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Interacting with Peers in Mathematics

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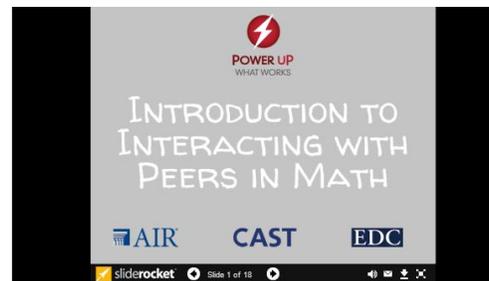
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Interacting with Peers in Mathematics

By: Judy Zorfass, Alise Brann, and PowerUp WHAT WORKS
(2014)

INTRODUCTION

Peer interactions can greatly benefit a student's understanding of mathematical concepts. To facilitate peer collaboration, teachers should pair students carefully, model effective ways to interact, provide students with relevant tools, and offer specific and differentiated advice. Struggling students may find it especially helpful to interact with peers who can provide explanations, clarify a process, and ask and answer questions. This “give and take” approach involves listening, speaking, writing, creating visual representations, and using virtual and physical manipulatives. This [slide show](#) expands on this introduction.



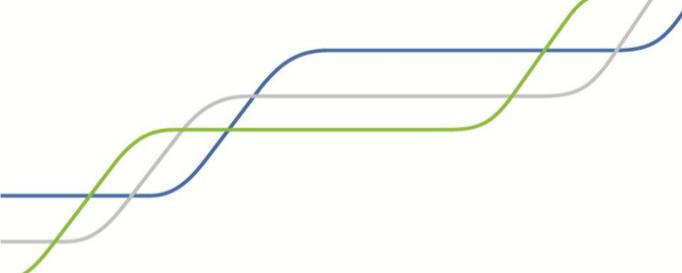
Interacting with peers aligns with two of the mathematics Common Core Practice Standards:

- [CCSS.Math.Practice.MP3](#) Construct viable arguments and critique the reasoning of others.
- [CCSS.Math.Practice.MP6](#) Attend to precision.

TEACHING STRATEGIES

When peers collaborate to discuss, read, and write about concepts, they can build their understanding of mathematical concepts and processes. However, your students need your help to learn how to use their peers as resources, as well as how to be a useful resource for their peers. See [UDL Checkpoint 8.3: Foster collaboration and communication](#).

One way to support your students is to give them various strategies and models to follow. This provides options for students who are less comfortable with some techniques. It also encourages students to think about how to interact in different



circumstances (e.g., one-on-one, as part of a group; or even, when agreeing or disagreeing).

In the “Fishbowl Discussion” activity, several students discuss a topic while others listen. If someone who is listening has something to add (or if you choose to have someone else step in), they replace one of the students in the discussion group before offering their opinion or suggestion. When a student says something, ask the class to respond. It is better to stay neutral (neither verifying nor correcting students) for as long as possible in order to give your students a chance to interact.

In the “Paired Verbal Fluency” activity, each student has a set number of seconds to talk, without interruption, while his or her partner listens. The students then switch roles so that the listener now has a chance to talk. They then switch back for a shorter time to give each other an opportunity to respond. Have students complete two or three rounds of this activity, taking turns in this way.

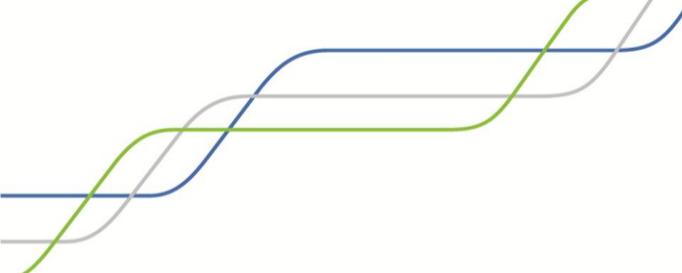


Students can make use of physical manipulatives or virtual tools to create alternative representations that support their ideas. For struggling students, being able to demonstrate what you are talking about is especially helpful. To further facilitate discussion, consider having students use digital communication methods, such as blogs, emails, and text messages. The video, [“Blogs and Wikis”](#), provides some concrete ideas about how to do this.

CLASSROOM EXAMPLE

Ms. Moore, a Grade 4 teacher, wants her students to be able to construct viable arguments and critique the reasoning of others ([CCSS.Math.MP3](#)). Her class includes a mix of visual, tactile, and numerical thinkers. At this point in the unit, her students have discussed equivalent fractions and have started working on adding fractions with like denominators. She finds that her students express their thinking about fractions in different ways.





She has identified a specific objective for the upcoming lesson: Students will discuss ways to decompose fractions, taking advantage of each student's different way of thinking to advance the understanding of their peers.

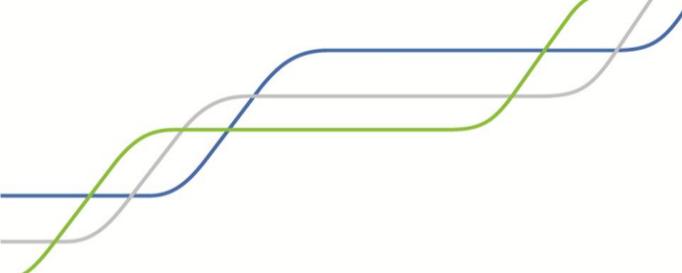
Ms. Moore uses her interactive whiteboard on a daily basis to communicate visually with the class, and to have them interact with numbers. She is planning to use a particular [virtual manipulative](#) to help students add fractions with like denominators and create different representations.

As her students engage in the lesson, she will assess their prior knowledge during the warm-up exercise using individual, student-held whiteboards. Having emphasized peer interaction, she will observe her students' discussions, as well as their strategies for completing the task.

Ms. Moore's lesson plan is outlined below. It is divided into three sections to show the steps she will take when she (1) launches the lesson, (2) conducts the learning task, and (3) brings the lesson to a close.

Lesson Plan

Launch	<ul style="list-style-type: none">• Begin the class with a warm-up exercise consisting of fraction addition problems using like denominators, using a virtual manipulative.  <ul style="list-style-type: none">• Explain the purpose of the lesson.• Discuss with students how to work on a math problem in a group.
Learning Task	<ul style="list-style-type: none">• Lead a class discussion about the different ways you can write a fraction as a sum of fractions with the same denominator.• Remind students that they can use manipulatives and applets if they want, and that everyone in the group should contribute.• Organize students into groups.



	<ul style="list-style-type: none">• Circulate as the groups work, providing prompts and feedback as needed.
Closure	<ul style="list-style-type: none">• Ask some groups to explain the strategies they used to find different combinations.• Invite feedback.

ONLINE TEACHER RESOURCES ON INTERACTING WITH PEERS

This article draws from the [PowerUpWHAT WORKS](#) website, particularly the [Interacting With Peers Instructional Strategy Guide](#). PowerUp is a free teacher-friendly website that requires no log-in or registration. The Instructional Strategy Guide on interacting with peers includes a brief overview that defines peer interaction and an accompanying slide show (see above); a list of the relevant mathematics Common Core State Standards; evidence-based teaching strategies to differentiate instruction using technology; short videos; and links to resources that will help you use technology to support peer interaction instruction. In addition, check out the section within the website on math formative assessment. If you are responsible for professional development, the [PD Support Materials](#) provide helpful ideas and materials for using the peer interaction resources. Want more information? See www.PowerUpWhatWorks.org.