool party!



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