

The logo for Making Math Real Institute features the text "Making Math Real" in a large, blue, serif font, with "INSTITUTE" in a smaller, blue, sans-serif font below it. The text is centered and surrounded by a light blue, stylized graphic of overlapping circles or ovals.

Making Math Real[®]

INSTITUTE

www.makingmathreal.org

MAKING MATH REAL MODEL FOR PROFESSIONAL DEVELOPMENT

The following professional development information is presented in a general format from which Making Math Real (MMR) can be prescriptive to the needs of any specific educational entity. The structure of the following professional development plan is based on a long-term, Orton-Gillingham-style approach wherein the focus is to provide instruction and ongoing support for the teachers and sustainability for the school/district. Refer also to the Making Math Real Professional Development Menu as the basis for a comprehensive plan. The process of providing instruction and support for the teachers and sustainability for the school requires a multi-year plan comprised of six phases:

- I. Content Methodologies
- II. In-class Demonstrations
- III. Cognitive Coaching
- IV. Development of prescriptive scopes and sequences
- V. Development of comprehensive assessments
- VI. Sustainability: training the future school/district Making Math Real coaches

PHASE I

Phase I focuses on providing the teachers with the **content methodologies** through the series of Making Math Real courses. Currently, there are eleven courses covering 520 hours of instruction. These courses are organized in either 2-day, 3-day, 4-day, 10-day or 12-day configurations, but may require additional time depending on the pace of each group of course participants. Also, please refer to the attached **Recommended Course Sequences Guide**. The guide lists courses in their designed order and also lists required prerequisites for some courses.

PHASE II

Phase II supports teachers with **in-class demonstrations** provided by Making Math Real Instructors. To maximize school wide effectiveness, Phase II should begin after a significant majority of school/district teachers have completed the same coursework. In this manner, maximum numbers of teachers could observe a single lesson at their respective grade levels. All demonstrations can only cover content teachers have learned in courses they have completed. The in-class demonstrations require advance coordination to ensure teachers and Making Math Real instructors are correctly prepared for each respective demonstrated lesson. If possible, it is most advantageous if multiple

teachers can observe the demonstrated lesson, thereby maximizing the cost benefit of Phase II support services. This can be achieved through a system of roving substitutes who can cover classes for approximately an hour. An essential element of the in-class demonstrations is the subsequent 30-45 minute debriefing during which the MMR instructor can answer questions, provide clarifications, and recommendations for follow-up teaching. Debriefings typically occur after each demonstrated lesson, or at a specified time later in the same day when all teachers observing a lesson can reconvene. Typically, there are a maximum of four demonstrated lessons with respective debriefings per day within a single school site. In our experience, teachers find the in-class demonstrations a key experience in integrating the Making Math Real professional development content presented in the coursework. Therefore, it is recommended that in-class demonstrations be scheduled as frequently as is feasible for the school.

There are two significant extended components of Phase II. The first is an **extended version of the in-class demonstrations**. Rather than a single lesson demonstrated, in the extended version, the Making Math Real instructor(s) demonstrate math lessons for an entire week. In this manner, teachers can observe all components of instruction including daily warm ups, class management, homework, tests, quizzes, differentiated instruction, whole group vs. small group instruction, and more.

The second extended component of Phase II is the **Clinical Practicum for Teachers** and Math Camp for Kids. This model is very much like the summertime Slingerland model in which school/district teachers learn directly from Making Math Real instructors and immediately apply their learning directly with school/district students. The Practicum is designed to be implemented during the summer and may range from two to four weeks depending on scheduling and budget. The children experience it as a Math Camp – not as a traditional summer school, since much of the prescriptive teaching and activities are game-based to facilitate maximum engagement for the children during the summer. The children and school/district teachers attend five days per week, children from 9:00am to 12:00pm, teachers, from 8:30am to 4:30pm.

- **Day 1:** Prior to the start of the Math Camp, the school/district teachers meet with MMR team for a full day (8:30-4:30), to prepare for the children's arrival the next day. During this day of preparation, school/district teachers will learn all the components of the practicum including the administration of the screening assessment developed specifically by David Berg, founder and director of the Making Math Real Institute, to be aligned specifically with the Making Math Real methods. The Screening for Sensory-Cognitive Development in Mathematics (SSCDM) in tandem with Making Math Real criterion measures will provide baseline assessment for all incoming children.

- **Day 2:** The next day is the first day the children arrive and is the orientation for the children and their parents. Children are immediately introduced and sent to their respective campsites in which they will be acclimated to the camp, play some games and take the SSCDM. The MMR lead instructor will administer the SSCDM, and the school/district teachers will each observe up to two students while they take the SSCDM. The role of the school/district teachers is to record the children's affective and cognitive

behaviors, crucial components for scoring and interpreting the assessment. Meanwhile, the director will remain with the parents and provide an orientation on Making Math Real and the Camp. Children and parents depart at 12:00 noon and the school/district teachers remain until 4:30 working with MMR lead instructors and the director, to begin scoring and interpreting the SSCDM.

- **Day 3:** Upon arrival at 9:00 AM, children go to their respective campsites, and as part of their first-day activities, take the companion MMR criterion skills assessment that is correlated to the SSCDM. After children depart at noon, school/district teachers remain to score the MMR criterion skills assessment and correlate all assessment: the SSCDM, the parent survey, the teacher survey, and the MMR criterion skills assessment to complete the baseline assessment from which, under supervision from the director and MMR lead instructors, school/district teachers will create individualized prescriptive lesson plans for each of their assigned students.

- **Day 4:** through the penultimate day of Camp: Each morning during the first hour, the MMR lead instructor will demonstrate a whole-class lesson during which school/district teachers are to support their assigned students and learn from the MMR lead instructor. During the second hour, under supervision from the MMR lead instructor, school/district teachers work with assigned students directly in accordance with daily lesson plans. During the third hour, teachers and students apply content learned for projects, outdoor games, etc. After students are dismissed at noon, school/district teachers and MMR instructors reflect and interpret students' processing and continue refining individualized prescriptions for students as each day new lesson plans are made for the following day of instruction.

- **Final day of Camp:** During the first hour, campers celebrate graduation in their respective campsites, and at 10:00 or 10:30am, parents arrive for full celebration with all students, school/district teachers, MMR lead instructors, and the director, David Berg.

The number of school/district children that can attend the camp depends on the number of MMR lead instructors contracted and the number of school/district teachers attending. There can be a maximum of four MMR lead instructors, not including the director, thereby allowing for a maximum of 60 school/district children in attendance. It is ideal for school/district teachers if they are assigned to only one student. However, if there are not 60 school/district teachers available for the Practicum, the maximum ratio of teachers to students is 2:1. Therefore, with a maximum number of school/district teachers, there can be a maximum of 15 children per campsite. If, for example, there is a MMR lead instructor and only five school/district teachers in a campsite, then there could be a maximum of 10 campers in that campsite.

Again, depending on the number of school/district children attending, and the extent of coursework school/district teachers have completed, the Math Camp can accommodate students from second grade through middle school. The precise determination of the range of grade levels covered would need to be determined based on the student population requesting admission to the camp.

The Clinical Practicum and Math Camp for Kids is a profoundly valuable experience for school/district teachers and students alike. The smallest camp possible would be a single MMR lead instructor along with the director, David Berg. Mr. Berg's role is the director and chief supervisor for all, not one of the lead instructors. The director must be able to observe, direct, provide demonstrations, and maintain the integrity of the program in all campsites all the time to provide maximum support for all.

It would be most financially beneficial in terms of cost and sustainability for the MMR lead instructors to be culled eventually from the school/district teachers themselves. The ability of the school/district to provide their own lead instructors is a key element supporting a school or district's plan for sustainability. However, please note, the ability for any educator to become a MMR Math Camp lead instructor identified by the director, is a significant and rigorous demand. The earliest the director would begin the identification process, and only the director would determine the identification of school/district teachers, would be after teachers have completed all coursework and completed three years of classroom practice under the director's supervision. At that time, the director would begin the identification process through direct examinations and observations of initial candidates for this position. All school/district teachers who successfully pass candidacy could become the future Making Math Real coaches for the school/district (see Phase VI), thereby establishing the most effective foundation for sustainability. In this manner, future Math Camps could require minimum staff from the Making Math Real Institute (only David Berg as the director and chief supervisor, and a coordinator), as most or all of the lead instructors would be school/district teachers.

The successful implementation of the Clinical Practicum and Math Camp for Kids, is a significant undertaking, requiring a minimum of six months advance time to begin organizing and structuring the manifold details necessary for a smooth running of the Practicum and Camp. For example, a vital part of the baseline assessment and MMR's ability to effectively group the children, parent and teacher surveys must be filled out and returned to MMR three months prior to the beginning of Camp. In this manner, MMR can begin to determine the best range of grade levels the Camp can serve. The successful running of the camp would also require a Making Math Real coordinator on site during the camp.

PHASE III

In Phase III, MMR lead instructors provide **cognitive coaching** by observing school/district teachers while they teach MMR methods in their respective classrooms. The design of Phase III is to provide school/district teachers with constructive feedback provided in post-observation debriefing sessions. Phase III is most effective if provided after school/district teachers have completed most, if not all, MMR courses and have received significant Phase II support. Therefore, at this phase, school/district teachers have already begun the process of integrating the professional development prior to receiving cognitive coaching. It is most advantageous if school/district teachers have had sufficient time and support in the methods prior to being observed.

As in Phase II, the In-class Demonstrations, the instructional day for Phase III would be comprised of four full-class observations and respective debriefings. Each debriefing is 30-45 minutes.

PHASE IV

After school/district teachers have completed all coursework and received long-term support, Phase IV provides teachers with the guided experience of creating **prescriptive scopes and sequences** for the academic year. Now that teachers fully comprehend the math content and understand how to teach it, Phase IV provides teachers with a fully detailed plan for structuring the developmentally appropriate order in which to present their respective grade level content in alignment with school/district and/or state standards. The director, David Berg, will personally provide direct supervision with teachers by grade level to map out each month of the year including the organization of all component materials that accompany each lesson. For example, for each month of the school year we make a folder that has all of the content and lessons for the month listed on the outside of the folder. The inside of the folder includes all Making Math Real materials and school/district-adopted materials allocated for each lesson placed in order by lesson. In this manner, teachers are organized and prepared for the entire academic year.

Phase IV typically requires a minimum of three full days of the director's specific supervision and support to complete each grade year's scope and sequence. The scope and sequence meetings may be structured to include all school/district teachers at each grade level, or to include representative groups of teachers by grade level. These representative teachers can then assist colleagues at their respective grade levels to make and prepare the same folders developed during the scope and sequence sessions. The advantage to having a maximum number of grade level teachers in attendance is the director's ability to answer specific questions and provide clarifications when indicated, thereby serving the most teachers with direct support.

PHASE V

The final phase of teacher support, Phase V, is the **collaborative development of prescriptive and authentic assessments by grade level** that is generated over the span of at least five full single-day visits per grade level distributed throughout the academic year. The assessments are designed to provide teachers with specific data to determine where to start instruction at the beginning of each school year and to provide ongoing data on effectiveness of instruction. Providing guidance and supervision, the director supports the school/district teachers in developing a series of three assessments for each grade level, one each for Fall, Winter, and Spring. As part of this design, the Spring assessment for a particular grade would also be the Fall assessment for the next grade. The development of authentic assessment represents the highest order of educational experience requiring extensive integration of the Making Math Real methods with significant experience in teaching them (Phases I–IV completed). The development of

each grade year's three respective assessments is a long-term ongoing process wherein the director meets with school/district teachers by grade level for one full day at a time to supervise the design of all content and problem sets comprising each section of each assessment. The school/district teachers then, on their own time, make the indicated problem sets. At the director's next scheduled visit, the director will first, review the school/district teachers' work, make edits, improvements, and any further changes as needed, then spend the rest of the day designing the next sections of the assessments with the teachers. Depending on scheduling, the recommended five sessions per grade level of Phase V may span a full academic year.

PHASE VI

Phase VI deals with developing a **plan for the sustainability of the Making Math Real professional development** for the school. A key element of sustainability is making sure there are a maximum number of qualified school/district teachers available to provide direct support for coaching new teachers coming to the school, supporting teachers currently in the school, and being utilized as MMR lead instructors for in-class demonstrations, coaching, and the Math Camp for Kids.

As the creator and developer of Making Math Real, David Berg will supervise all Math Camps, all Phase IV and V sessions, and provide ongoing supervision for designated school/district coaches in Making Math Real.

The minimum requirement for any educator to become designated as a Making Math Real coach is typically three years for completing all coursework, followed by an additional three years of applying the methods under the director's supervision while working with students with diverse processing styles and spanning multiple grade levels.

Phase VI begins as the director identifies those school/district teachers as candidates for becoming Making Math Real coaches. Once identified, those candidates will require additional direct supervision and mentorship from the director to receive more extensive and intensive support in learning and applying the methods, in assessing students' abilities and processing styles, in designing lessons and curriculum for both students and teachers, and in structuring effective coaching techniques. Phase VI support sessions are with all candidates and the director together scheduled in a series of single full-day meetings distributed throughout the academic year. The school/district Making Math Real coaches will have a tremendous responsibility and value in supporting the school/district. Therefore, ten meetings per academic year are recommended.

TIMELINE FOR ALL PHASES

- Phase I: First three years and on as needed
- Phase II: Can begin as early as second year and continues throughout as needed*
- Phase III: Can begin as early as third year and continues throughout as needed*
- Phase IV: Begins in fourth year
- Phase V: Begins in fifth year
- Phase VI: Training begins in 6th year; identification for candidacy may begin sooner

** These phases depend on amount of course work completed. The more course work completed, the earlier each phase can start.*

In summation, the Making Math Real professional development model is a multi-year commitment in which the focus is providing content and support for the teachers and sustainability for the school. **Please note again, that this report is only general in its details and is meant only to provide a baseline in considering the structure and organization of implementing this comprehensive professional development.** Further specifics regarding any and all phases can be provided upon request.

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