

Using 2U1 to Develop an Equitable Math Learning Community

Equitable teaching and learning of mathematics can only proceed in an environment where students engage deeply with significant mathematical ideas, have opportunities to express their math thinking and listen to the thinking of others, and take responsibility for their learning. Discussions, Math Workshop, and partner work offer critical opportunities to develop and support an equitable math learning community. The information in this document offers guidance about how the first unit of *Investigations* can be used to promote equity in the mathematics classroom and to support the identity and agency of students who have been historically marginalized in mathematics, including Black, Latinx, emergent bilingual, and gender- and neurologically-diverse learners.

How Discussions Support Equity Whole-class discussions are an essential feature of the *Investigations* curriculum, one that provides students the opportunity to articulate their ideas and consider the ideas of others, develop mathematical language, and compare and connect ideas, representations, and solutions. However, “classrooms that are rich in mathematical discourse...are...high-risk for reproducing patterns of racism and marginalization.” (Ball, 2019, slide 11) Therefore, it is important to think about and plan for how to make participation in such discussions equitable, how to establish a “community in which students are prepared to listen actively and contribute ideas.” (See *Implementing Investigations in Grade 2*, p. 30.)

How Math Workshop Supports Equity Math Workshop is an important structure that provides an opportunity for individuals, pairs, or small groups to work on several activities, usually focused on similar mathematical content, over several sessions. It helps “students develop independence and learn to take responsibility for their own learning as they choose activities, keep track of their work, use and take care of classroom materials, and work with others.” (*Implementing Investigations in Grade 2*, p. 36) Sometimes, some students are not afforded the opportunity to participate in Math Workshop because they are not perceived as ready to make their own choices, to work independently, or to work productively with a partner. An equitable math learning community provides support for all students to engage fully in Math Workshop.

How Partner Work Supports Equity A strong collaborative mathematics community gives students the opportunity to work together to solve problems, to learn from each other, to support and encourage others, and to be supported and encouraged by others in their growth as math learners. Throughout *Investigations* students work in partnerships as they engage in activities, play games, and discuss their work and ideas. Understanding what it means to “be a good partner” and how to make space for each person’s ideas, is an important part of an equitable learning community.

<p>Before School Starts</p>	<p>Planning for Discussions Consider how discussions will work in your class, in ways that support students’ development of a positive identity and equitable participation of the students in the class. There should be options of different ways to participate, an appreciation for taking risks, and an acceptance and celebration of difference. Use the page about Whole-Class Discussions (p. 30 of <i>Implementing Investigations in Grade 2</i>) to help you consider:</p> <ul style="list-style-type: none"> • how to organize the physical space so students can participate as both a contributor and a listener. • how students will indicate they would like to share a thought, build on an idea, or ask a question of or disagree with a classmate - in ways that are respectful of all learners. • how to communicate the power of mistakes as opportunities to learn and the importance of disagreeing respectfully • how and when you will use targeted facilitation moves (such as turn and talk or repeating/rephrasing) to support students’ participation and listening to others. • how you will support students who are reluctant to participate, before and during a discussion • how you will support students in listening carefully to each other • how to engage students in working together with you to achieve equitable participation. <p>Planning for Math Workshop Decide how Math Workshop will operate as an equitable structure, in ways that encourage perseverance, decision-making, agency, responsibility, and accountability.</p> <ul style="list-style-type: none"> • When and how will students make choices about which activity to work on, with what tools, and for how long? They might also be making choices about where to work and with whom. • How will activities be organized? How will the materials be made available? • How will students know what the activities are, where they can work, with whom, what’s expected and required, etc.? • How will students (and you) keep track of their choices? Of their work? <p>(See pp. 36-39 of <i>Implementing Investigations in Grade 2</i>.)</p>
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	<p>Planning for Partner Work Students work in partnerships as they do activities, play games, and discuss their work and ideas. Think about how to create equitable partnerships that support each student’s identity as a math learner. Consider:</p> <ul style="list-style-type: none"> • how to establish partners. Will you consider students’ math, social, language, and other needs? Will you assign partners randomly? Will students select their own partners? Will the method of choosing partners vary depending on the activity? • how often to change partnerships. Will students work together throughout a unit? for several sessions? for individual activities? • how to engage students in conversations about what it means to be a good partner, how to ask for and give help, and what a balanced partnership looks and sounds like. • whether you will use “Turn & Talk” as a structure during whole class discussions. If so, think about who students will talk to (e.g. a designated math partner, the person sitting to the right or across from them), how partners will take turns sharing their ideas, and how you will signal to bring them back together. • how to talk with students about expectations about listening to and responding to each other’s ideas.
<p>Session 1.1 4 Discussion, p. 29 <i>Today’s Number with 10 Cubes</i></p>	<p>Discussions Have a conversation about participation in whole class discussions, and your goal of having everyone contribute. Share decisions you have made about how discussions will be structured (how students can sit, show they would like to share a thought, respond to others). Ask students to share ideas about how to make discussions good learning opportunities for everyone.</p>
<p>Session 1.2 2 Math Workshop, p. 34 <i>Counting Cubes and Pattern Blocks</i></p>	<p>Math Workshop Introduce Math Workshop by communicating the decisions you’ve made about how this structure will work in your classroom. Talk with students about the purpose of and your expectations for Math Workshop.</p>
<p>Session 1.2 3 Discussion, p. 37 <i>Establishing a Mathematics Community</i></p>	<p>Math Workshop Take time to reflect together as a class about how Math Workshop went, including what worked and didn’t. Address any questions about where to get tools, how to move between activities, etc.</p>

Session 1.5 2 Activity, p. 56 <i>Do We Have 100?</i>	Partner Work Students work with a partner on this activity. Ask students to generate a list of things good partners do when working together (e.g. take turns, share materials, listen to each other’s ideas). Discuss one aspect of partner work together. It is likely that students work in pairs in other subject areas; find opportunities to discuss other aspects throughout the day and over time.
Session 1.5 3 Math Workshop, p. 49 <i>Counting and Coins</i>	Math Workshop Ask students to reflect on their experiences working with a partner during Math Workshop. Below are some examples of questions to pose to students (in writing, using emojis, via video – to keep students’ thoughts, which might include comments about individual children – private): <ul style="list-style-type: none"> • What do you like or dislike about working with a partner during Math Workshop? • What can make working with a partner hard? • What helps you work well with a partner? Use students’ feedback to inform a discussion that focuses on ways students can support and encourage each other as learners when working in partnerships.
Session 1.6 1 Discussion, p. 63 <i>Strategies for Counting Accurately</i>	Partner Work Explain that in this discussion, students will have opportunities to turn and talk to a neighbor about an idea or question. Explain how they will partner, and what’s expected of them during such a conversation. Afterwards, reflect briefly on how students felt the turn and talk went.
Session 2.2 1 Activity, p. 83 <i>Introducing Five-in-a-Row with Four Cards</i>	Partner Work In preparation for playing the Five-in-a-Row with 4 Cards game together, ask students: <ul style="list-style-type: none"> • How will you and your partner decide who will go first? • When one partner is taking their turn, what should the other person be doing? • If your partner is stuck and asks for help, how can you give them a helpful clue without telling them the answer?
Session 2.3 3 Discussion, p. 98 <i>Does Order Matter?</i>	Discussions At the beginning of the discussion, explain that students will have an opportunity to share ideas, listen to the ideas of others, and respond to other people’s ideas. Ask: <ul style="list-style-type: none"> • How can you show that you are listening to other peoples’ ideas? • How can you respond to someone else’s idea? (ask a question, add on, agree, disagree) How can you disagree in a respectful way? • How can you invite people into the conversation? Make room for others to contribute? Are you aware of how often you are speaking?

<p>Session 2.6 3 Discussion, p. 116 <i>Strategies for Subtracting</i></p>	<p>Discussions Now that students have participated in several discussions, have a conversation about what helps them participate. Ask questions such as:</p> <ul style="list-style-type: none"> • What helps you listen when a classmate is sharing? • What might help you share your ideas or work? What doesn't help? • How can we as a community support each other during discussions? <p>If you notice that some students are not speaking, find time for an individual conversation with them to better understand how you and others can support them during discussions. Also, consider creating an Exit Card with one or two questions that all students can respond to individually</p>
<p>Session 2.7 2 Math Workshop, p. 121 <i>Adding and Subtracting Single Digit Numbers</i></p>	<p>Math Workshop Expand the focus of conversations about Math Workshop to include issues of equity. For example, ask students to respond (in writing, using emojis, via video) to questions like:</p> <ul style="list-style-type: none"> • How did it go with your partner today? • Were you a “good” partner? (e.g. taking turns, listening, asking questions, helping without doing the work) • Did you do your own thinking? Did you listen to your partner’s thinking? • Did you share your thoughts? Did you make room for others to share? <p>You might follow up with a whole-class discussion about what you noticed in their responses.</p>
<p>Before you begin Investigation 3 of Unit 1</p>	<p>Math Workshop Now that Math Workshop has been up and running for several weeks, pause to reflect on whether/how it is meeting the goals of this structure.</p> <ul style="list-style-type: none"> • Are students making choices? (About which activity to work on, with what tools, and for how long? They might also be making choices about where to work and with whom.) Are all students getting to make choices? (Or, are some students repeatedly spending MW in a small group with the teacher?) • Are students working with increasing independence and responsibility? Do all students have the opportunity to get started, to make sense, and to persevere without interruption from an adult? Are they taking of materials appropriately? Completing and keeping track of their work?
<p>Session 3.1 4 Discussion, p. 143 <i>Strategies for Enough for the Class?</i></p>	<p>Discussions At the end of the discussion, ask students:</p> <ul style="list-style-type: none"> • What was helpful about listening to others’ ideas? • What would help you feel comfortable sharing your work/ideas in a future discussion? • What might make help you share an idea you’re not sure of yet?

Session 3.3 1 Activity, p. 152 <i>Introducing Collect 50 Cents</i>	<p>Partner Work As you introduce the new game, <i>Collect 50 Cents</i>, gather students’ ideas about how they will listen and respond when it is their partner’s turn to determine their answer.</p> <ul style="list-style-type: none"> • What will you be doing when it is your partner’s turn? • How will your partner know you are really listening to them? • What if you disagree with your partner’s answer? What are some things you could say?
Session 3.5 2 Activity, p. 168 <i>Grouping by 2s, 5s, and 10s</i>	<p>Partner Work Spend a few minutes discussing how partners worked together.</p> <ul style="list-style-type: none"> • What helped you work cooperatively with your partner? What difficulties did you have to work out together? • How did you manage your time? How did you complete the math work you needed to get to?
Session 3.7 2 Math Workshop, p. 180 <i>Tens and Ones</i>	<p>Math Workshop Gather information about students’ experience with Math Workshop and use it to inform a discussion about what could make it work better for everyone. Ask students to respond (in writing, using emojis, via video) to questions like:</p> <ul style="list-style-type: none"> • What do you like or dislike about Math Workshop? Why? • Do you prefer working alone, with a partner, or a small group during Math Workshop? Why? • What is challenging about Math Workshop? <p>You might follow up with individuals, have a conversation with small group, or have a whole-class discussion about what you noticed in their responses.</p>
Session 4.1 3 Activity, p. 194 <i>Observing the Students at Work</i> <i>How Many Children?</i>	<p>Discussions As you observe students at work on Student Activity Book pages 68-69, you’ll be looking for different strategies to share in the end-of-session discussion. Use this as an opportunity to support students who do not share often in the whole group. Let each student know why you would like them to share their work and ask them if they would like to “rehearse” with you beforehand. If students are hesitant, you can share their work or do it together.</p>
Session 4.2 4 Discussion, p. 204 <i>Strategies for Subtracting</i>	<p>Discussions At the end of the discussion, explain that you asked these students to share because they used different approaches, and that you want to give everyone in the class an opportunity to explain their work and thinking over time. Consider asking:</p> <ul style="list-style-type: none"> • What was it like for you to share your work today? • How did rehearsing ahead of time help you? (for students who did) <p>Let students know that you will be finding ways to support each of them in sharing their work and ideas with the class.</p>

<p>Session 4.3 3 Activity, p. 209 <i>How Many Rocks and Marbles?</i></p>	<p>Discussions The discussion at the end of this session includes opportunities for several students to share their solutions. As you observe this activity, consider asking students who have not yet shared in a discussion, or those who may not be viewed as having status in the math community, to share their solution.</p>
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As you leave Unit 1, the work of co-creating an equitable math learning community is not over. The curriculum will continue to suggest opportunities to check in on various aspects of norms in your classroom, and the questions above can be helpful tools for ongoing conversations with your students. You can also use these questions to keep equity at the forefront of your mind, as you reflect on how your class is functioning as an equitable learning community:

- What chances do students have for productive struggle? Do *all* students have opportunities to persevere?
- Where do students have opportunities to make choices? Is this true for *all* students?
- Whose voices am I hearing? Whose work is being shared and discussed? Whose ideas are not present in math discussions?
- How are partners working together? Are students aware of/trying to be a good partner?