PROJECT AAIMS: ALGEBRA ASSESSMENT AND INSTRUCTION – MEETING STANDARDS
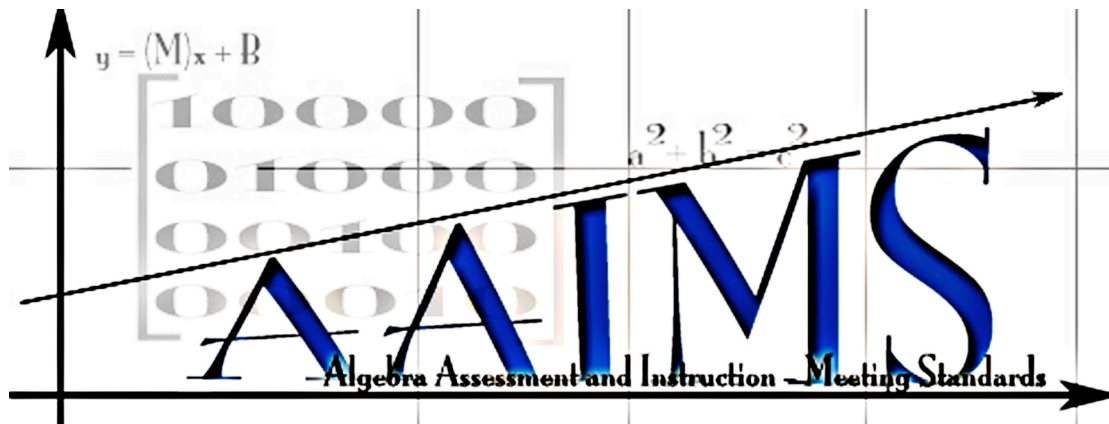

Classroom Observation Data for District A:

Momentary Time Sampling

Technical Report #1

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Executive Summary

This report documents the results of momentary time sampling observations conducted in District A during the spring of 2004. It identifies typical student and teacher behaviors, as well as typical instructional organization patterns and task formats in a variety of beginning algebra classes in this district. We describe some of the similarities and differences in algebra instruction for students with and without disabilities who were enrolled in 8th grade Algebra, Algebra I, Algebra IA or IB, Special Education Algebra, and Special Education Pre-Algebra. In addition, we report our findings about patterns of student behavior in each of these classes.

Overview

Access to general education curriculum has become a major emphasis in the education of students with disabilities since the 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA 1997). Access includes having meaningful participation in, and sufficient opportunities to make adequate progress toward, the district and state standards (Baker, Gersten, & Scanlon, 2002). Although this access does not necessarily require that instruction be delivered in general education settings by general education teachers, a growing proportion of students with disabilities are receiving a large proportion of their math instruction in this manner. One of the objectives of Project AAIMS is to examine the alignment of algebra curriculum, instruction, and assessment for students with and without disabilities. This report summarizes one portion of our efforts to further explore this issue.

To determine the extent to which algebra[1] instruction, curriculum, and assessment for students with disabilities is aligned with that of their non-disabled peers, the research activities imbedded in Project AAIMS included multiple means of gathering data. Two types of classroom observations were conducted concurrently. The first type used a systematic, momentary time sampling observation system, while the second type used an anecdotal observation form to document aspects of instruction that may not have been captured with the former system. In addition, interviews were conducted with teachers, administrators, and curriculum specialists to gather additional information about curriculum, instruction, and assessment at the district, building, and classroom level. Finally, school district documents related to instruction and assessment were reviewed as an additional source of information. Eventually, information from all of these sources will be integrated and a case study of each of the three participating districts will be developed.

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[1] Throughout this report any time we refer to algebra, we mean beginning algebra courses such as Algebra 1 or Pre-Algebra.

This report documents the results of the momentary time sampling observations conducted in District A during the spring of 2004. It specifically addresses the following questions: 1) How often were specific student and teacher behaviors, instructional organization formats, and task types observed in general and special education algebra classes? 2) What types of student behaviors were typical in these classes? 3) What types of teacher behaviors were typical in these classes? 4) What types of instructional organization formats were typical in the observed algebra classes? 5) What types of task formats were typical in general education and special education algebra classrooms? and 6) How were these variables related to each other in the algebra classes that were observed?

Method

Setting and Participants

Setting

District A serves four small towns and the rural agricultural areas between these towns. Approximately 7,000 people reside in the school district. The junior/senior high school has an enrollment of approximately 600 students; about 12 percent of these students receive special education services. Approximately 13 percent of the district's students are eligible for free and reduced lunch, and three percent are of diverse backgrounds in terms of race, culture and ethnicity.

Three years of mathematics is a graduation requirement in District A. Consequently, virtually all students must complete an algebra course. At the time of this study the district's junior/senior high school offered several alternatives for algebra instruction. Advanced students could take algebra in 8th grade, one year ahead of the typical timeline. At the high school level, which uses a traditional seven-period schedule, students could choose between Algebra I, the traditional course, taught over the course of an academic year, or Algebra IA and Algebra IB. With the IA/IB option, students completed the algebra course over a two-year time period. This slower pace was intended to allow additional time to master the concepts of algebra for students who might experience difficulty with this subject. In addition to these options, students who were receiving special education services could choose to enroll in either a Pre-Algebra course or an Algebra I course taught by a special education teacher. While the majority of general education students took Algebra I in ninth grade, there were some 10th, 11th, and 12th grade students enrolled in most of the various algebra options.

Participants

The participants included in this study included general and special education teachers and general and special education students. Four teachers from District A consented to participate in this study. Students in these teachers' algebra classes were invited to participate in project activities. Parent and student consent were obtained for the use of individual scores and demographic information that were analyzed for other technical reports. However, since this report focuses on group data gathered during observations of public behavior, our observations were not limited to only those students for whom both parental and student consent were obtained.

General and Special Education Teachers. Participating teachers included two general education algebra teachers (one high school teacher and one middle school teacher) and two special education algebra teachers. All of the teachers held standard Iowa teacher's licenses. One general education teacher had a 7-12 mathematics endorsement, while the other had a K-6 mathematics endorsement and a middle school endorsement. Both of the special education teachers had special education endorsements. Two teachers had additional graduate work beyond a Bachelor's degree and one of the special education teachers had a Master's degree. All of the teachers had at least three years of teaching experience (range 3 to 24 years) and a minimum of two years teaching algebra (range 2 to 4 years). The middle school general education teacher taught the eighth grade Algebra course. The high school general education teacher taught five algebra classes (three Algebra I classes, one Algebra IA class, and one Algebra IB class) throughout the day. One special education teacher taught pre-algebra to a small group of students with disabilities, while the other taught Special Education Algebra to another small group of ninth grade students identified as having deficits in the area of mathematics.

General and Special Education Students. Student participants included youth in the eighth through twelfth grade (13 to 18 years old) who were currently enrolled in a beginning algebra course. Fifteen students were enrolled in the eighth grade Algebra class, a total of 63 students were enrolled in the three Algebra I classes, 57 students were enrolled in either Algebra IA or Algebra IB, four students were enrolled in Special Education Algebra, and two students were enrolled in the Special Education Pre-Algebra course. Of the 141 students taking algebra, about thirteen percent were special education students. Six of these students received algebra instruction from a special education teacher (those in Special Education Algebra or Special Education Pre-Algebra). The remaining special education students received algebra instruction in a general education class.

Instruments and Measures

A primary objective of this study was to describe the types of instructional interactions occurring in general education and special education algebra classrooms. A momentary time sampling instrument, the Project AAIMS – Student Observation System (SOS-AAIMS), was used to assess student behavior, teacher behavior, instructional organization, and task format. (See Appendix A for the Project AAIMS-Student Observation System Manual.)

The SOS-AAIMS was developed for the purpose of observing student and teacher behavior in algebra classrooms. The tool was designed by modifying the Project Inclusion Student Observation System (Foegen, Marston, Robinson, & Deno, 1993), an instrument developed for an earlier research project, to reflect four aspects of algebra instruction for special education and general education classes. The SOS-AAIMS can be used to record the behaviors of students with and without disabilities, as well as the actions of general and special education teachers. In addition, the observational system also allows the researcher to record information about the types of instructional organization and task formats used throughout the class period. A brief description of the possible codes for each of the four aspects of this observation system follows. For a more complete description of each of the codes, see Appendix A for the Project AAIMS-Student Observation System Manual.

Student Behaviors

Four categories of student behaviors were observed and recorded. The four categories include active academic response, competing behavior, other appropriate, and off task. Whenever a student was overtly engaged in an active response to an academic task such as writing to complete an assignment or taking notes, the behavior was coded as an active academic response. If a student was overtly engaging in an active response that was disruptive or intrusive to class activities, then the behavior was coded as competing behavior. The other appropriate code was used when the student was not engaged in an active academic response or a competing behavior; instead, he or she was displaying behavior that was appropriate to the situation (e.g., raising one's hand while waiting for the teacher or watching as another student demonstrated a skill). Behavior was coded as off task when the student was not engaged in any of the three above behaviors. For example, the student may have been doodling on a notebook during independent work time or staring off into space.

Teacher Behaviors

Teacher behaviors were also classified into four categories: academic talk/listening, academic monitoring, task management, and other. If the teacher was talking about or presenting academic material to the entire class, a small group, or an individual student the behavior was coded as academic talk/listening. As one might surmise, this code was also used whenever the teacher was observed listening to a student's answer or question. It should be noted that the academic talk/listening code was used only when the "talk" dealt with substance of the academic material and not the structure of an assignment or activity. The code academic monitoring was used when the teacher was nonverbally monitoring student work during independent work (e.g., looking over a student's shoulder as s/he completed a problem or task). Whenever the teacher's behavior was intended to structure or organize a class activity, the observers used the task management code. The other code was used when the teacher's behavior could not be appropriately classified using any of the three behaviors just described. For example, if a teacher had to deal with a discipline issue, the observer would code the teacher's behavior as other.

Instructional Organization

Observers classified the instructional organization of each class by using four categories. These categories were: whole class, small group, independent, and other. Whenever the entire class was working as a group on the same activity, the observer used the whole class code. If the class was subdivided into small groups of two or more students who were working together to complete an academic task, then the small group code was used. During the times when the class was given an assignment and students were working individually to complete it, the observer used the code "independent." "Other" was used when the instructional organization of the classroom could not be classified according to any of the above three categories.

Task Format

Four categories of task format were also observed and recorded. The four categories included: lecture/discussion, paper/pencil, computer/media, and other. The lecture/discussion code was used when students were listening to a lecture or watching a demonstration. This code was also used for guided practice, such as when the teacher and students worked out sample problems together. Whenever students worked independently or in small groups solving problems from their textbooks or worksheets and there was little or no interaction between the

teacher and the students, observers used the paper/pencil code to describe the task format. Observers used the computer/media code if a computer or another type of media was used as an essential part of the lesson. For example, if the students used graphing calculators, then the computer/media code would be recorded; however, if the teacher used PowerPoint slides to accompany a lecture the lecture/discussion code was recorded. The other code was used whenever the activity could not be classified according to the three task format categories described earlier.

Sampling Procedure

The SOS-AAIMS used a momentary time sampling procedure with 15-second intervals to record data. The student, teacher, instructional organization, and task type were observed for the first five seconds and the relevant codes for each of these dimensions were recorded during the last ten seconds. Targeted students were observed for a series of one minute periods (four intervals). The one minute observations usually alternated between general and special education students. If there were no special education students in a class, low achieving students were observed in place of special education students. The two exceptions to this practice were the 8th grade Algebra class and the special education classes. Since all of the students taking 8th grade Algebra were advanced students (none of whom were receiving special education services), all of the data for these students were included in the analyses as 'general education.' Conversely, all of the data for the students in the special education classes were included in the analyses as 'special education.'

Observation Schedule

Observations spanned a four-week period with three observations occurring in each of the algebra classes. This was done to ensure that representative samples of classroom activities were reflected in the data. Most of the observations were conducted in April 2004. A Pocket PC version of Project AAIMS-SOS was used to record the data during each observation. The information was then downloaded onto a computer for data analyses.

Table 1 provides an overview of the observation schedule. The shaded boxes indicate observations when two people recorded SOS-AAIMS data to test inter-observer agreement. During these class periods, a second observer gathered parallel data to the primary observer using a paper version of the SOS-AAIMS. Our goal was to monitor inter-observer agreement in at least 20 percent of the observations to prevent observer drift. As one can see from this table, we surpassed this goal because six of the 24 SOS-AAIMS observations (25%) were conducted by two people. Point-by-point comparisons were made and the percentage of agreement was computed. The average agreement level across the 6 checks was 92.5%; individual agreement rates for each of the checks were 91, 99, 91, 98, 94, and 82%.

Table 1. Observation Schedule

Observation	SpEd Pre-Alg	SpEd Alg	8th Alg	Alg I	Alg I	Alg I	Alg IA	Alg IB
Obs 1	4/05/04	3/31/04	4/07/04	3/31/04	3/31/04	4/02/04	3/30/04	4/19/04
Obs 2	4/27/04	4/08/04	4/21/04	4/02/04	4/02/04	4/07/04	4/23/04	4/21/04

Obs 3	4/30/04	4/22/04	4/29/04	4/07/04	4/07/04	4/21/04	4/29/04	4/29/04

Results

Twenty-four algebra class periods (6 special education and 18 general education) were observed. The data for one of general education observations were lost due to technological difficulties. Thus, only 23 observations were analyzed for this report. Seventy-four percent of the observations were conducted in general education algebra classrooms. The remaining 26 percent of the observations were in the special education algebra/pre-algebra classrooms. All data for the two special education algebra classes were merged because of the small number of students (6) in these settings to protect the privacy of the participants.

Of the 3,391 observational intervals recorded, 1,431 intervals (42%) focused on general education students while 1,960 (58%) focused on special education or low achieving students. (Note: Low achieving students were observed when there were no special education students in a particular algebra class on the day an observation was conducted. This was the case for approximately 20 percent of the observations. The data for these low achieving students is included with the data for special education students in the tables that follow.) Table 2 shows the percentages of observation intervals by course type and student type. As one can see from this table, the percentages for the Algebra I and Algebra IA/1B classes were equal. (As we reported earlier, there were no special education students in the 8th grade Algebra class and no general education students in the special education algebra classes.)

Table 2. Percentage of General Education and Special Education Student Observation Intervals

Class Type	General Education	Special Education	Total
Algebra I	16%	16%	32%
Algebra IA/IB	15%	15%	29%
8th Grade Algebra	11%	0%	11%
Special Education Algebra/ Pre-algebra	0%	28%	28%
Total	42%	58%	100%

Student Behavior

Overall, students were engaged in active academic responses (45%) or other appropriate behavior (33%) for most of the observational intervals. There was some off task behavior (19%) and very little competing behavior displayed (2%) during this study. Table 3 provides a summary of student behavior, with the results disaggregated by general/special education students, general/special education classes, and course type.

When we combined the percentages for active academic responses with other appropriate behaviors to make a composite "on task" category we found that general education students, as a group, were on task for 78% of the observational intervals, while special education students were on task in 79% of the observations. As a whole, special education students displayed off task behavior slightly less often (18% as compared to 21%) and competing behavior slightly more often (3% as compared to 2%) than their general education peers.

When the data were analyzed by class type (i.e., general education algebra, special education algebra), substantial differences were found between the two class types. Students in special education algebra were on task 97% of the time, while students in general education algebra were on task 71% of the time. Students in general education algebra classes displayed more than eight times more off task behavior than students in the special education algebra classes.

Table 3. Summary of Student Behavior

Participants	Student Behavior			
	Active Academic Response	Other Appropriate Behavior	Off Task	Competing Behavior
All Students	45%	33%	19%	2%
All General Education Students	45%	33%	21%	2%
All Special Education Students	46%	33%	18%	3%
General Education Classes	42%	29%	26%	3%
Special Education Classes	53%	44%	3%	<1%
8th Grade Algebra	72%	27%	1%	0%
Algebra I	39%	26%	35%	1%
Algebra IA/IB	35%	34%	25%	6%
Special Education Algebra	53%	44%	3%	<1%

Across the four kinds of algebra courses, students in the 8th grade Algebra and special education classes were on task for at least 97% of the observational periods. In contrast, students in general education Algebra I and Algebra IA/IB were on task 65 or 69 percent of the time, respectively. Similarly, the percentages of off task and competing behavior in the 8th grade Algebra and special education classes were quite low (less than 4%), but off task and competing behaviors in the Algebra I and Algebra IA/IB classrooms occurred much more frequently (over 30%). One must consider the nature of the classes when interpreting these comparisons. The special education algebra classes were very small and the 8th grade algebra class was made up of a select group of fifteen advanced students which makes these classes easier for teachers to manage. The Algebra IA/IB classes had the most students with either 28 or 29 students and the Algebra I class size ranged from fourteen to twenty-five students. While the proportion of on task behavior was similar for the Algebra I and Algebra IA/IB classes (65% vs. 69%), notable differences existed in the proportion of off task, and competing behaviors. The Algebra I students who were observed were more likely to be off task (35% vs. 25%); however, they were much less likely to engage in competing behavior (1% vs. 6%).

Data gathered in the general education Algebra I and Algebra IA/IB classes provide the most direct comparisons between the behavior of students with, or without, disabilities; consequently, these data were examined in greater detail. (We did not include the 8th grade Algebra class because there were no students with disabilities in this class.) We conducted parallel analyses using cross tabulation of student classification (special education, general

education) with type of general education algebra course (Algebra I, Algebra IA/IB). Table 4 includes the data for these comparisons.

Table 4. Student Behavior by Course Type and Student Classification

Course and Student Classification	Student Behavior			
	Active Academic Response	Other Appropriate Behavior	Off Task	Competing Behavior
Algebra I				
Gen Ed Students	34%	28%	37%	1%
Special Ed Students	43%	24%	33%	1%
Algebra IA/IB				
Gen Ed Students	36%	43%	17%	3%
Special Ed Students	34%	24%	33%	9%

We found that special education and general education students in Algebra I displayed fairly similar behavior, while their Algebra IA/IB peers did not. The general education students who were observed in Algebra 1 displayed on task behavior during 62% of the observational intervals, while their special education peers were on task 67% of the time, even though they had the greatest number of intervals that were coded as active academic responses. When we looked at off task behavior, we found that the general education students in Algebra I were off task during 37% of the observational intervals, while their special education classmates were off task 33% of the time. When the data for the Algebra 1A/1B were examined, far more general education students showed on task behaviors (79%) than their special education classmates (58%), as well as all the students in the Algebra I class. The general education students in the Algebra IA/IB class also showed the least off task behavior of any of the other groups of students (17%). More competing behaviors were exhibited by students with disabilities in Algebra 1A/1B courses than in any other setting (9%).

Teacher Behavior

The second dimension of the SOS-AIMS was teacher behavior. An analysis of teacher behavior indicated that, as a group, the teachers spent the most time engaged in academic talk/listening (42%). Half of their time was split evenly between academic monitoring (25%) and task management (25%), while only a small portion of their time was spent displaying behavior that fell into the other category (8%). Data related to teacher behavior is presented in Table 5.

When the time spent actively teaching algebra content is examined, there are striking differences among the algebra course options. The 8th grade Algebra students experienced three times more class time devoted to academic talk and listening than the Algebra IA/IB students, twice as much time as the students in special education algebra classes, and more than one and one third times more than students in traditional Algebra I classes. While more than half of the

intervals in the Algebra I classes were coded academic talk or listening, this was not true for the Algebra IA/IB classes (24%) or the special education algebra classes (35%). One might assume that there would be a corresponding increase in the amount of academic monitoring observed in the classes with less teacher talk. The data showed that this appeared to be the case in the Algebra I and Algebra IA/IB classes, but not in the special education algebra classes because there was even less academic monitoring than academic talk or listening (15% as compared to 35%) in these classes. Three times as much time was spent on task management (e.g., giving directions or assigning homework) in the Algebra IA/IB classes and special education classes than in the Algebra I or 8th grade Algebra classes.

Table 5. Summary of Teacher Behavior

Participants	Teacher Behavior			
	Academic Talk/Listening	Academic Monitoring	Task Management	Other
All Teachers	42%	25%	25%	8%
All General Education Teachers	44%	29%	20%	7%
All Special Education Teachers	35%	15%	37%	13%
8th Grade Algebra	73%	18%	7%	2%
Algebra I	52%	28%	11%	9%
Algebra IA/IB	24%	35%	34%	6%
Special Education Algebra	35%	15%	37%	13%

Combining the academic talk/listening and academic monitoring categories to make a composite "instruction" category, one can see that special education teachers spent half of the observational periods engaged in instructional activities and half on task management or other activities. In contrast, the general education teachers spent almost three quarters (73%) of their time engaged in instructional activities and only 27 percent of their time on task management or other activities.

We further analyzed the data by examining the proportion of teacher behaviors in each of the different algebra course options. The 8th grade Algebra teacher spent a substantial majority of the observation intervals (91%) in instructional activities. The differences in the Algebra I and Algebra IA/IB percentages are particularly interesting to note because, as we noted earlier, all of these sections were taught by the same teacher. In the Algebra I classes, the teacher spent approximately 80 percent of the observational periods engaged in instructional activities while only 59 percent of the time in the Algebra IA/IB classes was devoted to instructional activities. Special education teachers spent half of their time involved in academic talk or listening or academic monitoring.

Instructional Organization

The third dimension of the SOS-AIMS focused on the instructional organization of the class periods that were observed. Table 6 shows the percentages for the four instructional organization categories. The data revealed that algebra teachers in both general and special education rely predominantly on whole class instruction and independent seatwork. Small

groups were only used during four intervals during an Algebra IA/IB class. In the general education classes we observed, roughly equal amounts of time were devoted to these two kinds of instructional organization; whereas, in the special education classes, only about one third of the observed class time was spent in whole class instruction and about three fifths of the time was spent doing independent work.

Table 6. Summary of Instructional Organization

Class Type or Course	Instructional Organization			
	Whole Class	Small Group	Independent Work	Other
All Classes	46%	0%	50%	4%
All General Education Classes	50%	<1%	46%	4%
All Special Education Classes	34%	0%	63%	4%
8th Grade Algebra	61%	0%	37%	2%
Algebra I	59%	0%	38%	3%
Algebra IA/IB	36%	<1%	57%	7%
Special Education Algebra	34%	0%	62%	4%

When the data were analyzed by course type, an interesting pattern emerged. The proportion of time that teachers spent on whole class instruction and on independent work were very similar for 8th grade Algebra and for Algebra I, but were essentially reversed for the slower-paced Algebra IA/IB classes and special education algebra classes, with a larger proportion of time spent on independent work and a substantially smaller proportion of time devoted to whole class instruction.

Task Format

Task format was the last dimension observed using the SOS-AAIMS. Observers were to mark the type of instructional activity that was most prevalent during each observation interval. The data on task format, presented in Table 7, revealed that lecture/discussion and paper/pencil were the most common task formats, accounting for 91% of the observational intervals. During our observations, teachers did not use computers or other media as learning tools in their algebra classes. In general education classes an equal amount of time was devoted to lecture/discussion and paper/pencil formats. A different pattern emerged in special education classes, where the format was more than twice as likely to be paper/pencil tasks as it was to be lectures or discussions. A slightly higher proportion of 'Other' codes were found in the data from the special education classes, which suggested that there was slightly more time during which a specific instructional task had not been assigned.

A more detailed analysis within the different types of general education courses revealed that the 8th grade Algebra and Algebra I students experienced very similar task formats during the observational periods as did the Algebra IA/IB and special education students. Almost twice as much time was spent in a lecture/discussion format in the 8th grade Algebra and Algebra I classes when compared to the Algebra IA/IB and special education algebra classes.   Considerably more

time was spent on pencil/paper tasks, as well as tasks labeled "other" in special education algebra classes and Algebra IA/IB than in 8th grade Algebra or Algebra I.

Table 7. Task Format

Class Type or Course	Task Format			
	Lecture/ Discussion	Paper/ Pencil	Computer/ Media	Other
All Classes	40%	51%	0%	9%
All General Education Classes	46%	46%	0%	8%
All Special Education Classes	24%	64%	0%	12%
8th Grade Algebra	58%	36%	0%	6%
Algebra I	56%	39%	0%	5%
Algebra IA/IB	30%	58%	0%	12%
Special Education Algebra	24%	64%	0%	12%

Exploring Interactions Among Observational Variables

Task Format and Instructional Organization

In addition to summarizing the data within each of the four observational categories, we were also interested in determining the interactions between the different variables. As one might surmise, the task format variable is very closely related to the instructional organization variable. When we examined the interactions between these two aspects of the SOS-AAIMS, we found the most common whole class activity was lecture/discussion and paper and pencil tasks were the most common form of independent work for both general education and special education algebra classes. As we noted earlier, there were only four instances of small group work in a single class (Algebra IA/IB) during all of the observation intervals; therefore it is not surprising to see that all of this time was spent doing a paper and paper task. Table 8 includes the percentages for different task formats during intervals with specific instructional organization labels by class type. (Although we have not included a table that includes data about the interaction between instructional organization and task format by course type, these patterns continued in the course by course comparison.)

Table 8. Instructional Organization and Task Format by Class Type

Class Type	Instructional Organization	Task Format		
		Lecture/Discussion	Paper-pencil	Other
Gen Ed Classes	Whole Class	91%	1%	8%
	Small Group	0%	100%	0%
	Independent Work	<1%	99%	1%
	Other	0%	2%	98%
Special Ed Classes	Whole Class	71%	17%	12%
	Small Group	0%	0%	0%
	Independent Work	0%	93%	7%
	Other	0%	0%	100%

Since task format and instructional organization were so closely related, we chose to use task format for future comparisons because it seemed to link most closely to student behavior.

Task Format and Teacher Behavior

The data for the cross tabulation of task format and teacher behavior is shown in Table 9. Teacher behavior was very similar in general education and special education algebra classes during lectures or discussions. As one might guess, teachers usually talked or listened during this task format. On the other hand, teacher behavior was very different during paper and pencil activities. Special education teachers spent more than twice as much time engaged in academic talk or listening during paper and pencil tasks than their general education peers did. They also used twice as much time doing "other" activities and considerably more time for task management (45% as compared to 26%). General education teachers were twice as likely to be monitoring students as they worked on paper and pencil tasks than the special education teachers.

Table 9. Task Format and Teacher Behavior by Class Type

Class Type	Task Format	Teacher Behavior			
		Academic Talk/Listen	Academic Monitoring	Task Management	Other
Gen Ed Classes	Lecture/Discussion	89%	1%	6%	4%
	Paper-Pencil	7%	59%	26%	7%
	Other	5%	16%	61%	18%
Special Ed Classes	Lecture/Discussion	91%	1%	8%	0%
	Paper-Pencil	17%	23%	45%	15%
	Other	16%	0%	51%	33%

Table 10 shows the percentages for the different teacher behaviors for each task format in each kind of course. The 8th grade Algebra class had the highest rate (97%) of academic talk or listening during lectures or discussion. Algebra I and Special Education algebra classes also had very high percentages of academic task or listening during lectures or discussions (both were 91%). Although the Algebra IA/IB classes had the lowest percentage of academic talk or listening (78%) during lectures and discussions, it was still the most prevalent teacher behavior by far. The Algebra IA/IB classes also exhibited the greatest percentage of task management teacher behaviors (13%) during lectures or discussions.

We were surprised to see that nearly half of the time students were engaged in paper and pencil tasks in the 8th grade Algebra class the teacher was talking to or listening to her students. Special education teachers spent seventeen percent of the time devoted to paper and pencil tasks engaged in academic talk or listening. The teacher in the Algebra I or Algebra IA/IB classes did very little talking or listening during paper and pencil tasks. Academic monitoring was the much more prevalent in these last two kinds of courses (68% and 56%, respectively). The 8th grade Algebra teacher also did a lot of academic monitoring while her students completed paper and pencil tasks (45%). In contrast, the special education teachers only spent 23% of this time monitoring student work. Instead, they spent almost half of the paper/pencil observation intervals engaged in task management activities such as giving directions or grading papers. The percentage of time spent on task management was also relatively high in the Algebra IA/IB classes (36%). The same teacher spent only 19% of his time on task management when students

were doing paper and pencil tasks when he was teaching the Algebra I classes. Any time the task format was labeled "other" the most common teacher behavior was task management.

Table 10. Task Format and Teacher Behavior in Different Courses

Course	Task Format	Teacher Behavior			
		Academic Talk/Listen	Academic Monitoring	Task Management	Other
8th Grade Algebra	Lecture/Discussion	97%	0%	1%	1%
	Paper-Pencil	47%	45%	7%	2%
	Other	0%	30%	61%	9%
Algebra I	Lecture/Discussion	91%	2%	4%	4%
	Paper-Pencil	3%	68%	19%	10%
	Other	4%	13%	30%	54%
Algebra IA/IB	Lecture/Discussion	78%	2%	13%	7%
	Paper-Pencil	1%	56%	36%	6%
	Other	7%	16%	75%	3%
Special Ed Algebra	Lecture/Discussion	91%	1%	8%	0%
	Paper-Pencil	17%	23%	45%	15%
	Other	16%	0%	51%	33%

Task Format and Student Behavior

The next set of interactions we examined compared student behavior during different task formats. Our assumption was that paper and pencil tasks would produce the highest rates of active academic responses. We also hypothesized that lecture/discussion would be associated with high rates of on task behavior, but that students would be more likely to be passive participants and display more other appropriate behavior rather than to be active participants and exhibit fewer active academic responses when this format was used. Table 11 provides a summary of the student behavior data within task formats.

Our hypothesis was true for paper and pencil tasks except for one comparison that involved the special education classes when we looked at all the combinations of student behavior and task format excluding the "other" category. ("Other" was excluded because these intervals included times when there was no assigned task or an assigned task that could not be classified using the categories prescribed by the SOS-AAIMS observation protocol.) In every course there were always more active academic responses than other appropriate behaviors during this type of task format. In all but the special education classes the percentage of active academic responses was more than double the percentage of other appropriate behaviors, and in the case of the 8th grade algebra class the percentage of active academic responses was more than four times the percentage of other appropriate behaviors. The percentages for active academic responses during paper and pencil tasks were also higher than the percentages for off task and competing behaviors. The exception to our hypothesis occurred when we compared the percentage of active academic responses during paper and pencil activities and lectures and discussions in the

special education classes. In this comparison there were slightly more active academic responses during lectures and discussions than with paper and pencil tasks (59% and 57%, respectively).

Table 11. Task Format and Student Behavior in Different Courses

Course	Task Format	Student Behavior			
		Active Academic Response	Other Appropriate Behavior	Off – Task	Competing Behavior
8th Grade Algebra	Lecture/ Discussion	69%	31%	1%	0%
	Paper/ Pencil	82%	17%	1%	0%
	Other	48%	52%	0%	0%
Algebra I	Lecture/ Discussion	35%	31%	33%	1%
	Paper/ Pencil	46%	14%	40%	1%
	Other	27%	0%	54%	20%
Algebra IA/IB	Lecture/ Discussion	28%	43%	21%	8%
	Paper/ Pencil	46%	20%	28%	7%
	Other	3%	77%	21%	0%
Special Ed Algebra	Lecture/ Discussion	59%	39%	<1%	1%
	Paper/ Pencil	57%	39%	4%	0%
	Other	21%	79%	1%	0%

On the other hand, our hypothesis related to lectures and discussions only held for the Algebra IA/IB classes. For these classes the percentage of active academic responses was 28% and the percentage for other appropriate behaviors was 43% under these conditions. For each of the other courses there were more active academic responses than other appropriate behaviors. This was especially true for the 8th grade Algebra class where the percentage for active academic responses was 69% and the percentage for other appropriate behaviors was 31%. In the special education algebra courses the percentages were 59% and 39%, respectively. Although the percentages were closer in the Algebra I classes (35% and 31%), there were still more active academic responses during lectures and discussion than we had predicted.

Comparisons between the courses showed that students in the 8th grade Algebra class displayed the most active responses during lectures and discussions (69%), as well as paper and pencil activities (82%). Students in the special education classes exhibited the next most active responses in both of these conditions with 59% during lectures and discussions and 57 % during paper and pencil tasks. The students in the Algebra I classes exhibited more active academic responses than students in the Algebra IA/IB classes during lectures and discussions (35% as compared to 28%); however the percentages were the same for paper and pencil activities (46%).

When we looked at on task behavior with the different task formats, we found that the 8th grade Algebra students and the students in the special education algebra courses had the highest percentages of on task behavior with both task formats. Even though the Algebra I students had more active academic responses during lectures and discussions, they had a lower on task percentage than their Algebra IA/IB peers (66% as compared to 71%). The Algebra IA/IB students also had more on task behavior when the task format was coded "paper and pencil" (66% as compared to 60%). Off task behavior was much more prevalent in the Algebra I and Algebra IA/IB classes than in the 8th grade or special education algebra classes for both lecture and discussions or paper and pencil tasks. Algebra IA/IB students had the most competing behavior during both of these task formats. However, during observation intervals when the task format was labeled "other," the Algebra I students displayed the most competing behavior of all (20%).

Table 12 shows the data for the cross tabulation of student behavior and task format by type of student in the general education algebra courses. We found some interesting results when we considered our earlier hypothesis (paper and pencil activities would lead to the highest percentages of active academic responses) and compared each combination of student behavior and task format (excluding any "other" percentages) for the general education and special education students in Algebra I and Algebra IA/IB. Whereas paper and pencil activities appeared to correspond with the most active academic responses in most courses (see Table 11), when we focused on the behavior of specific student groups (special education and general education students in Algebra I and Algebra IA/IB), paper and pencil activities were associated with the highest percentages of active academic responses for the special education students in both Algebra I and Algebra IA/IB, but not for the general education students. The combination with the greatest percentage for general education students in Algebra IA/IB was other appropriate behavior during lectures and discussions. For general education students in Algebra I the combination with the greatest percentage was "off task" during paper and pencil tasks.

When student behavior during lectures and discussions was analyzed, we found that our hypothesis about other appropriate behavior being more typical than active academic responses during this task format held for the students in Algebra IA/IB, but not Algebra I. General education students in Algebra IA/IB were the most likely to display other appropriate behavior during lectures or discussions, while special education students in Algebra I exhibited the least other appropriate behavior during this task format. General education students in Algebra IA/IB showed other appropriate behavior twice as often as they showed active academic responses. The percentages for special education students in Algebra IA/IB were actually very similar with 33% of the observation intervals coded "other appropriate behavior" and 31% of the intervals coded "active academic response." The percentages for general education students in Algebra I were even more similar with 34% of the intervals labeled "other appropriate behavior" and 35% labeled "active academic response. For the special education students in Algebra I, there was a difference of six percentage points between these two categories, with other appropriate behavior displayed during 28% of the observational intervals, and active academic responses shown during 34% of the intervals.

We were surprised to discover that the intervals with the most active academic responses were also the intervals with the most off task behavior (when the task format labeled "other" is excluded) for the Algebra IA/IB class. During intervals coded "paper and pencil" the general

education students in the Algebra IA/IB class displayed off task behavior during 22% of this time, and the special education students in Algebra IA/IB were off task during 35% of this time. For the Algebra I class, the intervals with the second highest rate of active academic responses were the intervals with the highest rate of off task behaviors. General education students in Algebra I were off task the most during paper and pencil intervals, while special education students exhibited the most off task behavior during lectures and discussions.

Table 12. Student Behaviors Associated with Task Format by Course and Student Classification

Course and Student Classification	Task Format	Student Behavior			
		Active Academic Response	Other Appropriate Behavior	Off–Task	Competing Behavior
Algebra I					
Gen Ed Students	Lecture/ Discussion	35%	34%	30%	1%
	Paper/ Pencil	33%	14%	52%	2%
	Other	24%	55%	21%	0%
Special Ed Students	Lecture/ Discussion	34%	28%	37%	1%
	Paper/ Pencil	58%	14%	27%	1%
	Other	30%	52%	17%	0%
Algebra IA/IB					
Gen Ed Students	Lecture/ Discussion	26%	53%	14%	7%
	Paper/ Pencil	50%	26%	22%	2%
	Other	0%	95%	5%	0%
Special Ed Students	Lecture/ Discussion	31%	33%	29%	8%
	Paper/ Pencil	41%	13%	35%	11%
	Other	5%	56%	39%	0%

The students in Algebra IA/IB displayed the most competing behavior. General education and special education students in Algebra IA/IB classes had similar rates of competing behavior during lectures and discussions (7% and 8%, respectively); however, the special education students in these classes exhibited much more competing behavior during paper and pencil tasks (11% compared to 2%).

With the exception of the special education students in the Algebra I classes, all of the groups had more on task behavior during lectures and discussions than during paper and pencil activities. General education students in Algebra IA/IB had the most on task behavior during lectures and discussions and paper and pencil tasks. Their general education peers in Algebra I showed the greatest variation in on task behavior between these two task formats. During lectures and discussion, these students were on task for 69% of the intervals, while they were on task for only 47% of the paper and pencil intervals. For special education students in both of these two classes, the on task percentage during these two task formats varied by ten points. For

the special education students in Algebra I, paper and pencil activities were associated with on task behavior for 72% of these intervals, while the on task percentage for lectures and discussions was 62%. For the special education student in Algebra IA/IB, more on task behavior was shown during lectures and discussions (64%) than during paper and pencil activities (54%).

The converse was also true with students in each group demonstrating more off task behavior during paper and pencil activities, except for the special education Algebra I students. General education Algebra I students displayed the most off task behavior of all during paper and pencil activities with more than half of these intervals labeled "off task." More than a third of the intervals were coded "off task" for special education students in Algebra I when the task format was lecture and discussion and when special education students in Algebra IA/IB were engaged in paper and pencil tasks. General education students in both classes displayed competing behaviors during 2% of the paper and pencil observational intervals. The percentages jump up considerably for general education students in Algebra IA/IB during lectures and discussions (7%). Special education students exhibited the highest percentages of competing behavior with 8% for lectures and discussions and 11% for paper and pencil activities.

Student Behavior and Teacher Behavior

Researchers have repeatedly asserted that teachers who maximize students' time on task and spend more time actively involved in teaching produce students who have higher achievement gains (Brophy & Good, 1986; Wallace, Anderson, Bartholomay, & Hupp, 2002). We were interested in determining which teacher behaviors tended to be closely associated with active academic responses by students in our observations. Table 13 shows the results from a cross tabulation analysis of teacher and student behaviors for each of the courses we observed.

The 8th grade Algebra class and the special education algebra classes exhibited the most active academic responses when teachers were talking or listening (75% and 73%, respectively). The Algebra I and Algebra IA/IB classes displayed active academic responses much less often (35% and 33%, respectively) under these circumstances. Nevertheless, in all but the Algebra IA/IB classes, active academic responses were the most typical behavior during intervals when the teacher spoke about the math topic for that day or listened to a student response.

For most courses more students were engaged in active academic responses (e.g., working on assignments) when teachers were engaged in academic monitoring than when the teachers were talking or listening. The most dramatic increase in active academic responses was found in the Algebra IA/IB classes where the percentage jumped twenty percentage points from 33% to 53%. The only exceptions were the special education algebra courses where the percentage decreased by 17% (from 73% to 56%).

The percentages for active academic responses stayed the same for the students in the Algebra I classes when we compared the intervals where teachers were engaged in academic monitoring with the intervals where the teacher behavior was labeled "task management." In each of the other courses the percentage of active academic responses dropped. The most significant drop was in the 8th grade Algebra class (a decrease of 54%). Even with this drop, the students in the 8th grade Algebra class were more likely to exhibit active academic responses during the observation intervals when their teacher was engaged in task management than the students in the Algebra IA/IB classes (31% as compared to 20%).

When we combined the percentages for active academic responses and other appropriate behavior to calculate "on task" percentages, we found that Algebra I students exhibited the least on task behavior (66%) during the intervals when their teacher was engaged in academic talk or listening. Algebra IA/IB students were on task during 77% of these observational intervals. The students in the special education algebra classes and the eighth grade Algebra class were on task during all or nearly all the academic talk or listening intervals.

Table 13. Student Behaviors Associated with Teacher Behaviors in Different Courses

Course	Teacher Behavior	Student Behavior			
		Active Academic Response	Other Appropriate Behavior	Off Task	Competing Behavior
8th Grade Algebra	Academic Talk/Listening	75%	25%	<1%	0%
	Academic Monitoring	85%	13%	2%	0%
	Task Management	31%	69%	0%	0%
	Other	100%	0%	0%	0%
Algebra I	Academic Talk/Listening	35%	31%	33%	1%
	Academic Monitoring	47%	15%	37%	1%
	Task Management	47%	20%	32%	1%
	Other	20%	32%	47%	1%
Algebra IA/IB	Academic Talk/Listening	33%	44%	17%	7%
	Academic Monitoring	53%	17%	26%	5%
	Task Management	20%	45%	30%	5%
	Other	28%	28%	28%	16%
Special Ed Algebra	Academic Talk/Listening	73%	24%	2%	1%
	Academic Monitoring	56%	43%	1%	0%
	Task Management	42%	57%	1%	0%
	Other	30%	61%	9%	0%

The on task percentages for the different algebra courses followed a similar pattern during the intervals when teachers displayed academic monitoring behavior. The students in the special education and 8th grade Algebra classes were nearly always on task while the Algebra I students had the least on task behavior (62%) and the Algebra IA/IB students were somewhere in the middle at 70%.

When teachers were performing task management activities, there was a small change from the earlier results. Instead of students in the Algebra I classes having the lowest percentage of on task behavior, the students in the Algebra IA/IB classes exhibited the least on task behavior. Even so, nearly two thirds of these students were on task when teacher behavior was coded "task management."

There was very little off task or competing behavior in the 8th grade Algebra course regardless of the teacher behavior. Only when teacher behavior was categorized as "other" did the students in the special education algebra courses display an increase in off task behavior (9% as compared to 1 or 2%). This is not surprising since disciplinary comments made by teachers were classified as "other." The most off task behavior was observed in the Algebra I classes with 32% or more of the student behavior coded as "off task" for each category of teacher behavior. When teacher behavior was labeled "other" for this course, the students being observed were off task during 47% of these intervals. Students who were observed in the Algebra IA/IB courses displayed the most off task behavior when the teacher was engaged in task management activities (30%) and the least off task behavior when the teacher was talking or listening (17%). The students who were observed in the Algebra IA/IB classes had the most competing behavior across all of the teacher behavior categories.

We wanted to see if there were any differences between the behaviors displayed by students with disabilities and their general education peers in the general education algebra classes. The data for these comparisons are shown in Table 14.

We first examined students' behavior when teacher behavior was labeled academic talk/listening. The percentages for active academic responses were very similar across all the student groups with at least 30% of these intervals with this code. The general education students in the Algebra I classes and the special education students in the Algebra IA/IB classes both had 36% under these conditions. The special education students in Algebra I were very close to this percentage with 35% of the academic talk/listening intervals coded "active academic response."

When active academic responses and other appropriate behavior was combined to make an "on task" category, general education students in the Algebra IA/IB classes showed the most on task behavior (83%) and special education students in the Algebra I class showed the least on task behavior (62%) during academic talk/listening. The special education students in Algebra IA/IB and the general education students in Algebra I exhibited the same amount of on task behavior when their teacher was talking or listening (71%).

Algebra I students were more likely to exhibit off task behavior than their Algebra IA/IB peers during academic talk/listening intervals. Special education Algebra I students displayed the most off task behavior (37%), general education students in Algebra I were next at 28%,

followed by special education students in Algebra IA/IB at 23%. Algebra IA/IB general education students had the lowest rate of off task behavior; however, they tied with their special education classmates for the most competing behavior during academic talk/listening intervals (7%). Algebra I students had very little competing behavior (1%) when teachers were talking about the math topic for the day.

Table 14. Student Behavior by Teacher Behavior, Course, and Student Classification

Course and Student Classification	Teacher Behavior	Student Behavior			
		Active Academic Response	Other Appropriate Behavior	Off Task	Competing Behavior
Algebra I					
Gen Ed Students	Academic Talk/Listening	36%	35%	28%	1%
	Academic Monitoring	40%	11%	46%	3%
	Task Management	27%	27%	45%	0%
	Other	12%	34%	54%	0%
Special Ed Students	Academic Talk/Listening	35%	27%	37%	1%
	Academic Monitoring	53%	20%	28%	0%
	Task Management	68%	12%	19%	2%
	Other	30%	30%	39%	2%
Algebra IA/IB					
Gen Ed Students	Academic Talk/Listening	30%	53%	11%	7%
	Academic Monitoring	55%	21%	23%	1%
	Task Management	21%	61%	15%	3%
	Other	39%	33%	21%	6%
Special Ed Students	Academic Talk/Listening	36%	35%	23%	7%
	Academic Monitoring	51%	13%	29%	8%
	Task Management	19%	29%	45%	8%
	Other	14%	21%	36%	29%

During academic monitoring intervals general education students in the Algebra IA/IB classes had the highest percentage of active academic responses (55%). In this case, special education students in the Algebra I classes were next most likely to display active academic responses (53%), followed by special education students in Algebra IA/IB classes (51%). The general education students in Algebra I classes only displayed active academic responses during 40% of the academic monitoring intervals.

When we looked at the combined on task percentages, the general education students in Algebra IA/IB were on task 76% of the time during academic monitoring, while special education students in Algebra I classes were on task for 73% of these intervals. Special education students in Algebra IA/IB classes were on task 64% of this time, and general education students in Algebra I were on task 51% of the time their teacher was engaged in academic monitoring.

General education students in the Algebra 1A/IB classes were much less likely to engage in off task or competing behaviors than any other group (24%) during academic monitoring. General education students in Algebra I classes exhibited about twice as much off task or competing behavior (49%) during these intervals. Special education students enrolled in the Algebra IA/IB classes displayed off task or competing behavior during 37% of the academic monitoring intervals, while the special education students in Algebra I displayed these behaviors during 28% of these intervals.

Task management was the third category of teacher behavior we examined. Special education in Algebra I classes were more than twice as likely as their Algebra I peers or the Algebra IA/IB students to display active academic responses when teachers were managing instructional tasks. The special education students in Algebra I displayed active academic responses during 68% of these intervals while their peers in the Algebra IA/IB classes exhibited this type of behavior during 19% of these intervals. The general education students in Algebra I were engaged in active academic responses during 27% of the task management intervals and their Algebra IA/IB peers displayed this behavior in 21% of these intervals.

Nevertheless, general education students in Algebra IA/IB classes were the most likely to display on task behavior during intervals labeled task management (82%). The on task percentages for the other groups when teachers were engaged in task management were 48% for special education students in Algebra IA/IB, 54% for the general education students in Algebra I, and 80% for special education student in Algebra I. When we examined the corresponding percentages for off task and competing behaviors during task management intervals, we found that the special education students in Algebra IA/IB were more likely to engage in off task or competing behaviors than their general education peers in these classes (53% compared to 18%). These students displayed more than twice as much competing behavior (8%) as any of the other groups of students. In Algebra I classes, general education students were twice as likely to exhibit off task behavior (45%) than their special education peers (21%).

The last category of teacher behavior we examined was the "other" category. General education students in the Algebra IA/IB classes were most able to stay on task during times when teacher behavior was labeled "other (72%). This was twice as much as the rate for special education students in the same classes (35%). In the Algebra I classes special education students were more likely to stay on task during this condition than their general education peers (60% as compared to 46%). Special education students in Algebra IA/IB displayed significantly more competing behavior (29%) during "other" observation intervals than the general education students in the same classes (6%) or their special education peers in Algebra I (2%). General education students in the Algebra I classes did not display competing behavior during observation intervals when teacher behavior was labeled "other."

Overall, special education students in Algebra I classes had more active academic responses than their general education classmates for all teacher behaviors except when teachers were engaged in behaviors labeled "academic talk/listening." (This trend also held when other appropriate behavior percentages were added to active academic response percentages to get a percentage for on task behavior.) The data for special education students in Algebra IA/IB indicated an almost opposite pattern. These students displayed a smaller percentage of active academic responses than their general education classmates with every type of teacher behavior except academic talk/listening. (When the on task percentages were calculated, special education students in Algebra IA/IB were on task less than their general education peers for every category of teacher behavior also.)

SUMMARY

Table 15 includes the top two most typical categories for each of the four dimensions of the SOS-AAIMS for District A. In this district, the most typical student behavior was active academic response in every beginning algebra course. The most common teacher behavior in the 8th grade algebra and Algebra I classes was academic talk and listening. In the special education classes it was task management, and in the Algebra IA/IB class it was academic monitoring. The 8th grade Algebra and Algebra I classes also had the same most common instructional organization and task format. These were whole class and lecture/discussion, respectively. The special education and Algebra IA/IB classes shared independent work and paper and pencil tasks as their most typical instructional organization and task format. Another interesting similarity between the Algebra IA/IB classes and special education algebra classes was that task format was coded "other" for 12% of the intervals in both of these courses. (See Table 7.) The following paragraphs provide more details about the typical behaviors in each of the courses we observed. The data summarized in this section regarding student behavior during intervals with specific task formats and teacher behaviors are presented in Appendix B.

Table 15. Most Typical Variables

Course	Student Behavior		Teacher Behavior		Instructional Organization		Task Format	
	Most Typical	Second Most Typical	Most Typical	Second Most Typical	Most Typical	Second Most Typical	Most Typical	Second Most Typical
8th Grade	AAR 72%	OAB 27%	ATL 73%	AM 18%	WC 61%	IW 37%	L/D 58%	P/P 36%
Special Education	AAR 53%	OAB 44%	TM 37%	ATL 35%	IW 62%	WC 34%	P/P 64%	L/D 24%
Algebra I	AAR 39%	Off T 35%	ATL 52%	AM 28%	WC 59%	IW 38%	L/D 56%	P/P 39%
Algebra IA/IB	AAR 35%	OAB 34%	AM 35%	TM 34%	IW 57%	WC 36%	P/P 58%	L/D 30%

AAR = Active Academic Response   OAB = Other Appropriate Behavior Off T = Off Task
ATL = Academic Talk/Listening AM = Academic Monitoring TM = Task Management

WC = Whole Class IW = Independent Work
L/D = Lecture or Discussion P/P = Paper and Pencil Task

8th Grade Algebra

In the 8th grade Algebra class, the most common student behavior was active academic response (72%). The teacher was engaged in academic talk or listening much more often than any other teacher behavior (73%). The eighth graders observed for this study were most likely to experience whole class instruction that was a lecture or discussion. When we examined student behavior in task format and teacher behavior we found that during lectures and discussion, which was the task format for 221 intervals, students exhibited active academic responses most often when teachers were engaged in academic talk and listening. (This was the strongest combination in all of the classes.) This was followed by other appropriate behavior while teachers were talking or listening. During paper and pencil tasks (135 intervals) the students most often displayed active academic responses while the teacher was talking or listening. The strength of this interaction among these variables was unique to the 8th grade Algebra class. The next most common combination was active academic responses during academic monitoring.

Special Education Algebra

In the special education algebra classes the most common student behavior was also active academic response (53%). The most typical teacher behavior was task management (37%), but this was closely followed by academic talk or listening (35%). Special education algebra teachers had the highest percentage of teacher behavior that was classified as "other" (13%). Students in special education algebra classes experienced much more time for independent work which mostly consisted of paper and pencil tasks. When the observed variables were nested, we found that during the 226 intervals that were coded "lecture/discussion" special education students were most likely to display active academic responses while teachers talked or listened. On the other hand, there was much more variability between student behavior and teacher behavior during the 597 intervals when students were doing paper and pencil tasks. The most typical combination was task management for teacher behavior and active academic response for student behavior, but this was true only 24% of the time. (This was the lowest percentage for the most prevalent combination across all the courses.) Task management with other appropriate behavior was the next most common combination followed by academic talk and listening with active academic responses.

Algebra I

Students in Algebra I classes exhibited active academic responses more than any other student behavior, but this occurred only in 39% of all the intervals. The next most common student behavior was off task behavior at 35%. Academic talk/listening was the most common teacher behavior because these classes spent a majority of their time in whole class activities that were mostly lectures or discussions. During the 601 intervals that were labeled lecture/discussion the most common combination of variables always included academic talk/listening on the part of the teacher. For 32% of the intervals, academic talk/listening was paired with active academic response by students, in 30% of the intervals, it was paired with off task behavior by students, and in 28% of the intervals, it was paired with other appropriate behavior. Academic monitoring was the common

teacher behavior during paper and pencil tasks (415 intervals). This teacher behavior was paired with students engaged in active academic responses for 32% of the intervals, off task behavior for 26% of the intervals, and other appropriate behavior for only 10% of the intervals.

Algebra IA/IB

Although active academic response was the most typical student behavior in the Algebra IA/IB classes (35%), other appropriate behavior was a very close second at 34%. These classes were unique in that academic monitoring was the most common teacher behavior (35%). Task management was the second most common teacher behavior at 34%. As we noted earlier, paper and pencil tasks during independent work time were the most typical task format and instructional organizational pattern. For 293 of the observation intervals in Algebra IA/IB classes, class time was devoted to lectures or discussions. During this time the most common combination of teacher and student behavior was academic talk/listening with other appropriate behavior (32%). This was followed by academic talk/listening with active academic responses (26%). The most competing behavior in any of the courses was displayed by students in Algebra IA/IB classes during lecture/discussion when teachers were engaged in academic talk or listening. During the 579 intervals where Algebra IA/IB students were engaged in paper and pencil tasks, the most common combination was academic monitoring and active academic response (32%). This was the same percentage as the Algebra I course.

Special Education and General Education Students in Algebra I and Algebra IA/IB Classes

When we compared the behavior of general education and special education students in general education courses, we found that even when the most common teacher behaviors stayed the same, there were major differences in student behavior in the Algebra I and Algebra IA/IB classes. During lectures and discussions, the most typical teacher behavior was academic talk/listening. However, the most typical student behaviors were different for general education and special students. The most common student behavior was active academic responses for general education students in the Algebra I classes and Algebra IA/IB classes (32% and 28%, respectively), off task for special education students in Algebra I (34%), and other appropriate behavior for general education students in Algebra IA/IB (40%). (We should note that behavior for general education students in the Algebra class had the closest percentages with off task at 26%, other appropriate at 31%, and active academic response at 32%.)

The most common teacher behavior during paper and pencil tasks was academic monitoring for Algebra I classes. For Algebra IA/IB classes the most common teacher behaviors were academic monitoring or task management during paper and pencil tasks. During 33 percent of the paper/pencil intervals when general education students in Algebra 1 classes were observed while their teacher was engaged in academic monitoring, their behavior was coded "off task." Special education students in both courses were most likely to display active academic responses during pencil and paper tasks, as were the general education students in the Algebra IA/IB classes. The special education students in the Algebra I class had the highest percentage of active academic responses at 37% during paper and pencil activities, while the percentage for general

education students in Algebra IA/IB was 34%, the percentage for special education students in Algebra IA/IB was 30%, and the percentage for general education students in Algebra I was 26%.

Competing behavior was most prevalent for general education and special education students in Algebra IA/1B during lectures or discussion and during paper and pencil tasks for special education students in Algebra IA/IB. Both the general education and special education students in the Algebra I class displayed very little competing behavior during lectures and discussions, and general education students in this class exhibited a bit more competing behavior during paper and pencil activities.

Lingering Questions

As we pointed out at the beginning of this report, one of the objectives of Project AAIMS is to determine the extent to which algebra instruction, curriculum, and assessment for students with disabilities is aligned with that of their non-disabled peers. By using a systematic, momentary time sampling observation system (SOS-AAIMS), we have found that students in different algebra courses receive different kinds of algebra instruction. This was true even when different courses were taught by the same teacher. We are still exploring the reasons for these differences. Technical Report #3 will present the results of the anecdotal observations that were conducted concurrently with the SOS-AAIMS observations. Some of the questions we will continue to consider as we analyze the additional observation data for Technical Report #3 and other sources of information for the District A case study are:

How much did class size, as well as enrollment policies affect student behavior in algebra classes?

Why were instructional patterns so similar for Special Education algebra classes and Algebra IA/IB classes?

Why was there so much competing behavior in Algebra IA/IB classes

Why did general education students in Algebra IA/IB classes display so much more on task behavior than their special education peers in the same class and their general education peers in Algebra I?

Was there any relationship between instructional organization, task format, teacher behavior, and student behavior variables and student achievement?

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APPENDIX A

Project AAIMS
Student Observation System

Description, Materials, Procedures, and Training Exercises

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Project AAIMS
Student Observation System Manual

Description, Materials, Procedures, and Training Exercises

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Project AAIMS
Student Observation System

Description

The Project AAIMS Student Observation System (SOS-AAIMS) was developed for the purpose of observing student and teacher behavior in algebra classrooms. It was designed by modifying the Project Inclusion Student Observation System (Foegen, A., Marston, D., Robinson, S. R., Deno, S. L., 1993) to reflect the elements of special education and general education algebra classrooms. The SOS-AAIMS can be used to record the behaviors of students with and without disabilities and general and special education teachers. Observers using the SOS-AAIMS also record information about instructional organization and task format.

The SOS-AAIMS uses a momentary time sampling procedure with 15 second intervals to record data. Observation sessions of 15 to 20 minutes are recommended. A group of targeted students (both general education and special education/low achieving) is observed, with each student being observed for a 1 minute interval and observations alternating between general and special education students. Using this pattern, the following target teachers/students might be observed:

15 second Interval	Target Student	Target Teacher
1	Spec. Ed. #1	Classroom tchr.
2	Spec. Ed. #1	Classroom tchr.
3	Spec. Ed. #1	Classroom tchr.
4	Spec. Ed. #1	Classroom tchr.
5	General Ed. #1	Classroom tchr.
6	General Ed. #1	Classroom tchr.
7	General Ed. #1	Classroom tchr.
8	General Ed. #1	Classroom tchr.
9	Spec. Ed. #2	Classroom tchr.
10	Spec. Ed. #2	Classroom tchr.
11	Spec. Ed. #2	Classroom tchr.
12	Spec. Ed. #2	Classroom tchr.
13	General Ed. #2	Classroom tchr.
14	General Ed. #2	Classroom tchr.
15	General Ed. #2	Classroom tchr.
16	General Ed. #2	Classroom tchr.

The following pages contain copies of the SOS-AAIMS recording forms and descriptions of the behaviors to be recorded. Observers should read the behavior descriptions carefully and memorize the definition and code letters for each category.

Student Observation System-Revised
Project AAIMS

Date of Observation_____   Time of Observation_____

Observer_____   Teacher/Classroom:_____

Student Behavior				Teacher Behavior				Instructional Organization				Task Type			
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
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ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
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ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH

Student Behavior				Teacher Behavior				Instructional Organization				Task Type			
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ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
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ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
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ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH
ActAc	ComBeh	OthAp	OffTsk	Aca T/L	AcaMon	TasMan	OTH	WhGrp	SmGrp	Indpt	OTH	LecDis	PapPen	CompMed	OTH

Category Definitions

Student Behavior

ActAc   **Active Academic Response:**   The student is engaging in an active response to an academic task. Examples: verbally answers a teacher's question, writes to complete an assignment or takes notes, reads aloud, presses keys on a calculator, uses manipulative materials.

CompBeh   **Competing Behavior:**   The student is engaging in an active response that is disruptive or intrusive to class activities. Behaviors such as out of seat/inappropriate place without permission; physical aggression toward other individuals, or objects, including vandalism of school property or materials; and noise are included. Examples: yells across the room to a friend, leaves desk without teacher's permission, hits another student. Key element: disrupts class activities or other students.

OthAp   **Other Appropriate:**   The student is not engaging in an active academic response or a competing behavior, but the behavior s/he is displaying is appropriate to the situation. Examples: raises hand while waiting for the teacher, listens to teacher's lecture/presentation, watches as another student demonstrates, looks at monitor displaying academic material.

OffTsk   **Off Task:**   The student is not engaging in any of the three above behaviors, therefore, s/he is not demonstrating an appropriate academic behavior, nor a competing behavior. Examples: stares off into space as teacher presents new information, draws or doodles on notebook during seatwork time, head down on desk.

> **NOTE**: If it is unclear whether OthAp or OffTsk, use student eye contact to judge. Example: eyes on teacher, board, or book (when appropriate), label OthAp. If eyes are elsewhere, label OffTsk.

Always code the highest possible behavior in the hierarchy. Off task will only be coded when none of the other categories can be used to describe the student's behavior.

Teacher Behavior

Aca T/L   **Academic Talk/Listening**   The teacher is talking about or presenting academic material with the entire class, a small group, or an individual student or the teacher is listening to a student's answer or question. Examples: presenting new material, asking students a question, answering student questions, providing feedback to students about the correctness of their answers, summarizing important points, writing on board or overhead. Aca T/L comments deal with the substance of the academic material (should be related to algebra concepts), rather than the structure (for example, "Do the first 20 questions" would be coded TasMan)

AcaMon   **Academic Monitoring:**   The teacher is <u>nonverbally</u> monitoring student work. Examples: Looking over a student's shoulder as s/he completes a problem or task, watches the student work a problem on the board, listens to the student read orally.

TasMan   **Task Management:**   The teacher's behavior relates to structuring or organizing the class activity so that `academic responses can occur. Examples: asks if everyone has their homework out, tells student to move chair to group location, turn to a specific page in the book, return to your seats. Does **NOT** include disciplinary comments on classroom behavior.

OTH   **Other:**   The teacher's behavior cannot be appropriately classified using any of the three behaviors above. Examples: wait time, discipline issues, reading daily announcements, speaking to principal or other visitors.

Instructional Organization

WhGrp   **Whole Class:**   The entire class is working as a group on the same activity. Examples: listening to lecture, discussion of content material, watching students put math problems on the board, completing example problems as part of the lesson.

SmGrp   **Small Group:**   The class has been divided into small groups of two or more students, working together to complete an academic task. Examples: students are working with a partner on Algebra assignment, cooperative groups are working on an Algebra problem or assignment.

Indpt   **Independent:**   The class has been given an assignment, and students are working individually to complete it. Examples: seat work, review prior to a test, taking a test.

OTH   **Other:**   The instructional organization of the classroom cannot be classified according to the above categories. If the teacher has not begun the class period or session, code the Instructional Organization as OTH.

Task Format

LecDis   **Lecture/Discussion:**   The current class activity requires that students listen to lecture or watch a demonstration. The class activity may also include discussion or verbal question/answer patterns between teacher(s) and students. Guided practice, as when the teacher and students are working out examples together, would also be included.

PapPen   **Paper/Pencil:**   The current class activity involves the use of books, workbooks, or worksheets. This should only be coded in the absence of lecture/discussion, as when students are working independently and little or no teacher/student interaction is taking place.

CompMed   **Computer/Media:**   The current class activity involves the use of the computer or some type of media (e.g., video, filmstrip).

OTH   **Other:**   The current classroom activity cannot be classified according to the categories described above. If the teacher has not begun the class and students have no activity that they are to be involved in, code the Task Format as OTH.

Directions for Marking the SOS-AAIMS Recording Form

Using the process described in the Procedures section, the observer will note the behavior of the student and the teacher, as well as the instructional organization and task format. To mark the SOS recording form, the observer should make a slash (/) through the appropriate code in each category. The categories have been designed to be mutually exclusive, so only one code should be appropriate within each of the four categories. Unless the observer missed an interval for some reason, every line of the SOS should have four slashes, one per category.

Procedures for Observing

Prior to the Observation Period

Make arrangements with the classroom teacher to do the observation. You may call or email the site coordinator at the school prior to the observation and ask them to let the involved teacher(s) know you will be observing and when. Ask that s/he introduce you (the first time you're in the class observing) as a person who wants to learn about how their class works.

You will also need to have the teacher identify the target special and general education students for you. This should be done so that the students are **NOT** aware that they are the subjects for the observation. It may be easiest to spend some time in the classroom prior to the observation period so that you can learn the names and faces of the target students. You may want to jot first names, initials, or some type of identifying code next to each one minute interval on the recording sheet. Remember to alternate between special and general education target students.

Whenever possible, arrive prior to the observation period to that you can enter the classroom during a natural transition period. If you are observing in multiple classrooms during a period this may not be possible. Position yourself to the side of the classroom, selecting a place where you will be able to see the target students. You may find it necessary to move or change position during the observation period. Select a position that will not be distracting to the students. Avoid engaging students or teachers in conversation or becoming involved in classroom activities during the observation period.

Classroom Observation Procedures

1. In most cases, you will begin the observation when the bell rings to start the period (middle school/high school).

2. Record the demographic information at the top of the form. Please mark your initials on each form also.
   ** Be sure to note characteristic of target student in margin. i.e.: boy in red striped shirt.

3. Set recording program to fifteen second intervals. To start observing, focus on the coding sheet and listen for the first audio cue.

4. When cue is heard, look up to locate the first special education student and observe his/her behavior (you will have 5 seconds to observe the student). When you hear the record cue record the appropriate code (you will have 10 seconds to record the student's and teacher's behavior,

the instructional organization, and the task type). (keep eyes averted from the student and teacher until next cue is heard).

5.   You will continue to observe this student for four 15 second intervals (1 minute). At the conclusion of the first minute you will move to observing the second student. You will observe this student for four 15 second intervals.

6.   Continue this pattern for recording. Remember to alternate between a special education and general education student each minute.

7.   If, for any reason, you must stop recording, mark the last interval coded and note the reason for stopping the observation. If the student being observed leaves the room for an extended period of time (sick and goes to nurse, sent to the principal/counselor, etc.), move to the next target student in the appropriate group (general/special education).

Following the Observation

Leave the classroom during a natural transition time or without drawing attention to yourself. If the teacher is available, thank him/her for letting you observe and indicate when you will be back again. **DO NOT INTERUPT THE TEACHER DURING CLASS**.

Double check the demographic information at the top of your recording sheet. Return the observation materials to the appropriate project staff person.

Directions for Using the SOS-AAIMS Pocket PC Program

Opening up EduMonit file on PC

1. Use the task bar to open the EduMonitor program.

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2. Select the **Open Data File** from the **File** menu. This will open the "save as" screen.

3. On the "save as" screen, enter the teacher's name, period, and date of observation. Example: Smith4th304. After you select **OK** the coding template will appear.

4. Select **Options** from the **Tools** menu. This allows you to change the defaults for the observing and/or recording interval(s). You can also change the number of intervals in the observational period.

5. Select the **Start Timer** menu from the **Tools** menu.

6. A single beep alerts you to observe. A double beep alerts you to record your observation.

7. Each column on the observation screen contains options specific to student behavior, teacher behavior, instructional organization, and task format respectively. The same categories are used as are used on the paper form of the SOS-AAIMS. The only difference is the abbreviations used.

Computerized SOS-AAIMS	Paper format of SOS-AAIMS	Category
	Student Behavior	
Ac Acad	ActAc	Active Academic Response
Cp Beh	CompBeh	Competing Behavior
Ot Appr	OthAp	Other Appropriate
Off tsk	OffTsk	Off Task
	Teacher Behavior	
Ac Tlk-L	Aca T/L	Academic Talk/Listening
Ac Mon	AcaMon	Academic Monitoring
Tsk Man	TasMan	Task Management
Other	OTH	Other
	Instructional Organization	
Wh Cls	WhGrp	Whole Class
Sml Grp	SmGrp	Small Group
Indep	Indpt	Independent
Other	OTH	Other
	Task Format	
Lect-Dis	LecDis	Lecture/Discussion
P-Penc	PapPen	Paper/Pencil
M-C-P	CompMed	Computer/Media
Other	OTH	Other

8. When selecting the type of behavior, organization, or task format simply tap on the circle before each option.

9. Save the file when exiting the program.

10. **Coding Practice Exercises**

Directions: After you have memorized the behavior categories and code letters, use this practice exercise to check your understanding of each of the four categories.

Student Behavior:

_____ 1. Bill is kicking the student next to him.

_____ 2. Sally is watching the teacher talk to another teacher in the doorway, rather than working on her math problems.

_____ 3. Maria is writing out her algebra problems.

_____ 4. Anton is yelling at a girl across the room.

_____ 5. Jessie is staring out the door, watching students in the hallway.

_____ 6. Rob is raising his hand, waiting for the teacher to call on him.

_____ 7. Joe has his head down on the desk. He is looking out the window while the teacher is demonstrating how to do a problem on the board.

_____ 8. Sue is throwing spitwads at the students across the aisle.

_____ 9. Chen is verbally answering the teacher's question about an algebra concept.

_____ 10. Tamika is working on an algebra program on the computer.

_____ 11. DeRod is doing his science homework during Algebra class, while the teacher is explaining a new assignment.

_____ 12. Carol is drawing animals on the margins of her math notebook.

_____ 13. Fred is sitting quietly at his desk, waiting for the teacher to start the lesson.

_____ 14. Jon is working on the assignment with his math partner.

_____ 15. Ling is carving her initials in the desk.

_____ 16. Karl is watching his algebra partner demonstrate how to do a problem.

_____ 17. Mary is out of her seat during the lecture, talking to another student.

_____ 18. Kinesha is out of her seat during the lecture, sharpening her pencil. She appears to be listening and the teacher does not appear to disapprove of her actions.

_____ 19. Beth is out of her seat at the small group table as she answers the teacher's question about how to do the problem.

<u>Teacher Behavior</u>

_____	1.	Teacher is describing a new behavior management program to the students.
_____	2.	Teacher is talking to an individual student as she completes a written assignment.
_____	3.	Teacher is telling students to move to their small groups.
_____	4.	Teacher is answering a student's question about the algebra concept being presented.
_____	5.	Teacher is listening to the target student answer a question.
_____	6.	Teacher is looking over a student's shoulder at the computer monitor.
_____	7.	Teacher is talking with the principal in the doorway of the classroom.
_____	8.	Teacher is showing students how to organize the materials in their math portfolios.
_____	9.	Teacher is reprimanding a student who is behaving inappropriately.
_____	10.	Teacher is telling students to turn to page 174 in the algebra book.
_____	11.	Teacher is summarizing important points from the class discussion about graphing linear equations.
_____	12.	Teacher is demonstrating and explaining a math problem for the target student.
_____	13.	Teacher is listening to a student answer his question about a math problem.
_____	14.	Teacher is pausing during her lecture as the daily announcements are read over the public address system.
_____	15.	Teacher is asking students if they have finished the homework assignment that is about to be corrected.
_____	16.	Teacher is reading the correct answers to the math homework as students correct their own papers.
_____	17.	Teacher is calling on the target student to answer a question about the topic being discussed.
_____	18.	Teacher is praising the class for excellent behavior during the previous day's assembly.
_____	19.	Teacher is explaining to a student why the answer given was not correct.

Instructional Organization

_____ 1. The class is watching as a small group of students put answers to problems on the board.

_____ 2. The teacher has not yet started to teach and the class is not expected to be doing any particular activity.

_____ 3. Clusters of four students are working together to answer the algebra review questions at the back of the chapter.

_____ 4. Students are completing worksheets and typing their answers on the computer.

_____ 5. The teacher is leading a discussion about graphing linear equations and is asking students to graph the equation on their calculator.

_____ 6. Pairs of students are listening to each other explain how they solved the problem.

_____ 7. Individual students are completing a reading assignment in the algebra book.

_____ 8. Students are taking a math test.

_____ 9. Students are working in groups to build models of an algebraic equation.

_____ 10. Students are lining up at the door to go to an assembly.

<u>Task Format</u>

_____ 1. Students are completing algebra problems and typing their answers on the computer.

_____ 2. Students are working algebraic story problems.

_____ 3. The teacher is waiting for the announcements to be read before beginning the class.

_____ 4. Students are reading their algebra textbooks and answering questions on worksheets.

_____ 5. The class is watching a video about important concepts in algebra.

_____ 6. The teacher is using power point slides to ask students questions about the content they've just read.

_____ 7. The teacher is lecturing about solving algebra word problems.

_____ 8. Students are taking turns orally answering algebra problems.

_____ 9. Students are working on several different math tasks on a computer program.

_____ 10. Students are transitioning between whole group and independent time.

_____ 11. The class is leaving at the end of the period to go to their next class.

_____ 12. The class is watching a computer simulation about graphing algebra equations.

_____ 13. Students working individually on their homework assignment.

_____ 14. The teacher is modeling a new type of algebra problem on the board as students try the same problem at their seats.

_____ 15. The class is using their calculators to generate answers to an algebra equation.

_____ 16. Students are taking a math probe on the computer.

_____ 17. Students are waiting while the teacher speaks with the principal at the door of the classroom.

_____ 18. The teacher has stopped the class activities three minutes before the bell and students are waiting to be dismissed.

_____ 19. Students are completing an algebra test.

_____ 20. The teacher is lecturing about integers.

Answers to Coding Practice Exercises

Student Behavior	Teacher Behavior	Instructional Organ.	Task Format
1. ComBeh	1. OTH	1. WhGrp	1. CompMed
2. OffTsk	2. AcaMon	2. OTH	2. PapPen
3. ActAc	3. TasMan	3. SmGrp	3. OTH
4. ComBeh	4. Aca T/L	4. Indpt	4. PapPen
5. OffTsk	5. Aca T/L	5. WhGrp	5. CompMed
6. OthAp	6. AcaMon	6. SmGrp	6. CompMed
7. OffTsk	7. OTH	7. Indpt	7. LecDis
8. ComBeh	8. TasMan	8. Indpt	8. LecDis
9. ActAc	9. OTH	9. SmGrp	9. CompMed
10. ActAc	10. AcaMon	10. OTH	10. OTH
11. OffTsk	11. Aca T/L		11. OTH
12. OffTsk	12. Aca T/L		12. CompMed
13. OthAp	13. Aca T/L		13. PapPen
14. ActAc	14. OTH		14. LecDis
15. OffTsk	15. AcaMon		15. LecDis
16. OthAp	16. TasMan		16. CompMed
17. ComBeh	17. Aca T/L		17. OTH
18. OthAp	18. OTH		18. OTH
19. ActAc	19. Aca T/L		19. PapPen
			20. LecDis

APPENDIX B

Student Behavior by Course, Task Format, and Teacher Behavior																	
Course	Task Format (down)	Student Behavior															
		Active Academic Response				Other Appropriate Behavior				Off Task				Competing Behavior			
	Teacher Behavior (across)	ATL	AM	TM	OTH	ATL	AM	TM	OTH	ATL	AM	TM	OTH	ATL	AM	TM	OTH
8th Grade Algebra	Lecture/ Discussion	68%	0%	1%	0%	29%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
	Paper/ Pencil	43%	38%	1%	0%	4%	7%	5%	1%	0%	1%	0%	0%	0%	0%	0%	0%
	Other	0%	30%	17%	0%	0%	0%	43%	9%	0%	0%	0%	0%	0%	0%	0%	0%
Algebra 1	Lecture/ Discussion	32%	1%	1%	0%	28%	0%	1%	1%	30%	0%	2%	2%	1%	0%	0%	0%
	Paper/ Pencil	1%	32%	9%	4%	1%	10%	3%	0%	0%	26%	7%	6%	0%	1%	0%	0%
	Other	0%	4%	21%	2%	2%	9%	9%	34%	2%	0%	0%	18%	0%	0%	0%	0%
Algebra 1A/1B	Lecture/ Discussion	26%	0%	1%	0%	33%	0%	8%	3%	14%	2%	3%	3%	5%	0%	1%	1%
	Paper/ Pencil	0%	32%	11%	3%	1%	8%	10%	1%	0%	14%	13%	1%	0%	3%	3%	1%
	Other	0%	1%	2%	0%	7%	9%	59%	2%	0%	6%	14%	1%	0%	0%	0%	0%
Special Education Algebra	Lecture/ Discussion	58%	1%	0%	0%	31%	0%	8%	0%	0%	0%	0%	0%	1%	0%	0%	0%
	Paper/ Pencil	15%	13%	24%	6%	1%	10%	21%	8%	1%	0%	1%	2%	0%	0%	0%	0%
	Other	14%	0%	3%	4%	0%	0%	0%	0%	1%	0%	48%	29%	1%	0%	0%	0%

ATL = Academic Talk/Listening   AM = Academic Monitoring   TM = Task Management   OTH = Other

		Student Behavior															
Course	**Task Format (down)**	Active Academic Response				Other Appropriate Behavior				Off Task				Competing Behavior			
	Teacher Behavior (across)	ATL	AM	TM	OTH	AT0+L	AM	TM	OTH	ATL	AM	TM	OTH	ATL	AM	TM	OTH
Algebra 1																	
Gen Ed Students	Lecture/ Discussion	32%	2%	1%	1%	31%	0%	2%	1%	26%	0%	2%	2%	1%	0%	0%	0%
	Paper/ Pencil	1%	26%	4%	1%	2%	8%	3%	0%	1%	33%	11%	8%	0%	2%	0%	0%
	Other	0%	6%	15%	3%	3%	3%	15%	33%	3%	0%	0%	18%	0%	0%	0%	0%
Special Ed Students	Lecture/ Discussion	31%	1%	2%	0%	25%	0%	1%	2%	34%	0%	1%	2%	1%	0%	0%	0%
	Paper/ Pencil	1%	37%	13%	6%	0%	12%	2%	0%	1%	19%	3%	4%	0%	0%	1%	0%
	Other	0%	0%	30%	0%	0%	17%	0%	35%	0%	0%	0%	17%	0%	0%	0%	0%
Algebra 1A/1B																	
Gen Ed Students	Lecture/ Discussion	25%	0%	1%	0%	40%	0%	9%	3%	9%	3%	1%	1%	5%	0%	1%	1%
	Paper/ Pencil	0%	34%	12%	5%	1%	10%	14%	1%	0%	12%	8%	2%	0%	1%	1%	0%
	Other	0%	0%	0%	0%	5%	12%	74%	5%	0%	3%	2%	0%	0%	0%	0%	0%
Special Education Students	Lecture/ Discussion	28%	1%	2%	0%	25%	1%	6%	2%	19%	0%	5%	5%	6%	0%	0%	2%
	Paper/ Pencil	1%	30%	9%	1%	0%	6%	6%	1%	0%	15%	19%	1%	0%	5%	4%	2%
	Other	0%	2%	4%	0%	9%	5%	42%	0%	0%	9%	28%	2%	0%	0%	0%	0%

Table title: **Student Behavior by Course, Task Format, Teacher Behavior, and Student Classification**

ATL = Academic Talk/Listening   AM = Academic Monitoring   TM = Task Management   OTH = Other