

Video Link and Info for Principle 1: Building Mathematical Discussions

Using academic language to reason about, explain, and justify mathematical ideas builds understanding and the capacity to make mathematical arguments.

<https://vimeopro.com/wested/math-pathways-and-pitfalls-principle-1>

Have You Wondered?

What makes some discussions more effective than others? Watch how teachers use different instructional approaches and tools, including *Discussion Builders*, to engage students in more rigorous and respectful math discussions.

Using the Principle With *Math Pathways & Pitfalls*

Teachers have stated that the Building Mathematical Discussions principle is important because it makes a classroom become a learning community, one that is undertaking a collaborative effort to make sense of the mathematics. In addition, having students articulate reasoning and justify their thinking is aligned with the Common Core State Standards Mathematical Practices.

Watch the three teaching practices in action in a variety of classrooms where teachers and students are using *Math Pathways &*

Pitfalls across grade levels.

Teaching Practice 1: Introduce and model ways to use academic language in context to clearly communicate and refine mathematical ideas.

In this video, Ms. Richards introduces “less than” as a Math Word used in “A Little Less,” a lesson from the grades 2–3 *Math Pathways & Pitfalls* book. Her 3rd grade students are given time to solve a starter problem analyzing the thinking of Nan, an imaginary student featured in the lesson.

After students discuss Nan’s solution in pairs and regroup, Ms. Richards summarizes students’ conclusions that “less than” means they will need to subtract in this problem.

Teaching Practice 2: Use discussion prompts to scaffold students’ respectful participation in rigorous mathematical discussion.

Each *Math Pathways & Pitfalls* lesson has a review of the *Discussion Builders* as part of the opener for the lesson. Teachers are prompted to ask students to focus on one or two of the *Discussion Builders* for any discussion.

In this video, Mr. Shinoda challenges his 4th graders to use as many *Discussion Builders* as applicable for discussing a starter problem solved by Rachel, one of the imaginary students featured in this lesson. The class is discussing the problem in a lesson titled “Shading Decimal Amounts.” After having students discuss the starter problem in pairs, he calls upon some students to present the *Discussion Builders* they used. Notice how he has prominently posted the *Discussion Builders* poster so students can refer to it as they discuss.

Teaching Practice 3: Prompt students to use mathematical language to explain their reasoning.

In the beginning, the manner in which students incorporate *Discussion Builders* and new vocabulary into their discussions may seem contrived and artificial. By the third or fourth math discussion, students usually begin to appropriate these new ways in talking, and

the use of Math Words and *Discussion Builders* becomes more authentic.

Teaching the *Math Pathways & Pitfalls* lesson “What’s the Difference?” Ms. Arrillaga tackles finding the “difference between” and “find the difference.” Her 2nd grade students understand that when compared, one number is larger than another by a certain amount. To find the difference between two numbers, students use the number line and learn there is more than one way to come to the same solution.

Using the Principle With District-Adopted Materials

After teachers introduce *Math Pathways & Pitfalls* to their students, tools such as Math Words and *Discussion Builders* can begin to be integrated into their regular math lessons. This exposure prepares students and teachers for the rigorous math discussions that are a hallmark of *Math Pathways & Pitfalls*. In the following video clips, you will see how different teachers, from primary to upper elementary grades, apply the three teaching practices in their district-adopted lessons.

Teaching Practice 1: Introduce and model ways to use academic language in context to clearly communicate and refine mathematical ideas.

In this video clip, 4th grade teacher Ms. Scharfenkamp introduces Math Words to her students. She carefully selected a *few* words that were likely to be used in discussion of the problem her class was working on.

Teaching Practice 2: Use discussion prompts to scaffold students’ respectful participation in rigorous mathematical discussion.

Now you will view some video from Mr. Fleischmann’s and Ms. Watts’s classrooms. Both teachers are preparing their students to use *Discussion Builders* to discuss math problems from their district-adopted curriculum. There are suggested ways to do this in the “Getting Started” section of the *Math Pathways & Pitfalls* books.

Mr. Fleischmann introduces the *Discussion Builders* to his kindergarten class. In this clip, he focuses on “adding to others’ ideas” as a way to help students build mathematical discussions. He likens adding to others’ ideas to building on top of other bricks. After teaching his students a few phrases to start sharing ideas, Mr. Fleischmann has students practice mathematical discussions with table partners.

Ms. Watts emphasizes the use of *Discussion Builders* as a way for students to respectfully contribute to a mathematical discussion. Listen for phrases such as “I am confused about...,” “I agree or disagree with...,” “I have a conjecture...,” and “What if we tried...”

Teaching Practice 3: Prompt students to use mathematical language to explain their reasoning.

In the following segment, Ms. Sampe leads her 2nd grade students to think about the tools and strategies they could use to solve math problems.

Notice that Ms. Sampe elicits mathematical explanations from the students not only when asking about the tools and strategies they can use to solve the problem but also when they are explaining their solution processes at the board.