

Promoting a Positive Math Identity

Module 2a – Building the Math Environment – Part 1

Facilitator's Guide

Time: 90 minutes

Facilitators: Instructional coaches or teacher leaders who work with secondary math teachers

Audience: Secondary math teachers

Session outcomes:

By the end of the session participants will be able to:

- Reflect on their math attitudes and beliefs
- Understand how to create a classroom climate that is identity-affirming for all students and promotes math learning
- Develop instructional practices that foster positive math attitudes

Materials and supplies

- PowerPoint slides
- Chart paper and markers
- Handout: Icebreaker activity (1 copy per group of 3-5 participants)
- Internet access
- Pre-loaded video: Inside Mathematics. (n.d.-a). day 4: identifying strategies for perseverance [Video] (Licensed under Creative Commons 3.0). Retrieved from <http://www.insidemathematics.org/classroom-videos/building-classroom-climates-for-mathematical-learning/secondary/taking-responsibility-for-learning/day-4-identifying-strategies-for-perseverance>

Note. These materials were produced for the Idaho State Department of Education and the Idaho Regional Mathematics Centers and were presented on August 13, 2019 at the Idaho Council of Teachers of Mathematics conference.

Session at a Glance

Timing	Segment	Key Activities
15 minutes	Welcome, introductions, and icebreaker	Facilitator introduces self, reviews learning objectives, and leads participants in an icebreaker activity.
5 minutes	Overview of math identity and agency	Review of math identity and agency definitions from Module 1. Identify the relationship between math identity and agency to the Standards for Mathematical Practice.
10 minutes	Cultivating your math self-awareness	Description of the impact of teachers' attitudes on students' math performance. Participants discuss their experiences with the icebreaker activity to begin cultivating their own math self-awareness.
55 minutes	Evidence-Based Strategies to Promote Positive Math Identities in Students (Part 1)	Summarize several evidence-based strategies that promote positive math identities in students, followed by a detailed description of each of the following strategies: bust stereotypes; positive climate; honor mistakes; and high expectations.
5 minutes	Reflection	Participants reflect on what they have learned in the session and how they will apply it in their practice.

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15 minutes	<p data-bbox="296 185 394 289"> Welcome, introductions, and icebreaker</p> <ol data-bbox="310 305 1163 435" style="list-style-type: none"> 1. Welcome participants to session. 2. Introduce self. 3. Review the background and progression of the modules in the training series. <p data-bbox="296 472 394 553"> Key Talking Points</p> <ul data-bbox="344 565 1213 1268" style="list-style-type: none"> • Slide 1 <ul data-bbox="386 597 1213 824" style="list-style-type: none"> ➤ This module is one in a series of modules developed by REL Northwest for the Idaho State Department of Education and the Idaho Regional Mathematics Centers. ➤ REL Northwest worked with these stakeholders to develop training modules that help middle school math educators in Idaho to implement evidence-based strategies to improve students' math attitudes. • Slide 2 <ul data-bbox="386 899 1213 1268" style="list-style-type: none"> ➤ <i>Module 1</i> provides an overview of the research base to build an understanding of why educators should consider students' math attitudes and beliefs. It also shows a link between math attitudes and outcomes. ➤ The current module, <i>Module 2</i>, focuses on how educators can change their practice and promote a classroom climate that is more conducive to positive math attitudes and beliefs. The module content is provided in two segments or sessions: Part 1 and Part 2. ➤ <i>Module 3</i> provides specific activities that educators can implement to promote positive math attitudes and beliefs. <ol data-bbox="310 1305 1205 1468" style="list-style-type: none"> 4. Review the module learning objectives (slide 3). 5. Display the first of the two icebreaker slides (slide 4). 6. Split participants into small groups of 3-5 people each. 7. Have the groups select one person to be the "teacher." 8. Pass the icebreaker activity handout to each group's teacher and 		<p data-bbox="1696 574 1927 607">Slide 1: Title slide</p> <p data-bbox="1696 646 1934 711">Slide 2: Training series progression</p> <p data-bbox="1696 1247 1934 1312">Slide 3: Module 2 learning objectives</p> <p data-bbox="1696 1351 1982 1416">Slides 4-5: Icebreaker (2 slides)</p>

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	<p>allow them two minutes to read it over independently. The handout will instruct the teacher to teach a problem to the rest of the group.</p> <p>9. Display the second icebreaker slide (slide 5), so other participants can see the problem.</p> <p>10. Allow the teachers five minutes to teach the problem to their small groups. At the end of five minutes, have one person from each group share out their group's answer.</p> <p>11. After all of the groups have presented, share the solution to the problem.</p> <p>N^2+1 Or $(n+1)(n-1) +2$ <i>Not a linear equation, because it is not a constant rate of change.</i></p> <p>12. Let participants know that you will give them a chance to debrief their work on this activity in a few moments.</p>		
5 minutes	 <p>Overview of math identity and agency</p> <p>1. Walk through the slides defining and summarizing math identity and agency from Module 1. Connect these concepts to the Standards for Mathematical Practice (SMPs).</p>  <p>Key Talking Points</p> <ul style="list-style-type: none"> • Slide 6 <ul style="list-style-type: none"> ➤ Math success depends on many factors. Of course, procedural skills and fluency, conceptual understanding of math topics, and mathematical reasoning are all important. ➤ But if we were able to peek behind the curtain of math success, we would see a more complicated process involving more than just math skills. In this training we will focus on the equally important contributors of math identity and math agency, as well as the surrounding math environment. 		<p>Slides 6-9: Elements of math success; Math identity and agency critical for math success; Key aspects of math identity; Connection with the Standards for Math Practice (4 slides)</p>

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	<ul style="list-style-type: none"> • Slide 7 <ul style="list-style-type: none"> ➤ As educators we care deeply about academic outcomes. We ask ourselves: Are our students mathematically proficient? Are our students ready for college-level math? ➤ When we attend to the math environment and support students by promoting a positive math identity, we are doing the groundwork to achieve our ultimate goal of making sure all students reach their potential in math. ➤ The research we have reviewed in this training shows that math identity and math agency are precursors for positive academic outcomes. Students with a positive math identity are more agentic about their math learning. Agentic students take more ownership of their learning and they engage in the types of behaviors that facilitate better outcomes—things like studying harder, seeking out assistance, and persevering when things get challenging. • Slide 8 <ul style="list-style-type: none"> ➤ Math identity is a complex topic. We will focus on the four aspects of math identity, which are distinct concepts but also interrelated. ➤ The previous module in this training covered the importance of these factors, how they are related to success in math, and why some students are less likely than others to develop a strong math identity. ➤ Today’s session is the first of two that focus on evidence-based classroom practices and strategies you can use to create a classroom environment that supports students in developing a positive math identity. ➤ In this training we will review ways to promote these aspects of math identity. We expect that actively promoting one aspect can also benefit the others. ➤ The final session will focus on shorter, more targeted strategies, or “kernels”, to promote positive math identities. • Slide 9 <ul style="list-style-type: none"> ➤ One way to situate the importance of math identity and 		

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	<p>agency is by considering them in relation to the Common Core State Standard (CCSS) Standards for Math Practice (SMP). The CCSS SMPs are meant to articulate the way mathematicians work and approach problems. These are the ways effective math students think and act when problem-solving in math. In other words, one way of framing the SMPs is that this is what math agency looks like in practice.</p> <ul style="list-style-type: none"> ➤ You may be familiar with the Routines for Reasoning framework. The authors of this framework make the case that not all math practices are equal. They frame SMP 1 as an overarching goal. SMPs 2, 7, and 8 are different “avenues of thinking” that promote SMP 1. SMPs 3, 4, 5, and 6 are the “supporting actors.” ➤ Because a positive math identity is at the root of math agency, math identity is related to all the SMPs and can also be thought of as a supporting actor. Without a strong math identity, students have little motivation to engage with math and persevere when they face challenges. <p>2. Pause for questions before proceeding.</p>		
10 minutes	<div style="display: flex; align-items: center;">  <div> <p>Cultivating Math Self-Awareness</p> <ol style="list-style-type: none"> 1. Display the “Cultivating Math Self-Awareness” slide (slide 10). 2. Ask a few participants to share their thoughts about ways teachers’ math attitudes can influence students, Chart their responses. 3. Review how teachers’ math attitudes influence their students and how they can cultivate math self-awareness and skills using the two slides provided (slide 11 and slide 12). </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <div> <p>Key Talking Points</p> <ul style="list-style-type: none"> • Slide 11 <ul style="list-style-type: none"> ➤ Research has identified a number of ways teachers’ math attitudes impact the students in the classroom. </div> </div>		<p>Slide 10: Cultivating math self-awareness</p> <p>Materials: Chart paper and markers</p> <p>Slides 11-12: How do teachers’ math attitudes impact students; Cultivating your own math self-awareness and skills (2 slides)</p>

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	<ul style="list-style-type: none"> ➤ Teachers' mindsets influence their pedagogical decisions. For example, when a student is struggling with math, a teacher with a fixed mindset (the belief that ability is a fixed quality that cannot be significantly changed) may change their pedagogy from <i>challenging</i> to <i>comforting</i>, such as assigning less math homework to the student. ➤ Teachers' math anxiety also influences their pedagogical decisions. Research shows that students with math-anxious teachers are more likely to have math anxiety, endorse math stereotypes, and learn less in math. ➤ One possible explanation is because math anxious teachers avoid teaching math and teach it differently. Specifically, they rely more on teaching skills and facts compared to deeper processing and mathematical reasoning. ➤ Teachers' attitudes about who belongs also influences students' math achievement. Particularly, the biases and stereotypes teachers have of their students as math learners plays a role in <i>creating</i> the students' own math identities. <ul style="list-style-type: none"> • Slide 12 <ul style="list-style-type: none"> ➤ Teachers should be aware of their own feelings about math and avoid expressing math negativity. For example, teachers should not disparage their own math skills. ➤ Additionally, teachers must have proficient understanding of the math concepts they are instructing, so they feel confident in their ability to teach math to their students. ➤ Teachers should also be aware of the assumptions they make about students as math learners. Holding biased or stereotyped beliefs about which students will be successful in math sets the stage for adopting classroom practices that negatively influence students' math identities. <ol style="list-style-type: none"> 4. Display the Discussion slide (slide 13). 5. Ask participants to think back to the icebreaker activity they just completed and discuss the prompts on the slide with their groups. 		<p>Slide 13: Discussion</p>

Timing	Topic/Steps/Activities	Facilitator Notes	Resources/ Materials
	<p>Key Discussion Questions</p> <ul style="list-style-type: none"> • How did you feel while teaching/working on this problem? • Did you notice any areas where the instructor/students did not seem comfortable? • How did this impact the instruction? How did this impact you as a teacher/learner? <p>6. After a few minutes, invite a few volunteers to share their groups' responses to the discussion prompts.</p> <p>7. Pause for questions before proceeding.</p>		
55 minutes	 <p>Evidence-based strategies to promote positive math identities in students (Part 1)</p> <p><i>Overview—5 min</i></p> <p>1. Display the slide with the list of evidence-based strategies for promoting positive math identities in students (slide 14) and summarize the list using the following key points.</p>  <p>Key Talking Points</p> <ul style="list-style-type: none"> • Slide 14 <ul style="list-style-type: none"> ➤ Cultivating awareness of your own math attitudes is a critical first step in creating a positive math culture. ➤ Next, we turn our focus to the classroom culture more generally. There are many evidence-based strategies you can employ in your classroom to help promote positive math identities among your students. ➤ In the next module, we will further subdivide strategies into those that target students' interpersonal or intrapersonal perceptions. ➤ All the strategies within this module are considered interpersonal, as they deal with the space and other people students encounter, and the role this plays in shaping their 		Slide 14: Summary of evidence-based strategies

Timing	Topic/Steps/Activities	Facilitator Notes	Resources/ Materials
	<p>math identities.</p> <p>2. Pause for questions before proceeding.</p> <p><i>Bust stereotypes-10 minutes</i></p> <p>3. Display the slide with the list of evidence-based strategies with “Bust stereotypes” highlighted (slide 15). Then provide an overview of how teachers can counter math stereotypes using the slide provided.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 16 <ul style="list-style-type: none"> ➤ We will begin by discussing ways you counter stereotypes we tend to hold about math. ➤ The physical space students encounter can transmit stereotypes in ways that affect students’ sense of belonging. Physical objects serve as cues about who belongs in that particular environment. These cues signal the culture of the people associated with that environment. ➤ In one study researchers assessed students' sense of belonging and interest in computer science. Researchers made their assessments based on determining the impact of academic environments that did or did not possess objects consistent with stereotypes about computer scientists. ➤ The study showed that girls were more likely to feel that they belonged in a non-stereotypical computer science classroom—that they would fit in and be similar to the other students—than a stereotypical classroom. ➤ In this case, the non-stereotypical computer science classroom contained objects that did not project stereotypes associated with STEM, such as computer parts and “science nerd” things like Star Trek posters. Rather, objects included neutral things commonly found in a classroom or office space, such as potted plants and nature posters. ➤ The researchers measured students’ computer science interest and found that girls were three times more likely to 		<p>Slides 15-16: Summary of evidence-based strategies: Bust stereotypes; Create non-stereotypical environments (2 slides)</p>

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	<p>be interested in taking a computer science course when the classroom did not project current computer science stereotypes. Boys were equally interested in taking computer science regardless of how the classroom looked.</p> <ul style="list-style-type: none"> ➤ It is important for classroom environments to be identity-affirming for all students, as stereotypical items are only identity-affirming for some students. ➤ One way to challenge stereotypes is by helping students see the diversity in the types of people who are mathematicians. Next, we'll discuss a way to do this. <ol style="list-style-type: none"> 4. Display the first of three slides with eight photos of people on them. 5. Tell participants that several of the people shown on this slide are mathematicians. Take each photo in turn and ask participants if they think the person is a mathematician or not by giving a thumbs-up sign if they think 'yes,' and a thumbs-down sign if they think 'no.' 6. Display the second of the three slides with the eight photos, which provides the names for each of the individuals shown. 7. Tell the participants that all eight of the people shown are mathematicians. 8. Debrief using the following key points. <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 17 <ul style="list-style-type: none"> ➤ Several of the people shown on this slide are mathematicians. Who do you think are the mathematicians? • Slide 18 <ul style="list-style-type: none"> ➤ All of the people on the slide are mathematicians. ➤ It was impossible to tell based on appearance alone. Your instinct might be to rely on stereotypes of mathematicians, such as most mathematicians are male. ➤ As a teacher, it is important not to hold preconceived assumptions about which students will succeed in math. ALL students are capable of success in math, and it is your role as teacher to help students achieve their math potential. 		<p>Slide 17-19: Who's a mathematician? (3 slides)</p>

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	<p>9. Display the third of the three “Who’s a Mathematician?” slides and review how participants can use this activity in their classrooms using the following key points.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 19 <ul style="list-style-type: none"> ➤ This is also an activity you can do with your students early in the school year to emphasize that all students can excel in math, no matter their background or current math identity. Ask students to identify the mathematicians and have a discussion around their answers to prove that anyone can be a mathematician. ➤ Then as an extension, have students break up into smaller groups, and assign each group one of the eight mathematicians to research. The groups will need to create posters about their assigned mathematicians, which they’ll present to the class. After the presentation, display the posters around your classroom. ➤ In addition to students researching and learning about diverse mathematicians, the posters produced during this activity also help you to create a physical environment that is non-stereotypical. ➤ Displaying images of diverse math role models sends students the message that it is normal—not exceptional—for mathematicians to be diverse, affirming the math identity of all students. <p>10. Pause for questions before proceeding.</p> <p><i>Positive climate-5 minutes</i></p> <p>11. Display the slide with the list of evidence-based strategies with “Positive climate” highlighted (slide 20).</p> <p>12. Display the slides describing how teachers can build a positive classroom climate and provide the following key points.</p>		<p>Slide 20: Summary of evidence-based strategies: Positive climate</p> <p>Slides 21-22: Build a positive classroom climate (2 slides)</p>

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	<p data-bbox="296 186 380 261"> Key Talking Points</p> <ul style="list-style-type: none"> <li data-bbox="348 277 1199 1040"> <p>• Slide 21</p> <ul style="list-style-type: none"> <li data-bbox="386 310 1184 440">➤ Teachers can do a lot to create a welcoming and inclusive environment in the classroom. Making eye contact and correctly pronouncing students' names are small but powerful cues that signal belonging. <li data-bbox="386 444 1199 574">➤ The Collaborative for Academic, Social, and Emotional Learning (CASEL) has a Signature Practices Playbook with many evidence-based tips for creating a welcoming, inclusive classroom. <li data-bbox="386 579 1199 774">➤ Some of their recommendations include the following: smiling and greeting students by name when they enter the classroom; structuring classroom activities, so every students' voice is heard by at least one other person; and including elements of personal choice within your instruction. <li data-bbox="386 779 1205 909">➤ These recommendations can be incorporated into your classroom through several practices, such as: interactive do-nows; turn to your partner to discuss; and think, ink, pair, share. <li data-bbox="386 914 1188 1044">➤ The keys to these ideas are intentionality and consistency. When these practices are done purposefully and consistently, they become habits that shape the classroom culture. <li data-bbox="348 1081 1213 1481"> <p>• Slide 22</p> <ul style="list-style-type: none"> <li data-bbox="386 1114 1163 1179">➤ Second, relationships make up a large component of the classroom environment. <li data-bbox="386 1183 1157 1281">➤ Relationships between teachers and students can be an important source of support, particularly for children who may have less secure/reliable relationships at home. <li data-bbox="386 1286 1213 1448">➤ Additionally, building positive relationships between students promotes a healthy climate. One promising study found that when teachers intentionally built relationships between students, they saw improved social behaviors, school connectedness, and academic achievement. <li data-bbox="386 1453 1173 1481">➤ To the extent possible, building relationships with families 		

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	<p>can also promote belonging for both parents and students. Some parents will enter a school or classroom and will see people that look like them, speak like them, and value the same things they do. But this won't be the case for everyone.</p> <ul style="list-style-type: none"> ➤ Teachers can ask themselves, from a parent's perspective: "Is this a place that reflects my culture, values, and language?" Teachers can then work to incorporate aspects of their students' cultures, values, and languages into the classroom to help promote the sense of belonging that comes from seeing yourself reflected in a setting. <p>13. Pause for questions before proceeding.</p> <p><i>Honor mistakes-15 minutes</i></p> <p>14. Display the slide with the list of evidence-based strategies with "Honor mistakes" highlighted (slide 23).</p> <p>15. Display the slides about honoring mistakes and provide the following key points.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 24 <ul style="list-style-type: none"> ➤ Math carries an emphasis on "correctness." However, math instruction has shifted to recognize the equal importance of the process used to arrive at a solution. ➤ Finding the correct answer doesn't indicate understanding on its own. Students' knowledge of what their answer means and how they arrived at it shows true conceptual understanding. ➤ The key to embracing the importance of understanding the process of math is reconceptualizing mistakes as an opportunity for learning. Mistakes let us know where we have misunderstandings and allow for targeted instruction to further our conceptual understanding. ➤ A classroom culture that emphasizes learning over correct answers is consistent with practices that build growth 		<p>Slide 23: Summary of evidence-based strategies: Honor mistakes</p> <p>Slides 24-25: Honor mistakes as part of the learning process (2 slides)</p>

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	<p>mindsets. In this kind of environment, wrong answers are valuable!</p> <ul style="list-style-type: none"> ➤ This may alleviate some of the pressure that highly math-anxious students feel. Normalizing and embracing mistakes also likely builds belonging by helping students reframe mistakes: Mistakes are not indicative that I don't belong. They're a normal part of the learning process! <ul style="list-style-type: none"> • Slide 25 <ul style="list-style-type: none"> ➤ One way that teachers can reconceptualize mistakes as learning opportunities is to cultivate a classroom culture that emphasizes learning over correct answers. In this kind of environment, wrong answers are valuable! ➤ Explain to students why mistakes are important. Mistakes are chances to learn and improve. ➤ Give your students work that encourages mistakes by keeping it at the edge of their current skill level. Emphasize that if students are getting all correct answers, the work isn't challenging enough and they aren't learning. <p>16. Display the first of two slides connecting honoring mistakes to the SMPs (slide 26).</p> <p>17. Invite a handful of volunteers to share how they think that honoring mistakes as part of the learning process supports and builds on the SMPs.</p> <p>18. Show the second of the two slides connecting honoring mistakes to the SMPs (slide 27) and make the following key points.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 26 <ul style="list-style-type: none"> ➤ How does honoring mistakes as part of the learning process support and build on the SMPs? • Slide 27 <ul style="list-style-type: none"> ➤ We see connections between SMPs 1, 2, 5, and 7. ➤ Central to honoring mistakes as part of the learning process 		<p>Slides 26-27: How does honoring mistakes as part of the learning process support and build on the SMPs? (2 slides)</p>

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	<p>is encouraging students to make sense of problems and persevere in solving them, even if they are not successful the first time. This is often referred to as “productive struggle.”</p> <ul style="list-style-type: none"> ➤ As the teacher, you need to go beyond simply celebrating mistakes and provide students with the skills to reason abstractly and quantitatively, select and use the appropriate tools when solving problems, and to look for and make use of structure when solving problems. ➤ When students make a mistake, help them understand why they made a mistake and how to solve the problem differently. <p>19. Display the slide with the still from the preloaded video (slide 28).</p> <p>20. Show the pre-loaded video of a teacher facilitating a student-led discussion to cultivate a norm of celebrating mistakes in the classroom.</p> <p>21. Debrief video with participants.</p> <p>22. Show the final celebrating mistakes slide, which shows a math problem with an incorrect solution. Have participants review it for a moment.</p> <p>23. Have participants form pairs and tell them that they will role-play a situation in which they’ve noticed a student has made a mistake while working on a problem.</p> <p>24. Have the partners take turns as the teacher responds to the student who made the mistake.</p> <p>25. After each partner has had a turn, ask one pair to volunteer to do their role-play in front of the group.</p> <p>26. As they present, highlight the following steps as you see them in the role-play, or provide them as suggestions if not acted out by the participants:</p> <ol style="list-style-type: none"> a. Step 1: Determine where the student’s misconceptions arose leading to the mistake. b. Step 2: Ask the student to explain their thinking. “<i>What did you do to solve this problem?</i>” c. Step 3: Highlight something the student did right when solving the problem. “<i>I see that the first thing you did was to address the exponent, 2-squared equals 4. Great job.</i>” 	<p><i>This video clip is also included at the end of Module 1. If your participants have already seen this video, consider skipping it.</i></p>	<p>Slide 28: Honor mistakes as part of the learning process</p> <p>Materials: Pre-loaded video #1 (See Materials and supplies)</p> <p>Slide 29: Honor mistakes as part of the learning process</p>

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	<p>d. Step 4: Let the student know that you are going to provide additional tools for solving the problem. <i>“Now, let me add some new information to help you solve this.”</i></p> <p>e. Step 5: Provide a specific tool to address the misconception. <i>“I see that next you found $10 + 10 = 20$ and $8 - 4 = 4$. What comes after exponents in the order of operations? (Multiplication and division) Where do you see multiplication or division in this problem? (10×8 comes before adding $10 + 10$ and subtracting $8 - 4$.) What equation do you get when you multiply 10×8 before adding and subtracting? ($10 + 80 - 4$) What do you do next? (Add and subtract from left to right.) $10 + 80 = 90$ and $90 - 4 = 86$.”</i></p> <p>27. Pause for questions before proceeding.</p> <p><i>High expectations-20 minutes</i></p> <p>28. Display the slide with the list of evidence-based strategies with “High expectations” highlighted (slide 30).</p> <p>29. Display the first four slides on high expectations and provide the following key points.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 31 <ul style="list-style-type: none"> ➤ Ability grouping or tracking implicitly communicates that teachers have a fixed mindset about students’ intelligence and potential. ➤ Students in ability-grouped or tracked classes are aware that they’ve been placed at a particular level based on a teacher’s perception of their ability. Students often feel that they’ve been labeled as “stupid” when they’ve been placed in a lower group, and they may lose their ambition for academic success. ➤ This can negatively impact students’ math identity, particularly their mindset and their sense of belonging in the math classroom. 		<p>Slide 30: Summary of evidence-based strategies: High expectations</p> <p>Slides 31-34: Hold high expectations for all students (4 slides)</p>

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	<ul style="list-style-type: none"> • Slide 32 <ul style="list-style-type: none"> ➤ When a school district abandoned tracking in middle school math, so all students took a rigorous three-year sequence of math courses from grades 6 through 8, all students benefitted. More students took advanced math classes in high school, and more students passed their math courses. Students did better on the state math test. In fact, the achievement gap between white and minority students narrowed dramatically after a single year. ➤ These results were consistent whether students started middle school with high or low math achievement. • Slide 33 <ul style="list-style-type: none"> ➤ Holding different expectations for different students is a common signal influencer in the classroom. ➤ Signal influencers are unconscious messages that can occur during teachers' daily interactions with students. These influencers often signal to students, especially students from marginalized groups, that they do not belong. ➤ An example of signal influencers includes the following: Researchers found that in poor rural schools, teachers provided richer and more rigorous educational experiences to their "best and brightest" students who they believed had the best chance of "making it out" of the community. Teachers gave far less attention to students they believed were more likely to stay in the community as adults (from Williams, 2018). • Slide 34 <ul style="list-style-type: none"> ➤ Signal influencers are particularly pervasive in math classrooms and serve to undermine both students' sense of belonging and mindset. <p>30. Display the final high expectations slide, which provides a brief classroom vignette (slide 35).</p> <p>31. Read the vignette aloud.</p> <p>32. Ask participants to think, ink, pair, share (allow participants to think about their response and jot down their thoughts. Then have</p>		<p>Slide 35: Hold high expectations for all students</p>

Timing	Topic/Steps/Activities	Facilitator Notes	Resources/ Materials
	<p>them share their ideas with the person sitting next to them).</p> <p>33. Ask for volunteers to share with the full group what they and their partners discussed.</p> <p>34. Debrief the vignette using the following key points.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 35 <ul style="list-style-type: none"> ➤ It is not uncommon for teachers to hold deficit views of their students' capabilities. As seen in the previous slides, this has a negative influence on students' math identity. ➤ Now that you've participated in this module, you have the knowledge to correct deficit views in both yourself and your colleagues. ➤ What are some examples of how you would respond? <p>35. Ask for volunteers to share how they would respond.</p> <p>36. Show the slide on communicating high expectations and provide the following key points.</p> <p> Key Talking Points</p> <ul style="list-style-type: none"> • Slide 36 <ul style="list-style-type: none"> ➤ The role of high teacher expectations was demonstrated in an experiment with 7th grade students. ➤ In the experiment, teachers provided critical feedback on student essays. Teachers either attached a note that emphasized the teachers' high standards and belief that the student was capable of meeting those standards, or they attached a note with a neutral statement. ➤ Students who received the note emphasizing high expectations had an increased likelihood of submitting a revision of their essay, and those students improved the quality of their final drafts. ➤ It was also pointed out that African American students were more likely than White students to revise their papers after receiving the high expectations notes. Researchers deduced 		<p>Slide 36: Communicating high expectations</p>

Timing	Topic/Steps/Activities	Facilitator Notes	Resources/ Materials
	<p>that many African American students often believed in the negative stereotypes about students' race and academic achievement, so they were more likely than White students to fear and react to negative feedback signals as a way to counteract or challenge the stereotypes.</p> <p>37. Display the next slide on communicating high expectations (slide 37).</p> <p>38. Ask participants: What might you say to communicate high expectations to all students in your classroom?</p> <p>39. Ask for volunteers to share their responses with the full group. Document provided responses on chart paper.</p> <p>40. After participants have a chance to share their ideas, display and read the examples provided on the slide and make the following key point.</p> <ul style="list-style-type: none"> • Slide 37 <ul style="list-style-type: none"> ➤ It is not enough to simply communicate high expectations for all students. You must also believe and act on what you say. If your actions, whether implicit or explicit, undermine what you're communicating about expectations, this will lead to further decreases in belonging and mindset, while eroding away the trust between you and your students. <p>41. Pause for questions before proceeding.</p>		<p>Slide 37: Communicating high expectations</p> <p>Materials: Chart paper and markers</p>
5 minutes	 <p>Reflection</p> <ol style="list-style-type: none"> 1. Display the reflection slide (slide 38). 2. Ask participants to think of responses to the discussion prompts on the slide for a moment. Then have them briefly share with a partner. 3. Display the slides providing information about REL Northwest and the references used to prepare this module. 4. Take any final questions from participants. 5. Thank participants for their time and contributions. 		<p>Slide 38: Reflection</p> <p>Slides 39-42: About REL Northwest; Contact us; Content References (4 slides)</p>