A First Look at Variability in Teachers' Math and Science Instruction and Curriculum Use[1]

An Interim Report for the CPS Office of Mathematics and Science
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[2] Numerous PRAIRIE authors produced this report collaboratively and share responsibility for its contents. The conclusions drawn in this report reflect a systematic analysis of data by external evaluators. For further information, please contact Carol Fendt (crfendt@hotmail.com) or Janise Hurtig (jhurtig@uic.edu) at (312) 413-3367.

1. Report Overview

This interim report is one of a series of external evaluation studies being conducted over the 2007-08 school year by the UIC PRAIRIE Group in order to examine the systemic education reform efforts of two Chicago Public School (CPS) initiatives: the Chicago Math and Science Initiative (CMSI) directed by the CPS Office of Math and Science (OMS) and the *CPS Cluster 4 Middle Grades Project* (C4MGP) directed by OMS. The aim of these studies is to provide OMS and these other key stakeholders with a deep, nuanced understanding of the processes and outcomes of the CMSI and C4MGP. Audiences for these studies include the leadership team of OMS, the Chief Educational Officer of CPS, the Chicago Community Trust, the MacDougal Foundation, and the CPS Department of Program Evaluation (DOPE). The studies build upon the PRAIRIE Group's ongoing external evaluation of various facets of the CMSI from 2003 to the present and ongoing external evaluation of the C4MGP that began in 2006.[3]

This interim report is the second study of the 2007-08 year that focuses on how contexts, supports, and sensemaking inform the development of CPS teachers' math and science instruction and their use of CMSI-supported curricula. The first data brief (January 2008) focused on the nature of middle grades teachers' math and science instruction, as well as key supports affecting instruction.[4] In this interim report, we focus primarily on factors contributing to *continuities, changes, and developments in math and science teachers' curriculum use and instruction*. Specifically, this report addresses the following two research issues and related questions:

1. Variation in use over the school year: Do teachers vary their math and science instruction and curriculum use over the school year? In particular, does the district-wide administration of the Illinois Standardized Achievement Test in mid-March affect teachers' instruction and use? If so, how and why? If not, why not?
2. Development of teachers' use and instruction: In what ways do teachers' math and science instruction and curriculum use develop or remain the same over time? What supports and other conditions contribute to changes and/or continuities in teachers' instruction and use or CMSI-supported curricula?

In the next section we describe methods used to collect and analyze data in response to the above two research questions. In the third section we report on findings from the data that address each of the above questions, interspersed with questions for discussion among OMS staff and other key stakeholders. These questions aim to encourage use of the findings in decision-making about program implementation and resource allocation, in the continuous effort to improve math and science teaching and learning.

While the focus of data collection for this report was teachers' math/science instruction, curriculum use, and related supports, there are limited but significant data pertaining to the AVID program in C4MGP schools, which we discuss in Appendix B of this report.

2. Methods

Data Sample and Collection: The data for this report are derived primarily from classroom observations and debriefs interviews with 37 teachers at 10 regular neighborhood CPS schools. (This sample represents 10 of the 12 schools selected for study for the January 11, 2008 data brief, "Middle Grades Math and Science Instruction and Supports in Cluster 4 Project Schools.") The 10 schools include seven Cluster 4 schools and three additional neighborhood schools that are case schools for PRAIRIE's external evaluation of the CMSI. We conducted interviews with nine administrators and five specialists, and observations of 11 meetings (grade level, departmental, or middle grades management) in order to supplement our understanding of the

[3] The numerous reports of findings from this external evaluation are available on the CPS Department of Program Evaluation website at http://research.cps.k12.il.us/cps/accountweb/Evaluation/View_Evaluation_Reports/View_Evaluatons_by_Date/

[4] "Middle Grades Math and Science Instruction and Supports in Cluster 4 Project Schools," January 11, 2008.

observational data. The aforementioned January 2008 report contains a detailed explanation of how teachers and schools were selected in order to address the programmatic concerns of OMS and C4MGP planners.

When possible, the teachers in our sample were purposefully selected because they appear to be committed to CMSI-supported curricula: either they tend to use CMSI-supported curricula as intended, have grown/developed as users (based on self-report and/or observation) or have the potential to do so. This sampling has been done because we understand that these teachers are most likely to support the CMSI theory of action.

To date, we have observed between 1 and 4 teachers at each school. We have observed 17 teachers twice and 20 teachers once. Of the 54 observations conducted, we had post-observation debriefs on 43 occasions, with 27 of the 37 teachers observed. Of the 37 teachers in our sample, 13 were also part of the 2006-07 sample of teachers we learned from through observations, debriefs, and/or grade-level focus groups, as part of ongoing external evaluation of the CMSI.

Because the sample for this report includes teachers who are participating in the Cluster 4 middle grades project, the vast majority (30 of 37) were middle grades teachers. We observed 17 middle grades teachers teaching math and 13 teaching science. We observed seven primary grades teachers teaching math.

Table 1 below provides a summary description of teachers and classrooms observed for this report, broken down according to type of school where data were collected.

Table 1: Data Sample by Teachers and Classrooms

	Teachers observed (by subject taught during observation)			**Classrooms observed (by grade level)***				
	Math	**Science**	**Math & Sci**	**K-5**		**6-8**		**K-8**
Schools by type (N=10)				**Math**	**Sci**	**Math**	**Sci**	
CMSI case schools (N= 3)	8	0	8	7	--	4	--	11
Cluster 4 Year 1 schools** (N=3)	7	7	14	--	--	10	8	18
Cluster 4 Year 2 schools*** (N=4)	9	6	15	1	--	12	12	25
Totals	24	13	37	8	--	26	20	54

* Number of classrooms observed is greater than number of teachers observed because several teachers were observed twice.
** One Cluster 4 Year 1 school is a CMSI case school
** One Cluster 4 Year 2 school is a CMSI case school

<u>Data Analysis:</u> Qualitative data used for this report include the following: math and science classroom observations, followed in most cases by debrief interviews with teachers about teaching practice, curriculum use, and supports; individual interviews with school administrators and math or science specialists or coaches; observations of grade-level meetings.

Multiple researchers systematically read interview and observational data from the 10 schools and 37 teachers in the sample in light of the research questions and overarching issues of *changes and developments in teachers' curriculum use and instructional practices.* Based on this initial reading we generated profiles of each teacher in the sample based on the following factors pertaining to teachers' curriculum use and instruction:[5]

[5] These factors are drawn from prior evaluation of instruction in CMSI schools, reported in two PRAIRIE reports from 2006-07: "A first look at teachers' descriptions of their use of CMSI curricula," November 22, 2006; and "Patterns and Prevalence in the Use of CMSI-Supported Curricula by CPS K-8 Teachers," February 5, 2007.

- Curriculum use: uses as is; modifies; skips; supplements
- Instruction: teacher vs. student dialogue (ratio); presence of student exploration; use of manipulatives
- Rationales around use/instruction: ISAT issues; student ability issues; source of rationale (messages)

(Two instructional factors, "presence of student exploration" and "use of manipulatives" are not reported on in this report, but will be taken up in the next report in which variation in use and instruction are explored in greater depth.)

Data compiled for each teacher profile were gathered from observations, debriefs, and focus group interviews going back from one to three years, depending on the teacher and school from which data were collected. These teacher profiles were then clustered by school in order to look for patterns or trends within a particular school. Previously collected school-level data used for comparative purposes included focus groups with teachers by grade level, classroom observations and debriefs with teachers, as well as interviews with school administrators and coaches, conducted during the 2005-06 and/or 2006-07 school year. Next we looked at this year's findings in light of comparable data from past years to see whether there were meaningful patterns of similarity or difference over time, indicating possible changes.

In order to contribute to a contextual understanding of the factors impacting teachers' instruction and use, we analyzed CPS data on attendance at OMS professional development workshops to determine which teachers, principals, and specialists in the sample attended 75% or more professional development of each session they registered for, for a given series. These data were then examined to see whether the professional development attended was appropriate for the curriculum the teacher is currently teaching. The results of that analysis are presented in Table 2 below:

Table 2: Rates of Attendance at CMSI Professional Development Workshop Series

Data Source	**Teachers attending 75% or more of at least one "appropriate" CMSI curriculum professional development workshop series**	**Principals/Specialists attending 75% of at least one "appropriate" CMSI professional development workshop series**
CMSI Case Schools (N=3)	Math: 7 of 8	1 from each of 3 schools
Cluster 4 Year 1 Schools (N=3)	Math: 5 of 7 Science: 2 of 7	1 from 1 school
Cluster 4 Year 2 Schools (N=4)	Math: 4 of 9 Science: 4 of 6	2 from 1 school 1 from 1 school
Totals 10 schools	Math: 16 of 24 Science: 6 of 13	At least 1 from 6 schools 0 for 4 schools

Findings, Analysis, and Questions for Discussion

Part 1: Variation in Use over the School Year

Do teachers vary their math and science instruction and curriculum use over the school year? In particular, does the district-wide administration of the Illinois Standardized Achievement Test in early-March affect teachers' instruction and use? If so, how and why? If not, why not?

According to the CMSI theory of action, if teachers use CMSI-supported curricula as intended, student learning outcomes in math and science should improve, including outcomes in the Illinois Standard Achievement Test (ISAT). "Use as intended" includes such things as pacing individual lessons to include each key element of the lesson when possible and following the year-long pacing guide in order to cover curricular units at the pace and in the order prescribed.

However, in the external evaluation studies for 2006-07 that looked at teachers' curriculum use for math instruction, the PRAIRIE evaluators found that *preparation for the ISAT was a key rationale teachers offered for why they skipped parts of the curriculum, changed the order in which they covered curricular units, or supplemented the curriculum with outside materials and/or activities.* The kinds of supplementing teachers reported doing in preparation for ISATs included: basic skills drills; extended response practice; or addressing a topic not (or not yet) covered in the curriculum because it would be covered on the ISAT.

In this section we report on whether, how and why teachers made changes in their use of CMSI-supported curricula for ISAT preparation in 2007-08. In order to begin to explore the sources of teachers' understanding about the role of ISAT preparation in their math and science instruction, we also report on the kinds of comments made by specialists/coaches and administrators with regard to the ISAT, as well as discussion about ISAT preparation and instruction that occurred in grade level meetings.

The data we report on were collected at two points in time <u>prior</u> to administration of the ISAT in the district: fall of 2007 and winter of 2008. In this report we compare fall and winter observations to begin to determine whether teachers' practices and rationales change as they approach the ISAT. These data will then be compared to data we will collect in spring 2008, to determine whether teachers' curriculum use, instruction, and rationales change following the ISAT. This comparison will be presented in the next evaluation report.

1. *<u>How are teachers' use and instruction affected by ISAT preparation?</u>*

Data collected from September 2007 – February 2008 indicate that ISAT preparation is a significant factor influencing teachers' instruction and use of CMSI curricula. Specifically, of the 37 teachers observed, 26 teachers either mentioned ISAT preparation to their students during the lesson, and/or during debrief interviews after the lesson. We have no data regarding ISAT preparation from 11 teachers in our sample. It bears noting that these numbers may be related to flaws in the fall 2007 data collection methodology, as the post-observation debrief instrument used at that time did not specifically prompt the teacher to reflect on whether and how preparation for the ISAT affected their curriculum use and/or instruction.

Of the 26 teachers who mentioned ISAT preparation in some way, 22 were middle grades teachers and four were primary grades teachers. This may be related to our sampling, as we only observed eight primary grades teachers, and not all were asked about the ISAT.

Eleven of the 26 teachers indicated explicitly that they <u>did not</u> vary their instruction in order to prepare their students for the ISAT. One teacher commented that the ISAT actually helped them keep to the intended pacing. Yet another middle grades teacher indicated that the curriculum she used (Connected Math) contained everything needed to prepare students for the ISAT.

While most teachers referenced the ISAT in the context of teaching a math lesson, researchers also found that in a few cases ISAT preparation affected teachers' science instruction and curriculum use. Seven of the 26 teachers who mentioned ISAT preparation were middle grades science teachers. Of these seven science teachers, two indicated that the ISAT does not affect their science teaching. Two others supplemented their science instruction to support math preparation; three modified their science instruction to emphasize writing; one teacher taught a unit earlier in the year in anticipation of the ISAT; and one science/math teacher skipped science completely prior to the ISAT, using that time to focus on math instruction.

Analysis of teachers' observed instruction and comments about the ISAT – either during classroom instruction or debriefs with researchers -- suggest that there were three ways in which teachers made changes or claimed to make changes to their instruction or use of the curriculum to prepare their students for the ISAT, as described below:

(a) <u>Teacher skips or supplements for ISAT preparation:</u> Five math teachers (two primary grades and three middle grades) and two middle grades sciences teachers supplemented their use of the CMSI curriculum to prepare their students for the ISAT. Five of the teachers supplemented by providing additional extended response practice or writing. Another added "computational" practice, and another added a unit she and her colleague had prepared. Only one middle grades math teacher described skipping a part of the lesson for ISAT preparation, cutting the investigations to do more rote computation "during the crunch before ISAT."

(b) Teacher changes the pacing over the school year to make time for ISAT preparation: Three middle grades teachers – two math and one science – noted that they change the pacing over the year to accommodate the ISAT. One science and one math teacher reported specifically changing the order of the instructional units.

(c) Teacher modifies instruction or use (including pacing of lesson) with ISAT preparation in mind: Four teachers described modifying how they taught or paced the lessons (without skipping entire lessons or parts of lessons) in order to prepare their students for the ISAT. For instance, one math teacher referred to pacing each lesson by going more quickly over areas the students already knew in order to "get more in before the ISAT." A science teacher described emphasizing the math concepts in the curriculum for the ISATs.

In addition to these three forms of explicit modification, six teachers commented about the ISAT to their students during the observed lesson but did not appear to modify the curriculum. Two teachers made connections for the students between the curricular content and the ISAT. For instance, during a 6th grade math lesson on area in which students had to refer to drawings in the textbook, the teacher implored the students to "please, on the ISAT, use all the pictures." Four other teachers seemed to reference the ISAT as a motivator. For instance, one teacher told her 8th grade math students that they needed to clarify their responses, "because the test won't be sent back." Another teacher told his 6th grade students that the previous year, students who counted on their fingers during the test were retained.

2. *Do teachers' practices in response to the ISAT correlate with other contextual factors?*

Data on variation in use/instruction related to ISAT preparation were also correlated with teachers' attendance at professional development workshops to determine whether that CMSI support might be related to how teachers approach their math and science instruction around the time of the ISAT. The findings do not suggest any evidence that teachers' attendance at the appropriate professional development sessions is related to whether and how they altered use or instruction for ISAT preparation.

Researchers also attempted to determine whether there were correlations between teachers' practices in response to the ISAT and several other factors, including: teachers' stated beliefs about the CMSI curricula; ratio of teacher talk to student talk during observed lessons (see Part B of report below); type of school; years using the curricula. No significant correlations or patterns could be determined, although it would not be implausible to propose that those teachers who indicated they do not modify their use or instruction for the ISAT because the curricula are compatible with the ISAT content probably are positively disposed toward the CMSI curriculum they are using. More generally, the findings suggest those teachers' decisions to modify or not modify their curriculum use or instruction to prepare students for the ISAT may be based on a range of possible influences at various levels.

3. *What do specialists and administrators say about the ISAT in relation to math and science teaching?*

Two sources of messages about ISAT preparation for math and science teachers are school specialists and administrators. Three specialists (two math and one math/science) and two principals (both in different schools) talked about the issue of ISAT preparation during interviews.

One specialist and one principal (at different schools) mentioned the difficulty in motivating middle school students to care about the ISAT. Principals at two schools described school-wide policies aimed at supporting ISAT preparation. In one case the principal described teachers' "vertical meetings," in which teachers above and below promotion grades teachers will meet to with them to discuss what students need to know in order to succeed on the ISAT. In the second case, the principal mentioned a school-wide policy to practice extended response on specific days.

A specialist at a different school expressed frustration at the lack of cooperation within the school regarding ISAT. The specialist indicated that she continued to have trouble convincing teachers that following the CMSI curricula would prepare students for the ISAT (versus the belief that supplementing and skipping would help).

3. *What kind of talk occurs in meetings prior to administration of the ISAT?*

In six teacher meetings at five different Cluster 4 schools we heard teachers, specialists, and administrators discuss the ISAT. At three of the meetings discussions were characterized by frustration over the ISAT. Teachers took this time to complain about policies, schedule changes, or collaboration. For example, at one school, teachers discussed how they were given an extended response practice sheet for students to complete in two days. The teachers felt this was too little time. Eventually these teachers briefly discussed ways to facilitate the exercise, like encouraging students to draw a concept map. At another school, teachers were upset about the schedule to proctor the test, but they eventually compromised on a different schedule.

At the other three meetings, teachers and administrators talked about strategies for the ISAT, ways benchmark assessments could be used to help teachers focus on students' weaknesses before the test, language that teachers should encourage students to use on the extended response, and ways to motivate students to prepare, such as a class trip.

In summary, of the 11 school-level meetings observed prior to the ISAT, during six meetings, some of the discussion focused on logistical issues of administering the ISAT, instructional preparation issues, or both. While in no instances did we record discussion that specifically directed teachers to modify their math or science instruction to better prepare their students for the ISAT, it is reasonable to suggest that the messages conveyed during these meetings contributed to a sense of urgency about organizing instructional practice around ISAT preparation.

Questions for Discussion

- What kinds of information about the issue of ISAT preparation are provided during OMS-provided PD? By citywide specialists and/or area coaches?
- What understandings about if and how the CMSI-supported curricula prepare students for the ISAT are teachers taking away from those supports?
- What other sources of information (messages) contribute to teachers' decisions about whether and how to modify their math/science teaching and curriculum use in order to prepare students for the ISAT?

Part 2: Development of Teachers' Use and Instruction

In what ways do teachers' math and science instruction and curriculum use develop or remain the same over time? What supports and other conditions contribute to changes and/or continuities in teachers' instruction and use of CMSI-supported curricula?

There are many possible indicators of teachers' development as users of CMSI-supported math and science curricula. For the purposes of this report, we focused on how teachers engage students in the lesson, by looking at the relative proportion of three kinds of classroom activities:

1. "teacher talk" defined as teacher lecture/explanation/teacher led discussion;
2. "student talk" defined as student conversation with other students or the teacher and student engagement in a kind of call/response with teachers;
3. "individual work time" defined as time given for students to work or the time students were engaged in test-taking.

For each observation of a lesson, researchers divided the entire time of the lesson into one of these three categories. The researchers then calculated the percent of time devoted to each category of classroom activity. The mean for the percent of each lesson spent in teacher talk was 51.5%. In other words, on average, teachers spent about half of the lesson lecturing, explaining, and/or leading discussion. The mean for student talk was 31%, while the mean for individual work time was 17 %.

When plotted, percent teacher talk mirrored the bell curve with approximately 15 teachers talking 60-100% of the lesson time (top quartile) and approximately 9 teachers talking 0-35% of the lesson time (bottom quartile). The mean for student talk was 31 (top quartile with 10 teachers with 40-100% student talk; bottom quartile with 10 teachers with 0-15% student talk) while the mean for individual work time was 17 (top quartile with 10 teachers with 22-100% individual time; bottom quartile 10 teachers with 0-5% individual time). **Appendix A** to this report provides two examples of classroom observations that exemplify classrooms in the range of the top quartiles of teacher talk or student talk. As noted in the description above, the range within these quartiles is quite large, spanning 40 and 60 points, respectively.

For each of the 37 teachers observed in 2007-08 (5 of whom were also observed in 2005-06 and/or 2006-07), we examined the relative proportion of these three kinds of classroom activity and looked for continuities or changes by individual teacher. We looked to see whether there was a discernible difference in the proportions of teacher talk to student talk to independent work, for teachers (n=11) observed at two different times within the 2007-08 school year. We then compared proportions of classroom talk for the five teachers in this year's sample whom we also observed in 2006-07 and/or 2005-06. For both the teachers observed multiple times so far this year and the teachers observed this year and past years, no patterns were discernible relative to proportions of talk within the lesson observed. In other words, there is no pattern to teacher variability over time. Multiple observations of the same teacher revealed a teacher's classroom instruction to be either as different as Ms. Brown to Mr. Green (Appendix A) or not. For example, one observation of a middle grades science teacher revealed 80% of teacher-talk while the second observation revealed only 40%. A middle grades math teacher consistently revealed 70% teacher-talk. At this point in time, we are unable to determine neither a consistent pattern nor a reason for this variability.

We then looked to see whether there were patterns within or across types of schools in terms of ratios of classroom time devoted to each category of activity. In the majority of our sample schools (n=7) there was no discernible pattern among teachers from the same school. In 3 schools, teachers from the same school either were all in the top quartile for teacher talk (n=2 looked like Ms. Brown) or all teachers were in the top quartile for student talk (n=1 looked like Mr. Green). We caution drawing any conclusions from this as the sample of teachers within these schools is very small. Only two teachers were observed for a total of three observations in the two schools with high teacher talk. In one school where we observed 3 primary classes and 2 middle grades classes we noted a consistently higher percent of student talk. Again, we caution drawing any conclusions based on these five observations.

We also looked for similarities or differences between math or science classrooms. However, there were no significant differences between science or math classrooms regarding teacher talk. The mean for teacher talk across classrooms were Science: 52%; and Math: 51%.

It bears noting that, due to the small number of primary grades teachers in our sample, we were not able to compare primary and middle grades classrooms for this report. However, such comparison may be worth considering in the future, given the distinct views teachers often have of middle grades students' abilities and needs as they are preparing for high school.

Finally, we looked to see whether teachers' participation in at least one section of grade/content appropriate professional development (at 75% or greater attendance) correlated in some way with proportions of teacher talk, student talk, and individual work time. In all cases, teachers' participation in professional development was not significantly related to who did the majority of talking in their classrooms.

Questions for Discussion

- According to OMS staff, university coaches and OMS tools such as the Classroom Observation Guide, effective instruction should include high proportions of student-centered discovery and student talk (whether student-teacher or student-student talk in small groups). While the curricula promote discovery learning, we are unclear whether the curricula uphold specific kinds of student groupings and instructional activities to do this. Nor is it clear to us whether or not it is recognized that teachers can achieve this balance in different ways and still use the curricula "as intended." Do the CMSI curricula promote certain patterns of classroom talk?
- Given the theory of action about teachers' development as effective users of CMSI-supported curricula, do program planners expect to find patterns in classroom talk within a given school? Do program planners expect to find changes in the proportion of teacher versus student talk for teachers over time and with greater exposure to CMSI professional development?
- Is it possible to use the curricula "as is" and have 50% of classroom talk coming from the teacher? Is it possible to use the curricula "as is" and have only 30 % of classroom talk coming from students?
- If teachers are using curricula "as intended," what kinds of trends in classroom talk do planners expect to see?
- Should teachers' participation in professional development have an influence on the qualities of this talk?

APPENDIX A: Examples of Classrooms in the Top Quartile of Teacher Talk or Student Talk

Example 1: Portion of a middle grades math class observation with high teacher talk (top quartile)

Ms. Brown works at the blackboard in front of her class of 6th grade students. She is writing out a calculation multiplying fractions—taking her directions from one of her students who tells her what to do step-by-step. The other students watch with books open on their desks. Ms. Brown finishes the calculation, turns and asks the class, "Did anyone do it differently?" No one answers.

Ms. Brown continues by writing the following on the board: 80/200 → 40/100.

She asks students to recall when they worked on fractions and how to change fractions back to decimals and provides an example of moving decimals to make percents. For example the teacher explains and writes on the board, ".4 is same as .40 same as 40%, right?" No one answers.

Ms. Brown continues with the multi-step problem: "Now, the entire group is how many?" No one answers. Ms. Brown continues: "We keep changing how many people we interview." Student: "75."Ms. Brown replies, "So 75 people interviewed. The same percentage that said 'yes.' All I need to do is take 75 and multiply by the part that says 'yes.' (She writes the calculations on the board.) How many digits on right of decimal (a student replies, inaudible). Ms. Brown replies, "So have 30.0." She points to what was previously on the board, 30/75, and remarks, "Isn't that a cool way of doing it? I like that way; it makes it easy. You can use the calculator to go back and check…What was it? 500 people, multiply by 1. Is that what you got earlier?" Student affirms this. Ms. Brown goes on with the problem, "Or if I take my .4 multiply by 100, what do I get? My 40, right? So now you got a couple of ways of using ratios like I did, multiply to get numbers you can use."

Example 2: Portion of middle grades science classroom with high student talk in science classroom (top quartile)

After launching the lesson about density and reviewing the prior days work about plastics, Mr. Green makes a table on the chalk board. The teacher asks if this is a good table. A number of students give their thoughts about this table: some say it looks good; one student says he would be able to work on it for the test; another suggests the teacher make some changes to which Mr. Green replies there is no need to change the data. Mr. Green pushes the students further asking, "If you give this to another school, would you be able to make them understand it?" Students appear to be struggling with the question. The teacher reminds them that they won't be able to explain everything as scientists. "Would you be able to explain it?" (Students: yes)

Some students suggest breaking the table down and Mr. Green says they're on the right track. Students keep thinking and one suggests breaking the liquids down. Mr. Green gives the young man the marker and tells him to make the changes. As the student goes up on the board another student tells him to be specific. Mr. Green asks the student what she meant by that? The student on the board writes alcohol, alcohol water, salt water, and water. The other students are yelling things out at him. The students decide to label the column "the four different types of liquid" and everyone is helping him spell. The student labeled the plastics: "4 different kinds of plastic."

Students go back and forth with the teacher trying to break their thoughts down into descriptions or categories and away from long sentences. One student says, "Do you understand what I mean?" to the specialist who is watching the lesson unfold. The specialist says that maybe they could do check marks instead of having all those words. The specialist continues talking and tells the student who wrote the different kinds of liquids if he could put that on the top and just put check marks where all the words are.

The student extends the table and writes A for alcohol. The specialist tells him to draw a vertical line to make columns for the liquids. The student does that after the A, AW, SW, and W. He then extends the horizontal lines from the plastics table.

Mr. Green sits in the back and looks on. Most of the other students are shouting out helpful hints to the student that is at the board. Mr. Green returns to the front and tells them that for homework, they should write out their best version of this table. He explains what should be included. "If you have better ideas, include them also. It has to be on notebook paper so I can read it."

For the last 10 minutes of class, students are for the most part quietly working on making a table. The teacher takes time to work with students individually as needed.

APPENDIX B: The AVID Program

In this Addendum we present preliminary findings pertaining to the AVID program. These findings emerged through a close reading of the corpus of data collected in CMSI and Cluster 4 case schools between September 2007 and March 2008. The evaluators have included these findings as an addendum because they may have relevance to audiences involved in the C4MGP, but are not directly related to the research questions addressed in the body of this April 2008 interim report.

In a January 2008 data brief ("Middle Grades Math and Science Instruction and Supports in Cluster 4 Project Schools") we discussed some aspects of AVID and instruction, including the varying degrees and ways teachers used AVID in their classrooms. (The sample for that report is a sub-sample of data used for this report.) Findings from data for this report indicate similar trends in teachers' uses of AVID in the classrooms as described in that report. *In particular, we continued to observe different levels of commitment, use, and relationship with AVID Coaches between schools, administrators and teachers, and even teachers within the same school.* Moreover, while the teacher sample is small, it bears noting that, to date, we have not found any noticeable differences between Year 1 and Year 2 schools in terms of teachers' uses and understanding of AVID. Below we report on additional themes relating to teachers' uses of AVID in their middle grades classrooms.

(a) Frequency of Implementation

During debriefs with classroom teachers, we asked them to describe if and how they had used AVID in the observed lesson. Twenty-five teachers discussed their use of AVID either in the lesson or in their more general use of AVID. Thirteen of the 25 teachers who discussed their use of AVID said they used AVID "here or there" in their classes. For example, some teachers noted the use of AVID binders, while others mentioned using AVID strategies such as note taking procedures and pair/share. The remaining eight teachers, did not remark about how they incorporated AVID or said they rarely or never used AVID in their classrooms.

Even though teachers used AVID differently and to different extents, of the 25 teachers interviewed, 15 noted that AVID was helping their students. These teachers all mentioned that, as a result of AVID, their students had improved organization, either with respect to keeping homework and notes, knowing their assignments, or keeping track of their grades.

(b) Visions about the AVID Program

The data suggest that teachers, specialists, and administrators may have different visions for what AVID can do for their students. Differences in vision may be related to roles. For instance, in interviews with nine principals or assistant principals and five specialists, eight mentioned that AVID was useful to students because it helped them prepare for and think about their futures. In comparison, when we asked teachers about the benefits of AVID for their students, only three of 25 teachers mentioned a similar vision for students' futures, while the majority mentioned the current classroom function of improving organization and note taking. This discrepancy might be related to differences in experiences of instructors versus support staff versus administrators, but it also begs questions about how messages concerning the AVID program circulate in schools.

(c) Wanting More Guidance

Five of the 25 teachers we spoke with said they still wanted some direction with how to implement AVID in their classrooms. This desire persisted even though they had been trained in using the AVID program. For example, one teacher mentioned that in teaching organization to her students, she was not sure if she was just supposed to help them organize binders or if there was something else she could have done or emphasized. It is also worth noting that at the time of our observations, five teachers (from three schools) had still not met the AVID Coach. The teachers wanted more help implementing certain activities and getting feedback on their instructional use of AVID.

Questions for Discussion

- Given the wide range of use of AVID across and within C4MGP schools, what level and quality/consistency of AVID use do program planners want to see in schools?
- If greater levels and consistency of use of the AVID program are desired, what can program planners do to promote these increases?
- Given the different understandings of and visions for AVID expressed by school personnel, how can program planners ensure that administrators, teachers, and students hear a consistent message?
- How do the district/program planners envision sustainability of the program and what supports to will be put in place to increase its likelihood?