

Appendix D

How the Mathematics at Work High-Leverage Team Actions Support the NCTM Principles to Actions

The *Beyond the Common Core: A Handbook for Mathematics in a PLC at Work* series and the Mathematics at Work process include ten high-leverage team actions teachers should pursue collaboratively every day, in every unit, and every year. The goals of these actions are to eliminate inequities, inconsistencies, and lack of coherence so the focus is on teachers' expectations, instructional practices, assessment practices, and responses to student-demonstrated learning. Therefore, the Mathematics at Work process provides support for NCTM's Guiding Practices for School Mathematics as outlined in the 2014 publication *Principles to Actions: Ensuring Mathematical Success for All* (p. 5). Those principles are:

- **Curriculum principle**—An excellent mathematics program includes a curriculum that develops important mathematics along coherent learning progressions and develops connections among areas of mathematical study and between mathematics and the real world.
- **Professionalism principle**—In an excellent mathematics program, educators hold themselves and their colleagues accountable for the mathematical success of every student and for personal and collective professional growth toward effective teaching and learning of mathematics.
- **Teaching and learning principle**—An excellent mathematics program requires effective teaching that engages students in meaningful learning through individual and collaborative experiences that promote their ability to make sense of mathematical ideas and reason mathematically.
- **Assessment principle**—An excellent mathematics program ensures that assessment is an integral part of instruction, provides evidence of proficiency with important mathematics content and practices, includes a variety of strategies and data sources, and informs feedback to students, instructional decisions, and program improvement.
- **Access and equity principle**—An excellent mathematics program requires that all students have access to a high-quality mathematics curriculum, effective teaching and learning, high expectations, and the support and resources needed to maximize their learning potential.
- **Tools and technology principle**—An excellent mathematics program integrates the use of mathematical tools and technology as essential resources to help students learn and make sense of mathematical ideas, reason mathematically, and communicate their ideas.

Table D.1 (pages 158–159) shows how the HLTAs support NCTM's principles.

Table D.1: The HLTAs and NCTM Principles to Actions

<p style="text-align: center;">Mathematics At Work High-Leverage Team Actions</p>	<p style="text-align: center;">NCTM's Guiding Practices for School Mathematics</p>
<p>HLTA 1. Making sense of the agreed-on essential learning standards (content and practices) and pacing</p> <p>What do we want all students in each grade level or course to know, understand, demonstrate, and be able to do?</p> <p>Procedures are in place that ensure teacher teams align the most effective mathematical tasks and instructional strategies to the content progression established in the overall unit plan components.</p>	<p>Curriculum principle</p> <p>Professionalism principle. The professionalism principle specifically calls for teachers to collaboratively examine and prioritize the mathematics content and Mathematical Practices that students are to learn.</p> <p>Teaching and learning principle. The teaching and learning principle establishes mathematics goals to focus learning.</p> <p>Tools and technology principle</p>
<p>HLTA 2. Identifying higher-level-cognitive-demand mathematical tasks</p> <p>Teacher teams choose mathematical tasks that represent a balance of higher- and lower-level cognitive demand for the essential learning standards of the unit of study.</p>	<p>Teaching and learning principle. Effective teaching and learning practices include implementing tasks that promote reasoning and problem solving and supporting productive struggle in learning mathematics.</p> <p>Tools and technology principle</p>
<p>HLTA 3. Developing common assessment instruments</p> <p>Develop, design, and create common end-of-unit assessments as a team before the unit begins based on high-quality design and test-evaluation tools.</p> <p>Ensure the assessment instruments are aligned with the instructional discussions and practices used during the unit and connected to all aspects of the essential learning standards for the unit.</p>	<p>Assessment principle</p> <p>Professionalism principle. The professionalism principle specifically calls for teachers to collaboratively develop and use common assessments.</p> <p>Tools and technology principle</p>
<p>HLTA 4. Developing scoring rubrics and proficiency expectations for the common assessment instruments</p> <p>Design common scoring rubrics and assessment practices to align with expected student reasoning and proficiency for every essential learning standard of the unit.</p>	<p>Assessment principle</p>
<p>HLTA 5. Planning and using common homework assignments</p> <p>Homework should be viewed as a daily opportunity for formative self-assessment and independent practice for students.</p> <p>Homework protocols include limiting the number of daily tasks, providing spaced practice, balancing cognitive-demand levels, providing all assignments to the students in advance of the unit, and carefully aligning the essential learning standards for the unit.</p>	<p>Assessment principle</p>

<p>HLTA 6. Using higher-level-cognitive-demand mathematical tasks effectively</p> <p>Teachers provide targeted and differentiated in-class support as students engage in mathematical processes and peer-to-peer discussions for learning by using higher-level-cognitive-demand tasks in every lesson.</p>	<p>Teaching and learning principle. Effective teaching and learning practices include implementing tasks that promote reasoning and problem solving and supporting productive struggle in learning mathematics.</p> <p>Tools and technology principle</p>
<p>HLTA 7. Using in-class formative assessment processes effectively</p> <p>Teacher teams do deep planning for small-group discourse and peer-to-peer in-class formative assessment processes via meaningful, specific, and timely teacher feedback with subsequent student action. This requires much more than the diagnostic tool of checking for understanding. To be formative, students must receive feedback during class and take action on that feedback.</p> <p>Teachers intentionally use differentiated and targeted scaffolding and advancing Tier 1 RTI supports as students engage in higher-level-cognitive-demand tasks.</p>	<p>Assessment principle</p> <p>Teaching and learning principle. Effective teaching and learning practices include eliciting and using evidence of student thinking.</p>
<p>HLTA 8. Using a lesson-design process for lesson planning and collective team inquiry</p> <p>Teachers ensure all lesson elements contain successful opportunities for student demonstration of understanding, with feedback and action on student learning.</p> <p>Teachers actively engage in a teacher team–developed and team-designed lesson, observe teachers teaching the lesson, and debrief the lesson in order to learn from colleagues.</p>	<p>Professionalism principle. The professionalism principle specifically calls for teachers to collaboratively discuss, select, and implement common research-informed instructional strategies and plans.</p> <p>Teaching and learning principle. All lesson designs should draw from the eight research-informed mathematics teaching practices.</p> <p>Tools and technology principle</p>
<p>HLTA 9. Ensuring evidence-based student goal setting and action for the next unit of study</p> <p>Teachers and teacher teams require students to correct their errors and identify the essential learning standards that are strengths and weaknesses based on the results of the end-of-unit assessment.</p> <p>Teachers work with students to complete and carry out a plan for improvement and action based on end-of-unit assessment results and outcomes for proficiency.</p>	<p>Teaching and learning principle. Effective teaching and learning practices include eliciting and using evidence of student thinking.</p> <p>Assessment principle</p>
<p>HLTA 10. Ensuring evidence-based adult goal setting and action for the next unit of study</p> <p>Teachers and teacher teams score all end-of-unit assessments together and calibrate scoring to ensure accuracy and freedom from bias.</p> <p>Teachers work together after the unit to determine if proficiency targets for students were achieved.</p> <p>Teachers collaboratively and carefully consider how end-of-unit results are used to impact instruction and team planning for the next unit.</p>	<p>Assessment principle</p> <p>Professionalism principle. The professionalism principle specifically calls for teachers to collaboratively develop action plans that they can implement when students demonstrate that they have or have not attained the standards.</p> <p>Access and equity principle</p>