Frequently Asked Questions about MiC

Teacher Professional Development

I am going to teach MiC for the first time. How do I get started?

The best way to get started is to experience the curriculum! Work through a complete unit as though you were a student; do each problem and think about the strategies a student might use. Check the answers and teacher notes and hints in the Teacher's Guide. Note assessments and reflections for each section. This is the best way to get a feel for how MiC develops the mathematical concepts. It also lets you anticipate how students might answer the questions. If you can arrange to do the problems with someone else who is teaching the same unit, you will really have the MiC experience!

How is MiC different from other middle grades textbook series?

When you open an MiC unit, the first thing you will probably see is more text and fewer problems than in a traditional textbook. These words are important because they establish the context, pose questions to the student reader, and summarize important concepts. (See FAQ below for tips on dealing with reading difficulties.) Another difference is that almost all MiC problems are *in context* (not surprising, given the name of the curriculum!). You will rarely see what we call "naked" problems, that is, pages of procedural problems without context. Another difference is that there are usually multiple strategies students will use to solve problems rather than a single algorithm outlined by the text. Student strategies will vary in efficiency, sophistication, and formalism, but they should be valued as long as they are mathematically sound and the student understands what he or she is doing. We expect that over time students will progress to using the more efficient and formal strategies but hopefully not at the expense of understanding.

What professional development is recommended for MiC?

Professional development is critical to the success of implementing MiC. Initially, a complete overview of the curriculum and the resources for the teacher provide structure for implementation. It is suggested that a minimum of six hours be devoted to initial training. It is essential that teachers be comfortable with the first unit they are going to teach. Sustained professional development insures successful implementation. At least quarterly, one full-day workshop for unit training is suggested. A support network either from common planning time or extra time meetings provides immediate feedback and increases the comfort level for each teacher. Continuing professional development activities should include Strand Overviews and also more in depth training on the units. See Professional Development Workshops on page 77.

Are there any general guidelines for teaching with MiC?

Just as we expect students to solve problems using a variety of strategies, so do we expect that there are many different ways to teach MiC effectively. There are, however, specific student expectations in the classroom that are likely to lead to increases in student understanding.

- Students are given the opportunity to talk and work together to solve problems.
- Students are encouraged to explain their thinking and to justify their answers.
- Students are engaged in complex, higher level problem solving.
- Students collaborate on strategies and solutions.
- Students listen to other students' strategies.
- Students constantly assess their own and others' strategies.

What can I use to supplement MiC?

MiC is a complete curriculum that can stand on its own without teachers having to supplement. In those cases where teachers feel additional practice is needed, Additional Practice exercises are provided in the back of the Student Book. Extra practice worksheets may be generated from the Test and Practice Generator or downloaded from MiC Online. *Number Tools* and *Algebra Tools* student workbooks provide practice for the Number strand and Algebra strand units. The Teacher's Guides offer suggestions for enrichment and remediation when necessary.

Do my students have to work in groups all the time?

MiC requires discourse; student to student and student to teacher. A cooperative classroom and an atmosphere that supports different strategies is essential. Students may need time to think about the solutions before sharing strategies. Teachers make decisions about the best groupings for their classrooms; the Teacher's Guides make suggestions regarding grouping for specific problems.

Should I let students take the units home?

MiC units are textbooks. The student units are conveniently three-hole punched for ease of use in a binder. This protects the units and makes it easy for the students to carry all math materials in one binder. The units are used for approximately four weeks, so durability should not be a problem. Usually, parents/guardians want to see the text at home so that they can monitor their student's progress.

What can I do if I don't understand the math in the unit?

What to do? First of all don't panic or otherwise feel bad about yourself. Think of it as an opportunity to learn something new. The next step is to read and study the information in the Teacher's Guide. If it is a particular problem you don't understand, compare your answer to what is in the Teacher's Guide. Maybe you can figure it out from looking at the answers. If the whole topic is unfamiliar to you, use the Math in the Unit section on pages viii and ix and the Section Overviews in the Teacher's Guide. Another strategy is to talk to other MiC teachers in your building, and don't be embarrassed to ask for help. If a student doesn't understand something, we encourage them to ask questions. The same holds true of teachers.

Is it O.K. to use only some pages from a unit and skip the rest?

This is usually not a good idea.

Student Learning

How can students learn their math facts without drill and practice?

Students can learn their math facts by application within the problem situations encountered in MiC. Additional practice is not necessary but may be the choice of some teachers.

How can I help students who have reading problems?

Teachers new to MiC are often concerned about the reading demands of MiC for their less able readers. While these concerns are reasonable, one should remember that you don't learn to read by avoiding it. In MiC, students read in order to extract important information, that is they have to read for understanding. However, the words they have to read are about familiar contexts, and they are often accompanied by pictures that support the meaning of the words. Some students need more support. Teachers support students with reading difficulties in a variety of ways. Some teachers read aloud to the class especially when new contexts are introduced. This allows the teacher to make sure that everyone understands new vocabulary and is familiar enough with the context so as to engage in the questions related to it. Another strategy is to group students so that there is always an able reader available.

How can I support English Language Learners using MiC?

The strategies to support ELL students are similar to those for struggling readers with a few additions. Be careful to provide a good balance of the auditory and visual (words and pictures) in your presentations. If there is too much "teacher talk," students with a limited listening vocabulary will soon be lost. If they can see words or representations at the same time, they are more likely to understand. Pairing students to help one another is another useful strategy.

How can I adapt MiC for students with learning disabilities?

Before you make any adaptations for learning disabilities, take some time to see how your students do with MiC lessons. Because there are usually several different ways for students to solve problems, students with learning disabilities often have access to the mathematics without adaptations. However, if adaptations are needed, look for suggestions in the Reaching All Learners sections in the Teacher's Guide. Also look on page 80 of the Teacher Implementation Guide for other suggestions.

How does MiC support advanced learners?

Advanced learners are supported by MiC in a number of ways. Sometimes schools accelerate them through the curriculum or a subset of it in order to have them take Algebra I in grade 8 or even earlier. Other times these students are grouped together and allowed to progress through the units at their own rate. If you choose this approach, make sure that students check in with you on a regular basis and that you monitor the quality and depth of their explanations since you will have less chance to hear their discussions and justifications. Another way to work with advanced students is to keep them working with the rest of the class, but to expect more from them in terms of their work. For example, in the Reaching All Learners sections, you will often find ways to extend the lessons or to offer extra challenges.

What should I do if students still don't know the material at the end of a unit?

One of the things that is different about MiC is the notion of mastery. We do not expect students to have mastered most skills and concepts by the end of a single unit. Skills and concepts are often introduced in one unit at an informal level, revisited and deepened in a later unit, and finally formalized and mastered in Level 3 units. So at the end of a unit, teachers should be realistic about the goals of the unit when judging whether or not their students "know the material." The Math in the Unit overview on pages viii and ix in the Teacher's Guide will help you understand the level of understanding expected by the end of the unit. The quizzes and Unit Test provided in the Teacher's Guide of each unit are well aligned with the goals of the unit. If students are successful with these assessments, then they know the material. If they are not successful, then you will remediate as you would with any curriculum. Has the student missed school? Are they attentive and engaged or have they missed something important because of inattention? What specific concept or skill is not understood? To remediate you might assign additional work from the Additional Practice pages from either the end of the Teacher's Guide or appropriate pages in *Number Tools*. Remember that the choice to move to the next unit is often the best decision you can make. A new unit provides a fresh start. You can be sure that concepts and skills will always reappear in another unit, and students will have new opportunities to deepen their understanding.

Resources

Where can I find help planning lessons?

In each Section Overview of the Teacher's Guide, you will find a suggested pacing guide including problems to be used for introduction, class work and homework. The Math in the Unit pages viii and ix will help you understand how these problems fit into the unit and the larger curriculum. After doing these problems yourself, without looking at the answers, you will have a good idea of how students are likely to respond, and you will be able to tailor you planning accordingly. Remember, the goal of planning is not to avoid mistakes by students, but rather to know how to turn them into deeper understanding. And finally, don't forget to talk to other teachers when you are planning.

What manipulatives will I need to do MiC?

Most of the manipulatives you will need for MiC are things that you probably already have in your classroom such as: rulers (centimeters and inches), yard and meter sticks, scissors, graph paper, and tape. Compass cards are used in some units, but they can be made using transparencies and a blackline master found in the Teacher's Guide of *Figuring All the Angles*. The full list of materials needed for each unit can be found in the Teacher's Guide Unit Overview on page xviii. A class set of manipulatives for MiC is also available for the convenience of the teacher.

Technology

Do students need a calculator in sixth grade?

Scientific calculators should be available for all levels of MiC. Some Level 3 units have optional activities involving graphing calculators. There will be times when teachers will not want student to use calculators, for example, when teaching a number unit. When thinking about calculators, a good question to ask is, "Will arithmetic get in the way of students doing significant problem solving?" If the answer is yes, then making calculators available will allow more students access to the mathematics.

What calculator do you recommend?

Most scientific calculators will be appropriate for grades 6 and 7. Look for ones that contain trig functions, square and square roots, a memory key, and that use the standard order of operations. Almost any calculator designed for use in the middle grades is appropriate.

When do students need a graphing calculator with MiC?

Some of the Level 3 units contain optional graphing calculator activities. Graphing calculators are not required in any MiC unit, although using them might enhance student understanding of some topics.

Is there software that goes along with MiC?

Several MiC units make use of applets, which are small programs dedicated to specific tasks. These applets are available via the Internet, and they can be used either in school or at home. The Teacher's Guides identify the applets and where they can be found.

Are computers needed in class?

In general, computers are not needed in class. Sometimes it might be helpful to have one available for demonstration purposes, but they are not required.

Assessment

How can I prepare my students for the end-of-unit assessment?

If students are successful answering the questions posed in the sections, then they will require no additional preparation to be successful on the end-of-unit assessment. Do make sure that students understand how to answer an open response item. Modeling good answers and sharing scoring strategies may be helpful.

Where can I find more assessment problems?

The Test and Practice Generator contains many appropriate MiC problems to allow you to design customized assessments for your students. This collection of problems is searchable by content, problem level (based upon the Assessment Pyramid), and type (open ended, short answer). Many teachers also write their own problems based upon the content of the unit.

How can I be sure my students are learning what they need to learn?

There are a couple of levels to this question. If the question refers to making sure the students have mastered the goals of a particular unit, then read the response to the question above: "*What should I do if students still don't know the material at the end of a unit?*" If the question refers to much bigger issues such as "Are these the right mathematical topics for middle school students to be learning?" or "Will my students be well prepared for high school mathematics?", then one needs to examine the development process that resulted in MiC. Because there is not enough time to teach everything, all curricula involve choices. The choices made for MiC were based upon the philosophy of Realistic Mathematics Education (see page 56 for a fuller discussion of RME), and they are consistent with the recommendations of the NCTM Principles and Standards for School Mathematics. MiC was extensively tested in classrooms, and it has been revised based upon feedback from experienced teachers and extensive review by mathematicians and mathematics educators. Research has shown that if MiC is well implemented, students learn significant mathematics, and they are well prepared to learn mathematics at the high school level.

Parents

What suggestions can I make if parents want to help their children with math homework?

Most teachers are thrilled if parents want to be involved in helping with their child's homework. However, a few guidelines will help.

- The strategies students use on problems might be unfamiliar to parents. Rather than showing their child "the right" way to do the problem, they should ask their child to explain their thinking.
- If a child (and parent) has worked hard on a problem without success, he or she should stop after a reasonable amount of time and ask for help in class the next day.
- If the parent is unfamiliar with the mathematics, he or she can still help by asking questions that will stimulate thought, such as:
  - "Have you done any problems like this before?"
  - "Can you explain what you do understand about this problem?"
  - "What do you think the problem is asking you to do?"

What should be included in a Parents' Night presentation?

Parents' Night is a good way to inform families about MiC. Planners should keep in mind the following points:

- The evening should be introduced by an administrator to provide information on how MiC was selected and to underscore the importance of the implementation effort.
- Parents should engage in activities from MiC. These can be facilitated by teachers who are comfortable with the activity.
- The activities should show significant mathematics that can be approached using different strategies, but should also be easy for the parents to complete.
- Conclude with questions and answers. This part of the evening should be moderated by an administrator. Be prepared for challenging parents. Invite them to set up a later appointment to discuss their concerns.
- Plan for at least one hour but no more than two hours.

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Alignment to NCTM Standards

Level 1 units

NCTM Standard	Picturing Numbers	Models You Can Count On	Expressions and Formulas	Take a Chance	Fraction Times	Figuring All the Angles	Comparing Quantities	Reallotment	More or Less
Communication	x	x	x	x	x	x	x	x	x
Connections	x	x	x	x	x	x	x	x	x
Reasoning and Proof	x	x	x	x	x	x	x	x	x
Representations	x	x	x	x	x	x	x	x	x
Problem Solving	x	x	x	x	x	x	x	x	x
Number and Operations	x	x	x	x	x			x	x
Geometry			x			x		x	x
Measurement			x			x	x	x	
Algebra			x				x		
Data Analysis and Probability	x			x					

MiC was designed to align to the NCTM *Principles and Standards for School Mathematics*. Emphasis on number concepts (ratio, proportion and percent) and number models and their application in and connections to the other strands provide a sound foundation for students' mathematical learning. Progressive Formalization, one of the tenets of the MiC curriculum design, helps students develop concepts from informal to pre-formal to formal throughout the curriculum. Connections within and among strands assist students as they make sense of the mathematics and provide ample opportunity for practice and reflection.

Level 2 units

NCTM Standard	Facts and Factors	Dealing with Data	Made to Measure	Operations	Packages and Polygons	Ratios and Rates	Building Formulas	Triangles and Beyond	Second Chance
Communication	x	x	x	x	x	x	x	x	x
Connections	x	x	x	x	x	x	x	x	x
Reasoning and Proof	x	x	x	x	x	x	x	x	x
Representations	x	x	x	x	x	x	x	x	x
Problem Solving	x	x	x	x	x	x	x	x	x
Number and Operations	x	x		x		x	x	x	
Geometry	x	x	x		x			x	
Measurement			x		x	x	x	x	
Algebra				x			x	x	
Data Analysis and Probability		x							x

Building on the informal concepts from Level 1, Level 2 MiC emphasizes the pre-formal development of concepts within and among all strands. Integers, proportional reasoning, and algebraic formulas become the emphasis for Level 2. The connections of these topics within the geometry and data strands form the basis for formalizing and applying formulas in Level 3. The curriculum design supports student learning at a pre-formal level while allowing select students to progress to formalization as they become ready.

Alignment to NCTM Standards

Level 3 units

NCTM Standard	Revisiting Numbers	Ups and Downs	It's All the Same	Graphing Equations	Insights into Data	Patterns and Figures	Looking at an Angle	Great Predictions	Algebra Rules!
Communication	x	x	x	x	x	x	x	x	x
Connections	x	x	x	x	x	x	x	x	x
Reasoning and Proof	x	x	x	x	x	x	x	x	x
Representations	x	x	x	x	x	x	x	x	x
Problem Solving	x	x	x	x	x	x	x	x	x
Number and Operations	x		x			x		x	x
Geometry		x	x	x	x	x	x		x
Measurement		x	x		x		x		
Algebra		x		x		x			x
Data Analysis and Probability					x			x	

Continuing the progressive formalization from Levels 1 and 2, Level 3 MiC emphasizes the formalization of algebraic concepts as well as number algorithms and geometric applications. Connections within and among strands provide opportunities for students to build on prior knowledge and develop completely the higher order thinking skills necessary for high school mathematics.