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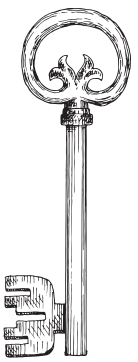

Take Stock of Your Mathematics Program's Health

Destiny is not a matter of chance, it is a matter of choice; it is not something to be waited for, it is a thing to be achieved.

—William Jennings Bryan

The office phone rings and the voice on the line is a reporter from the *Washington Post*. She is gathering information for a story showcasing the nation's top mathematics programs. She begins by asking for your name and official job title. Then, in rapid-fire succession, she asks these two questions: "Would you describe your mathematics program as healthy?" and "What evidence can you provide to back up your claim?" After a long pause, you take a deep breath and begin to speak.

Effective mathematics leaders know exactly what to say in such situations. They know exactly which words to use to describe exemplary mathematics teaching and learning for students, effective professional learning programs for staff, and engaging partnerships with families and community stakeholders. Effective leaders know exactly which measure of progress to reference when describing growth for each part of their program. So, what exactly will you say to the reporter? If the reporter were to interview fifty members of your mathematics community, would they say the same thing? In this chapter, you will explore strategies for critically analyzing your mathematics program. You will learn how to recruit and train a representative team of stakeholders who will gather data using a mathematics program audit. Finally, you will explore strategies for empowering your team to engage the entire mathematics community of teachers, leaders, and community members in a transparent and continuous process of program improvement.

Highly effective mathematics leaders routinely engage in self-reflection and thorough analysis of feedback that they collect regularly from representative stakeholders. Self-reflection begins with this simple exercise adapted from Mona Toncheff and Timothy Kanold (2015): in thirty seconds or less, write down your vision for

exemplary mathematics teaching and learning. After writing down your thoughts, ask at least twenty stakeholders from your district, "What is our vision for exemplary mathematics programming?"

Be sure to include teachers, students, parents, community leaders, central office leaders, special educators, English learners staff, and school-based administrators. Each time that a stakeholder provides a response that very closely aligns to what you wrote, give yourself a point. Each time a stakeholder provides a response that does not, take one point away. Each time a stakeholder responds, "I don't know," or provides an answer diametrically opposed to your vision, take away two points. At the end of the exercise, consider your total and how it reflects your leadership. Of course, developing, communicating, and living a common vision for mathematics programming is just one of several checkpoints for effective mathematics leaders. Figure 1.1 contains a few other checkpoints to consider.

Answer the following questions and list the evidence to support the answer choices.

- Do students, teachers, and families have access to high-quality curricular resources that align directly to clearly developed student learning targets? Are other stakeholders invited, regularly, to scrutinize the curriculum to stimulate growth?
- Are collaborative teams of mathematics teachers developing common assessments with common scoring practices and providing students with high-quality feedback to guide their goal setting?
- Are teachers receiving high-quality professional learning so that they have the resources, skills, and knowledge to teach students effectively?
- Are school-based administrators providing meaningful formative feedback to teachers during formal and informal observations? How variant are those conversations from school to school?
- Are the powerful voices of students, families, and community partners leveraged to improve mathematics classroom instruction?

Figure 1.1: Taking stock of the district mathematics program (self-reflection).

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A leader's self-reflection coupled with the examination of stakeholder feedback is an excellent gauge of the health of the mathematics program. However, to become an elite mathematics leader, you will need to engage a collaborative team of stakeholders in a comprehensive program audit of your mathematics program.

Securing Representation

Caveat: It may be difficult to secure representation from all of the listed stakeholders. If this is the case, be sure that members of the team consider the perspectives of each stakeholder group listed. Further, members should take responsibility for gathering data from these groups.

Engage Stakeholders as Members of a Mathematics Leadership Team

Undoubtedly, every mathematics program has components that function at high levels. But, it is also likely that programs contain components that remain underdeveloped, require a slight tune-up, or need a complete overhaul. How do effective leaders know which segments of the mathematics program are high functioning?

The first and most important step in closely analyzing your mathematics program is to assemble representative stakeholders, critical friends, and field experts to serve on your MLT. Creating this team

ensures that your finger is on the pulse and that you are fully aware of the needs of those you serve. Stakeholders are much more likely to fully engage in district initiatives when leaders they trust fully represent and support them. MLTs should include students, parents, community partners, mathematics teachers (all levels), special education teachers, English learners teachers, representatives from institutions of higher education, curriculum directors, mathematics coaches, and other interested stakeholders. As you consider which stakeholders to recruit, take a moment to think about the following three questions.

1. Who are the trusted members of the mathematics community whom leaders count on for advice and guidance?
2. Do these trusted community members represent all student and stakeholder groups or do we need to find additional candidates?
3. Do these trusted community members believe that each and every student can learn rigorous mathematics? Further, do they believe that all students should have access to the full mathematics program by the time they graduate?

The responses to these questions will provide leaders with a great list of candidates to begin recruiting for the MLT. But before reaching out to each candidate, take a moment to consider question 3 at greater depth. There is one important characteristic that each member of the leadership team must share; each member must believe, in the deepest part of his or her heart, that all students deserve access to rigorous mathematics instruction. Issues of equity and access in the mathematics program will be part of each and every MLT discussion and decision. There is simply no place on the MLT for stakeholders who believe that mathematics is for an elite few, those born with the capacity, or that some students, given their limited supports at home, just won't be able to understand calculus. These attitudes permeate every school district and we cannot ignore them, but neither can we allow them to bog down the important work of the MLT. One of the critical roles of an MLT leader is to bring a common understanding of issues of equity and access to light. Timothy Kanold and Matthew Larson (2012) describe the challenge like this: "To pursue equity, you, your teams, and other mathematics leaders [and members of your MLT] need to break through the social issues and disparities to engage each student in rich mathematics experiences" (p. 113).

It is unlikely that all members of the team will initially possess a deep understanding of the complex issues of institutional inequity, but leaders can nurture and strengthen it over time. If you doubt a potential team member's beliefs about issues of equity and access, ask the following questions and pay careful attention to the team member's response and his or her tone and body language.

- Do you believe that every student can successfully complete algebra 1 prior to entering high school? Why or why not?
- What do you believe are the root causes of our gap in achievement among student groups?

Pay attention to who takes ownership of the issues of equity that persist in our profession. Look to recruit those who believe that there are adult actions that will reduce or eliminate student opportunity gaps. On the other hand, if prospective candidates begin by placing blame on society, families, lifestyles, or family income, thank them politely and cross them off the list of MLT candidates. Once you finalize the prospective list, place a personal phone call to invite each potential candidate to join the team. Figure 1.2 (page 10) provides some key talking points for reaching out to recruit MLT candidates.

- Explain *why* you are forming an MLT.
  - Create systematic and sustained program improvement.
  - Ensure students receive the highest quality mathematics instruction.
  - Ensure teachers who support mathematics instruction receive the support, resources, and training they deserve.
  - Empower students, families, and community stakeholders as equal partners in the mathematics instructional improvement process.
- Clearly explain the intended work of the MLT.
  - Conduct and analyze results from a mathematics program audit (figure 1.4, page 12).
  - Develop a vision for exemplary mathematics programming.
  - Develop SMART goals with clear performance measures.
- Clarify time commitments and describe how long members will be involved with the MLT.
  - Initially, the time commitment will be high (biweekly).
  - After the work associated with the audit, the time commitment will be moderate (monthly).
  - After the team sets goals, establishes supporting systems, and clearly defines measures of performance, the time commitment will be light (quarterly).
- Explain exactly *why* you have identified someone as an excellent MLT candidate.

Figure 1.2: Talking points for MLT recruitment.

Once you form the MLT, it is time to bring the team together to engage in a mathematics program improvement process. During the first meeting, focus on the two objectives of (1) establishing a collaborative and inclusive team culture and (2) analyzing and, if necessary, revising the mathematics program audit. Figure 1.3 is an agenda example for the first meeting of the MLT.

MLT Preliminary Meeting

Agenda

I. Introductions and icebreaker
II. Collaborative establishment of norms and protocols
III. Review of anticipated goals and outcomes
   a. Build a strong MLT. *How will we work together?*
   b. Examine and propose edits to the mathematics program audit.
   c. Take stock. Discuss data and review student performance data.
IV. Action items

Figure 1.3: Agenda example for the first MLT meeting.

During the first meeting, ensure that team members get to know one another and begin to develop an understanding of the team's strengths. To accomplish this, schedule time for team-building activities. Also, be sure to establish meeting norms and discussion protocols. One of the strongest messages mathematics leaders send is to value each and every team member's ideas and perspectives. At subsequent meetings, display meeting norms on the agendas and on presentation slides as a reminder of

the team commitment to foster a fully inclusive and collaborative team environment. (Visit www.allthingsplc.info/tools-resources for additional ideas.)

Nurturing positive group dynamics will pay dividends during the tough work ahead. Consider investing a little time during each meeting to bring the group closer together. At the beginning of each meeting, invite MLT members to share personal or professional moments of joy or inspiration. Build on personal celebrations by celebrating the team's work. Select stories that highlight the team's accomplishments since the last meeting. These actions will nurture a community that operates in the spirit of collaboration, trust, and transparency.

Mathematics Program Audit

After the introductory portion of the meeting, provide the MLT with a copy of the mathematics program audit (figure 1.4, page 12).

As an exercise, give individual team members time to carefully preview the audit. After five to ten minutes, the facilitator of the MLT asks small groups of two or three team members to relate their observations and to make a list of questions or concerns they would like to share with the whole group. This is an important moment in the group's early development, since the whole-team debriefing serves as another opportunity to build buy-in and consensus. The facilitator of the MLT should ask the following four questions to drive the whole-group discussion.

1. What meaningful observations did you make about the mathematics program audit?
2. What did you like about the audit and why?
3. What changes in the audit would you recommend and why?
4. As representatives of stakeholder groups, how might we collect data to inform each statement in the audit? What specific processes might we use?

We designed the first three questions to invite revision of the audit process. Mathematics leaders understand that each of the four keys to effective mathematics leadership represents a vital component of the mathematics program. One responsibility of mathematics leaders is to invite revision while maintaining the integrity of the audit review process. Inevitably, some members of the MLT may be less comfortable collecting data for one or more statements in the audit. It is the MLT facilitator's job to determine whether the proposed revision strengthens or weakens the audit process. If a proposed change weakens the audit process, the facilitator must have the courage to say so and take care to confront important issues such as this to maintain the integrity of the audit review process. Then, the facilitator must challenge the group to strengthen the proposed change.

> ***Effective Leadership Tip***
>
> *As the leader, you may want to digitize the process using an application such as Google Forms. Google Forms is an easy-to-use survey tool that records participant responses in a spreadsheet. Leaders can archive and evaluate responses over time as a strategy for monitoring the mathematics program's health.*

We designed the fourth question of the list to invite suggestions for the data collection process. The audit will be most meaningful if the facilitator empowers each member of the MLT to collect data from the stakeholders they represent. This action reinforces each MLT member's role as a representative of specific stakeholder groups. The data collected from the audit will serve to drive the vision setting, SMART goal setting, and decision making for the mathematics program, so it is best to be as inclusive as possible.

4—Strong Evidence	3—Some Evidence	2—Little Evidence	1—No Evidence
This statement consistently aligns with site-based collaborative teams and district leaders.	This statement somewhat represents the actions of site-based collaborative teams and district leaders.	This statement occasionally represents the actions of site-based collaborative teams and is not a consistent action from district leaders.	This statement does not reflect the actions of site-based collaborative teams and district leaders.

Key of Mathematics Leadership	Mathematics Leadership Actions	Statements	Self-Rating	Comments
Establish a clear vision for mathematics teaching and learning.	Develop a collaborative vision for an exemplary mathematics program.	All stakeholders collaboratively develop, clearly articulate, and understand the vision for exemplary mathematics teaching and learning.	4 3 2 1	
		The vision for exemplary mathematics teaching and learning drives strategic planning, SMART goal setting, budgetary expenditures, and professional learning, and includes measures of success.	4 3 2 1	
		All mathematics teachers and leaders believe in high expectations for all students.	4 3 2 1	
	Establish measures of success.	The mathematics program's vision promotes equity and access to rich, meaningful mathematics for all students.	4 3 2 1	
		Mathematics leaders continually monitor the vision of teaching and learning and consistently provide feedback to teachers, administrators, students, and parents.	4 3 2 1	
		Mathematics leaders clearly define, monitor, and celebrate measures of success with stakeholders during the school year.	4 3 2 1	
		Collaborative teams set SMART goals aligned to the district mathematics vision.	4 3 2 1	
		Student enrollment in advanced coursework (such as AP and college-level courses) proportionally represents district demographics.	4 3 2 1	
		The entire system utilizes evidence of data-driven processes. Collaborative teams adapt instruction based on student thinking, use trends in benchmark assessments to modify curriculum, use trends in student performance to create or modify interventions, and use data to drive decision-making processes.	4 3 2 1	
		Mathematics leaders provide meaningful, action-oriented feedback on student performance and clearly communicate it to all stakeholders.	4 3 2 1	

Key of Mathematics Leadership	Mathematics Leadership Actions	Statements	Self-Rating	Comments
Support visionary professional learning for teachers and teacher leaders.	Engage teachers in worthwhile and differentiated professional learning.	Collaboration is a vital element of continuous professional learning. Every part of the mathematics program (such as curriculum development and professional learning) shows evidence of collaborative structures.	4 3 2 1	
		The collaborative team's work is a vital component of the district professional learning plan.	4 3 2 1	
		District and site schedules permit job-embedded professional learning and time for collaboration during the school day.	4 3 2 1	
		Professional learning opportunities align to district or site mission, vision, values, and goals.	4 3 2 1	
		After new professional learning, teachers and collaborative teams engage in evidence-based goal setting and action for the next unit.	4 3 2 1	
		All collaborative team members work to activate the vision and support the team's work through peer accountability.	4 3 2 1	
		District- and site-level leaders provide a professional development plan that includes multiple delivery systems with activities differentiated for the various learning needs of participants.	4 3 2 1	
		District and site leaders develop and implement a professional learning plan that addresses the needs identified by quantitative and qualitative data analysis. Professional learning is discipline specific and job embedded but also emphasizes a whole-school approach to learning.	4 3 2 1	
		The mathematics leadership team evaluates professional learning by examining participants' reactions, the degree of their learning, their use of the professional learning content, the degree of support and change in the organization resulting from the professional learning, and the effect of the professional learning on students' achievement and learning.	4 3 2 1	

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Figure 1.4: Mathematics program audit.

Key of Mathematics Leadership	Mathematics Leadership Actions	Statements	Self-Rating	Comments
	Develop highly skilled and highly effective mathematics leaders.	Site-level leaders ensure that teachers assigned to work with low-performing students are experienced and have high expectations for student achievement. Evidence shows that these teachers have successfully accelerated low-achieving students and the teachers have a strong desire to continue working with these students.	4 3 2 1	
		District-level leaders create multiple opportunities to develop teacher leaders through professional learning and support from team and instructional leaders.	4 3 2 1	
		District-level leaders provide supportive conditions for teacher leaders to consistently collaborate and engage in reflective practices.	4 3 2 1	
		Site-level leaders consistently select highly engaging and effective teachers to serve as instructional team leaders.	4 3 2 1	
	Build the capacity of site-based administrators and district leaders.	District and site leaders develop and implement a professional learning plan that addresses the needs identified by quantitative and qualitative data analysis. Professional learning is discipline specific and job embedded, and also emphasizes a whole-school approach to learning.	4 3 2 1	
		The site-based leadership team requires team members to use the professional learning standards and resources in collaboration with district-level leadership, and ensure that all professional learning results in improving all students' learning.	4 3 2 1	
		District mathematics leaders ensure that all site-based leaders participate in ongoing mathematics leadership development.	4 3 2 1	
Develop systems for activating the vision.	Engage high-leverage team actions.	Mathematics collaborative teams, site leaders, and district teams consistently analyze data and student work to systematically answer the four critical questions of a professional learning community culture (DuFour, DuFour, Eaker, Many, & Mattos, 2016). 1. What do we want students to know and be able to do? 2. How will we know if they know it? 3. How will we respond if they don't know it? 4. How will we respond if they do know it?	4 3 2 1	
		Mathematics collaborative teams receive feedback regarding their effectiveness in promoting strong collaboration versus cooperation.	4 3 2 1	

Key of Mathematics Leadership	Mathematics Leadership Actions	Statements	Self-Rating	Comments
	Create and implement well-designed and articulated curriculum and assessments.	Essential learning standards are clearly articulated for each course, unit, and lesson and describe both what students should understand and be able to do (content and mathematical practice standards).	4 3 2 1	
		Essential learning standards support horizontal and vertical learning progressions. Resources support the development of standards with an equal intensity of conceptual understanding, procedural fluency, and application (mathematical rigor).	4 3 2 1	
		Curriculum provides opportunities for all students to access rich mathematical tasks via the Standards for Mathematical Practice.	4 3 2 1	
		Mathematical tasks promote reasoning and problem solving. Tasks vary and address multiple levels of cognitive demand.	4 3 2 1	
		District leaders, in conjunction with teachers, design assessment blueprints provided to all teachers. Teachers use these same blueprints to frame unit plans and for daily lesson planning.	4 3 2 1	
		The curriculum, instructional resources, and assessments align. This alignment is clear to teachers, students, and parents, and the curriculum is transparent to all stakeholders.	4 3 2 1	
		District and site-based assessments are balanced in cognitive demand.	4 3 2 1	
		Assessments vary in the type of questions and are not solely procedural.	4 3 2 1	
		Students receive timely feedback on their progress in the content and the development of the Standards for Mathematical Practice.	4 3 2 1	
		Common assessments are created before a unit of instruction and reviewed during and after the unit to ensure they align to the instructional blueprint and assess the essential learning targets, both content and process requirements.	4 3 2 1	
		District leaders articulate clear, nonnegotiable actions defining high-quality assessment practices.	4 3 2 1	
		Mathematics teams collaboratively score student work, establish strong inter-rater reliability, and use the results to provide specific feedback for all stakeholders.	4 3 2 1	
		Collaborative teams engage students in the assessment cycle as part of continuous improvement. Feedback and action are required elements of the assessment cycle.	4 3 2 1	
		All stakeholders have a clear understanding of effective formative assessment processes that result in teacher and student action through evidence gathering and feedback.	4 3 2 1	

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Key of Mathematics Leadership	Mathematics Leadership Actions	Statements	Self-Rating	Comments
	Monitor consistent expectations for exemplary instruction.	Communication in the mathematics classroom is vital to students sharing their understanding of concepts and procedures. Students engage in high levels of discourse every day to develop meaningful understanding of mathematics.	4 3 2 1	
		Differentiation is evident in flexible grouping, lesson design, and mathematical tasks.	4 3 2 1	
		Districts and sites develop and monitor intervention models to ensure all students have access to core instruction and tiered interventions.	4 3 2 1	
		The Standards for Mathematical Practice are observable during every classroom walkthrough, and students can describe which Mathematical Practice they are developing.	4 3 2 1	
		Teachers consistently implement the curriculum to the depth of each essential learning standard. Site and district leaders observe the intended curriculum daily.	4 3 2 1	
		Teachers employ research-informed instructional strategies consistently and use and connect mathematical representations.	4 3 2 1	
		Teachers design lessons to build procedural fluency from conceptual understanding for application. Teachers support students' productive struggle in learning mathematics.	4 3 2 1	
		District-level leaders, in conjunction with site-level leaders, ensure they provide dedicated time for interaction between teachers and intervention program staff to ensure continuity of instruction.	4 3 2 1	

Key of Mathematics Leadership	Mathematics Leadership Actions	Statements	Self-Rating	Comments
Empower the vision of family and community engagement.	Activate the student voice to check alignment between vision and reality.	Student voices are prevalent and honored throughout the mathematics program. District and site-based leaders make regular efforts to gather insights from students through interviews or surveys. The student voice serves as a catalyst for program improvement.	4 3 2 1	
	Empower families as informed advocates.	Parent and guardian voices are prevalent and honored throughout the mathematics program. District and site-based leaders make regular efforts to develop parents and guardians as advocates and to ensure parent participation in professional development, curriculum development, and advisory groups.	4 3 2 1	
		District- and site-level leadership teams have a well-defined process for gathering and responding to feedback on practices for involving parents and families in student achievement.	4 3 2 1	
		District- and site-level leadership teams have a systematic process for analyzing data and reasons for parents' and families' noninvolvement in student achievement.	4 3 2 1	
		The site-level MLT has a process to inform parents and families about school programs and student progress. The process fosters two-way communication and ensures participation is representative of the school community.	4 3 2 1	
	Build and engage a strong network of partnerships.	Community voices are prevalent and honored throughout the mathematics program. District and site-based leaders make regular efforts to activate community stakeholders to promote the love of mathematics (for example, through hosting community fairs, developing student intern programs, serving as mentors and role models, and so on).	4 3 2 1	
		Additional staff (such as counselors, support staff, paraeducators, intervention specialists, administration, and so on) take ownership of and establish collective capacity for ensuring improved student achievement.	4 3 2 1	
		The site-level leadership team collects data on the school climate and takes steps to make the climate welcoming and invitational for all visitors.	4 3 2 1	

*Visit **go.SolutionTree.com/leadership** for a free reproducible version of this figure.*

The facilitator should charge the MLT members to develop a list of stakeholders that they will invite to participate. Students, families, teachers, staff, administration, community members, and partners from institutions of higher education are all possible audit participants. Challenge the MLT members to brainstorm various opportunities to engage stakeholders. For example, MLT members might engage stakeholders in the audit process during school staff meetings, monthly mathematics department meetings, mathematics leadership meetings, PTA meetings, or church or community meetings, or at home using an online version of the audit. Work with MLT members to brainstorm various methods for communicating the audit. Examples include the school system website, a weekly newsletter, social media or a blog, or local newspapers. Finally, challenge your team to think of strategies for collecting the audit data. Consider using multiple methods of data collection, from traditional pencil-and-paper methods to online surveys, to be as inclusive as possible. Once the team members understand the task at hand, communicate clear agreements about the time frame for data collection. Select a reasonable time frame so that team members have a realistic opportunity to gather data from a wide range of stakeholders. Finally, send your MLT members out into the community and into schools to collect information that will guide the vision process.

Move From Vision to Action

Effective mathematics leaders work hard to create a culture of transparency, trust, and collaborative problem solving. Recruiting and empowering a diverse leadership team committed to equity and excellence for all students demonstrates commitment to that pursuit. Further, engaging the MLT in the meaningful work that accompanies the mathematics program audit informs the vision process and subsequent strategic planning. This work steers the mathematics program on a pathway of continuous improvement and ultimately leads to increased student achievement. Table 1.1 describes the relationships among district-, site-, and team-level engagement in taking stock of the mathematics program.

Table 1.1: Mathematics Leadership Commitments for Taking Stock of Your Mathematics Program's Health

District's Role	Site-Level Leader's Role	Collaborative Team's Role
Form an MLT with stakeholders representing all student groups and the community.	Form a site-level MLT responsible for representing the school's voice in the mathematics program.	Apprise all team members of district mathematics leadership actions and initiatives and provide feedback to the site-level MLT.
Facilitate analysis and revision of the mathematics program audit.	Facilitate analysis and revision of the mathematics program audit for site-based staff.	Submit team recommendations for revisions for the mathematics program audit to the lead facilitator of the MLT.
Charge MLT members to collect data using the mathematics program audit.	Gather site-level data to include in the mathematics program audit.	Provide evidence and artifacts to support the mathematics program audit data collection process.

*Visit **go.SolutionTree.com/leadership** for a free reproducible version of this table.*

The results from the mathematics program audit (figure 1.4, page 12) illuminate the program's strengths and opportunities. Chapter 2 shows MLTs how to take the next step and use that information to reimagine their vision for teaching and learning mathematics.