



Long Beach Unified School District
Office of Research, Planning and Evaluation

**Implementation of the
MAP²D Lesson Structure**

Excerpted from the 2007-08 Evaluation Report

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This report summarizes evaluation findings with respect to implementation of the MAP²D “Lesson Structure”, based on observations and interviews of 40 fifth-grade classrooms. It is intended to be informative for principals and teachers who seek to better understand the lesson design, the difficulties teachers face in its implementation, and how some have maximized its effectiveness. The MAP²D program includes 30-minutes of daily instruction in basic math facts, plus a 60-minute main lesson that follows a specific structure consisting of 7 components:

- Step 1: Problem of the Day
- Step 2: Lesson Opener
- Step 3: Input/Modeling
- Step 4: Structured Guided Practice
- Step 5: Guided Practice
- Step 6: Student Presentations
- Step 7: Closure & Preview

Step 1: Problem of the Day

The first step of the MAP²D lesson plan is the “Problem of the Day” or “POD.” Approximately 10 minutes should be allocated to the POD, which is designed to warm-up the classroom through structured practice of word problems or spiraled content from prior trimesters. The key components of fidelity to the POD include:

- Each day’s math lesson begins with two word problems
- The teacher models the first problem while the students just watch
- Students practice the second problem independently
- The teacher discusses the second problem with the students afterwards

Overall, 47 percent of observed teachers implemented the POD with high fidelity, 19 percent with medium fidelity, and 33 percent with low fidelity. Quite a few teachers struggled with time management or had not established an efficient routine for the POD. (Ten teachers took 15 or

more minutes to complete the POD.) Only 36 percent of teachers modeled the first problem in the manner recommended, with students quietly watching as the teacher explains aloud each step of the thought process. It is considered vital to the program design that students watch the teacher solve a problem correctly and efficiently. Some teachers felt that unless they involve the students they will lose their attention. Nonetheless, the best routines for the POD were established by teachers who asked students to put their pencils down and just watch.

One technique used by teachers to help condition the class was to begin by explicitly emphasizing, “Eyes are up here, you are not copying,” or alternatively, by prompting a routine *choral response* from the students. For example, one teacher began with:

T: Eyes on me, pencils down, mouths...
Ss: Shut!

Another teacher, who had modified the POD to include 3 problems, began the lesson with:

T: First problem...
Ss: *You do!*
T: Second problem...
Ss: *We do together!*
T: Third problem...
Ss: *We do alone!*

This teacher had created a template worksheet for the POD. On the left side was each word problem, with space on the right for students to follow the UPS method.¹ The teacher modeled the first problem, and explicitly followed the UPS steps by underlining important facts, checking for “operation words” as clues for which operation to use, and showing her work. Due to an established routine, this extended 3-problem approach lasted exactly 10 minutes.

¹ The “UPS” method involves three sequential steps to solving a word problem. The first step is to “Understand” by reading the problem and underlining the question. The second step is to “Plan” by underlining key information and choosing an operation to solve the problem. The third step is to “Solve” the problem and check if the answer is reasonable.

Step 2: Lesson Opener

The second step of the MAP²D lesson structure is the “Lesson Opener.” Here the teacher should establish a specific objective for the lesson and connect this to what the students have already learned. The key components of fidelity to the Lesson Opener include:

- The teacher clearly states and writes (or displays) a specific objective for the day
- The students copy (or paste) the objective into their math journals
- The teacher activates students’ prior knowledge connected to the objective

Overall, 39 percent of observed teachers implemented the Lesson Opener with high fidelity, 33 percent with medium fidelity, and 28 percent with low fidelity. Over 80 percent of observed teachers stated a clear objective and students utilized math journals in 88 percent of classrooms.

However, fifty percent of observed teachers did not activate prior knowledge, or only did so in a cursory manner. Others were effective at providing continuity by connecting new content to what students had already learned. For example, one teacher asked for volunteers to recall the prior day’s lesson. Another teacher utilized an easy-to-remember mnemonic phrase to tap into student memory of an algorithm. A number of teachers displayed charts or posters of the procedural steps for solving problems the class had been working on. A few teachers asked students to refer to journals and look up notes and examples from prior lessons.

Typically, math journals were used for practice and for note-taking. In some cases, teachers were strict about keeping the journals free of practice work, which was instead completed using scratch paper or whiteboards. Two teachers even required students to maintain a “Table of Contents” that was added to each day. As one teacher explained, “MAP²D has you do all the practice work in your journal, but then it’s too messy to look at for homework or before a test.” In one highly successful class, the teacher asked students to refer back to prior journal entries and called on them to read aloud the steps used to solve problems connected to the day’s lesson.

Step 3: Input/Modeling

The third step of the MAP²D lesson structure is “Input/Modeling” during which teachers introduce new content and explain their thought process while demonstrating problem-solving techniques. The key components of fidelity to Input/Modeling include:

- The teacher introduces new content connected to the lesson objective
- The teacher models by vocalizing each step of the thought process
- During modeling, students put pencils down and just watch the teacher
- When prompted, students record new content in their journals

Overall, 39 percent of observed teachers implemented Input/Modeling with high fidelity, 33 percent with medium fidelity, and 28 percent with low fidelity. In 61 percent of observed classrooms, the teachers did model problem solving, but in many cases, students were not expected to put their pencils down and just watch the teacher. A common issue in low fidelity classrooms was that no new content was introduced – teachers continued from where they (apparently) had left off with the day before. A key element of the MAP²D design is that each day is a uniquely-focused lesson with a specific objective that builds on prior learning.

Approximately 70 percent of teachers did a good or excellent job of emphasizing academic math *vocabulary* during their lesson. Exemplary teachers would model vocabulary usage throughout the lesson, and also maintain high expectations for student discourse. Overall, there was inconsistent evidence of teachers using the MAP²D “Instructional Strategies”.

Often the lines between Input/Modeling and Structured Guided Practice were blurred. This was acceptable so long as the teacher introduced new content, modeled problem solving, and led discussion using active participation techniques. The sequencing could vary, and some teachers alternated between modeling (just watch) and discussion (solicit input). However, in the absence of new content connected to the objective, it was not clear what the specific purpose of the lesson was. In the absence of modeling, it was not always clear what procedure or strategy students should use. When Input/Modeling is implemented with high fidelity, whole class discussion during Structured Guided Practice reinforces student understanding of lesson objectives.

Step 4: Structured Guided Practice

The fourth step of the MAP²D lesson structure is “Structure Guided Practice” or SGP.” During the SGP, which should take 5-10 minutes, teachers actively engage the entire class with the new content. The key components of fidelity to Structured Guided Practice include:

- The class is guided through a practice session prior to independent practice
- The teacher utilizes active participation strategies to engage all students
- The teacher consistently checks for understanding of all students
- The teacher adjusts instruction based on student understanding of new content

Overall, 42 percent of observed teachers implemented SGP with high fidelity, 25 percent with medium fidelity, and 33 percent with low fidelity. Strong application of active participation strategies to simultaneously engage all students and maintain a high “level of concern” was observed in less than half the classrooms. Although whiteboards were used effectively during SGP in a number of classrooms, and frequent checks for understanding were often implemented, teachers varied in the extent to which they acted on the information these strategies generated.

In a number of classrooms, student input was not adequately structured by the teacher, with students free to call out responses. In some cases, the teacher would solicit input from only a few, typically the more confident, higher-achieving students. In other cases, teachers tended to rely on whole-class checks for understanding such as “raise your hand if you got the correct answer,” or “thumbs-up if you understand” without acting on the information. In either event, students who appeared confused or less confident with the material might be overlooked.

In the most effective, high-fidelity classrooms, teachers utilized a variety of strategies to actively engage students with new content – e.g., randomly calling on students, choral response, thumbs-up/down, partner-sharing, or small group discussion. Teachers of students who achieved higher achievement gains tended to be more effective at quickly scanning the classroom for mistakes during SGP, and if they were unable to respond themselves (because they were busy helping another student), they would direct peers to assist their struggling neighbors.

Step 5: Guided Practice

The fifth step of the MAP²D lesson structure is “Guided Practice,” which should take approximately 20-30 minutes. During this time students work both independently and cooperatively in small groups on a set of problems connected to the lesson objective. The key components of fidelity to Guided Practice include:

- There are several problems for students to solve
- Each student works independently at first
- Students should ask peers for help before seeking assistance from the teacher
- Groups work to reach consensus on solutions in preparation for presentations

Overall, 31 percent of observed teachers implemented Guided Practice with high fidelity, 39 percent with medium fidelity, and 31 percent with low fidelity. Most classrooms devoted instructional time to independent practice of a set number of problems, and this usually did follow whole-class instruction. And in most cases, students did sit together in small, heterogeneously-grouped tables of 4-6 students. Quite a few teachers had adopted the Kagan cooperative learning model, in which students who are at distinctly different levels are grouped together at the same table (e.g., a high, medium-high, medium-low and a low student), and they try to modify or rotate groupings regularly throughout the school year.

Partner-sharing was commonly observed between neighbors, and there were a number of good examples of effective peer-coaching (including roaming peer coaches in some classrooms). However, it was less common for students to work together to *reach consensus* as a *table group* in *preparation* for the presentations. Only a few observed teachers demonstrated that they had mastered how to *actively manage a classroom of independent cooperative learning groups*. Quite a few teachers either lost management of the class while they worked with individual students or table groups, or they were too detached and permissive, essentially allowing the students to direct their own affairs, which typically led to uneven levels of engagement.

There were several outstanding examples of Guided Practice. In these classrooms, teachers encouraged students to compare their answers with team members and discuss any differences

that arose. It was explicitly reinforced that preparing for the presentations meant the students needed to make sure that *every member of the group* understood *how* to solve each problem correctly. Not coincidentally, the presentations in these classes tended to be more effective. In one class, the teacher stopped by every table group and asked the following series of questions:

- “Did everybody have the same answers?”
- “Did anyone have to change their answers?” (and if so) “Why?”
- “Is *everyone* ready to present?”

In another classroom, the teacher used a timer to segregate Guided Practice into two phases: *independent practice* and *teamwork*. There were posted instructions for the “teamwork” phase:

- Share answers and help each other if there was disagreement.
- You are free to use white boards or whatever tools work best for you.
- If you finish reaching consensus, practice your presentation skills, including using the language of the discipline.

Some teachers worked with a small group of struggling students during Guided Practice. Although utilized by some high-performing teachers, this approach segregates weaker students from the cooperative learning component and can weaken management since the teacher is busy working with this one small group. One top-performing teacher therefore decided, “I’ve found that by pulling kids up to the desk, I lose management throughout the back of the room. So now, I know who my kids are who aren’t getting it, and instead of pulling them into a small group, I check on them repeatedly during my rounds.” He also emphasized that constructing an environment conducive to cooperative learning required effort and commitment:

The one thing I’ve *built* here is, “You guys are going to fail in my classroom if you can’t help each other.” If I see them coaching each other, I don’t get involved, unless they’re moving in the wrong direction. A lot of times they explain it better to their partner than I do.

Step 6: Student Presentations

The sixth step of the MAP²D lesson structure is the “Presentations” in which students demonstrate understanding of lesson content as the culmination of the coordinated lesson activities. The key components of fidelity to Student Presentations include:

- One student is chosen from each group to present a problem
- Presenters and problems are chosen randomly by the teacher
- The student explains each step of how they solved the problem
- Presenters are encouraged to ask for help from their team members

Overall, 33 percent of observed teachers implemented the student presentations with high fidelity, 28 percent with medium fidelity, and 39 percent with low fidelity. The presentations was the program component the largest number of teachers felt was the most challenging or did not work well for their students. There were four main concerns expressed. First, there was too much “dead time” during the presentations, which led to students becoming bored or antsy. Second, the time was wasted for higher-achieving students in the class who already understood how to solve the lesson problems. The third concern was that too many students were not effective at presenting in front of the class because they struggled with the material or were shy. Finally, some teachers felt it was unrealistic for a student to present from each group each day.

Overall, the most fundamental challenges affecting the quality of presentations related to a lack of established routines, time management (of the lesson as a whole), and low expectations for cooperative teamwork during Guided Practice in preparation for the presentations. Sometimes teachers hovered over the students or spoon-fed them answers to help them get through their presentation. In other cases, the teachers had selected higher-achieving students to present.

At times the students simply struggled to articulate their thinking or present the problems in an efficient or effective manner. This generally led to low engagement levels by the other students, who naturally became restless and disengaged. In many classrooms, the problem was exacerbated by inability of students to project their voice effectively across the room.

Often, the most effective student presentations were observed in classrooms with higher achieving students. However, there were exemplary presentations across all levels of student ability. In one classroom, the teacher was especially patient and encouraging. Rather than intervening when a student struggled, he would calmly interject, “It looks like you might need to call 911.” At this point, the whole table group would come up to assist their team member.

A number of teachers had devised innovative practices for the presentations. Some teachers utilized computerized programs or spinners to randomly select students and the problem to present. In a couple of cases, students used microphones to aid voice projection. However, another teacher said he stopped using a microphone because, “Then the kids don’t learn to project their voices. That’s one of the things we’re working on, so I don’t want to give them that crutch.” Another teacher said she encouraged students to use their “teacher voice”, which she defined as loud and clear, and she strived for students to emulate how she models a problem.

Table points were allocated in several classrooms for successful completion of the presentations. In one exemplary class, the teacher allocated a maximum of 5 points for each presentation. Unless the student was thorough in their explanations, their team would not receive full credit. Each table was allowed only one “lifeline” and team members eagerly raised their hands to provide support. In an interesting twist, other teams could steal points from the presenting group if the “lifeline” advice was inaccurate. This practice, combined with very strict scoring rules created a tension and energetic buzz that was lacking in most other classrooms.

Technology was also used to support the presentations. One teacher facilitated a more efficient process by managing the presentations through his SmartBoard. He created slides in which students simply had to articulate the steps and the numbers to input. The SmartBoard enabled “rewinding” if a mistake was made. This practice freed the student from writing everything out, and permitted them to speak directly to their peers. Another high-performing teacher had students sit at his teacher station and use the video overhead projector, which enabled the students to present using pencil and paper (rather than messy markers on transparencies).

Step 7: Closure & Preview

The seventh and final step of the MAP²D lesson structure is the “Closure” and “Preview” during which the class summarizes the day’s learning experience and the teacher provides a glimpse of the next day’s lesson. The key components of fidelity to Closure and Preview include:

- The teacher elicits student responses to summarize what they learned
- Teacher provides a glimpse of the next lesson (e.g., solving a quick problem)

Overall fidelity was comparatively low. Only 19 percent of observed teachers implemented both the closure and preview with high fidelity. A majority, 53 percent, implemented both with low fidelity – 46 percent did not do closure, whereas 58 percent did not complete the preview.

In cases where management and coordination of lesson activities was strong, the teacher was more likely to finish with a meaningful closing activity. Conversely, where management and routines were comparatively weak, the lesson was more likely to end as a result of the “clock running out,” or with students having already disengaged in anticipation of lunch or recess.

Teachers who implemented the most effective closure and preview were those who utilized active participation strategies to elicit responses from all students to demonstrate understanding of the lesson objective. For example, one teacher asked students, “What is most important thing you want to remember from today’s lesson?” The teacher wrote the students’ suggestions on the overhead while the students wrote in their notebooks. Finally, the teacher instructed the students to put their pencils down while she displayed a preview problem for the next day.