



# Math in Focus™: Theory and Practice

Volume 4

Winter and spring break have come to an end, so now we begin to think toward assessment (if it hasn't been at the forefront already!). Transitioning toward the new standards often means extra time has been taken to build understanding of content at a deeper level and to build pre-requisite understandings that were needed to move students forward at this higher level. The concern may be that all the content for the grade level will not be covered by year's end and/or by the time the state's assessment is administered. Therefore, in order to move forward, try to stay focused on what students know, instead of what they don't know.

## **Assessment Within the *Math in Focus* Curriculum: In Theory**

Why do we assess? Most importantly, it is to guide instruction. If we know at what level students understand and can apply content, then we can instruct toward a higher level and move students forward in their thinking. Using formative assessment helps the teacher design lessons and create questions to meet student needs and push them to the next level. Through questioning, all students can show what they understand.

We also assess students to grade them against a standard. Mastery of content is a process and can be defined at different levels: basic understanding of concepts, applying understandings in routine situations, and being able to use mathematical understandings to solve problems they've never seen before. These novel situations on assessments are necessary because if we assess in exactly the same way that we teach, we are only assessing a procedure. Only at this higher level, can we determine whether we are creating true mathematicians.

Finally, when teachers can define what students understand, then he/she can communicate these understandings with parents and administrators. This holds us accountable and allows us to use the data to keep us on the right track.

## **Assessment Within the *Math in Focus* Curriculum: In Practice**

Following a gradual release lesson design, as *Math in Focus* does, allows for many opportunities to assess students and change instruction to meet student needs and move them forward. Often pages that may look procedural are actually thought-out, deliberate problems that build upon each other so that students use and develop what they know. Being "developmentally ready" for difficult problems is less about age and more about experience. It is our job to create these experiences.





Have our students acquired instrumental understanding or developed relational understanding? Instrumental understanding can be defined as more procedural; it is efficient and accurate, but void of deep understanding. Richard Skemp, one of the researchers whose work is foundational to Singapore mathematics, describes instrumental understanding as "rules without reason." Developing relational understanding is about connections and derived understanding; relational understanding is knowing not only what to do, but also being able to articulate why you are doing it.

The Common Core State Standards for Mathematical Practice have set the precedent and created the necessity to put our students into situations to develop relational understanding.

*"The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily."*

A lesson can no longer be about getting through the parts. It must be about students thinking about the mathematics, making connections, knowing both the how and the why. Each day, the teacher has the opportunity to introduce content instrumentally or relationally. Which understanding will prove more helpful when students are assessed?

*Math in Focus* has many opportunities to assess students and the teacher must use each as a decision point about whether to take some time to go back to concrete/pictorial representations, move forward with scaffolds to differentiate for the learners, or move ahead with the knowledge that a coherent curriculum will provide opportunities for students to build understanding.

If one wants to accurately assess whether students have gained this understanding, the assessment must be meaningful instead of the "next page in the book". Meaningful assessment should:

- Be conceptual and procedural
- Ask students to apply concepts to solve problems
- Require students to explain their thinking and reason quantitatively

There are many opportunities to meaningfully assess in *Math in Focus*:

- Recall Prior Knowledge—a discussion/instructional piece that allows the teacher to determine pre-requisite knowledge on a topic/content
- Pre-Assessment—a more formal assessment of pre-requisite knowledge that allows the teacher to pinpoint specific disparities in understanding and determine how to move forward
- Teach/Learn—the initial introduction of new content where the teacher is directly involved in new learning and assesses whether the students need scaffolding by changing the number range, by choosing the entry point in the concrete to pictorial to abstract pedagogy, and by techniques in questioning





- Guided Practice—opportunities for students to construct understanding of content with the teacher, the peers, or the materials as the guide
- Let's Practice—the first place where a student can show understanding of the lesson independently. This portion of the lesson helps teachers determine whether students should move on to the Workbook to prove understanding or whether the teacher should intervene with re-teaching options
- Workbook (at school)—the opportunity to prove understanding. Application opportunities on these Workbook pages are invaluable. Work should be completed at school as it is the last part of a lesson on which new learning will be built so that teachers can feel confident of understanding.
- Put On Your Thinking Cap/Brain at Work—non-routine problem solving opportunities that ask students to dig deep, cognitively, into the content. This activity helps the teacher assess whether students are ready for the Test Prep.
- Chapter Wrap Up—this anchor chart is a chance for the teacher to assess, through discussion, the level of understanding of the chapter's content
- Chapter Review/Test—this provides practice of content at the basic level and allows the teacher one final chance for the assessment to affect instruction within the chapter
- Test Prep—gives the teacher insight to the level of understanding that each student holds
- Examview/Online Test Generator—allows opportunities to create assessments to match student needs
- Benchmark Assessment—an assessment that check retention and use of understandings

In practice, the assessment opportunities discussed allow for growth. Scaffolding during assessments is appropriate the first year with the knowledge that only when the scaffolds are removed, can one determine the depth of understanding.

Be encouraged by the successes your students have had thus far. When considering performance, it's not always about where they are, but about where they were!

If you have ideas to share on assessment, we would love to hear from you!

Take Care,  
The *Math in Focus* Specialist Team

