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Moving Forward: Mathematics Learning in the Era of COVID-19

We live in uncertain times. Public health is at the forefront of our minds, and our schools have been disrupted in ways we have never seen. Although no one can predict how education might look in the coming months, it is in the best interests of our students to strategize how we might best meet their needs in the upcoming months. *Moving Forward* is the result of a joint effort of NCSM: Leadership in Mathematics Education (NCSM) and the National Council of Teachers of Mathematics (NCTM) that presents considerations, questions, and potential solution processes to educators and school leaders to address the challenges induced by the COVID-19 pandemic of spring 2020. In this document, we show how effective practices for mathematics teaching and learning can provide helpful direction to address the challenges that teachers, school leaders, and policymakers face now and will continue to face in the months ahead.

This document is organized around three major areas that require consideration when planning for the 2020–2021 school year. These three areas have serious implications for equitable access to high-quality mathematics teaching and learning: (1) structural considerations, (2) teaching practices, and (3) advocacy.

THREE AREAS WITH SERIOUS IMPLICATIONS FOR
EQUITABLE ACCESS TO HIGH-QUALITY MATHEMATICS TEACHING AND LEARNING

The Purpose of This Document

The focus in this document is on decisions that must be made regarding equitable access to high-quality mathematics teaching and learning, intentionally considering the needs of each and every learner and teacher. Decision makers—whether they be teachers, teams, teacher leaders, coaches, administrators, or policymakers at the local, state, and provincial levels—must consider the diverse needs of learners and teachers when making policy and instructional decisions. To ensure diverse perspectives are considered, content specialists, teachers, support staff, families, and students should be represented and approached in a collaborative decision-making process.

The intent is not to cover the entire educational landscape but rather to start a conversation about some of the most potentially important choices that will require action from schools, districts, provinces, and states that lead to informed action. The aim is to address general guidelines that have wide applicability while also recognizing that local schools and districts may have unique conditions that warrant attention, including in-person, remote, or hybrid instruction. Mathematics learning is particularly vulnerable in a disrupted school year (Kuhfeld and Tarasawa 2020), so mathematics teaching and learning must be prioritized in any plan. Questions and processes are described in this document to facilitate the collaborations needed around issues influencing how to move mathematics learning forward.

In *Moving Forward*, we present each major area with these guiding questions.

- Who should be part of which conversations and decisions (teachers, families, school level leaders, students, or other partners and stakeholders)?
- What supports are necessary for educators to thoughtfully engage learners in meaningful learning of mathematics when students, teachers, and leaders move forward with learning?
- What questions do we need to ask before taking next steps?

NCSM and NCTM's vision for mathematics teaching and learning includes empowering those we serve, and, in that spirit, we intentionally view students and teachers through a lens focusing on strengths that positively contribute to mathematics teaching and learning, an asset-based lens. Thus, part of the purpose of this document is to focus on the *opportunities for learning* rather than *learning gaps* and to consider what mathematical content students know and what mathematical dispositions they have because focusing on the mathematical strengths they bring to the table is critical.

Within each area, questions are presented that leaders should ask as they work together to make decisions regarding the teaching and learning of mathematics for the next school year. Potential structures and protocols are shared that leaders could use to facilitate that collaborative work. Students learning at different times, teachers teaching content with different pacing, and systems flexibly adjusting to meet students' needs are all issues educators confront yearly; thus, these are not new. However, the scale and proximity of many of these issues make returning in the 2020–2021 academic year unique. *Moving Forward* into the 2020–2021 academic year will require attention to educators' and learners' social, emotional, and academic needs. Many critical decisions and bold leadership are necessary, but we must be mindful that these decisions will affect the lives of people.

Structures Supporting Mathematics Teaching and Learning

The 2019–2020 school year was interrupted by the outbreak of COVID-19, and although learning continued in a virtual or out-of-school manner, the structures of school systems were abruptly altered. Interruptions in learning such as those experienced in the 2019–2020 school year and anticipated during the 2020–2021 school year have the potential to exacerbate structural inequities and widen differences in what groups of students experience. Intentional planning for flexible structures that support all students and teachers equitably provides leaders with the ability to actively guard against those inequities.

NCSM's position paper, *Closing the Opportunity Gap: A Call for Detracking Mathematics* (2020b), and NCTM's Catalyzing Change series (2018, 2020a, 2020b) include key recommendations calling for the elimination of ability grouping and tracking for PK–12 students and discontinuing the practice of tracking teachers. A key recommendation in the Catalyzing Change series calls for dismantling structural obstacles that stand in the way of mathematics working for each and every student across PK–12 mathematics (NCTM 2018).

Schools, districts, states, and provinces are making decisions about structures for their systems with new lenses for the 2020–2021 school year due to a variety of uncertainties about student and teacher strengths and needs after a disrupted spring. Evidence-based productive and unproductive structures were developed from recommendations in NCTM's *Principles to Actions: Ensuring Mathematical Success for All* (2014), NCTM's Catalyzing Change series (2018, 2020a, 2020b), and NCSM's *Essential Actions: Framework for Leadership in Mathematics Education* (2020a).

What are productive structures to organize students for instruction?

Decisions about how students will be organized for instruction will vary within schools and across school districts and will reflect beliefs about how and which students can and should learn mathematics. Well-intended school leaders may inadvertently make existing inequities in school structures worse.

Unproductive structures isolate and label students and do not promote equitable access to high-quality mathematics teaching and learning. Consider the following productive structures for organizing students that are true for any school year (NCSM 2020a; NCTM 2018; NCTM 2020a; NCTM 2020b). Then, use the *Questions to Consider* as you and your leadership team are making decisions about creating structures for the 2020–2021 school year.

STRUCTURES THAT ORGANIZE STUDENTS FOR INSTRUCTION

Productive Classroom Structures	Questions to Consider
Engage in heterogeneous groupings, both between and within classes, where expectations for learning are high and the greatest gains can be made collectively for all students. Provide differentiated support for each student to reach grade-level standards by designing rich tier 1 instruction that allows for multiple entry points and solution pathways and uses a range of approaches. Provide just-in-time interventions during the school day that do not replace daily, grade-level instruction and are designed on the basis of the results from effective formative assessments. Students move in and out of flexible interventions as needed.	In what ways are students organized for mathematics instruction in our school or district so that each and every learner has access to high-quality mathematics instruction? What initial steps can be taken in our school or district to prevent labeling, ability grouping, and tracking students in mathematics as we prepare for the flexibility required for the 2020–2021 school year? How do we support the elimination of tracking and instead structure interventions that provide high-quality instruction and other classroom support, such as math coaches and specialists? How are we ensuring that access to technology does not adversely affect students' access to high-quality mathematics, particularly as instruction moves between in-school and remote learning? What structures exist to support students with diverse learning needs? How will these structures differ as instruction moves between in-school and remote learning? How might our well-intentioned student organization solutions result in new, unexpected inequities?

Recommendations for structures that support student learning

- Assign students to teachers using structures that ensure heterogeneous ability groups, being mindful of potential inequities, such as access to technology, as schools shift between in-school and out-of-school learning.
- Create strategically mixed groups of students with a variety of strengths within classes and have them collaborate to complete rich tasks in a variety of media, including digital and print.
- Prioritize mathematics teaching and learning by providing additional time allocations for mathematics and fortifying intervention plans. Ensure that highly qualified mathematics teachers are in place for initial instruction and any intervention plans.

What are productive structures that support teachers?

We must recognize the strengths that teachers bring and the potential of professional collaboration. Structures need to be in place to support the work that teachers do and professional collaboration building on teacher strengths. Too often, teacher tracking is associated with student tracking and is the practice of assigning predominately one track of learners to particular teachers. Students benefit when teachers teach heterogeneous classes of students at the elementary and middle school levels and a mix of classes at the high school level (NCTM 2018; NCTM 2020a; NCTM 2020b). That is particularly true for the 2020–2021 school year, when school closures and student mobility and absenteeism related to COVID-19 create new challenges for students and teachers.

As you are planning for the 2020–2021 school year, consider using structures for teaching assignments that you might not ordinarily consider, such as the following:

- **Looping** is a structure where teachers are assigned to the same group of students over multiple years (Hitz, Somers, and Jenlink 2007). Since teacher–student and student–student relationships were interrupted in the spring of the 2019–2020 school year, looping is a way to allow students and teachers some continuity in these relationships. This does not imply beginning where you left off in the previous grade but rather considering prior knowledge on which to build new student learning. Teachers can then effectively bridge last year's learning into the learning for the 2020–2021 school year because they know what was taught and what the students learned.
- **Team teaching** or **co-teaching models** can be used creatively (Hunt 2010). For example, if teacher pairs work with the same students during periods of in-school instruction, then when schools are closed and turn to virtual or out-of-school instruction, each teacher may work with one group of their shared students. Perhaps one teacher creates lessons to be delivered digitally to provide remote instruction and another teacher creates a paper-and-pencil version of the same content/lesson to support students who do not have access to technology.

As with any new structure, be sure to consider both the advantages and possible constraints, including teacher certification, teacher content knowledge, and the importance of relationships and knowing the strengths of students and teachers alike.

Consider the following productive structures for organizing teachers that are true for any school year (NCTM 2018; NCTM 2020a; NCTM 2020b). Then, use the *Questions to Consider* as you and your leadership team are thinking about creating structures for the 2020–2021 school year.

STRUCTURES THAT SUPPORT TEACHERS

Productive Classroom Structures	Questions to Consider
Teachers in elementary and middle schools teach heterogeneous classes of students. In high school, teachers in the same department have a balance of upper- and entry-level math course assignments. Teachers participate in regular professional learning to grow their skills and collaborate to plan effective and flexible instruction for their students through a cycle of continuous improvement that allows for responding to varied contexts.	What structures are in place to support teachers if school begins and then we need to transition to out-of-school instruction? How are teachers supporting one another in the use of technology to facilitate and deliver in-person, remote, or hybrid instruction? How are teachers given opportunities to collaboratively create long-term goals, plan, make connections among key mathematical ideas, and design flexible and responsive instruction between in-school and remote learning? How can we advocate for teacher support in the implementation of new structures? How might your well-intentioned teacher organization structures result in new, unexpected inequities?

Recommendations for structures that support teachers

- Create vertical teams that design and implement tasks that incorporate relevant previous grade-level material with the on-grade level using the progression of the standard.
- Provide teachers with professional learning about relevant topics—for example, dealing with trauma or remote learning engagements—and then decide as a team how to implement new learning, adjust for students' needs, and monitor for successes.
- Establish clear, robust yet reasonable expectations for teachers and students for addressing learning needs.
- Encourage teams to take collective responsibility and implement a response to student learning after examining evidence of student thinking.

Effective school leaders look for structures that equitably support students and teachers. Leaders can use this moment as an opportunity to examine critical areas in need of support as well as create the best opportunities for teachers and students to be successful whether they are in classrooms or in other spaces. This means examining whether all students have access to high-quality teaching, curriculum, and resources. Additionally, this means understanding ways to support teachers with providing students with the mathematics necessary to experience joy, wonder, and beauty so that students can make informed decisions about their futures. All teachers and students deserve the best opportunities to be successful no matter the circumstances.

Teaching Practices Supporting Mathematics Teaching and Learning

COVID-19 interrupted the 2019–2020 school year and in doing so created disruptions in the relationships among students and between students and teachers. Crisis situations induce certain responses that can impede mathematics teaching and learning. Those responses should be attended to before teachers can resume in-person, remote, or hybrid instruction. Attention must be given to the social and emotional needs of students, teachers, and staff since students were (and still could be) separated from their peers and teachers for an extended period of time.

Teaching during COVID-19 reveals that establishing relationships is significant for mathematics teaching and learning. When planning for mathematics teaching and learning, prerequisite skills are needed for that learning, and effective teaching practices are needed to move students forward in their learning of mathematics.

The following section outlines some overarching considerations for planning purposes.

Determining Essential Learning for All Students

Standards for each grade level and course describe one full year of content that students are expected to learn. Consider the mathematics that is absolutely essential for students to learn and the connections of mathematics across grades and courses. As well, teachers should be mindful of continuing to connect mathematical content with mathematical processes, such as problem solving, communication, multiple representations, and connections. *Essential learning* is defined as the critical skills, knowledge, and dispositions that each student must acquire as a result of each course, grade level, and unit of instruction (Kanold et al. 2018; Schuhl et al. 2020).

Grade-level or course-level teams, with support from district leaders, should identify essential learning using guiding documents such as *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics: A Quest for Coherence* (NCTM 2006) and *Catalyzing Change* (NCTM 2018–2020). As well, many state and provincial departments of education or other educational organizations provide curriculum documents that help teachers identify curriculum focal points from within their specific curriculum standards. Teams can use the following criteria to determine which standards are essential:

- Does this standard represent the major work of the grade or course?
- Will student learning in future grades and courses be hindered without understanding and proficiency of this standard?
- Is this standard connected to important ideas in previous grades and courses?

Teachers should work collaboratively to develop a shared understanding of essential learnings to ensure all students have equitable access to a viable curriculum. Once determined, essential learnings should be shared with as many stakeholders as possible so schools and districts employ a cohesive approach to support student learning.

DETERMINING ESSENTIAL LEARNING FOR ALL STUDENTS

Potential Resources	Questions to Consider
Focus of the Grade Level • Catalyzing Change Series • *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics* • Developing Essential Understanding Series	What are the essential learnings for the grade level for the upcoming school year? How have the essential learnings been communicated to all stakeholders (e.g., families, special education teachers, etc.)? Have teachers and mathematics specialists met in school-wide and district-wide teams to look at the essential learnings across the district to ensure vertical coherence? How have we allocated the time and created the structures to meet as grade-level teams to plan out units of study around the essential learnings? How have we taken the necessary steps to ensure all students have equitable access to a viable curriculum by allocating time and resources toward the mastery of the essentials? What evidence do we have of that?

Determining Necessary Prior Knowledge

Educators should view students in terms of their strengths, not weaknesses, and avoid the urge to immediately reteach all the skills we think students should have learned before arriving at school this fall. It is more productive for teachers to think of learning opportunities that are most important for students in relation to the mathematics learning progressions.

There are better options than using testing at the beginning of the school year to assess a laundry list of prerequisite understandings from previous grades that would consume a significant amount of instructional time. Prerequisite skills or understandings that may have been missed as a result of COVID-19 could be strategically taught right before the connected unit of study or incorporated as spiral review or as part of instructional routines and procedures. Teaching these skills as connected to grade-level or course-level content deepens students' mathematical understanding.

Before each unit of study, teachers should collaboratively identify prerequisite understandings, using sources such as the *Mathematics Coherence Map*, that will build the foundational understanding for the essential learning in each unit of study students are about to enter. They should collaboratively plan how to support students in making connections to previous learning, incorporating tasks and lessons that build conceptual understanding before the unit of study.

DETERMINING NECESSARY PRIOR KNOWLEDGE

Potential Resources	Questions to Consider
Mathematics Progressions of Learning • Progression Documents Planning for Prior Knowledge • *Mathematics Unit Planning in a PLC at Work®, Grades 3-5* • "Protocol to Determine Prior Knowledge for a Mathematics Unit"	Which of the prior grade-level standards did the students not have the opportunity to learn? Which topics were addressed primarily through remote instruction? Using the information from previous grade-level teams, have teams determined the prerequisite understandings students will need to enter units of study and have they strategically placed them right before that unit or within the unit as appropriate? What are common misconceptions or prerequisite understandings in this topic? What instructional strategies or tasks have been proven to be effective that we will commit to using?

Determining What Students Already Know and Introducing New Learning

To maximize time focused on teaching and learning, teachers should be intentional about selecting and using formative assessments strategies that support teaching. The way in which teachers collect evidence and use it to make instructional decisions has a significant impact on student learning (Wiliam 2011). Using the formative assessment strategies as well as designing quality formative assessments are needed to understand what students know and to build bridges to what they are learning. This is an opportunity to recognize students' strengths and to design and facilitate instruction that is strengths-based.

Employing assessments used formatively provides the necessary feedback to modify instruction to meet the needs of students. Open-ended mathematics tasks or constructed response items can be used as tools to gather insights about the mathematics that students know and understand. Teachers who work with students in remote learning situations should look for digital resources that allow them to collect the same type of data as during in-person opportunities.

DETERMINING WHAT STUDENTS KNOW

Potential Resources	Questions to Consider
Rigorous Math Tasks • "Great Modeling Tasks in Three Acts" • NCSM Great Tasks for Mathematics Series • *High School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice* • NCTM Activities with Rigor and Coherence • Principles to Actions Professional Learning Toolkit • "Using Talk to Make Sense of Mathematics" Formative Assessments • *The Formative Five* • *Jump Start Formative Assessment*	What information is needed from the formative assessment tasks to provide support for the grade-level essential learnings? How might mathematical tasks be incorporated to determine students' previous understanding in place of pretests and posttests? How will grade level teams and courses incorporate effective formative assessment strategies into current instructional teaching practices? How will grade-level teams and courses ensure that new learning is intentionally connected to previous understanding? How do we maximize instructional time to focus on mathematics teaching and learning? How can we use technology to gather insights about the mathematics students know and understand?

The Most Effective Teaching Practices

It is essential to use the eight equitable and effective mathematics teaching practices advocated by NCTM in *Principles to Actions* (2018) regardless of whether instruction is in-person, remote, or hybrid.

- Establish mathematical goals to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representations.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support productive struggle in learning mathematics.
- Elicit and use evidence of student thinking.

Taken together, these practices support formative assessment strategies. For example, **eliciting and using evidence of student thinking** requires teachers to ensure all students believe that their mathematical thinking is valued. Effective implementation of this teaching practice includes **posing purposeful questions**, examining students' work on tasks, and observing students engaged in doing mathematics.

It is critical that we continue to **support students in productive struggle** and engage them in **meaningful mathematical discourse** that happens in and out of the classroom. Students can formulate their thoughts and then record their thinking and **connect mathematical representations** in a variety of ways, including using tools and devices.

At the heart of **implementing tasks that promote reasoning and problem solving** based on specific **goals that focus student learning** is a shift in thinking from an emphasis on answer getting (i.e., "How can I get my students to figure out the answer to this problem?") to an emphasis on problem solving (i.e., "How can I use this problem to teach the mathematics of this unit?").

EFFECTIVE MATHEMATICS TEACHING PRACTICES

Potential Resources	Questions to Consider
Good Questions *More Good Questions* *5 Practices for Orchestrating Productive Mathematics Discussions* 5 Practices in Practice Series Discourse Actions to Promote Student Access High-Yield Routines for Grades K–8 Taking Action Series Principles to Actions Professional Learning Toolkit *Strengths-Based Teaching and Learning in Mathematics*	How will we best support teachers in the implementation and enhancement of the eight mathematical teaching practices? How will we use evidence of student thinking to inform our teaching practices and advance student learning? How will we engage students in and facilitate meaningful mathematical discourse as a routine practice? How will we identify and implement tasks that promote reasoning and problem solving as an ongoing practice throughout the school year? How will we engage in collaborative planning and reflect on the successes and challenges of implementation of equitable mathematical teaching practices to learn from one another and improve our instructional practices over time?

Recommendations for teaching practices

- Work collaboratively to develop a shared sense of the essential grade-level content that students must learn.
- Work collaboratively to develop a shared sense of the prerequisite knowledge for that essential grade-level content.
- Use formative assessment strategies to gather evidence of student learning, provide feedback on what students know, and use that feedback to design and facilitate instruction.
- Focus instructional strategies on effective mathematics teaching practices.

As we are *Moving Forward,* it will be critical that teachers, school, district, state, and provincial level leaders work collectively to identify the essential learnings, the prerequisite skills needed for those learnings, and effective teaching practices to support student learning.

Advocating for Teachers, Students, and Humanizing the Development and Implementation of Education Policies and Practices

Mathematics teachers and leaders must continue to speak to and support the development and implementation of educational policies and practices to promote high-quality, equitable mathematics teaching and learning for every student (NCTM 2014; NCSM 2020a). With the interruption of the school year by the outbreak of COVID-19, we know that current policies and budgets will need to be modified to address the current reality. The anticipated interruptions during the 2020–2021 school year call into question the validity of data generated by state or provincial assessments. There are new demands on teachers for managing in-person, remote, or hybrid teaching as well as assessment practices that affect instructional time.

It is also important to recognize that getting back to the "status quo" should not be the collective goal. The current situation has revealed existing challenges and problems, which cannot be ignored. National, state, province, and district leaders should consider the impact of policies on budget, assessment programs, and support for teachers. Three critical focus areas are presented for consideration: (1) policy and budget; (2) assessment practices; and (3) framing support for teacher professional learning and collaboration.

What do we need to consider regarding policy and budgetary decision-making?

Decision makers will be faced with budgetary decisions that may affect the ability to ensure that all students have access to quality teaching and learning, resources, and instructional time for mathematics. It is essential to examine nonnegotiables for the teaching and learning of mathematics in preparation for possible budgetary cuts.

Consideration	Questions to Consider
Policy and Budget	What national, state, or provincial policies have been put in place to guide school districts as to how, what, and when they can reopen? What happens if there are waves of stopping and starting, staggered openings, modified schedules, or other developments? How will this impact the budget? How will this affect the school calendar? How have we humanized the situation with policymakers and stakeholders, so they know the human impact of fiscal decisions? What advocacy measures can we take to ensure that all schools have the financial means, resources, and support needed to undergird meaningful mathematics teaching and learning? How do we promote the allocation of resources to ensure that all students are provided with an appropriate amount of instructional time to maximize their learning potential? How do we ensure every student is provided access to grade-level content and high-quality teaching?

Consideration	Questions to Consider
Policy and Budget	How have we worked to make sure that all students have the technology components, software, and access needed to continue mathematics instruction away from the brick-and-mortar school? When budgetary decisions are made, what considerations do we speak to and find support for, such as crucial positions that support teachers–for example, instructional math specialists, coaches, and other instructional leaders?

What should we consider when making decisions about assessment practices?

In addition, the opportunity exists to reevaluate assessment systems within schools, districts, states, or provinces to refocus on the use and intent of instructional time. Currently, assessment systems usually contain three types: (1) formative, (2) summative, and (3) state or provincial assessments. Because of the unpredictable and unprecedented circumstances around COVID-19, systems should consider immediate action in the following areas:

- **Waive, eliminate, or postpone state, provincial, or district assessments** that measure student learning at a particular moment in time (including the beginning of the year) in order to redirect all within-school time into focused instructional time in the classroom with the classroom teacher.
- **All district-level assessments should be carefully reviewed** and only those demonstrably connected to content and resulting in actions should be used. Any assessment that does not substantially inform instruction should not be used at the expense of time that would otherwise be spent on student learning.
- **Support and protect time for teacher collaborations around formative assessment tasks** and problems that are focused on the essential learnings.

Maximize time spent on assessing student understanding and developing the key mathematical ideas that are embedded within the essential learning. Minimize time spent on state or provincial and summative assessments (NCTM 2010).

Consideration	National, State, Province, and District Level Leaders Questions to Consider
Assessment Practices	What systemic impacts will affect the validity and reliability of data from large-scale assessments? What other measures (metrics) might states or provinces report in regard to educational system health, wellbeing, and recovery? What district-wide assessment systems are in place, and how many instructional days do these district-wide assessments affect for testing and analyzing data? Are formative assessments used to inform instruction? Daily? Weekly? Unit-by-unit? What time within the contract day do teachers have to collaborate, analyze, and plan as a response to data collection that results in meaningful opportunities for students?

Consideration	National, State, Province, and District Level Leaders Questions to Consider
Assessment Practices	What actions have the leadership taken to eliminate new initiatives that may influence planning formative assessments?

What should we consider when making decisions about professional learning and collaboration?

When teachers reenter their classrooms, uncertainty will likely surround such items as policy changes, essential learnings, and possible transitions between in- and out-of-school learning. Teachers themselves may have experienced emotional distress during this time as well. Within this uncertainty exists a key opportunity for stakeholders to explicitly define the system culture and to create a new normal by advocating for the support and professional learning of teachers. It will also be important to recognize and leverage teachers' strengths.

Systems should consider possibilities such as these:

- **Create a culture where professional learning and increasing teacher capacity are priorities.** Create and sustain structures that promote job-embedded professional development by placing mathematics coaches and instructional specialists in buildings and at larger system levels (NCSM 2007a).
- **Prioritize time and value teacher collaboration** by creating regular opportunities throughout the school year for teachers to meet with grade-level and course-alike teachers as well as vertical teaming collaboration. Avoid such pitfalls as teacher isolation by creating virtual and face-to-face support groups for teachers, mathematics coaches, and instructional specialists that meet on a regular basis. Focus these collaboration efforts on identifying protocols; creating a shared vision of assessment, grading, and intervention; developing action plans for co-teaching and the implementation of rich mathematical tasks; and facilitating curriculum-mapping discussions. (Kanold et al. 2018; NCTM 2014; NCSM 2007b).
- **Integrate the use of tools and technology** that further the visualization, modeling, and sense making about mathematics. For these to be implemented effectively, consider professional learning focused on how to promote reasoning and sense making with tools and technology while learning content. Also provide opportunities on how to use technology to give student feedback and to maintain communication with families (NCTM 2014).
- **Increase transparency** with key stakeholders by having clear, concise, and consistent communication about policy decisions, along with a clear process for asking and answering questions and collecting feedback. For example, initiate a weekly videocast, podcast, or online newsletter and then encourage teacher voice by including a feedback survey/form that is monitored. Include community stakeholders and family groups as often as possible so to create a collaborative partnership.

The following table lists some questions to consider about the critical advocacy focal points of professional learning and collaboration.

Consideration	Teachers, Principals, Mathematics Coaches, Instructional Specialists Questions to Consider
Professional Learning and Collaboration	What professional learning opportunities do we have for increasing content knowledge and best practices for remote teaching? How can we create opportunities for teacher collaboration, both with grade-level and subject-alike teachers as well as vertical teaming collaboration? What opportunities can we create to support collaboration in developing and implementing essential learning? How can we leverage mathematics coaches and instructional specialists to maximize job-embedded professional learning? How can we support teachers in the use of formative assessments to inform student learning? How are we helping teachers navigate and implement curriculum changes? How can we advocate for policies that value the need for teacher collaboration and work time—before the 2020–2021 school year begins, during this school year, and beyond? What supports are in place to help teachers ensure that all students have access to high-quality mathematics resources and content—both with face-to-face and out-of-school learning?

Recommendations for advocacy

- Use a strengths-based approach by focusing on what skill sets your teachers and students already have versus what they might still need (Kobett and Karp 2020).
- Provide and protect access to rigorous and engaging instruction, learning, and support for each and every student.
- Build and sustain a positive identity and disposition toward mathematics for all teachers and students.
- Ensure that we are increasing, not decreasing, opportunities for each and every student.
- Communicate with, engage with, and support our families and community.

Policymakers and school leaders may find themselves in unenviable positions as they make policy and budgetary decisions that may adversely affect teachers and students. Humanizing the impacts of those decisions on teachers and students helps to keep systems in perspective.

Your Role in Moving Forward

When we get to the other side of COVID-19, we will be asked and we will ask ourselves, Did we do enough for each and every student, our teachers, and our communities? Were we able to lead; to be bold and transparent in the decisions we made; and to connect with students, support rigorous and engaging mathematics discourse and learning, help them understand their world, and increase their opportunities for the future? Opinions will differ about how well the work was done and whether

students received what they needed to move forward. The questions you must ask yourself are, Did I do all that was necessary and within my control and influence to ensure that each and every student had the opportunity and access to learning? Was equity at the forefront of my decisions? We have the opportunity to be innovative and to think purposefully about addressing traditional/systemic structures, practices, and beliefs that have allowed inequities to persist. Together, we can move forward.

Highlighted Resources

Determining Essential Learning for All Students

- Catalyzing Change: Initiating Critical Conversations Series (NCTM)
- Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics: A Quest for Coherence Series (NCTM)
- Developing Essential Understanding Series (NCTM)

Determining Necessary Prior Knowledge

- Progression Documents (McCallum 2007)
- *Mathematics Unit Planning in a PLC at Work®, Grades 3–5* (Schuhl et al. 2020)
- "Protocol to Determine Prior Knowledge for a Mathematics Unit" (Schuhl et al. 2020)

Determining What Students Know

- "Great Modeling Tasks in Three Acts" (NCSM)
- NCSM Great Tasks for Mathematics Series (NCSM)
- High School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice (Berry et al. 2020)
- NCTM Activities with Rigor and Coherence
- Principles to Actions Professional Learning Toolkit (NCTM)
- "Using Talk to Make Sense of Mathematics" (Bill and Speranzo 2017)
- The Formative Five: Everyday Assessment Techniques for Every Math Classroom, Grades K–8 (Fennell, Cobett, and Wray 2017)
- "Jump Start Formative Assessment" (Floyd et al.)

Effective Mathematics Teaching Practices

- Good Questions: Great Ways to Differentiate Mathematics Instruction in the Standards-Based Classroom (NCTM 2017)
- More Good Questions: Great Ways to Differentiate Secondary Mathematics Instruction (Small and Lin 2010)
- 5 Practices for Orchestrating Productive Mathematics Discussions (Smith and Stein 2011
- "Discourse Actions to Promote Student Access" (Candela, Boston, and Dixon 2020)
- High-Yield Routines for Grades K–8 (McCoy, Barnett, and Combs 2013)
- Taking Action Series (NCTM)
- Principles to Actions Professional Learning Toolkit (NCTM)
- Strengths-Based Teaching and Learning in Mathematics: 5 Teaching Turnarounds for Grades K–6 (Cobett and Karp 2020)

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