

WEBINAR



Implementing a Problem-based Instructional Model

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Access for English Language/Multilingual Learners

Q: Are all these students English-speaking? We've been having a hard time engaging non-native English speakers with IM. How do you recommend engaging multilingual learners in your curriculum?

A: You can learn more about embedded support for learning language and content simultaneously in IM K–12 Math™ in the “How To Use These Materials” section [Access For English Language Learners](#) on the IM demo site. (Visit our current Certified Partner's sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum.)

These related IM Certified Blog posts might be helpful:

- [Math Language Routines: Discourse with a Purpose](#)
- [Unlocking Learners' Thinking Using Mathematical Language Routines](#)

Access for Students with Disabilities

Q: How do I convince my colleagues that problem-based learning is more beneficial to students who have learning disabilities that are language-based in the long term?

A: Math language routines help all students learn content and the language of mathematics simultaneously. The curriculum gives prompts for teacher moves that help each student to find their voice in a classroom where learning is driven by student discourse. For each grade-level course K–12, each lesson of the curriculum has a suggested strategy for access for students with disabilities and for English learners right there in the teacher lesson plan.

We also offer IM Certified Professional Learning for *Enhancing Access with Math Language Routines*. If you are interested in learning more about IM Certified Professional Learning opportunities, you can reach out to one of our IM Certified Partners.

Q: How do you scaffold for the needs of learners with disabilities? What do you do when the struggle moves from productive to unproductive?

A: We use guidelines from the [Universal Design for Learning](#) as a framework to provide suggestions for teacher moves that will open up [Access For Students with Disabilities](#) to the on-grade-level mathematics for a wide range of learners. (Visit our current Certified Partner's sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum.)

We also offer IM Certified Professional Learning for *Enhancing Access with Universal Design for Learning*. If you are interested in learning more about IM Certified Professional Learning opportunities, you can reach out to one of our IM Certified Partners.

Assessment

Q: Do all grade levels have an end-of-course assessment?

A: There are currently no end-of-year summative assessments in IM K–12 Math™, however there are End-of-Course Assessments and Resources in IM K–5 Math™, which are a resource for major work of the grade and not intended to be given to students all at one time.

The assessments available in IM K–12 Math™ are organized differently in Grades K–5 and 6–12.

K–5

- Daily Formative Assessments (Cool-downs)
- Section-level Checklists or Checkpoints
- End-of-Unit Assessments and Resources
- End-of-Course Assessments and Resources

6–12

- Daily Formative Assessments (Cool-downs)
- Check Your Readiness (Pre-Unit Diagnostic) Assessment
- Mid-Unit Assessments (depending on the length of the unit)
- End-of-Unit Assessments

Building Thinking Classrooms

Q: Do you have any experiences in using IM with strategies found in *Building Thinking Classrooms*?

A: Peter Liljedahl, author of *Building Thinking Classrooms in Mathematics* (2020), joined us live to offer field-tested and practical ways to build engaging math classrooms that center student thinking, and encourage both student autonomy and collaboration. Click [here](#) to view IM on-demand webinars.

Centers

Q: Do centers fit into the daily lessons or are they meant to be supplemental?

A: Centers are embedded in the pacing and lesson structure of K–1 and show up as optional center days in Grade 2. Grades 3–5 will need to find additional time within the school day or add in center days into the pacing.

IM K–5 Math™ has centers that are intended to give students time to practice skills and concepts that are developed across the year. There are two types of centers. Addressing Centers address the work of a lesson or section of a unit. Supporting Centers review prior unit or prior grade-level understandings and fluencies. Each center builds across multiple stages that may span several grades. Students in the same class can play different stages of the same center or different centers during “learning station” time.

Curriculum

Q: Where are the lesson summaries?

A: In IM K–5 Math™, section summaries are found in the last non-optional lesson of each section. In IM 6–12 Math™, the student lesson summaries are found at the end of the lesson in both the teacher guide and student materials. There are also lesson summary videos which can be found in the parent materials for Grade 6–Algebra 1.

Q: Do you plan to expand the high school curriculum to include more courses, such as Pre-Calculus, Calculus, or Statistics?

A: There are no additional high school math courses on our roadmap at this time. As a nonprofit organization, Illustrative Mathematics depends on grant funding for new initiatives, products, and services. This is not currently one of our grant-funded projects.

Curriculum Access

Q: What is the best way to access and use the IM curriculum to its fullest extent?

A: As a non-profit authoring team, IM creates our IM K–12 Math curricula, but we have no structure for the manufacture, printing, sales, and distribution of the materials. We have three IM Certified Distribution Partners that can help you access the curricula digitally in different ways and help you with pricing, including a free digital option.

IM will always support a no-cost, CC BY licensed digital version of our curriculum through one of our IM Certified partners, and that partner is currently Kendall Hunt Publishing. To access the free, OER version of the curriculum, go to im.kendallhunt.com. A no-cost registration is required for educators to access all of the teacher materials. The Certified Partners also help us by selling print resources and our IM Certified® Professional Learning, which supports implementation with launching the curriculum in Year 1 and going deeper in Year 2 and beyond. Our [Partner Page](#) has information on all three partners as well as links to their sites.

Engagement

Q: What is the best approach to engaging students who traditionally may have been able to disengage from the learning? What is the best way to invite them into the discussions? Is it just a matter of time and opportunity?

A: IM K–12 Math™ uses a [problem-based approach](#) that is driven by student discourse. (Visit our current Certified Partners' sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum.) Students should take an active role, both individually and in groups, to see what they can figure out before having things explained to them or being told what to do. Teachers play a critical role in mediating student learning, but that role looks different than simply showing, telling, and correcting. The teacher's role is to:

- ensure students understand the context and what is being asked
- ask questions to advance students' thinking in productive ways
- help students share their work and understand others' work through orchestrating productive discussions
- synthesize the learning with students at the end of activities and lessons

The IM teacher guides offer suggestions for grouping students to promote collaboration and teacher moves to advance student thinking.

Extra Practice

Q: Where can I find extra practice?

A: Our approach in IM 6–12 Math™ emphasizes distributed practice rather than massed practice (lots of the same types and content problems at once). We usually use “distributing” to mean sprinkling around the content, but it also means, “Don’t try to do too much at once.” Each lesson has an associated practice problem set that contains a few questions practicing the new learning from that day, and also several questions of cumulative review. Practice problems, when assigned in a distributed manner, give students ongoing practice, which also supports developing procedural proficiency.

Providing access to grade-level mathematics does require that teachers make strategic adjustments in order for students to engage, make sense of the questions being asked, persist, collaborate with peers, share their thinking, listen to and understand each others’ thinking, internalize and try on new ideas, and practice and apply what they are learning. Here are some strategies to consider before, during, and after a lesson as teachers plan to:

- adjust common instruction: adjust the launch, directions, sequence of activities
- use specific resources: offer a support such as sentence frames to students who need access for participating in conversation with their classmates
- individualize practice: offer various practice assignments for students to choose from

When we apply these suggestions to a problem-based classroom, we consider what supports are already included in the curriculum and how teachers can plan to support access and challenge for all students through:

- Daily Practice Problems
- Are you Ready for More?
- Math Modeling Prompts in Algebra 1, 2, and Geometry

Often, a teacher can adjust or amplify something that’s already in the curriculum. For example, the Responding to Student Thinking suggestions in cool-down guidance are helpful. This guidance suggests when students will have more chances to practice, points to emphasize in future lessons, or when teachers should press pause and revisit the work in lessons or practice problems. Teachers may see a need and plan to individualize practice either before or after a lesson. This IM Certified Blog post may spark some ideas about [Planning for Meaningful Practice](#).

Family Materials

Q: What materials do you offer to use with parents who think the instruction is happening “too slowly” when compared to more traditional approaches?

A: Information for families is available in the partner platforms including:

- Unit Family Support Resources with Family Support Letters that outline the work of the unit
- [Family Guide for K–5 Instructional Routines](#) located on the IM Resource Hub
- In Grades K–5, each family unit letter also includes a section labeled “Try it at Home” with math prompts and questions for families to interact with their child at home.
- For Grade 6–Algebra 1, Family Support Materials also include [videos](#) of the summaries for each section of a unit. Grant funding made this project possible for Grade 6–Algebra 1, but we don’t currently have the videos for K–5, Geometry, or Algebra 2 courses.
- In IM 6–12 Math™, each student lesson includes activities that are followed by a student lesson summary. An example from the Algebra 1 course can be found at this [link](#): (You’ll need to scroll down the page. Visit our current Partners’ sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum).

These blog posts and resources might be helpful in partnering with families to better understand IM K–12 Math™:

- [Building A Supportive Home/School Partnership](#) (9–12 Focus)
- [Building a Supportive Home/School Partnership](#) (6–8 Focus)
- [FASTalk: Activating the Power of Families to Support Mathematics](#)

Grading Practices

Q: How do you grade students? If our system is not standards-based, how do teachers decide what to put in the grade book? What suggestions do you have for grading student performance? Specifically, what advice would you give to a school that is using “point-gathering” grading practices while trying to implement IM? What advice do you have to help teachers that have to live in a point-gathering system while teaching in a data-gathering curriculum?

A: When we created the curriculum, we chose not to prescribe homework assignments or decide which student work should count as a graded event. This was deliberate because homework policies and grading practices are highly variable, localized, and values-driven shared understandings that evolve over time. For example, the curriculum needed to work for schools where nightly, graded assignments are expected; schools where no work done outside of class is graded; and schools who take a feedback-only approach for any formative work.

The IM Certified Blog post, [IM 6–12 Math: Grading and Homework Policies and Practices](#), shares some information gathered from a survey sent to teachers using IM in their classrooms.

K–5 Webinars and Resources

Q: Will you have a webinar for the lower grade levels? This is our first year implementing IM and we need some help on the organizational/center part of this curriculum. Is there going to be a time to discuss elementary classrooms or is this just for middle school or high school instructors?

A: We do have some [IM K–5 Math™ On-Demand Webinars](#) for teachers that can be accessed under the heading *IM Featured Content*. (To navigate to the webinars from the link above, scroll down the webpage to the heading *IM K–5 Math On-Demand Webinars*. If needed, click the plus symbol to open the accordion to reveal the menu of available webinars.)

IM Certified Partners

Q: Illustrative Mathematics also wrote Open Up Resources, right?

A: An explanation of the evolution of IM curricula from 2017 to 2019 might be helpful. IM authored, reviewed, and approved all of the content contained in Open Up Resources 6–8 Math 2.0. Open Up Resources 6–8 Math 2.0 is a high-quality curriculum, and IM is proud of its collaboration with Open Up Resources, which brought one of the first full-course OER middle school math curricula to students and teachers across the country. The IM curriculum is released under a [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](#). Information about IM 6–8 Math v. III copyright is at the bottom of [this web page](#). (Visit our current Certified Partner’s sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum.)

With CC BY 4.0, others are free to share and adapt the materials (even commercially) with proper attribution.

This [link](#) gives more information on how we work with our current Certified Distribution Partners. IM is a nonprofit organization and our partners give a portion of proceeds from the sale back to IM for the ongoing development and enhancement of the curriculum and professional learning. In addition, our three certified partners, as distributors, have made a commitment to continue to give the IM authors oversight of their IM curriculum digital and print experiences, thus preserving the curriculum pedagogical style and sequencing intended by the authors. The content is the same for all three partners—it's just the format or layout that's different. The lessons are exactly the same information, but the format from different certified distribution partners may have visually aesthetic differences. IM Certified Distribution Partners exclusively offer IM Certified curricula for free and via enhanced teacher and student experiences in digital and print formats. Having three partners for IM 6–12 Math™ and two partners for IM K–5 Math™ gives districts and schools more choices and flexibility to meet the needs of their students.

Q: Do we have to use Imagine Learning to have full access to IM?

A: As a non-profit authoring team, IM creates our IM K–12 Math™ curricula, but we have no structure for the manufacture, printing, sales, and distribution of the materials. We have three IM Certified Distribution Partners that can help you access the curricula digitally in different ways and help you with pricing, including a free digital option. The Certified Partners also help us by selling print resources and our [IM Certified Professional Learning](#). Our [Partner page](#) has information on all three partners as well as links to their sites.

Q: Is this a demo or do you have to use Kendall Hunt or Imagine Learning to fully access IM for K–5?

A: IM will always support a no-cost, CC BY licensed digital version of our curriculum through one of our IM Certified partners, currently Kendall Hunt Publishing. To access the free, OER version of the curriculum, go to im.kendallhunt.com. A no-cost registration is required for educators to access all of the teacher materials as an open education resource. For IM K–5 Math™, Imagine Learning loads our curriculum into their learning platform in order to offer an enhanced digital version that is subscription-based, and Kendall Hunt also has a digital delivery option.

Q: So, if it is an OER curriculum, what is the benefit of using an IM Certified Partner?

A: Our three certified partners, as distributors, have made a commitment to continue to give the IM authors oversight of their IM curriculum digital and print experiences, thus preserving the curriculum pedagogical style and sequencing intended by the authors. The content is the same for all three partners—it's just the format or layout that's different. The lessons are exactly the same information, but the format from different certified distribution partners may have visually aesthetic differences. IM Certified Distribution Partners exclusively offer IM Certified curricula for free and via enhanced teacher and student experiences in digital and print formats.

As IM Certified Partners, these partners can also offer our IM Certified Professional Learning which is authored and facilitated by our team at IM.

IM Certified® Professional Learning

Q: What do we have to provide to our district to attend IM professional learning?

A: IM Certified Professional Learning can be scheduled through your IM Certified Partner for your district or school or via academy-style learning. Academy-style learning is a good option for individual teachers or schools who only have a few teachers who need training. You can view all [upcoming academy offerings](#) on the IM website.

Q: When attending the virtual professional learnings that are available online, do you recommend that we go through the Certified Partner that we are using to access the material, or can we go through any of the Certified Partners?

A: We recommend going through the Certified Partner being used for digital access, so that any views of the curriculum used during PL will match what the teachers will see while using the curriculum. However, since the content covered during a PL session will be the same regardless of the Certified Partner, it is possible to go through any Certified Partner.

Q: What kinds of Professional Learning take priority during the transition to IM? What can a math coach do to support teachers during that transition?

A: Implementation success increases when teachers and school leaders share a vision for mathematics teaching and learning, understand what this may mean in terms of their practice, and understand why and how adopting IM is a part of that vision. Many schools find it helpful to begin by having a discussion regarding what your district vision is for math instruction. NCTM has tools that help facilitate this shift in instruction by providing guidance on the 8 Effective Teaching Practices and productive vs. unproductive beliefs.

- [NCTM Principles to Actions Book and Toolkit](#)
- [NCTM Taking Action Series](#) is an application-based approach to the publication *Principles to Actions* mentioned above. It includes classroom videos, transcripts, and discussion questions that can be used with teachers to help them anchor their discussions in observation.

Other great resources for districts in planning for systemic, sustained change include:

- [Curriculum Support Guide](#) from Curriculum Partners
- [Systems for Instructional Improvement: Creating Coherence from the Classroom to the District Office](#)
[Creating Coherence from the Classroom to the District Office](#) by Cobb et al.

This related IM Certified Blog post might also be helpful:

- [Supporting Teachers During Implementation of Illustrative Mathematics: Big Ideas For Coaches and Teacher Leaders](#)

We also offer an entire IM Certified Professional Learning catalog that has options for Leading IM Implementation and a menu of offerings for teachers and coaches to engage in professional learning with opportunities prior to implementation that focus on instructional routines. If you are interested in learning more about [IM Certified Professional Learning](#) opportunities, you can reach out to one of our IM Certified Partners.

Q: Are you looking for more people to become certified trainers?

A: Learn more about the [IM Certified Facilitator](#) application process. IM accepts applications from talented educators interested in joining our enthusiastic, dedicated, and inclusive community of IM Certified Facilitators. At IM, we believe that all students should have the opportunity to experience grade-level mathematics through challenging and engaging problem-based curricula. IM Certified Facilitators have a unique opportunity to gain additional skills and strategies in supporting teachers implementing IM Certified curricula in their classrooms. Facilitators earn certification in IM K–5 Math™, IM 6–8 Math™, and IM 9–12 Math™. All are welcome to apply and we especially welcome applications from professionals with experience in urban schools, people of color, and those who share IM's commitment to racial justice through ensuring the right of every learner to engage in meaningful, rigorous, grade-level mathematics.

Implementation

Q: How would you approach implementing a problem-based approach in a school culture that is used to the textbook chapter math exercises approach as to minimize backlash? What advice do you have for teachers and instructional coaches in a district who are implementing problem-based instruction for the first time next year?

A: Implementation success increases when teachers and school leaders share a vision for mathematics teaching and learning, understand what this may mean in terms of their practice, and understand why and how adopting IM is a part of that vision. Many schools find it helpful to begin by having a discussion regarding what your district vision is for math teaching and learning. The National Council of Teachers of Mathematics (NCTM) has tools that help facilitate this shift in instruction by providing guidance on the 8 Effective Teaching Practices and productive vs. unproductive beliefs.

- [NCTM Principles to Actions Book and Toolkit](#)
- [NCTM Taking Action Series](#) is an application-based approach to the publication *Principles to Actions* mentioned above. It includes classroom videos, transcripts, and discussion questions that can be used with teachers to help them anchor their discussions in observation.

Professional learning and district support for school leaders will support their understanding of their role in the implementation process—alignment to vision, what to expect, how to support teacher learning, school conditions, etc. The IM Certified Professional Learning Catalog has options for Leading IM Implementation. Other great resources for districts in planning for systemic, sustained change include:

- [Curriculum Support Guide](#) from Curriculum Partners
- [Systems for Instructional Improvement: Creating Coherence from the Classroom to the District Office](#) *Creating Coherence from the Classroom to the District Office* by Cobb et al.

In addition to professional learning for leaders, the IM Certified Professional Learning Catalog includes options for teachers and coaches to engage in professional learning around our problem based design. If you are interested in learning more about IM Certified Professional Learning opportunities, you can reach out to one of our IM Certified Partners.

These related IM Certified Blog posts might also be helpful:

- [Beyond Curriculum Adoption: A Vision of the IM Classroom](#)
- [Promoting Change: Reflections from the UnboundEd Five-Day Standards Institute™ 2022](#)
- [Supporting Teachers During Implementation of Illustrative Mathematics: Big Ideas For Coaches and Teacher Leaders](#)

Pacing and Scheduling

Q: What suggestions do you have for teachers who may not have enough time to complete every lesson in the curriculum but must touch all math standards? When our classes are shorter than estimated across the tasks, how do we get through all the content in a single day?

A: IM 6–12 Math™ lessons are designed for 45 minutes of instruction with practice problems falling outside of that time. If you have shorter blocks of time for math instruction, you will need to make decisions about what to cut and what to keep based on the unit learning goals. Some districts have decided to increase their math instructional minutes in order to accommodate more time for math instruction. There are a variety of IM Certified Professional Learning opportunities available to support you in planning, including our Focus on Planning and Pacing session.

Q: How do you incorporate the lesson practice problems consistently after the IM lesson? Do you assign the practice problems for homework or immediately following the lesson?

A: The IM 6–12 Math™ lessons are designed for 45 minutes of instruction. Practice problems fall outside of that time. Some teachers assign practice problems as homework, some use them as opportunities for revision, and others use them in additional support courses.

Q: A block schedule can make it challenging to complete the IM curriculum from beginning to end. How should we accommodate that? How do you get the content in for K–12 when you have a block schedule with a shorter block of 35–40 min?

A: This IM Certified Blog post [Planning Lesson for a Block Schedule](#) will highlight some considerations when planning lessons with block scheduling. In addition, our authoring team has created [Guidance for Block Scheduling](#) that may be helpful in thinking about how to organize your math block.

Parent Nights

Q: Have you had experience with a parent night activity to help educate parents? If so, what have you included?

A: The IM Certified Blog post, [Building a Supportive Home/School Partnership](#), will be helpful when thinking about parent engagement nights. It includes a free downloadable high school family math night resource.

Planning

Q: What do you consider in planning that helps you move the learning forward? Are there examples of questions for teachers as they navigate this teaching style?

A: Our teacher guides offer suggested questions to pose during the lesson activities and teacher moves to advance and respond to student thinking. This IM Certified Blog post, [The 5 Practices Framework: Explicit Planning vs Explicit Teaching](#), explains an approach in which teachers anticipate, monitor, select, sequence, and connect learning.

Problem-based Learning

Q: Is “problem-based” the same as or different from “inquiry-based” instruction?

A: “Inquiry-based” can mean different things to different people. IM K–12 Math™ is a problem-based curriculum. Problem-based instruction means believing all students can solve problems on their own and giving them a chance to try. Teachers play a critical role in mediating student learning in a problem-based classroom. For example, teachers launch the problem so that students understand the context and what is being asked, ask questions to advance students’ thinking in productive ways, help students share their work and understand others’ work through orchestrating productive discussions, and synthesize the learning with students at the ends of activities and lessons. Learn more about [IM’s approach to problem-based instruction](#). (Visit our current Certified Partners’ sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum.) The IM Certified Blog posts [What is Problem-Based Instruction?](#) and [How Do Students Perceive Problem-Based Learning?](#) offer further insights.

Q: What system and structures, like math language routines, are most helpful in setting the culture and expectation for the year?

A: The warm-ups consist of instructional routines that are considered our invitation to the lesson. The instructional routines are also one of our IM Certified Professional Learning offerings offered in preparation for IM implementation. This IM Certified Blog post, [The 5 Practices Framework: Explicit Planning vs Explicit Teaching](#), highlights an instruction routine in which teachers anticipate, monitor, select, sequence, and connect learning. This series of IM Certified Blog posts provides further insights for teachers into ways to support students as they become part of a problem-solving community of learners.

- [How Do Students Perceive Problem-Based Learning?](#)
- [Inviting Students to the Mathematics](#)
- [Concrete Representations that Give Students a Way to Get Started](#)
- [Explicit Classroom Norms to Teach Kids How to Learn From Solving Problems](#)

The IM demo site has more information about [math language routines](#) and other [instructional routines](#). (Visit our current Certified Partners' sites—[Kendall Hunt](#), [Imagine Learning](#), or [McGraw-Hill](#)—for the full curriculum.)

Q: My school will be transitioning to IM for K–6. What should teachers focus on and develop so that students may be successful entering into the middle to high school curriculum?

A: The lesson structure and overall design is consistent for grades K–12. However, there are some differences in centers, practice problems, assessments, and a few new instructional routines in K–5. We have two videos that might provide more details: The first is an [overview of the K–5 materials](#) and the second is a [comparison between K–5 and 6–12 curriculum features](#).

Q: What would you name as the tenets or pillars of problem-based instruction? What beliefs need to be in place as a site or district to support teachers in transitioning to problem-based instruction from more traditional instruction?

A: Some resources that you might find helpful regarding our approach to problem based learning:

- [What is a “Problem-Based” Curriculum?](#) Our authoring team put together this resource found in the IM Teachers Guides that addresses the components of problem-based curriculum.
- The IM Certified Blog post [How Do Students Perceive Problem-Based Learning](#) may also be helpful.

Regarding supports that need to be in place in transitioning to a problem-based curriculum, it is helpful if teachers have knowledge of the 8 Effective Teaching Practices laid out in NCTM's *Principles to Actions*.

As far as supporting teachers in making the shift, IM offers an entire catalog of IM Certified Professional Learning that can be purchased and scheduled through our IM Certified Distribution Partners. These include offerings for teachers, coaches, and leaders as well as offerings for each of the implementation stages (pre, implementation, and ongoing support). Visit this link for more information on [IM Certified Professional Learning](#).

Productive Struggle

Q: I'm very interested in actually embodying the growth mindset—particularly in offering the next-level Zone of Proximal Development, especially for kids who sail through the problems and lose interest in exploration of strategies that they don't consider efficient?

A: One of the instructional routines used in IM K–12 Math™ is the 5 Practices for Orchestrating Discourse. In this routine, the teacher purposefully chooses and sequences different student strategies to help students make connections between them. We offer IM Certified Professional Learning offerings that support the usage of this routine.

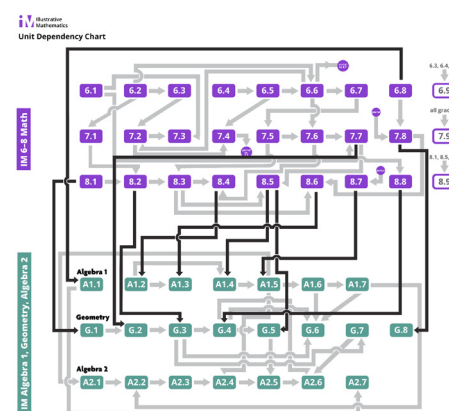
Q: How do you encourage high-ceiling work when kids opt for efficiency instead?

A: IM K–12 Math™ is designed to value the knowledge and experiences students bring to the classroom. If a student has a preferred efficient way of solving a problem, this should be encouraged. For students opting for procedures when they do not have a solid conceptual understanding, this will be brought to light through the purposeful design of our activities. Students are given opportunities throughout the lessons and cool-downs to explain their reasoning in a number of ways. Teachers can and should pose questions to learn more about student understanding.

Progressions

Q: Does IM have a concept-based progressions map (for example, a trace of fraction understanding in elementary school) that can be used to plot the course for intervention work, and so that students can track their own progress in intervention?

A: IM K–12 Math™ provides a coherent, standards-aligned curriculum. Our unit dependency diagrams are a great way to see how our units build within and across grades. These unit dependency charts can be found for each grade level within the course guide. IM K–5 Math™ also offers [Section Dependency Charts](#) that can be viewed on the IM Resource Hub.



Research

Q: Can you share the research on problem-based learning?

A: Below you will find several of the publications and resources we used in the design of IM K–12 Math™.

Curriculum Design

- National Research Council. 2001. *Adding It Up: Helping Children Learn Mathematics*. Mathematics Learning Study Committee, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press. <https://doi.org/10.17226/9822>
- National Research Council. 2000. *How People Learn: Brain, Mind, Experience, and School: Expanded Edition*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/9853>.
- Common Core: National Governors Association Center for Best Practices, Council of Chief State School Officers (2010). *Common Core State Standards (Math)*. National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C.

- National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: National Council of Teachers of Mathematics.
- Progressions: <http://ime.math.arizona.edu/progressions/>

Additional K–5 Design Principles

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- Gay, G. (2010). *Culturally Responsive Teaching: Theory, Research, and Practice*. New York: Teachers College Press.
- Hammond, Z. (2015). *Culturally Responsive Teaching and the Brain: Promoting Authentic Engagement and Rigor Among Culturally and Linguistically Diverse Students*. Thousand Oaks, CA: Corwin Press.
- Hiebert, J., Carpenter, T. P., Fennema, E., Fuson, K., Human, P., Murray, H., Alwyn, O., & Wearne, D. (1996). Problem solving as a basis for reform in curriculum and instruction: The case of mathematics. *Educational Researcher* 25(4), 12–21. <https://doi.org/10.3102/0013189X025004012>
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Access for English Learners

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Additional K–5 Mathematical Language Development and Access for English Learners

- Aguirre, J. M. & Bunch, G. C. (2012). What's language got to do with it?: Identifying language demands in mathematics instruction for English language learners. In S. Celedón-Pattichis & N. Ramirez (Eds.), *Beyond Good Teaching: Advancing Mathematics Education for ELLs*. (pp. 183–194). Reston, VA: National Council of Teachers of Mathematics.
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- Gibbons, P. (2002). *Scaffolding Language, Scaffolding Learning: Teaching Second Language Learners in the Mainstream Classroom*. Portsmouth, NH: Heinemann.
- Kelemanik, G, Lucenta, A & Creighton, S.J. (2016). *Routines for Reasoning: Fostering the Mathematical Practices in All Students*. Portsmouth, NH: Heinemann.
- Zwiers, J. (2011). *Academic Conversations: Classroom Talk that Fosters Critical Thinking and Content Understandings*. Portland, ME: Stenhouse.
- Zwiers, J. (2014). *Building Academic Language: Meeting Common Core Standards Across Disciplines, Grades 5–12* (2nd ed.). San Francisco, CA: Jossey-Bass.

Universal Design for Learning and Access for Students with Disabilities

- UDL/Cast: CAST (2018). Universal design for learning guidelines version 2.2. Retrieved from <http://udlguidelines.cast.org>

Additional K–5 Universal Design for Learning and Access for Students with Disabilities

- Brodesky et al., 2002. Accessibility strategies toolkit for mathematics. Education Development Center. Retrieved from http://courses.edtechleaders.org/smi_3/documents/2020/MathAccessStrategies.pdf

K–5 Student Journal Prompts:

- Baxter, J. A., Woodward, J., & Olson, D. (2005). Writing in mathematics: An alternative form of communication for academically low-achieving students. *Learning Disabilities Research & Practice*, 20(2), 119–135.
- Baxter, J. A., Woodward, J., Olson, D. & Robyns, J. (2002). Blueprint for writing in middle school mathematics. *Mathematics Teaching in the Middle School*, 8(1), 52–56.
- Liedtke, W. W. & Sales, J. (2001). Writing tasks that succeed. *Mathematics Teaching in the Middle School*, 6(6), 350–55.
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K–5 PLCs:

- DuFour, R., DuFour R., Eaker, R., & Many, T. (2006). *Learning By Doing: A Handbook for Professional Learning Communities at Work*. Bloomington, IN: Solution Tree.
- Gibbons, L. K., Kazemi, E., Hintz, A., Hartmann, E. (2017). Teacher time out: Educators learning together in and through practice. *Journal of Mathematics Educational Leadership*, 18(2), 28–46.

K–5 Teaching Moves that Support Math Community:

- <https://www.serpainstitute.org/5x8-card/vital-student-actions>

Small Group Instruction

Q: Some teachers in my building want to be able to teach this in small groups instead of a whole group. Is this something that is supported or encouraged in IM? Can you structure lessons as small groups or blended learning?

A: When small groups of students work in isolation of their peers to synthesize learning, it can be an equity issue and create more barriers for historically marginalized students to access grade-level mathematical meaning-making.

If we believe that all students deserve access to grade-level mathematics by engaging in the problem-based teaching and learning cycle, and we also believe that during this cycle students voice their thinking around mathematical ideas and use language to negotiate meaning with their peers. If the teacher is supported to make use of those ideas to meet the mathematical goals of the lessons, then access to grade-level mathematics means students have access to the thinking of *all* of their math class peers during activity and lesson syntheses. Therefore, a structure where students work in isolated groups with or without a teacher to do math or synthesize learning is not in sync with the design principles of the curriculum or what IM believes about equity.

Teacher Beliefs and “Buy in”

Q: If we choose to purchase and use IM, how do you suggest we as leaders get the rest of the staff on board? Do you have advice for working with teachers that will be implementing IM next year that do not yet “buy in” to the problem-based approach? What beliefs need to be in place as a site or district to support teachers in transitioning to problem-based instruction from more traditional instruction? How can I help teachers understand the shifts in teaching math? How can I support teachers to shift in this direction, give up control, and be willing to flow of what the students are doing?

A: Implementation success increases when teachers and school leaders all share a vision for mathematics teaching and learning, understand what this may mean in terms of their practice, and understand why and how adopting IM is a part of that vision. Many schools find it helpful to begin by having a discussion regarding what your district vision is for math teaching and learning. The National Council of Teachers of Mathematics (NCTM) has tools that help facilitate this shift in instruction by providing guidance on the 8 Effective Teaching Practices and productive vs. unproductive beliefs.

- [NCTM Principles to Actions Book and Toolkit](#)
- [NCTM Taking Action Series](#) is an application based approach to the publication *Principles to Actions* mentioned above. It includes classroom videos, transcripts, and discussion questions that can be used with teachers to help them anchor their discussions in observation.

Professional learning and district support for school leaders will support their understanding of their role in the implementation process—alignment to vision, what to expect, how to support teacher learning, school conditions, etc. The IM Certified Professional Learning catalog has options for Leading IM implementation. Other great resources for districts in planning for systemic, sustained change include:

- [Curriculum Support Guide](#) from Curriculum Partners
- [Systems for Instructional Improvement: Creating Coherence from the Classroom to the District Office](#) *Creating Coherence from the Classroom to the District Office* by Cobb et al.

In addition to professional learning for leaders, the IM Certified Professional Learning Catalog includes options for teachers and coaches to engage in professional learning around our problem-based design. The instructional routines are a great place to start with teachers. If possible, some professional learning and practice with instructional routines the spring before they implement IM will give teachers a chance to try out some of the routines before implementing IM lessons. The routines are bite-sized activities that mirror the problem-based lesson structure, and include the instructional practices embedded in the curriculum. If you are interested in learning more about IM Certified Professional Learning opportunities, you can reach out to one of our IM Certified Partners.

These related IM Certified Blog posts might also be helpful:

- [Beyond Curriculum Adoption: A Vision of the IM Classroom](#)
- [Promoting Change: Reflections from the UnboundEd Five-Day Standards Institute™ 2022](#)
- [Supporting Teachers During Implementation of Illustrative Mathematics: Big Ideas For Coaches and Teacher Leaders](#)

Unfinished Learning

Q: How do we address learning gaps from COVID with the whole-school roll out? Is there a tool/guide for scaffolding curriculum for students who have learning gaps 2–3 school years below level?

A: The authoring team created [Curriculum Adaptation Packs](#) that are housed on our [IM Resource Hub](#) to help identify prior concepts and skills that students need to access the content in each unit. These adaptation packs also provide just-in-time support to keep students progressing in their learning.

Q: Are there IM books for students who have learning gaps below average level?

A: IM is designed to be used with the entire, inclusive classroom with built-in teaching moves. This approach is in contrast to a strategy of “teaching to the middle” and then intervening, using separate programs, for students who aren’t getting what they need. Individual students can have their unique needs addressed within the structure of the IM lessons and centers. When a teacher is responding to student work during the lesson, each student’s learning is being addressed just in time and not postponed until later with a separate experience.

Videos

Q: Are there any videos of the lessons that model this facilitation in various grade levels that we could use as professional learning for teachers? Are there videos showing what the math language routines look like in the classroom? Are there videos available to support the transition to a problem-based model in K–5 to show a traditional lesson vs. a problem-based lesson using the same content?

A: As part of the new IM Classroom Experience, our team is currently working on a project to capture classroom video as well as student, teacher, and leader testimonials. We do not yet have a timeline for release, but this will be an additional resource available in the future.

Q: Are Lesson Summary videos in Geometry and Algebra 2 available?

A: As a nonprofit organization, IM relies on grant funding from foundations and other organizations for projects such as the lesson summary videos, which was funded to support teachers and students with distance learning during the 2020–2021 school year. This is not currently on our roadmap to develop.

Q: What are good videos for middle and high school students who are English language learners in a math class or students who are absent?

A: We do have video lesson summaries for Grade 6–Algebra 1. Those videos can be accessed in the family materials resources on your IM Certified Partner platform. Other great resources are the student lesson summaries found at the end of the student task statements for each lesson.

The Webinar

Q: Will you share the slides and recording?

A: A recording of the webinar is available [here](#).