Big Idea 1: Beliefs and Mindsets

NCSM is a mathematics education leadership organization that equips and empowers a diverse education community to engage in leadership that supports, sustains, and inspires high quality mathematics teaching and learning every day for each and every learner. (NCSM Mission Statement, 2017)

We need to nurture and empower a culture of productive professionalism in order to achieve the NCSM mission and vision. We must be ready to challenge our own thinking, including our own beliefs, expectations, and habits, and those of others in order to ensure "high quality mathematics teaching and learning every day for each and every learner." We need to develop, encourage, and embrace a growth mindset for ourselves, our colleagues, and the communities we serve. A growth mindset is a place that is open for revision and new thinking (Boaler, 2015; Dweck, 2016). It allows us to take risks and to develop our own bold leadership.

In this section, we will examine how attending to our mindset can contribute to empowering and nurturing a culture of productive professionalism. At the beginning of this chapter, you met three Algebra 1 teachers who decided to analyze student work samples in order to improve their teaching (Figure 3.2). These teachers developed a working theory of action that if they could collaborate, analyze data, and reflect on its implications, that they could improve their collective teaching and thus improve student achievement. A set of common beliefs and assumptions creates a mindset through which leaders, and the teachers who they support, view their work. A productive mindset is an essential part of empowering a culture of productive professionalism.

The Importance of Beliefs and Mindset

Essential Action

Ensure assumptions, beliefs, expectations, and habits are examined in order to shape the school or department culture around teaching and learning of mathematics.

We have read the fairy tales and seen the movies where the evil queen or the beautiful princess looks in a mirror to see what really exists. Similarly, a mindset that leads to the empowerment of a culture of productive professionalism starts with looking in a "mirror" so that we can see what initially exists regarding our own beliefs and attitudes. Effective mathematics leaders engage in a commitment to self when they work with those in their immediate sphere of influence to examine their own assumptions, beliefs, expectations, and habits in order to determine how likely they are to nurture productive professionalism. There are two key factors that mathematics leaders will employ as we empower a productive culture: bold leadership that helps teachers to challenge their existing assumptions and beliefs, as well as an examination of personal mathematical identities.

Bold Leadership Challenges Its Own Assumptions and Beliefs

NCSM President Connie Schrock (2017–2019) said, "I believe there is much we must do to support the teachers that we lead. Bold leadership goes beyond a typical job description" (NCSM, 2019d, p. 1). Lambert (2002) asserts that when teachers' beliefs change, they view their instructional practice in new ways. She goes on to suggest that the work of leaders is to engage teachers in sustained conversations about teaching and learning mathematics.

Mathematics leaders are responsible for creating opportunities and conversations that challenge teacher beliefs. We bring out the mirror! These conversations are part of the ongoing, regular dialogue between the leader and teacher, both informally and formally. Ignoring the power of beliefs and mindset or missing opportunities to shift beliefs and mindsets undermines the likelihood of change and improvement (NCSM, 2014b, p. 14).

Consider this quote from Dr. Brené Brown (2018):

> *I want to live in a world with braver, bolder leaders... we desperately need more leaders who are committed to courageous, wholehearted leadership and who are self-aware enough to lead from their hearts, rather than unevolved leaders who lead from hurt and fear.* (p. 4)

"I believe there is much we must do to support the teachers that we lead. Bold leadership goes beyond a typical job description."

— Connie Schrock, NCSM President (2017–2019)

How are you committed to lead with courage when it comes to engaging in critical conversations? A study by the Green Peak Partners and Cornell School of Industrial and Labour Relations (Flaum, 2010) found self-awareness to be the strongest predictor of overall success of leaders. The researchers found that leaders who were self-aware were stronger leaders. The leaders inspired trust, were able to set high expectations, and used strong relational skills and respect to support meeting the expectations. Self-awareness begins with asking yourself the hard questions. Consider the following questions:

- Do I have low expectations for certain populations?
- Do my teachers integrate social-emotional learning competencies into their mathematics instruction?
- Do all students have access to challenging mathematical courses?
- Are we reproducing patterns of privilege and disadvantage in our classrooms by being a gatekeeper of mathematics? (Noguera, 2018)

Have a courageous conversation with yourself first so you can have them with your teachers and leaders that you serve.

"Daring leaders who live into their values are never silent about hard things...Living into our values means that we do more than profess our values, we practice them."

— Dr. Brené Brown

Overcoming the inequities in mathematics education is an ongoing challenge and critical if we are going to live our values. "Daring leaders who live into their values are never silent about hard things...Living into our values means that we do more than profess our values, we practice them. We walk our talk—we are clear about what we believe and hold important, and we take care that our intentions, words, thoughts, and behaviors align with those beliefs" (Brown, 2018, pp. 184, 186). Instantiate Dr. Brown's advice about living into your values by being bold. Ensure examination of assumptions, beliefs, expectations, and habits in order to shape the school's or department's culture around teaching and learning of mathematics.

To boldly examine your current assumptions, beliefs, expectations, and habits and access and equity in mathematics, use the tool in Figure 3.4.

To what degree do you agree or disagree with these statements in the context of your school?

Agree				Disagree
1	2	3	4	5

1. Mathematics ability is a function of opportunity, experience, and effort—not of innate intelligence. Mathematics teaching and learning cultivate mathematics abilities. All students are capable of participating and achieving in mathematics, and all deserve support to achieve at the highest levels.
2. Equity is attained when students receive the differentiated supports (for example, time, instruction, curricular materials, programs) necessary to ensure that all students are mathematically successful.
3. Equity—ensuring that all students have access to high-quality curriculum, instruction, and the supports that they need to be successful—applies to all settings.
4. Students who are not fluent in English can learn the language of mathematics at grade level or beyond at the same time that they are learning English when appropriate instructional strategies are used.
5. Effective mathematics instruction leverages students' culture, conditions, and language to support and enhance mathematics learning.
6. Effective teaching practices (for example, engaging students with challenging tasks, discourse, and open-ended problem solving) have the potential to open up greater opportunities for higher-order thinking and for raising the mathematics achievement of all students, including poor and low-income students.
7. The practice of isolating low-achieving students in low-level or slower-paced mathematics groups should be eliminated.
8. All students are capable of making sense of and persevering in solving challenging mathematics problems and should be expected to do so. Many more students, regardless of gender, ethnicity, and socioeconomic status, need to be given the support, confidence, and opportunities to reach much higher levels of mathematical success and interest.

Figure 3.4. Productive Beliefs About Access and Equity in Mathematics Tool
Source: NCTM (2014a, pp. 63–64).

Visit www.mathedleadership.org/EAresources to download a free reproducible version of this figure.

Audre Lorde once said, "When I dare to be powerful, to use my strength in the service of my vision, then it becomes less and less important whether I am afraid." Bold leadership requires strength in the service of your vision. Your vision becomes more clear as you examine your personal mathematics identity.

Personal Mathematics Identity

As mathematics leaders build collective capacity, we are constructing our identities as mathematicians and leaders. As we develop meaning of mathematics leadership, we are also developing a knowledge of how to serve others. Our personal identities allow for bold leadership that embraces learning with courage, taking risks, and having a sense of possibilities. Our personal identity is forming through reflective interactions with others (Lambert, 1995).

Mathematics identity is defined as the dispositions and deeply held beliefs that students develop about their ability to participate and perform effectively in mathematical contexts (Aguirre, Martin, & Mayfield-Ingram, 2013). Teachers, peers, and parents can all exert an influence on the mathematics identities that students develop. A key consideration about mathematics identities is that they are strongly connected with the other identities that students construct and view as important in their lives, including their racial, gender, language, cultural, ethnic, family, faith, and academic identities (Aguirre et al., 2013).

Sami Briceño (2018) advises to be mindful of mindset messages you and your students communicate to yourselves and each other. Words have power. Are the words used as a vehicle to empower students or belittle them? All educators must reflectively ask themselves, "How have I influenced the mathematical identities of my students?" Reflection is the key to honing an educator's craft.

Use questions like the ones shown in Figure 3.5 to guide a reflection on mathematical identities.

Reflective Question	Response
What range of mathematics identities are expressed and performed by your students?	
What actions do you take to positively affirm your students' mathematical identities?	
What are some of the various identities that your students express and perform through the stories that they narrate in your mathematics classroom?	
How do you model positive mathematical agency and provide opportunities for students to demonstrate this?	
What additional family roles do your students take on that might contribute to their positive development in mathematics?	

Figure 3.5. Reflective Questions for Mathematical Identities

Visit www.mathedleadership.org/EAresources to download a free reproducible version of this figure.

Bold leaders build their capacity to sharpen the mathematical lens through an active engagement in ongoing professional learning. Bold leaders attend conferences, webinars, and online classes; participate in district/regional/provincial professional development; visit other schools; observe colleagues; collaborate with a mathematics mentor principal; join the mathematics community on Twitter; subscribe to blogs; read journals; and join national professional organizations such as NCSM: Leadership in Mathematics Education or National Council of Teachers of Mathematics (NCTM) and local affiliates of these two mathematics professional organizations. Both NCSM and NCTM maintain lists of current affiliates on their respective websites.

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Effective mathematics education leaders self-examine their own beliefs and mindsets, including their own mathematical identities. They also create structures for those whom they lead, students, or other educators to do the same. Examining your own beliefs and mindsets honors your *commitment to self.* Designing and creating structures for your colleagues to reflect on their beliefs and mindsets, as well as take action to sharpen them, honors your *commitment to colleagues.*