



## Leveraging Multiple Mathematical Competencies

Leveraging multiple mathematical competencies has been associated with improved learning outcomes for students across various demographic groups. (the iris center, 2017) research suggests that students are more engaged and motivated in mathematics when their diverse mathematical competencies are recognized and valued (guy et al., 2015).

### The 5 Equity-Based Practices

1. Going Deep With Mathematics
  2. **Leveraging Multiple Mathematical Competencies**
  3. Affirming Learners' Mathematical Identities
  4. Challenging Spaces of Marginality
  5. Drawing on Multiple Resources of Knowledge
- Aguirre, et al, 2013



#### The "How!"

Teachers leverage multiple mathematical competencies by recognizing and valuing the diverse mathematical strengths and assets

of all students, where educators can create a learning environment that honors students' identities, fosters a sense of belonging, and maximizes learning opportunities for every learner. By also providing tasks that challenge students at various levels and avoiding restrictive tracking practices and deficit labels, educators can create an equitable learning environment where every student has the opportunity to flourish in mathematics.



#### What Does This Look Like?

- Avoid labeling students in deficit ways, position each student as mathematically competent. Look for multiple ways that students demonstrate their knowledge, such as through the use of language, gestures, pictures, physical models, and concrete objects.
- Employ pedagogical strategies that encourage student collaboration, critical thinking, and mathematical communication.

- Present tasks that offer multiple entry points, allowing students with varying skills, knowledge, and levels of confidence to engage with the problem and make valuable contributions.
- Integrate students' cultural and personal identities into curricular materials, instructional routines, and math talk.
- [Leveraging Multiple Math Competencies Quick Look](#)

#### Planning with Your PLC

##### Questions to Consider:

- What are some common labels applied to students and how does this negatively impact your interactions with them?
- How can we avoid unfairly labeling students or perpetuating stereotypes?
- What practices do you use to draw on all students' mathematical assets, including personal and cultural?
- How can we collaborate with colleagues, parents, and students themselves to ensure they see themselves as valued in math class?



***Students bring assets into the learning environment that should be valued and capitalized on in the design of learning opportunities.***

—Dr. H. Richard Milner IV

***A child in an environment where they feel loved and safe will choose to leave their comfort zone.***

—Dr. Bruce Perry, neurologist



## Leveraging Multiple Mathematical Competencies



**We assume that grades are a measure of mathematical promise. Grades are a measure of progress, but not a measure of promise. It is easy to make assumptions about why people aren't performing mathematically, based upon our own experiential vantage point.**

–Francis Su, (Mathematics for Human Flourishing, 2020)



### How Leveraging Competencies in Math is Connected to Equity

*Implementing this equity-based math practice has been shown to reduce achievement gaps and promote equity in mathematics education. By creating a classroom environment that celebrates diversity and honors students' varied mathematical strengths, educators can foster a sense of belonging and empowerment among all learners.*

Leveraging multiple mathematical competencies is essential for promoting equity, inclusion, and academic success in 6-8 mathematics education. At the classroom level, by recognizing and valuing the **diverse mathematical strengths** and abilities of all students, educators can create a learning environment that honors students' identities, fosters a sense of belonging, and maximizes learning opportunities for every learner. Inequities in the mathematics classroom occur when the teacher views students as having deficits and/or gaps in knowledge and lowers expectations by providing less challenging, rigorous tasks. An **equity-minded** teacher sees each student through an **asset lens**, assuming they are mathematically competent and adjusts instruction to leverage their abilities without lowering expectations or content standards.

Students are often positioned as **low or high status** in the mathematics classroom by both the teacher and their peers due to their race, gender, neurodiversity, and fluency with the English language. Students who are assigned high or low statuses in mathematics tend to fulfill those expectations by achieving at a high or low rate, respectively. These **hierarchies of assumed competence**, which are formed in our classrooms, can greatly affect access, participation, and learning (Cohen and Lotan 1997). Leveraging mathematical competencies means assigning each and every student mathematical competence and engaging them in cognitively demanding tasks that draw from their community and cultural experiences. By ensuring all students have **access** to high-quality mathematics education and supporting them in developing mathematical understanding, educators can provide equitable opportunities for educational and career advancement, regardless of socio-economic backgrounds.

### Tasks that Can Be Used to Leverage Multiple Competencies in Mathematics



- Middle School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice (Conway, et al., 2023)
- NCTM Social Justice and Equity Resources @ <https://www.nctm.org/socialjustice/>
- The Labeling Game found at <https://valleyfamilyfun.ca/the-label-game/>
- [TODOS-Math.org](https://www.todos-math.org)

### Want to Learn More?



[\*The Impact of Identity in K-8 Mathematics: Rethinking Equity-Based Practices\*](#) (Aguirre et al., 2013).

Guy, G. M., Cornick, J., & Beckford, I. (2015). More than Math: On the Affective Domain in Developmental Mathematics. *International Journal for the Scholarship of Teaching and Learning*, 9 (2). Retrieved from <https://files.eric.ed.gov/fulltext/EJ1134636.pdf>

The IRIS Center. (2017). *High-quality mathematics instruction: What teachers should know*. Retrieved from <https://iris.peabody.vanderbilt.edu/module/math/>

Cohen, E. and Lotan, R. (1997). *Working for equity in heterogeneous classrooms*. Teachers College Press.

Turner, et al. (2016). Learning to leverage children's multiple mathematical knowledge bases in mathematics instruction. *Journal of Urban Mathematics Education*, 9(1), 48-78.

Teachers and schools should resist tracking students based on their labels. Instead of grouping students into categories such as "high" or "low" achievers, or segregating them within classes based on their abilities, educators should aim to provide tasks that allow all students to engage meaningfully with mathematics.

Adapted from: Aguirre, J., Mayfield-Ingram, K., & Bernard Martin, D. (2013). *The Impact of Identity in K-8 Mathematics*. NCTM. <https://www.nctm.org/Store/Products/The-Impact-of-Identity-in-K-8-Mathematics-Rethinking-Equity-Based-Practices>