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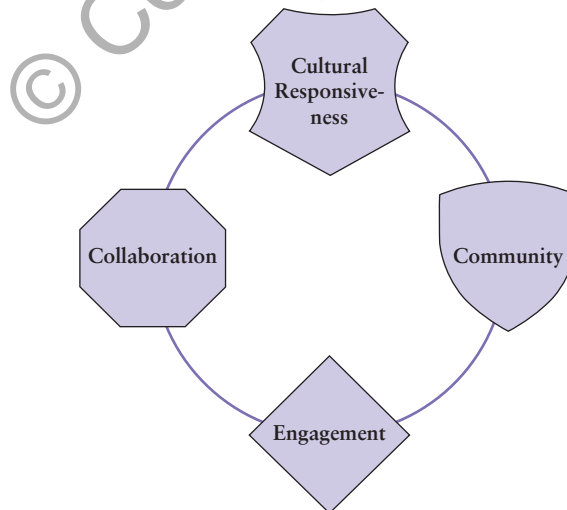
ENVISIONING THE IDEAL MATHEMATICAL ENVIRONMENT FOR TMSJ

In the previous two chapters, we asked you to look closely at yourself and learn about the children in your classroom. The work of TMSJ starts with oneself. Now, it's time to consider the ideal mathematical environment for TMSJ. This will require you to reflect on your classroom and its culture to determine actions you will take to create a space that encourages equal participation and where all your children are safe socially, emotionally, and academically. Figure 4.1 shows the cornerstones that form the foundation for TMSJ, grounded in an equitable and engaging mathematical environment:

- ▶ cultural responsiveness
- ▶ community
- ▶ collaboration
- ▶ engagement

In Chapter 4, we focus on the first three cornerstones and will continue with engagement in Chapter 5.

Figure 4.1 Cornerstones of the TMSJ Mathematical Environment



Each of us engaged in mathematics experiences while growing up. Some of us loved the experience while others disliked it. However, the experience shaped each of us as mathematics educators. Many of us experienced mathematics mostly through the assimilationist environment. An assimilationist environment is one that requires children to learn mathematics through the Eurocentric lens of the dominant North American culture—one that centers

white-identifying people and the white experience and asks children to *assimilate* to that perspective. In this environment, instruction focuses primarily on ancient Greek and European mathematical precepts, generally references white mathematicians as the originators and arbiters of mathematics, and relies heavily on direct instruction, rote memorization, and mimicking. In this environment, our teacher would demonstrate how to solve a mathematical problem, which we would then replicate, and then we practiced independently—also known as “I Do, We Do, You Do.” For much of the last three decades, this was a common—if not predominant—pedagogical approach in schools. It had less of a focus on contextualized or situational problem-solving designed to build and demonstrate thinking and more of a focus on procedural tasks that children were expected to replicate over and over for practice and then replicate again on a test to demonstrate proficiency.

One drawback of teaching mathematics through an assimilationist lens is that it robs children of seeing themselves and their loved ones in the mathematics. It neutralizes the subject into a stark and limited narrative of how numbers work together—and who figured that out—but it does little to help children understand how mathematics relates to and is applicable to their lives. This is one of the goals of TMSJ.

Before discussing the ideal TMSJ mathematical environment, we invite you to reflect on the kind of classroom experience you had as a child or know of from your professional experience.

Now, let’s look at the first of the four cornerstones of the ideal environment for TMSJ: cultural responsiveness.



TRY THIS: REFLECTING ON YOUR EXPERIENCE

Take a moment to reflect on how mathematics learning is structured in your classroom, your building, or your district. Is this structure similar to or different from your experience as a student? Explain.

As you compare and contrast your school experience with your current environment, consider whether your current environment is what you imagined it would be. What do you love about it? What would you like to change?

Cultural Responsiveness

As defined in Chapter 1, culturally responsive teaching focuses on centering children’s cultural identity in the mathematics experience (Gay, 2002). Using this definition as a foundation, we are positing a concept of culturally responsive mathematics environments in which mathematics instruction is shaped around the unique thinking, knowledge, and problem-solving skills of diverse groups of children. In addition, as described in Chapter 1, this is a constructivist approach in which teachers encourage learning through engagement and exploration, and it reflects the diverse cultural backgrounds children bring to the classroom. Chapter 3 stressed the importance of learning about your children, which is a necessary step if you are to create a culturally responsive environment. Table 4.1 highlights select elements of cultural responsiveness, based on Gay’s (2002) culturally relevant instruction, that should be prominent for TMSJ. We also describe what it looks like in the mathematics classroom.

Table 4.1 Elements of Cultural Responsiveness

Element	What It Looks Like in the Mathematics Classroom
Positive perspectives on families	Educators view families through an asset-based lens, always believing that families are giving their best effort.
Learning within the context of culture	When engaging children in mathematics tasks, educators seek ways to authentically integrate components of children's respective cultures.
Student-centered instruction	Educators consistently seek ways to focus on children throughout the lesson, acting as a facilitator of building knowledge rather than a bearer of all knowledge to be delivered.
Culturally mediated instruction	Educators incorporate diverse ways of knowing, understanding, and representing information.
Reshaping the curriculum	Educators consider ways to decenter whiteness in the curriculum experience, ways to incorporate the lived experiences of all children, and ways to allow them to showcase their thinking.

Source: Adapted from Gay (2018).

As you consider which elements need to be elevated in your classroom, we remind you to focus your attention on your children so that you can create an environment that is not just a space for learning mathematics but also a safe and supportive community.

Community

The second cornerstone, community, involves creating a space in which all children can “make sense of their and others’ lived experiences and understand their and others’ agency” (Conway et al., 2022). Community begins with using an understanding of your children’s identities to shape classroom values and commitments. This understanding also guides your selection of instructional practices that are student centered and student focused, to foster a sense of belonging in which all children are seen, heard, cared for, and valued as creative thinkers and doers of mathematics. There are two components to building community: values and commitments.

BEGIN WITH CLASSROOM VALUES

As you establish classroom values, consider focusing on those that have the potential to deepen your children’s understanding of the social justice domains (identity, diversity, justice, and action) as well as develop their social, emotional, and cognitive skills and competencies. In Table 4.2, we integrate several social justice outcomes (Learning for Justice, 2016) with selected competencies from the Collaborative for Academic, Social and Emotional Learning (CASEL) Framework.

Community begins with using an understanding of your children's identities to shape classroom values and commitments.

Table 4.2 How Social-Emotional Competencies and Social Justice Outcomes Shape Mathematics Classroom Values

Social-Emotional Competency	Social Justice Outcomes in the Context of Mathematics Teaching and Learning
<p>Self-awareness: The ability to understand one's own emotions, thoughts, and values and how they influence behavior in different contexts.</p>	<p><i>I-1. Students will develop positive social identities based on their membership in multiple groups in society.</i></p> <p>Teachers recenter identities, perspectives, and knowledge traditions that have often been silenced.</p> <p>Children recognize that people's multiple identities interact and create unique and complex individuals that contribute to their learning of mathematics.</p> <p><i>D-6. Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.</i></p> <p>Teachers design and implement a curriculum that honors diversity in mathematical reasoning, sensemaking, and multiple forms of engagement to promote individual and collective learning.</p> <p>Children express comfort in working with and learning from people who are both similar to and different from them and engage respectfully in collaborative work and discussion.</p>
<p>Social awareness: The ability to understand the perspectives of and empathize with others, including those from diverse backgrounds, cultures, and contexts.</p>	<p><i>I-2. Students will develop language and historical and cultural knowledge that affirm and accurately describe their membership in multiple identity groups.</i></p> <p>Teachers attend to and honor students' multiple social identities in curricular design and its implementation.</p> <p>Children develop language and historical and cultural knowledge to affirm and describe their membership in multiple identity groups and their contributions to mathematics.</p> <p><i>D-8. Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.</i></p> <p>Teachers create multidimensional classrooms, raising students' expectations for contributions from each and every child.</p> <p>Children express curiosity about the mathematical contributions and experiences of others and exchange ideas and perspectives in an open-minded way.</p>
<p>Relationship skills: The ability to establish and maintain healthy and supportive relationships and to effectively navigate settings with diverse individuals and groups.</p>	<p><i>I-4. Students will express pride, confidence, and healthy self-esteem without denying the value and dignity of other people.</i></p> <p>Teachers view students as competent mathematical beings whose lived experiences and community and cultural ways of knowing are leveraged during mathematics instruction.</p> <p>Children express self-love, pride, confidence, and healthy self-esteem about themselves and their community as mathematical thinkers and learners.</p> <p><i>D-9. Students will respond to diversity by building empathy, respect, understanding, and connection.</i></p> <p>Teachers deconstruct stereotypes about students' mathematical identities and who can and cannot do mathematics.</p> <p>Children respond to diversity by building respect, understanding, connections, and empathy for different ways of knowing and being in mathematics classrooms.</p>

Sources: SEL directly from CASEL (n.d.); SJ Outcomes from Teaching Tolerance (2016); Context from Bartell, et al. (2022) and Koestler et al. (2022). For additional guidance on social-emotional and academic development, visit Stride 3: Creating Conditions to Thrive (<https://equitablemath.org>) and Integrating Social, Emotional and Academic Development (SEAD): An Action Guide for School Leadership Teams (<https://www.aspeninstitute.org/publications/integrating-social-emotional-and-academic-development-sead-an-action-guide-for-school-leadership-teams>).

CLASSROOM COMMITMENTS BRING VALUES TO LIFE

Classroom values set the stage for you to now work with your children to develop classroom commitments. More than rules for classroom management, classroom commitments require buy-in from students and are the norms that help establish an environment where children can be themselves and learn from their classmates. Commitments should

- ▶ evolve from the classroom values and emphasize interactions between all individuals (teacher-child, child-child, child-other educators/adults) so that everyone can feel safe to actively participate in the mathematics classroom;
- ▶ establish norms that foster a sense of belonging, welcome multiple perspectives, and encourages diverse views;
- ▶ be co-created, reviewed, and revised in an appropriate manner based on your children’s ages.

Table 4.3 provides considerations for these three commitment areas and ways they may show up in the mathematics classroom.

Table 4.3 Social Justice at the Center of Mathematics Classroom Community Commitments

Commitments Should	Social Justice Standards in the Context of Mathematics Teaching and Learning
<p>Emphasize Interactions</p> <ul style="list-style-type: none"> • Model respectful ways of listening, questioning, and valuing each other’s mathematical ideas. • Set expectations for sharing solutions and asking questions. • Be mindful of the ways all individuals respond to each other. • Provide guidelines for listening and question stems for children to use when critiquing the reasoning of others. 	<p><i>J-11. Students will recognize stereotypes and relate to people as individuals rather than representatives of groups.</i></p> <p>Teachers locate causes of inequalities in social conditions (e.g., tracking, ability grouping, Eurocentric curriculum) rather than believe conditions are inherent within individuals. Teachers provide students with opportunities to use mathematics to explore these causes.</p> <p>Students recognize stereotypes and pervasive myths around what mathematics is and what it means to know and be good at mathematics.</p>
<p>Foster Belonging</p> <ul style="list-style-type: none"> • Ensure accurate pronunciation of children’s names and use of preferred pronouns. • Have a list of expectations for learning in mathematics class created by children. • Ensure mathematical discourse begins with acknowledging each voice. • Monitor adult-child and child-child interactions and address microaggressions. • Have children generate a list of expectations that can help them be successful. 	<p><i>J-14. Students will recognize that power and privilege influence relationships on interpersonal, intergroup, and institutional levels and consider how they have been affected by those dynamics.</i></p> <p>Teachers explicitly shift the power dynamic between children-teacher and children-children by centering identities, perspectives, and knowledge traditions that have often been silenced.</p> <p>Students recognize that power and privilege influence relationships on interpersonal, intergroup, and institutional levels and consider how they have been affected by those dynamics in their mathematics learning experiences and in the world.</p>
<p>Be Co-Created</p> <ul style="list-style-type: none"> • Present a set of norms and gather feedback to adjust. • Provide processing time and revisit norms. 	<p><i>A-17. Students will recognize their own responsibility to stand up to exclusion, prejudice, and injustice.</i></p> <p>Teachers provide students with a consistent opportunity to recognize their own responsibility to stand up to exclusion, prejudice, and injustice.</p> <p>Students plan and carry out collective action using mathematics as a tool to address injustice in the world.</p>

Sources: Teaching for Tolerance (2016); Bartell et al. (2022); Koestler et al. (2022).