

**CMSI 8th Grade Algebra:  
Logistics, Structure, Instruction, and Professional Development  
Interim Report**

A Data Brief for the CPS Office of Mathematics and Science  
Prepared by the PRAIRIE Group, UIC College of Education

**March 21, 2008**

Carol Fendt, Rodney Harris, Jessica Lent, Endea Murry, Stacy Wenzel<sup>1</sup>

This data brief is one in a series of external evaluation studies being conducted over the 2007-08 school year by the PRAIRIE Group in order to examine the systemic education reform underway as part of the Chicago Math and Science Initiative (CMSI) supported by the CPS Office of Math and Science (OMS), the Office of High School Planning (OHSP), and the Department of Program Evaluation (DOPE). The aim of these studies is to provide OMS and other key stakeholders with a deep, nuanced understanding of the processes and outcomes of the CMSI. These studies build upon the PRAIRIE Group's external evaluation of various facets of the CMSI from 2003 to 2008.<sup>2</sup> As with past evaluations, the 2007-08 evaluation studies are based on rigorous data collection and analysis that are conducted in such a way as to provide timely and useful feedback to the audiences including the leadership team of the OMS, the Chief Educational Officer of CPS, the OHSP, and the DOPE as decisions are made about the allocation of resources in the effort to continually improve math and science teaching and learning.

This data brief addresses the following key questions:

1. What are the logistics and structure of 8<sup>th</sup> grade algebra classes and how are these characteristics related to 8<sup>th</sup> grade algebra instruction?
2. What are the qualities and characteristics of high-quality instruction in the 8<sup>th</sup> grade algebra classes being implemented?
3. What does the teacher preparation (professional development and university courses for 8<sup>th</sup> grade algebra) look like and how do teachers describe its relevance to their 8<sup>th</sup> grade algebra instruction?

### **Methods**

This interim report utilizes data from interviews with six key OMS and OHSP staff, ten observations of 8<sup>th</sup> grade algebra classes, and a number of OMS/OHSP documents related to selection criteria of students for 8<sup>th</sup> grade algebra and characteristics of schools and teachers involved in the 8<sup>th</sup> grade algebra initiative. While our overall sample of twenty schools mirrors the characteristics of the population in terms of students' SES (race/ethnicity and percent low income), teacher certification, time of course offering, and curriculum; our current data on ten preliminary schools have a higher percentage of Type 3 certified teachers than the whole population. In addition, as described in the discussion below, while we chose schools based on the time of course offering, three schools in our sample changed their schedule compared to the schedule as noted in district documents. Furthermore, only one school had exactly the same minutes of instruction per week and schedule as noted in district documents; a number of schools

---

<sup>1</sup> Authors produced this report collaboratively. They share responsibility for its contents. The conclusions drawn in this report reflect a systematic analysis of data by external evaluators. The hope is that these findings can facilitate improvement of this and related programs through open discussion and consideration of data-driven understandings. For further information, please contact Carol Fendt at [crfendt@hotmail.com](mailto:crfendt@hotmail.com) or (312) 413-3367.

<sup>2</sup>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/](http://research.cps.k12.il.us/cps/accountweb/Evaluation/View_Evaluation_Reports/View_Evaluatons_by_Date/)

changed either their minutes of algebra instruction and/or when within the school day they offered the course. Minutes of algebra per week ranged from 225 and 300. All but one teacher in our sample were teaching algebra for the first time this school year or had less than five years experience while only one had more than ten years of experience teaching 8<sup>th</sup> grade algebra. In addition, the majority of the teachers in these ten schools were Type 3 certified (n = 8). Eight teachers in the sample participated in one of the university partner programs for endorsement: four at the University of Chicago, three at the University of Illinois at Chicago, one at DePaul. The sample schools utilized the following curricula in the 8<sup>th</sup> grade algebra instruction:

<i>District-supported algebra curricula</i>			<i>Other algebra curricula</i>		
<i>Cognitive Tutor</i>	<i>Discovering Algebra</i>	<i>Glencoe</i>	<i>McDougal Littell</i>	<i>Prentice Hall</i>	<i>UCSMP</i>
1	2	3	2	1	1

Observation protocols were developed based on prior work of the Department of Program Evaluation, the Office of Mathematics and Science, and research on mathematics education. Our discussion of findings related to these data do not utilize all aspects of the protocol attached in Appendix C but provide a preliminary analysis of these data in light of what patterns seem to be emerging. Our findings are organized around the three evaluation questions noted on page 1: logistics and structure of 8<sup>th</sup> grade algebra classes, qualities and characteristics of instruction in 8<sup>th</sup> grade algebra classes, and teacher preparation and relevance to 8<sup>th</sup> grade algebra instruction.

### **Logistics and Structure**

#### **Time of Day**

As noted above, we chose the ten schools in this sample based on characteristics that included whether the course was taught before, during, or after school. However, we found that three schools had changed the time of day the courses were taught; one changed halfway through the school year. Two observed classes took place before school and eight took place during school. (One of the classrooms we visited met during and after school, but we only observed the class during the school day.) The scheduling within the school day also varied depending on the school. At two schools, there were two separate classes of 8<sup>th</sup> grade algebra students. Two other schools had block scheduling, where the length of the algebra period varied depending on the day. In addition, one school had a split period for algebra within the same day.

In schools where the time of day did not match our original list, we asked teachers to explain why. One teacher assumed that the change was made from after school to before school because the administration did not want students in algebra to miss other after school activities. Another teacher mentioned that before-school funding for her was not secured before classes started, so her algebra classes took place during the regular school day.

Generally, teachers were happy with the scheduling logistics of their math classes. One teacher, who commented that her 8<sup>th</sup> grade algebra students were very behind in other 8<sup>th</sup> grade math skills, mentioned she would like to change the time of her algebra class from during the school day to the afternoon so she could spend the school day working with an 8<sup>th</sup> grade math curriculum and “spiral” it in with algebra after school. In addition, one teacher said she would prefer to teach algebra during the day but conceded that this arrangement would not work because she teaches other math classes throughout the school day.

Through our analysis of these first ten observations, PRAIRIE researchers noticed that some schools might require an 8<sup>th</sup> grade math course (e.g., Connected Mathematics) in addition to their algebra class.

Thus, some students may be enrolled in two concurrent math courses, especially if students take algebra in the morning or afternoon. To ascertain the extent to which this happens, we have added clarifying questions about how schools schedule algebra to our protocol and plan to address this issue in the second algebra data brief.

**Reflection Question**

There are a range of schedules for algebra among schools. Both teacher pay and the ability to offer students algebra in addition to the regular 8<sup>th</sup> grade math courses (e.g., Connected Mathematics) are affected by what time of day 8<sup>th</sup> grade algebra is taught in a school. Is it important that OMS/OHSP/Cluster 4 Middle Grades Project (C4MGP) provide a more concrete model for scheduling algebra within the school day? What are the pros and cons for each model?

**Length of Classes**

Schools differed on weekly time allotment for their algebra classes. Eight schools were teaching a different number of minutes of algebra each week than official OMS/OHSP records reflected. In one case, a school had one less hour per week for algebra than was originally scheduled. On the other hand, another school added 50 minutes per week. The following table represents the various configurations of time devoted to 8<sup>th</sup> grade algebra periods in seven of the schools:

<i>Number of minutes per class period</i>	<i>Number of days per week</i>	<i>Number of schools</i>
60	5	4
60	4	1
55	5	1
40-50	5	1

The other three schools had more complex class period schedules. At one of these schools, a teacher had a block period once a week for 1.5 hours and 50-minute periods three days a week. Another school had seventy minutes a day but as a split period, with lunch period dividing the class. The last school's schedule required the algebra teacher to teach an extra 1.5 hours in the afternoon once a week to supplement in-school time, which averaged 40 minutes a day. This school also had block periods that prevented classes from meeting each day. While teachers were generally happy with the logistics of their classes as mentioned above, most mentioned that they would ideally prefer to have more time to teach algebra.

**Reflection Question**

Given that the range of algebra instruction from 225 to 350 minutes a week, some students are getting more instruction than others. What can OMS/OHSP/C4MGP do to ensure all students receive at least the minimum 60 minutes of mathematics/algebra instruction consistently throughout the year?

**Flexibility of Schedule**

Three teachers explicitly mentioned that they had flexibility when they taught their classes during the day and that they used it to the advantage of 8<sup>th</sup> grade algebra. For example, at one school, the algebra teacher, who also had the algebra students for homeroom and for social studies, reported that because of the upcoming ISAT and algebra exams, she only taught social studies every other day and used the additional time to teach algebra. Another teacher, whose algebra class was also her homeroom class, had a split period of algebra. Therefore, depending on whether her students came late from another class, she

sometimes swapped advisory time with one segment of her algebra class to give algebra instruction more time. In another case, a teacher taught an extra 1.5 hours in the afternoon once a week to supplement in-school time and appreciated the length of this after school period because it provided more time for exploratory activities.

### ***Reflection Questions***

- Teachers want more time for algebra. Some teachers are making this time at a disadvantage to other classes or activities. What can OMS/OHSP/C4MGP do to make sure teachers get enough time to teach algebra such that it is not at the expense of other courses?
- Should algebra be taught in addition to a regular CMSI 8<sup>th</sup> grade math course?

### **Enrollment of Algebra Students**

OMS/OHSP provided schools with two tools to help them select students for the 8<sup>th</sup> grade algebra. The CMSI *Student Selection for 8<sup>th</sup> Grade Algebra* criteria (see Appendix A) suggested four key considerations: academic performance (e.g., ISAT scores), student's understanding of key concepts, student's attitude and motivation, and parental/guardian support and understanding of additional commitment by an 8<sup>th</sup> grade algebra student. The OMS *Student Readiness Rubric* (Appendix B) also provided a structure by which to evaluate students on a 1-4 scale for ten mathematical concepts, such as multi-step problem solving ability and graphing ability.

Asking teachers if they specifically used these tools was not part of our protocol, and only one teacher specifically mentioned the CMSI and OMS rubrics in choosing students for the algebra class. However, we found that the criteria schools used matched the district's suggestions for the selection of students for 8<sup>th</sup> grade algebra.

According to the teachers in our sample, students were chosen for the 8<sup>th</sup> grade algebra class based on several factors in various combinations at each school, including ISAT scores (mentioned by nine teachers), 7<sup>th</sup> grade math teachers' recommendations (mentioned by six teachers), entrance/readiness exams created by school staff (mentioned by five teachers), and an evaluators' sense of a student's "mathematical capacity" (mentioned by one teacher). Two teachers explained that the ISAT scores could not be the only factor; otherwise, the algebra classes would be too small. In 8 of the 10 schools, the enrollment decision was made at the end of 7<sup>th</sup> grade. In two schools, the decision was made at the beginning of 8<sup>th</sup> grade. A teacher at one school mentioned that there were a couple of 7<sup>th</sup> graders in the 8<sup>th</sup> grade algebra class, presumably chosen with a similar basis for enrollment.

Student attendance ranged from 3 to 30 in the classes we observed. While the class with only three students was held on a cold winter morning, the teacher explained that ten students normally attended. Since we only have data on the students in the classes we observed (versus actually enrolled in the course) and due to our small sample, we were not able to analyze fully how the time of the class may have affected the number of students enrolled. For example, a teacher at another school mentioned that teaching algebra before school worked out best for her. In previous years, when she taught it during the school day, students who were not actually prepared for algebra were put in her classroom.

### ***Reflection Questions***

- Is the use (or non-use) of the CMSI rubric an issue for OMS/OHSP? If so, what can these departments do to ensure that schools use the rubric for selecting 8<sup>th</sup> grade students?
- If only a few students qualify for algebra based on the CMSI Algebra Readiness rubric, should the school still offer 8<sup>th</sup> grade algebra? If only a few students are in the class, how can OMS/OHSP/C4MGP support this offering financially such that it stays a class for those who meet the "readiness" criteria?

## Qualities and Characteristics of Instruction

### What Does Instruction in 8<sup>th</sup> Grade Algebra Look Like?

We used the classroom observation protocol (see Appendix C) to determine what instruction looked like in the 8<sup>th</sup> grade algebra classrooms. During our visits we scored teachers on a scale from 1-4 (1 being “not at all” and 4 being “to a great extent”) on each of 13 different “teacher moves.” Students were ranked on that same scale on each of 13 different “student moves.” While our findings from ten classroom observations and follow-up interviews represent only one moment in time for those teachers and students, they do offer a glimpse of what instruction in 8<sup>th</sup> grade algebra looks like. In addition, while we are not making a direct comparison to CPS findings in 9<sup>th</sup> grade algebra classrooms as noted in CPS’ internal report *Two Period Algebra: Final Report on Program Implementation and Participant Reactions in 05-06* (2006), our analysis will allow us to contribute to a dialogue around a comparison. For example, we were able to look at 8<sup>th</sup> grade algebra classrooms in terms of instructional approach (teacher moves), lesson content, learning activities (rigor), and student engagement (student moves).

### How We Assessed Rigor

Classrooms were determined to be either high in rigor, moderate in rigor, or low in rigor. During the course of a classroom period, no lessons we observed were high in rigor for the entire period, moderate in rigor for the entire period, or low in rigor for the entire period. There was typically some kind of combination of demand on students.

Within each category of rigor (high, moderate, or low), we determined how a particular portion of class scored on our rigor scale. Possible scores were 1) not at all, 2) to some extent, 3) to a significant extent, or 4) to a great extent. Our assessments were based on the number of minutes spent on different activities as a percentage of total minutes allowed for the period.

If the percentage of class time spent on any category of rigor (high, moderate, or low) was 50 percent or greater, we rated that classroom as being at that level of rigor (high, moderate, or low) to a great extent. Similarly, if classroom activities were at either level of rigor between 33 and 50 percent of the lesson period, that lesson was determined to be at that rigor level (high, moderate, or low) to a significant extent. Classrooms that were considered to be at either of the rigor categories between one and 33 percent of the time were said to be at that level of rigor (high, moderate, or low) to some extent. Lastly, in lessons where we found no evidence of rigor in one of the categories, those classrooms were not at all rigorous at whichever level (high, moderate, or low) it applied.

For example, in one of the classrooms we saw our rigor assessment was:

- Class was high in rigor to a great extent.
- Class was moderate in rigor to some extent.
- Class was not at all low in rigor.

These determinations were made based on the number of minutes spent working on different activities, which is illustrated in the following table:

<b>Rigor (high, moderate, or low)</b>	
To a great extent	50% or more of total class time
To a significant extent	33% to 50% of total class time
To some extent	1% to 33% of total class time
Not at all	0% of total class time

## Level of Rigor

We assessed levels of rigor in the classrooms we observed as defined by Smith and Stein's (1998)<sup>3</sup> *Levels of Demands*. High rigor activities are lessons that are complex and require characteristics such as non-algorithmic thinking, among other traits. Qualities of lessons low in rigor include students reproducing previously-learned facts and engaging in unambiguous tasks. Classroom activities that are of moderate rigor lie between these two extremes. Across the ten sample schools, we saw highly or moderately rigorous mathematical content being covered in all of the observed lessons.

For example, a lesson we considered to be high in rigor had students take on the role of engineers building an interstate highway from Pittsburgh to Cincinnati. In this highly rigorous activity, given certain information, students had to answer a series of questions about how many miles of highway would be completed over different periods of time and use a complete sentence in their answer. The class worked on this project in groups with the teacher moving from group to group and providing whole group instruction as well.

This lesson was considered to be high in rigor because it required students to dig deeper into the algebraic concept of defining variables, setting up an equation, and solving for the unknown. While they did indeed go through that process, they did it in the context of a real world example that actually required them to solve a practical problem applying the concept of defining variables, setting up an equation, and solving for the unknown. Several students had difficulty with this problem. This rating is in line with other criteria for higher-level demands on students as noted by Smith and Stein, including:

- Focusing students' attention on using procedures with the goal of developing deeper levels of understanding of mathematical concepts and ideas.
- Requiring considerable cognitive effort which may result in some level of anxiety for the student due to the unpredictable nature of the solution process required.

In an example of a lesson with a moderate level of rigor, the teacher used the overhead most of the class period to go over problems involving multiplying and dividing with exponents. As the teacher did the problems, she asked students how to do the problem step by step. This lesson could have been elevated to a high level of rigor had the teacher offered some practical use of why exponents are important, for example, determining future values of money. With respect to overall content, all of the lessons we saw covered topics ranging from functions and relations to linear equations to exponential functions to graphing in the x-y plane.

### **Reflection Questions**

- What percent of class time would you consider a "great extent"?
- Should all lessons have components of low, medium, and high rigor? If so, in what proportions?

### **Most Common Teacher Moves**

- Teachers gave students an adequate opportunity to respond to questions.
- Teachers showed respect for students' ideas and answers - even if incorrect - and addressed misconceptions.

It makes sense to talk about these two teacher moves together. The first teacher move refers to the scenario where teachers are giving students enough time to respond to questions. To elaborate, once a

---

<sup>3</sup>Smith, M.S. & Stein, M.K. (1998). Selecting and creating mathematical tasks: From research to practice. *Mathematical Teaching in the Middle School*, 3(5), 344-349.

student answers a question, the teacher can either respond to the student's answer or ignore the student's answer and move on to something else. In the second teacher move teachers showed respect for students' ideas and answers, even if incorrect. It follows that teachers who give students time to respond to questions are likely to be more thoughtful to students' answers, making it plausible to look at these two actions together.

There is a common thread among teachers who make these moves on a consistent basis. They all led classrooms where learning activities were at least high in rigor to a significant or great extent. Five of the nine teachers made these moves regularly; they also taught lessons that were high in rigor to a significant extent or to a great extent. In these high-demand lessons, teachers focused on their students' learning by asking questions and providing wait time and/or encouraging feedback.

There do not appear to be any systematic patterns connecting the most frequent teacher behavior with why teachers gave students an adequate opportunity to respond to questions. Two of the teachers said they did not think their students understood the material, yet they were just as patient and responsive as teachers who said their students understood the lesson content. Of all the characteristics noted about our sample (time of day classes met, teacher certification type, whether or not teachers attended Algebra Initiative university courses), none seemed to be related to these teacher moves—none seemed to influence the fact that teachers were more patient and responsive with their students than any other characteristic.

#### **Least Common Teacher Moves**

- Teachers provided internal summaries and transitions between topics.
- Teachers encouraged students to respond to each other's questions and/or comments.

Teachers rarely provided internal summaries and transitions between topics. In three observations, we noted no change in topic, thus no need for transition within the lesson. In addition, most teachers did not overtly encourage students to interact with each other. This observation may be related to the manner of instruction because teachers tended to engage in whole group, lecture/questioning, and/or teacher-focused instructional approaches as opposed to student-discovery approaches, usually resulting in students working in small groups.

Two of the three teachers who encouraged their students to interact with each other at a high level had their students doing group work. The other teacher encouraged students in their seats to interact with students at the board, and vice versa. Learning activities in these classrooms were considered high in rigor to a great or significant extent. While we were only in a limited number of classrooms, it appears that when students worked in small groups, they usually responded to each other more and their lessons were typically of a higher rigor.

#### ***Reflection Questions***

- Of the teacher moves noted on the protocol, which ones would you hope to observe more often?
- How might PD be shaped to support the lesser-used teacher moves if they are equally important?

#### **Most Common Student Moves**

- Students seemed comfortable asking questions, sharing ideas, and engaging in risk taking.
- Students seemed interested and challenged by the lesson.

Students' comfort in asking questions seemed to be directly related to the most commonly practiced teacher moves. If teachers give their class adequate opportunities to respond to questions and show respect for students' ideas and answers—in effect create a climate of respect and trust—students are likely to be comfortable sharing their thoughts in the classroom. Because the teacher has acted in a patient and compassionate way, students may be more at ease in expressing themselves in ways that have a positive impact on their learning. In nine of the observed lessons, students seemed comfortable asking questions as noted by how readily students asked questions and the extent to which students asked each other questions.

In half of the classrooms, students seemed to show a high level of interest and seemed to be greatly challenged by the lesson. In three of these classrooms, students were also involved in high rigor learning activities to a great extent. At this point, we can only speculate that there are connections among student interest, challenging material, and rigor.

### **Least Common Student Moves**

- Teachers asked questions but students were generally interacting with each other during classroom discussion.
- There was classroom discussion.

The distinguishing element of both of these student moves was classroom discussion, which we rarely observed. Six classrooms were fairly low in classroom discussion. Of those six, four did not have students working in small groups. In one classroom students engaged in classroom discussion to a great extent, and we observed students working in groups and talking with each other about algebra the entire class period. The three other classrooms where students interacted with each other during classroom discussion also included group work.

### ***Reflection Questions***

- Of the student moves noted on the protocol, which do you most hope to observe more often?
- How might PD be shaped to support the lesser-used student moves if they are equally important?

### **8<sup>th</sup> Grade Algebra Compared to 9<sup>th</sup> Grade Algebra**

While we did not directly compare our findings to CPS' findings on 9<sup>th</sup> grade algebra instruction, we asked 8<sup>th</sup> grade algebra teachers to compare their courses to 9<sup>th</sup> grade algebra. Nearly all of the teachers felt that they were teaching the class at the 9<sup>th</sup> grade level. One teacher, however, mentioned that even though she was teaching algebra to 8<sup>th</sup> graders, she did not feel as if it was on a high school level because her students were lacking many important mathematics fundamentals since all but one student were performing below 50% on the ISAT.

We asked teachers to tell us what they were doing differently in their 8<sup>th</sup> grade algebra class from what they were doing in their regular 8<sup>th</sup> grade mathematics class. Again, all indicated that there was a difference in rigor.

My other 8th grade math class is probably...even though we use an 8th grade curriculum, I pull a lot from 7th grade curriculum, and they don't push through the content as quick as the algebra class does. The algebra class catches on quickly. They are not afraid to try. I have a better relationship with the algebra class, and I see them twice a day so it's like they get a double period

of math. Because of that, I do teach them differently and the algebra class is definitely more advanced than the regular 8th grade class.

With this [8<sup>th</sup> grade algebra] group, we're taking those word problems and having multi-steps including distributive property, etc., multi-step word problems. In my regular 8th grade math, we're doing simpler word problems. So they are still identifying the variables, but they're not so multi-step. And my 7th graders are doing the same thing. So what I do is I step it up a notch with each group.

Worlds of difference... Well, this is a homogeneous group. This is a pilot group for us. And they're all pretty strong in math. So we can get into concepts, we can get into some problem solving, we work at a fast pace. The other groups, because we did skim off the strong students, some are—there's a considerable resistance to doing math. And we are doing some, a lot of basic kinds of math. And, the lessons, sometimes the lessons have problems A, B, and C. For some of the class, I try to get them up to B, but we're doing A and B. This class, I'm doing like all C work and the pace is so much faster. The other classes I have to spend a couple of sessions on the new concept. The other class is studying pre-algebra. The other thing is this class had no pre-algebra. So they went from like 7th grade to a 9th grade curriculum but because they're strong it wasn't too much of an issue.

#### **Reflection Questions**

- How do you understand the differences between 8<sup>th</sup> grade and 9<sup>th</sup> grade algebra in terms of content, pacing, type of problems, and expectations?
- How do you understand the differences between 8<sup>th</sup> grade CMSI math and 8<sup>th</sup> grade algebra in terms of content, pacing, type of problems, and expectations?

#### **Curricular Materials and Instruction**

CPS recommends three algebra curricula (*Cognitive Tutor*, *Discovering Algebra*, and *Glencoe*) and supports these curricula through teacher training in their use. Of our ten sample schools, six used one of the CPS-recommended curricula (see the table on page 2), and the other four used other curricula. We are unable to make judgments regarding any of these curricula based on such a small sample; however, we saw no significantly high rigorous lessons with the *Glencoe* curriculum whereas we did see significantly high rigorous lessons with all the other curricula. All the *Glencoe* lessons were moderately rigorous to a great extent.

*Glencoe* is the curriculum of choice in an overwhelming number of schools, not only in our sample but in all the schools approved to teach 8<sup>th</sup> grade algebra. Roughly 45 (63%) of all the schools approved to teach 8<sup>th</sup> grade algebra teach using the *Glencoe* curriculum. Teachers described this curriculum as promoting a traditional approach to skill development. CPS' other recommended curricula are more technology and inquiry based. For example, a teacher using *Cognitive Tutor* explained that she opted for these materials because of the opportunities to work in the computer lab and facilitate differentiated instruction.

#### **Reflection Question**

- Have texts for 8<sup>th</sup> grade algebra been chosen based on the rigor of the lessons within?
- Does text dictate rigor?

## Teacher Preparation and Its Relevance to Instruction

### OHSP Professional Development

The Office of High School Planning offers eight professional development opportunities for teachers of 8<sup>th</sup> grade algebra over the course of this school year. Three were held in August prior to the start of school, and five were scheduled throughout the school year from September to May. According to OHSP staff, the goal of these workshops is to train teachers to effectively use the curriculum.

This training is an effort to maximize teachers' time and to get teachers to talk about their practice. During the summer, teachers were prepared and charged with the role of getting their students ready for high school through various strategies suggested by the OHSP. Both high school teachers of 9<sup>th</sup> grade algebra and elementary school teachers of 8<sup>th</sup> grade algebra were encouraged to attend these sessions to promote professional communities across the grade school-high school divide.

Six professional development workshops for 8<sup>th</sup> grade algebra teachers have been offered so far this school year. The six teachers using a district-recommended curriculum (*Glencoe, Discovering Algebra*, and *Cognitive Tutor*) attended at least one of these in-services. Teachers not using district-supported curricula did not attend the training. As mentioned above, four schools in our sample chose to teach a curriculum other than a district-supported curriculum.

We attended a workshop in January that, by all accounts, seemed to be typical of the general format of all the sessions. In the morning there was a brief discussion about ISAT and the 8<sup>th</sup> grade algebra exit exam. This discussion was followed with a technology demonstration using *Capri Jr.* and *Geometer's Sketchpad*, a discussion/analysis of student work and a discussion of activities and lessons within the context of the curricula in relation to real-world application. In the afternoon, the teachers split up according to curricula.

Of the six teachers in our ten school sample who attended professional development, the majority of them felt that it was beneficial because it gave them an opportunity to talk with their colleagues about their practice and go over what was working or not working in the classroom. For example, in the *Glencoe* breakout room they worked on pacing and constructed responses. The *Discovering Algebra* group worked on problems and discussed what that curriculum specifically wanted students to learn. Teachers said they enjoyed professional development because it helped them feel more confident and comfortable with their teaching.

It is not clear to us if the OHSP professional development was geared only towards district-supported curricula or if it was generic enough to provide assistance to all teachers of 8<sup>th</sup> grade algebra. Based on interviews with teachers, we found that three teachers not using district-supported curricula were completely unaware of district training opportunities for 8<sup>th</sup> grade algebra teachers. This issue would be a moot point if this professional development was geared solely to curricula supported by the district; however, if these sessions are geared towards other goals, this issue may be a place for greater communication.

### ***Reflection Questions***

- If the district has decided to support only a subset of the curricula that are being used, what is the plan for helping move schools to use these curricula and how is it being communicated to schools?
- Is 8<sup>th</sup> grade algebra PD generic enough to support all the curricula being used while schools make this transition? Considering what teachers feel to be the benefits of PD--promoting collegiality in particular--and considering at least half of each PD session would benefit all 8<sup>th</sup> grade algebra teachers, what efforts need to be made to reach out to teachers not using district supported curricula?
- Teachers have described the benefits of PD in terms of the opportunity to develop stronger professional communities rather than curriculum implementation. If this is a goal of this PD, are steps being made to recruit teachers who are not using the district-supported curricula to participate in at least the first half of a PD sessions?
- Does this PD promote the teacher/student moves the district wants to see regardless of curricula?

### **Teacher Certification and University Courses**

Teachers in the 8<sup>th</sup> grade algebra program must have either Type 3 (elementary) or Type 9 (high school) certification. In addition, Type 3 teachers must also receive an algebra credential/certification, which can be accomplished by taking two additional courses at one of the three universities participating in the program and passing an algebra exam. Type 9 teachers just need a math endorsement, which certifies them to teach algebra in high school.

In our ten school sample, eight teachers are Type 3 certified and two are Type 9 certified. All eight Type 3 teachers were certified to teach 8<sup>th</sup> grade algebra through the University Partner endorsement program. When reflecting on the University Partner endorsement program, some teachers indicated that the content of the courses was helpful to them, especially with respect to implementing ideas in their classrooms. Some of the comments were:

The course itself, not the professor, [were helpful]. The concepts that it [the course] covered I thought were extremely helpful and kind of reviewing the algebra concepts that I had not necessarily reviewed in a while. It helped me tighten up my algebra, and I think every time I look at it I tend to learn more from it, and I can see how to change it and do things differently.

I thought it was really, really good. What I like was, I hadn't been, it's been years, you get used to teaching 7th and 8th grade math you forget things sometimes. So, it gave me a lot of refreshers. It gave me a lot of tidbits on what to do with the kids: How to engage them; how to get them to not just do the math. I hate when they [the students] just do the math. I want them to understand why they're doing it, and how it's relevant. So, those are the kinds of things that they [the instructors] demonstrated to us. The instructor, I thought he was excellent.

Conversely, at least two of the teachers found parts of the experience to be less than enlightening. They indicated:

The professor that I had... I did not make a connection with him, and I don't think a lot of students made a connection with him. To my knowledge I don't think he had ever taught in an elementary school. I think he only taught at the college level/university level, and we didn't receive a lot of ideas on how to implement algebra. I learned algebra, but the implementation at the elementary school level or the middle school level was not there. I want to say I learned more of the content rather than the method.

I was afraid of taking the exam based on what I was learning in my class work. The instructor assumed people knew a lot of things that they didn't know...Somebody might ask a question. He'd say, "It's common sense!" That happened a few times, he shut people down. So I was a little bit fearful. I was passing the tests and all and I had a good understanding of it, but I wasn't quite sure what was going to happen when I took the exam...It was two courses...And I had the same professor.

Therefore, how the characteristics of high quality teaching of 8<sup>th</sup> grade algebra are conveyed and experienced by teachers taking the courses seemed to vary regarding course content and actual experiences in the classes. Teachers clearly wanted to learn new ideas and strategies that could be immediately implemented in their classrooms. They measured relevance of the courses to the extent that they are able to do just that.

***Reflection Question***

Some university instructors seem to provide teachers with content knowledge and also demonstrated effective teaching strategies for middle school students. On the other hand, other professors offered instruction in content knowledge but were not as successful in helping teachers develop effective strategies for teaching middle school students. What are OMS/OHSP and university partners doing to promote instruction that both provides solid content knowledge and builds teachers' repertoire of effective teaching practices for 8<sup>th</sup> grade students?

**Conclusion**

While our data are limited, we have been able to see what looks to be the start of a pattern in terms of teacher and student moves. We noticed variations within observed classes: curriculum used, size of class, time class was offered, types and levels of instruction, and teacher preparation. In addition we believe we are seeing what might be a pattern in terms of rigorous lessons and the curricula being utilized in those classrooms. Likewise, we note the disparity of training opportunities for teachers not using district-supported curricula. We look forward to further data collection and analysis to see if these trends continue in our larger sampling. It is our hope that these findings and reflection questions will spark discussion among partners about the 8<sup>th</sup> grade algebra program to ensure its success in reaching its goals.

## **Appendix A**

### **Student Selection for 8th Grade Algebra**

Schools should consider the following criteria when deciding which students to enroll in 8<sup>th</sup>- grade algebra.

#### ***Academic Performance***

- Did the student earn a scale score of 245 or greater on the spring 2006 6<sup>th</sup>-grade ISAT mathematics exam?
- Did the student earn a scale score of 255 or greater on the spring 2007 7<sup>th</sup>-grade ISAT mathematics exam?
- Did students have an “A” or “B” grade average in 7<sup>th</sup>-grade mathematics?

#### ***Understanding of Key Concepts***

The Algebra Readiness Rubric, available at <http://cmsi.cps.k12.il.us/>, is a tool that will enable teachers and schools to make informed decisions about student understanding of key pre-algebra concepts.

- Do students demonstrate understanding of the key mathematics concepts?

#### ***Attitude and Motivation***

- Does student have attendance at or above the citywide average for seventh grade?
- Does the student complete homework on a regular basis?
- Does the student complete in-classroom assignments?
- Does the student seek out academic challenges?

#### ***Adult Recommendations***

- Does the student’s 7<sup>th</sup>-grade mathematics teacher support enrollment in 8<sup>th</sup>-grade algebra?
- Does the student’s parent support enrollment in 8<sup>th</sup>-grade algebra, and understand the additional commitment and work that it will entail?

**Appendix B**  
**Student Readiness Rubric for 8<sup>th</sup> Grade Algebra**

**Student Name:** \_\_\_\_\_ **Student ID:** \_\_\_\_\_ **7<sup>th</sup> Grade ISAT Score:** \_\_\_\_\_  
**School:** \_\_\_\_\_ **7<sup>th</sup> Grade Math Teacher:** \_\_\_\_\_

**Instructions for 7<sup>th</sup> Grade Mathematics Teacher:**

Please complete this rubric for students who met or exceeded standards on the ISAT mathematics score, and who you believe are well prepared for 8<sup>th</sup> Grade Algebra. This rubric should be considered when deciding to place students into 8<sup>th</sup> Grade Algebra the following year. Assess the student’s level in each area using the scale below. Total all scores and use the scale provided below to recommend course placement. Additional comments may be added on the reverse side.  
In addition to the student’s ISAT score and the results of the readiness rubric, the student’s attendance should be at or above the citywide average for the current school year.

- 1 = No evidence:** Student demonstrates no understanding of these mathematical concepts.
- 2 = Little evidence:** Student demonstrates a limited and/or very inconsistent understanding of these mathematical concepts.
- 3 = Emerging evidence:** Student demonstrates understanding of mathematical concepts in many, but not all, contexts.
- 4 = Strong evidence:** Student demonstrates a deep understanding of mathematical concepts in most or all contexts.

<b>MULTI-STEP PROBLEM-SOLVING</b>				
Student can solve computational problems involving the four basic operations in various settings that require more than one step.	1	2	3	4
<b>FRACTIONS, DECIMALS, PERCENTS AND PROPORTIONAL REASONING</b>				
Student is able to: Understand ratio and proportion both conceptually and procedurally (e.g., “If 30 pairs of gym shoes cost \$2050, how much would five pairs of gym shoes cost? Explain how you know this;” or, “If a 75-foot tall building casts a shadow that is 15 feet long, how long of a shadow will a 25-foot tall building cast at the same time of day?”); Translate between fractions, decimals, and percentages (e.g., “Out of a class with 14 boys and 12 girls, what fraction/decimal/percentage of the class is girls?”).	1	2	3	4
<b>POSITIVE AND NEGATIVE NUMBERS</b>				
Student is able to: Compare and order positive and negative integers, fractions, and decimals (e.g., “Place these numbers in order from least to greatest: $-1/2$ , 1200, -17.89, 0.5, $34/39$ , 0.75, -8, $-17\frac{1}{2}$ , etc.”); Add, subtract, multiply, and divide positive and negative integers, fractions, and decimals using the proper order of operations.	1	2	3	4
<b>VARIABLES AND PATTERNS</b>				
Student is able to: Understand the meaning of a variable in an algebraic expression; Evaluate simple algebraic functions for a specific value of a variable (e.g., “Evaluate $-12x + 9$ , for $x = -2$ ”); Solve linear equations with whole number coefficients (e.g., “Solve for $x$ if $-5x + 2 = x - 7$ ”);	1	2	3	4

Identify and describe patterns in sequences of numbers.				
<b>GRAPHING</b>				
Student is able to: Identify and graph numbers (integers and fractions) on a number line; Identify and graph ordered pairs of numbers in the x-y (horizontal and vertical) coordinate plane; Represent relationships in both tabular and graphical form (e.g., “Given an x-y graph showing how many jumping jacks a student completed in three minutes, make a table of the data and describe how the number of jumping jacks changes for each 10-second interval.”).	1	2	3	4
<b>EXPONENTS</b>				
Student can: Understand and interpret repeated multiplication in exponential form; Simplify and evaluate expressions involving exponents and scientific notation.	1	2	3	4

TOTAL SCORE: \_\_\_\_\_

**Placement Recommendation:** (Please check one.)

\_\_\_\_\_ 6 to 17: I recommend this student in a regular 8<sup>th</sup> grade mathematics class.

\_\_\_\_\_ 18 to 24: I recommend this student be placed into 8<sup>th</sup> Grade *Algebra*.

Teacher Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Appendix C**  
**8<sup>th</sup> Grade Algebra Classroom Observation Protocol**  
**2007-2008**

**Teacher name:**  
**Algebra curriculum using:**  
**School and ID number:**  
**Observer recording notes:**  
**Story of Initial Contact:**

\*\*\*\*\*  
**STEP 1: PRE-OBSERVATION LESSON INFORMATION**  
 \*\*\*\*\*

**1. Whole or part of lesson:**

- What is lesson being taught? \_\_\_\_\_ Page numbers in text: \_\_\_\_\_
- What are the big ideas in the lesson?
- What does the teacher expect students to learn in this lesson?
- Has the teacher made any changes to the lesson, compared to what curriculum guidelines suggest, based on their assessment of their students' understanding of the lesson's main ideas?

\*\*\*\*\*  
**STEP 2: CLASSROOM OBSERVATION**  
 \*\*\*\*\*

**PART A: Set-Up**

**Date of Observation:**  
**Time Observation Started:**  
**Time Observation Ended:**  
**Individuals present: Number of students** \_\_\_\_\_ **Number of adults** \_\_\_\_\_

- Who were the other adults in addition to teacher:
- What was their role (i.e., teaching a lesson, assisting students with work, observing the lesson, other)
- Comments on other adults in the classroom
- How were students arranged within class:

1a	1b	1c	1d	1e	1f	1g	1h	1i	1j
2a	2b	2c	2d	2e	2f	2g	2h	2i	2j
3a	3b	3c	3d	3e	3f	3g	3h	3i	3j
4a	4b	4c	4d	4e	4f	4g	4h	4i	4j
5a	5b	5c	5d	5e	5f	5g	5h	5i	6j
6a	6b	6c	6d	6e	6f	6g	6h	6i	6j
7a	7b	7c	7d	7e	7f	7g	7h	7i	7j
8a	8b	8c	8d	8e	8f	8g	8h	8i	8j
9a	9b	9c	9d	9e	9f	9g	9h	9i	9j
10a	10b	10c	10d	10e	10f	10g	10h	10i	10j

Description of site:

List of materials collected:

\*\*\*\*\*

**PART B: Observation of 8<sup>th</sup> Grade Algebra Lesson (Insert observational notes here. Note time throughout and how students are organized throughout, in addition to trying to capture as much dialogue as possible.)**

\*\*\*\*\*PART

**C: Post-observation analytic notes: Pedagogy and learning**

*Soon after you have completed the observation, take some time alone to address the following key instructional issues based on what you observed. You may be able to do this right after the observation, or after the post-observation interview/debriefing (next section). If there are two observers, each observer should complete this part separately. Each observer's distinct analysis is an important contribution to the field study.*

\*\*\*\*\*

**1. How were students organized for instruction?**

- Was the room layout conducive to collaborative learning? If so, how?
- Were students organized into a large group for instruction? Explain.
- Were students structured for small group work? Explain.
- Were students working independently at their desks on an assignment? Explain.
- Were students working at computers, either independently or in pairs/small groups? Explain

**2. What was the overall focus of lesson content (address all that apply)?**

*This would include but not necessarily limited to: graphing in the x-y plane; slope; writing equations using point-slope, slope-intercept, and two points; lines of best fit; variables and patterns; exponents and radicals; fractions, percents, and proportional reasoning; signed number operations; multi-step problem solving; probability and odds; solving linear equations; functions and relations; direct and indirect variation; inequalities; systems of equations and inequalities; exponents and exponential functions; quadratic equations and functions; polynomials and factoring; rational equations; radicals; other (please describe).*

- Were other activities taking place? For example, assessment (quiz, test), algebra related game (please describe), computer use (i.e., *Cognitive Tutor*), test preparation (for externally mandated exams), other (please describe).

**3. Please assess the quality/level of teaching and learning.**

**3a. Teacher Moves:**

- Did the teacher use some type of “opener” which was related to appropriate algebra content (i.e., yesterday’s class, today’s class)? Was the lesson connected to students’ prior knowledge?

Not at all \_\_\_\_\_

To a significant extent \_\_\_\_\_

To some extent \_\_\_\_\_

To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher clearly state goals or objectives for the class period, or were they clearly posted in the room?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher provide internal summaries and transitions between topics?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Were the key ideas of the lesson summarized? This could be done by the teacher or students.

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher provide feedback to students about their work?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher listen carefully to student comments and questions?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher encourage active participation of all students?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher show respect for students' ideas and answers, even if incorrect? Were misconceptions addressed? How?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher encourage students to respond to each others' questions and/or comments?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher use open-ended questioning strategies to guide students? Did the teacher use questioning to help students develop an understanding of the concepts in the lesson?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher give students an adequate opportunity to respond to questions?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did the teacher encourage/allow students to use multiple strategies for solving a problem?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Were students consistently encouraged to verbalize their thought process and explain answers (i.e., during class discussion, in groups, with teacher, etc.)?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

### **3b. Student Moves:**

- Did students seem comfortable asking questions? Did the climate encourage students to ask questions, share ideas, and engage in risk-taking?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Were students engaged in collaborative learning? If so, please describe.

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Did students demonstrate an understanding of the key mathematical ideas in the lesson?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Were students developing algebraic habits of mind, for example, doing-undoing, building rules to represent functions, abstracting from computation, etc.?

Not at all \_\_\_\_\_  
To some extent \_\_\_\_\_

To a significant extent \_\_\_\_\_  
To a great extent \_\_\_\_\_

Explain your assessment:

- Were students generally engaged in the lesson? For example, did students seem to be:
  - Interested in what they were doing?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Enthusiastic about the class?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Interested and challenged by the lesson?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Working hard to do a good job?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Other manifestations of student engagement (attendance, homework, prepared for class, complete assignments on time, on time for class, classroom behavior, etc.)?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Was there classroom discussion?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- If there was discussion:

- Did the teacher ask questions where many answers may be correct but students rarely interacted with each other?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Were student opinions valued?

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

○ Did the teacher ask questions but students were generally interacting with each other?  
 Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
 To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

**4. Was there evidence of classroom rigor? Explain.**

*Class activities were **highly complex** or demanding for students (i.e., complex and non-algorithmic thinking; explore and understand the nature of mathematical concepts, processes, or relationships; self-monitoring; use relevant knowledge and experiences; analyze task and determine possible solution strategies; considerable cognitive effort, relate activities to real-world, everyday experience).*

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
 To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

*Class activities were **moderately complex** or demanding (i.e., algorithmic; focused on producing correct answers; limited explanation required; use of visual diagrams, manipulatives, and symbols, some cognitive effort required).*

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
 To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

*Class activities were **low in complexity** (i.e., reproducing previously learned facts, cannot be solved using a procedure, unambiguous, copying, no connection to concept being learned, virtually no cognitive effort required).*

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
 To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

- Class activities not relevant for assessing rigor (i.e., teacher telling students or students figuring out missed assignments or some other non-topical activity).

Not at all \_\_\_\_\_ To a significant extent \_\_\_\_\_  
 To some extent \_\_\_\_\_ To a great extent \_\_\_\_\_

Explain your assessment:

\*\*\*\*\*

**STEP 4: POST-OBSERVATION DEBRIEF**

**Teacher / grade taught:**  
**Teacher ID number:**  
**Algebra curriculum using:**  
**Date/time of debrief:**

As soon as possible after the observation, the researcher(s) should conduct an interview/debrief with the teacher. The following themes and questions should be addressed:

\*\*\*\*\*

### PART A: Pedagogy and Learning

1. How typical was this lesson?
2. What went well in *this* class session?
3. What could/should be improved in *this* lesson?
4. Do you think that the students understood the material in *this* session? What caused you to come to this conclusion?
5. Are you teaching this class at what you feel is a regular 9<sup>th</sup> grade/high school level?
6. What are you doing differently in your 8<sup>th</sup> grade algebra class than you are in your other 8<sup>th</sup> grade math classes?

\*\*\*\*\*

### Part B: Teacher Background

7. How long have you been teaching grade 8 algebra?
8. What type of certification do you have (type 09, type 03)? (SKIP THIS QUESTION IF PRESSED FOR TIME)
  - If Type 03, did you take the Algebra Initiative university courses and then pass the exam to obtain the 03? (SKIP THIS QUESTION IF PRESSED FOR TIME)
  - When did you pass the exam? (SKIP THIS QUESTION IF PRESSED FOR TIME)
  - Where did you take the Algebra Initiative courses (DePaul, University of Chicago, UIC)? (SKIP THIS QUESTION IF PRESSED FOR TIME)
    - How many courses did you have to take?
    - What were the courses?
    - How long did it take you to finish the program?
    - How would you assess the courses, instruction, and overall program?

\*\*\*\*\*

### Part C: Class Schedule and Logistics

9. What is the schedule for this class? (# of days it meets, length of class, what time of day. Ascertain if class meets during time it is scheduled to meet. If it meets at a different time find out why)
10. How many students are enrolled in this class?
11. How are students selected for the course? When are they selected?
  - Do students in 8<sup>th</sup> grade algebra still have to take regular 8<sup>th</sup> grade math?
  - How do the students get appropriate credit for regular 8<sup>th</sup> grade math, 8<sup>th</sup> grade algebra, and 9<sup>th</sup> grade algebra?
12. How well do you think this schedule and logistics work? Are there ways to improve upon this system?

\*\*\*\*\*

### Part D: Supports and Challenges

13. What supports do you need in order to be successful in teaching 8<sup>th</sup> grade algebra?
14. What are some of the barriers you've found to successfully implementing 8<sup>th</sup> grade algebra?
15. Have you utilized some of the following supports? If so, how have you found them to be helpful or not?
  - District-provided professional development workshops
  - Math specialists or coaches visiting your school (Specify what type of specialist; who; how interacted)

- Other (specify)

\*\*\*\*\*

### **PART E: Curriculum Use**

*Questions about curriculum use should be asked of all teachers. Ask curriculum-specific questions depending on the curriculum that was used. Select from the list below to ask teacher how they decided to use, not use, or modify aspects of the particular curriculum:*

**ASK THE FOLLOWING QUESTIONS IF USING CURRICULUM OTHER THAN THE ONES LISTED. OTHERWISE, DETERMINE THE DISTINGUISHING CHARACTERISTICS OF THE CURRICULA SUPPORTED BY CPS.**

- 16. Why did you choose the curriculum you're using rather than one of the ones supported by CPS?**
- 17. Why did you think algebra was appropriate with the curriculum you're using?**

**Cognitive Tutor:**

Ask teachers how they made decisions to use/ not use/ modify aspects of Cognitive Tutor lesson.

**Discovering Algebra:**

Ask teachers how they made decisions to use/ not use/ modify aspects of Discovering Algebra lesson.

**Glencoe:**

Ask teachers how they made decisions to use/ not use/ modify aspects of Glencoe lesson.