

# MICHIGAN'S CURRICULUM INDICATORS SURVEY (CIS) RESULTS

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE  
NATIONAL ALTERNATE ASSESSMENT CENTER

NOVEMBER, 2007

Karvonen, M., Smith, M. A., Wakeman, S. Y., Flowers, C., & Browder, D. M. (2007, November). *Michigan's Curriculum Indicator Survey (CIS) results*. Charlotte, NC: University of North Carolina at Charlotte, National Center on Alternate Assessment.

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## CURRICULUM INDICATORS SURVEY (CIS) RESULTS

The Curriculum Indicators Survey (CIS) was administered in Michigan as part of the alignment study on Michigan's alternate assessments based on alternate achievement standards (MI-Access) conducted by the University of North Carolina at Charlotte under the auspices of the National Alternate Assessment Center. This report summarizes the methodology and findings from the CIS administration.

### Methodology

The CIS is a five-part survey designed to measure, through teacher self-report, the enacted academic curriculum in English language arts (ELA), math, and science, for students with significant cognitive disabilities who are eligible to take a state's alternate assessment based on alternate achievement standards. The CIS is based on the concepts in the Surveys of Enacted Curriculum but is adapted for the unique needs of this population of teachers and students.

- Part 1 asks for background information on the teacher (e.g., educational experience, characteristics of case load, and instructional influences in each academic subject).
- In Part 2, teachers provide information about the types of students on their case load, based on students' levels of symbolic communication. They are then asked to select a single student on their case load who will serve as the "target student" for the remaining three parts of the survey.
- Parts 3-5 measure the English language arts, math, and science curriculum being taught to the target student during the current academic year. For each academic skill taught, teachers rate three pieces of information: (1) the intensity of coverage of the topic, (2) the highest performance expectation (depth of knowledge, or DOK) of the student on the topic, and (3) the grade level or band from which activities, materials, and contexts were adapted for instruction on that skill. There are also a few questions in Parts 3-5 about the types of instructional methods used to teach the academic content.

Teachers were invited to complete the short version online in February 2007. The Michigan Department of Education provided a list of eligible teachers in English language arts, math, and science, and included an approximately equal number of teachers who used the Partial/Supported Independence and Functional Independence assessments. Forty-five teachers were identified in the original list provided by MDE, but that number included some duplicates across the subject areas. Thirty-two teachers were recruited for participation via email.

Halfway through the two week survey window, follow-up emails were sent to teachers who had completed some parts of the survey, encouraging them to finish the remaining sections. As an incentive, respondents who completed all five sections received gift cards. Some teachers who completed the short version of the survey also responded to the long version of the survey as part of a validation study conducted by NAAC.

Two people who were originally recruited were not eligible to participate (one was retired and the other was not a teacher). Of the 30 eligible participants, 15 completed the full survey. While this 50% response rate was considered high in light of the length of the survey, the responses of 15 teachers are unlikely to reflect the curriculum taught by the population of teachers statewide who administer the MI-Access assessments. As such, alignment indices between the enacted curriculum and the MI-Access were not calculated because the low number of responses rendered those indices invalid. Instead, this report provides purely descriptive results.

*Organization of the Findings*

CIS results are organized into two sections: (a) respondents' backgrounds and (b) the enacted (taught) curriculum. Within the second section, results are reported for each subject (English language arts, math, and science). An appendix contains supplemental tables.

## Section 1: Respondents' Backgrounds

A total of 15 teachers, 14 female and 1 male completed Part 1 of the CIS. The majority (n=14) held Master's degrees, while one had a bachelor's degree. Distributions of years of teaching experience are summarized in the table below. The majority had twenty or fewer years of experience teaching students with significant disabilities or teaching academics.

### Number of Respondents Reporting Years of Teaching Experience

Years of experience	Total Teaching	Teaching students with sig. cog. disabilities	Teaching ELA	Teaching Math	Teaching Science
0-10	2	6	6	6	10
11-20	9	6	8	7	4
21 or more	4	3	1	2	1

Ten of the respondents were identified as administering Supported Independence/Participation assessments, three administered Functional Independence assessments, and two administered both forms of assessment. Relatively few respondents held licensure in the academic subjects (3 in ELA, 3 in math, 0 in science). All respondents held certification in special education, and almost all (n = 12) were certified in elementary education. Fewer respondents had middle (n = 4) or secondary licensure (n = 1). None held National Board certification.

Teachers were also asked to report the amount of time in the past year that they had spent in professional development on content standards and instructional strategies in each of the three academic subjects. Response distributions are shown below. The most widely reported professional development experiences were in ELA and math content standards, followed by ELA instructional strategies and science content standards. Slightly fewer than half of respondents reported receiving professional development in science instructional strategies.

### Time Spent in Professional Development in Past 12 Months

	none	1-5 hours	6-10 hours	11-15 hours	> 15 hours
Instructional strategies in teaching ELA/Reading	20.0	33.3	20.0	6.7	20.0
ELA/Reading content standards	20.0	13.3	13.3	40.0	13.3
Instructional strategies in teaching math	40.0	26.7	13.3	6.7	13.3
Math content standards	20.0	33.3	6.7	26.7	13.3
Instructional strategies in teaching science	53.3	13.3	20.0	0	13.3
Science content standards	26.7	20.0	26.7	6.7	20.0

## Section 2: Academics

Teachers completed surveys on the enacted curriculum for their students in English language arts (ELA), math, and science. Fifteen teachers completed Part 2 of the survey, in which the target student was identified for Parts 3-5.

In order to understand the characteristics of the learners selected as target students, respondents were asked to identify which of the three levels of communication best reflected what the student could currently do.

**Level 1 (awareness/presymbolic):** Has not yet acquired the skills to discriminate between pictures or other symbols (and does not use symbols to communicate). May or may not use objects to communicate. May or may not use idiosyncratic gestures, sounds/vocalizations, and movements/touch to communicate with others. A direct and immediate relationship between a routine activity and the student’s response may or may not be apparent. The student may have the capacity to sort very different objects, may be trial and error. Mouthing and manipulation of objects leads to knowledge of how objects are used. May combine objects (e.g., place one block on another).

**Level 2 (early symbolic):** May use some symbols to communicate (e.g., pictures, logos, objects). Beginning to acquire symbols as part of a communication system. May have limited emerging functional academic skills. Representations probably need to be related to the student’s immediate environment and needs.

**Level 3 (symbolic):** Communicates with symbols (e.g., pictures) or words (e.g., spoken words, assistive technology, ASL, home signs). May have emerging or basic functional academic skills. Emerging writing or graphic representation for the purpose of conveying meaning through writing, drawing, or computer keying.

The majority of teachers identified target students who had symbolic communication (Level 3). Of the target students selected, none were enrolled in elementary grades, six in middle grades, and four in high school.

*Communication Levels of Identified Target Students, by Enrolled Grade Band*

Assigned grade band	Level 1	Level 2	Level 3	Total
pK-2			1	1
3-5	1	1		2
6-8	1		6	7
9-12			4	4
no assigned grade		1		1
<b>Total</b>	<b>2</b>	<b>2</b>	<b>11</b>	<b>15</b>

While disability labels are not precise classifications in terms of students’ levels of functioning, teachers were asked to provide this information about their target students for descriptive purposes. The most frequently reported categories were mental retardation and speech or language impairment. None of the respondents selected target students with hearing impairment, visual

impairment, serious emotional disturbance, traumatic brain injury, other health impairment, or deaf-blindness.

*Disability Labels of Target Students (N = 15)*

IDEA Disability Label	# of Target Students
Mental Retardation	12
Speech or Language Impairment	5
Orthopedic Impairment	2
Multiple Disabilities	2
Autism	1
Specific Learning Disability	1

Thus, the target students are primarily enrolled in middle and secondary grades, and have symbolic communication systems. Given the small number of CIS responses and the characteristics of the target students selected, the Michigan Department of Education is strongly cautioned to realize the enacted curriculum described in this report is unlikely to represent the curriculum of all students who take the MI-Access.

## ENGLISH LANGUAGE ARTS

A total of 14 teachers completed the English language arts (ELA) section of the short version CIS, which includes both reading and writing. This section of the report summarizes teacher responses to the ELA section as well as ELA-related items from Part I of the survey (general background).

### ***ELA Content***

The table below provides an overview of the distributions of depth of knowledge (DOK) expected of target students for items within each of the four ELA topics. Frequencies represent the number of items, across target students, for whom the content was taught in 2006-07. Distributions of DOK expectations for each item within each topic are reported in Table E.1 in the appendix.

#### *Distribution of ELA Content Taught, by Depth of Knowledge*

Topic	N	Attention		Memorize/ Recall		Perform		Comprehend		Apply		Analyze/ Synthesize/ Evaluate	
		n	%	n	%	n	%	n	%	n	%	n	%
Language	70	11	15.7	7	10.0	23	32.9	10	14.3	17	24.3	2	2.9
Reading and Literature	132	33	25.0	35	26.5	22	16.7	23	17.4	14	10.6	5	3.8
Composition	71	17	23.9	6	8.5	20	28.2	10	14.1	14	19.7	4	5.6
Media	19	4	21.1	6	31.6	5	26.3	3	15.8	0	0	1	5.3

The most frequently taught ELA topic was Reading and Literature. Thirty-nine percent of the responses within this topic came from items related to understanding texts, genre, fiction, and poetry (see Table E.1). Language and Composition were the other two most frequently reported ELA topics included in the enacted curriculum for target students in 2006-07. The highest performance expectations for the target students in that academic year were fairly evenly distributed across the attention, memorize/recall, performance, comprehension, and application levels in all topics except Media. In very few instances were students expected to analyze, synthesize, or evaluate material.

### ***Grade Level Materials, Activities, and Contexts***

After identifying each type of ELA content and DOK at which the target students were taught, teachers were also asked to identify the grade band or grade from which activities, materials, and contexts were adapted to teach the corresponding ELA content. The table below summarizes the distribution of responses to items within each ELA topic. (Respondents could identify more than one grade band if applicable to the target student.)



The majority of ELA materials were adapted from elementary grades, either preK-2 or 3-5. Very few teachers reported using materials, activities, or contexts that were not designated for a specific grand band.

*Percent of CIS items taught to target student with materials, activities, contexts in each grade band*

	pK-2			3-5		6-8		9-12		No grade band	
	N	n	%	n	%	n	%	n	%	n	%
Language	92	31	33.7	26	28.3	21	22.8	6	6.5	8	8.7
Reading and Literature	173	77	44.5	46	26.6	34	19.7	7	4.0	9	5.2
Composition	103	36	35.0	32	31.1	28	27.2	4	3.9	3	2.9
Media	22	5	22.7	4	18.2	8	36.4	1	4.5	4	18.2

### ***Other ELA Instruction Information***

Tables E.2 – E.5 in the appendix provide additional results related to ELA instruction. Highlights of these findings are as follows:

- **Instructional activities:** The most frequently reported instructional methods used recently with the target students in ELA were small group instruction, scaffolded instruction with supports, and use of hands-on materials or manipulatives. The highest rate of expected independent, active performance within a lesson was seen in small group instruction, scaffolded instruction, and performing assessment skills for data collection.
- **Resources:** Teachers most frequently reported using computers, materials from websites, teacher-made manipulatives, and teacher-adapted commercially made materials to teach students who take the MI-Access assessments. Fewer than half of respondents reported using assistive technologies, commercially made print materials and manipulatives designed for the population. More than half of respondents reported providing ELA instruction to the target students in other settings within their schools, and employing other special educators and school staff as resources in teaching ELA skills.
- **Instructional influences:** The strongest influences on teachers’ choices about ELA instruction are student needs as documented on IEPs (20% moderate or strong influence), classroom assessment results (93% moderate or strong influence), state curriculum framework or content standards (80% moderate or strong influence), and instructional materials (77% moderate or strong influence). Lesser influences included prior alternate assessment results (33% strong influence) and national ELA standards (29%).
- **Classroom assessment:** For the purpose of assessing their students in ELA, teachers most frequently reported using observational data (73% once per week or more frequently) and performance on-demand (60% once per week or more frequently). Objective tests were used weekly or more often by nearly half of respondents (47%).

## MATHEMATICS

A total of 15 teachers completed the math section of the short version CIS. This section summarizes teacher responses to the math section as well as math-related items from Part I of the survey (general background).

### ***Math Content***

The table below provides an overview of the distributions of depth of knowledge (DOK) expected of target students for items within each of the five math topics. Frequencies represent the number of items, across target students, for whom the content was taught in 2006-07. Distributions of DOK expectations for each item within each topic are reported in Table M.1 in the appendix.

*Distribution of Math Content Taught, by Depth of Knowledge*

Topic	N	Attention		Memorize/ Recall		Perform		Comprehend		Apply		Analyze/ Synthesize/ Evaluate	
		n	%	n	%	n	%	n	%	n	%	n	%
Number Sense and Operations	41	4	9.8	6	14.6	13	31.7	8	19.5	9	22.0	1	2.4
Patterns, Relations, and Algebra	35	6	17.1	7	20.0	12	34.3	5	14.3	4	11.4	1	2.9
Geometry	36	3	8.3	12	33.3	12	33.3	6	16.7	2	5.6	1	2.8
Measurement	38	7	18.4	8	21.1	8	21.1	2	5.3	12	31.6	1	2.6
Data Analysis, Statistics, and Probability	12	5	41.7	4	33.3	1	8.3	1	8.3	1	8.3	0	0.0

The Number Sense and Operations topic was most frequently endorsed ( $n = 41$ ). Items in the Geometry, Measurement, and Algebra topics were endorsed at approximately the same rate ( $n = 35$  to  $38$ ). All responding teachers reported that their target students were taught number sense and measurement tools such as clocks and calendars (see Table M.1). The highest performance expectation for the target students tended to be at the memorize/recall, performance, or comprehension levels, although there were high rates of application in Number Sense and Operations and Measurement. The highest performance expectation tended to be lower (attention or recall level) in Data Analysis and Probability. Few of the target students were expected to analyze, synthesize, or evaluate material in math.

### ***Grade Level Materials, Activities, and Contexts***

After identifying each type of math content and DOK at which the target students were taught, teachers were also asked to identify the grade band or grade from which activities, materials, and contexts were adapted to teach the corresponding math content. The table below summarizes the distribution of responses to items within each math topic. (Respondents could identify more than one grade band if applicable to the target student.)

The majority of math materials were adapted from elementary grades, either preK-2 or 3-5. Across topics, a total of 16% of items were taught with materials, activities, or contexts specific to a certain grade. No teachers reported adapting materials from high school grades in four of the five topics.

*Percent of CIS items taught to target student with materials, activities, contexts in each grade band*

	pK-2			3-5		6-8		9-12		No grade band		Specific grade	
	N	n	%	n	%	n	%	n	%	n	%	n	%
Number Sense and Operations	53	20	37.7	21	39.6	8	15.1	0	0.0	1	1.9	3	5.7
Patterns, Relations, and Algebra	42	13	31.0	17	40.5	9	21.4	0	0.0	2	4.8	1	2.4
Geometry	43	18	41.9	16	37.2	6	14.0	0	0.0	2	4.7	1	2.3
Measurement	53	13	24.5	21	39.6	14	26.4	2	3.8	0	0.0	3	5.7
Data Analysis, Statistics, and Probability	16	4	25.0	9	56.3	3	18.8	0	0.0	0	0.0	0	0.0

### ***Other Math Instruction Information***

Tables M.2 – M.5 in the appendix provide additional results related to math instruction. Highlights of these findings are as follows:

- **Instructional activities:** The most frequently reported instructional methods used recently with the target students in math were small or large group instruction, the use of manipulatives to solve problems, and the use of computers, calculators, or assistive technology. Across most instructional activities, teachers most frequently reported expecting the target students to perform actively with supports.
- **Resources:** Teachers most often reported using computers, materials from websites, teacher-made manipulatives, and commercially prepared materials designed for students who take alternate assessments in order to teach math lessons. The majority also used materials adapted from general education. While four-fifths of teachers reported using real-life materials to teach math, slightly fewer than half said math concepts were taught in inclusive classrooms. More than half of respondents reported enlisting support from other special educators and other support staff to assist with math instruction.
- **Instructional influences:** The strongest influences on teachers’ choices about math instruction are student needs as documented in IEPs (100% moderate or strong influence) and classroom assessment results (93% moderate to strong influence). National math standards were less of an influence (33% moderate to strong influence).
- **Classroom assessment:** For the purpose of assessing their students who take the MI-Access Mathematics assessment, teachers reported using observational data and performance on demand most frequently (73% once per week or more frequently). One third of respondents also reported using objective tests for assessment purposes once per week or more frequently.

## SCIENCE

Fifteen teachers completed the science section of the CIS. This section summarizes teacher responses to the science section as well as science-related items from Part I of the survey (general background).

### *Science Content*

The table below provides an overview of the distributions of depth of knowledge (DOK) expected of target students for items within each of the six science topics. Frequencies represent the number of items, across target students, for whom the content was taught in 2006-07. Distributions of DOK expectations for each item within each topic are reported in Table S.1 in the appendix.

#### *Distribution of Science Content Taught, by Depth of Knowledge*

Topic	N	Attention		Memorize/ Recall		Perform		Comprehend		Apply		Analyze/ Synthesize/ Evaluate	
		n	%	n	%	n	%	n	%	n	%	n	%
Earth and Space Science	26	3	11.5	12	46.2	2	7.7	5	19.2	3	11.5	1	3.8
Life Science (Biology)	67	12	17.9	13	19.4	20	29.9	19	28.4	2	3.0	1	1.5
Physical Science (Chemistry & Physics)	36	13	36.1	9	25.0	6	16.7	8	22.2	0	0.0	0	0.0
Technology/Engineering	11	2	18.2	3	27.3	2	18.2	2	18.2	1	9.1	1	9.1
History/Nature of Science	17	10	58.8	2	11.8	1	5.9	2	11.8	2	11.8	0	0.0
Science as inquiry	11	3	27.3	4	36.4	1	9.1	1	9.1	2	18.2	0	0.0

The most frequently taught science subject was Life Science. The most frequent responses within this category were for the items related to characteristics of organisms and personal and community health (see Table S.1). Physical Science and Earth and Space Science were the other two most frequently reported science topics included in the enacted curriculum for target students in 2006-07. In History/Nature of Science, the highest performance expectation tended to be that the target students would attend to the content or memorize and recall the content. The highest performance expectation extended upward into the performance and comprehension levels in Biology. Few of the target students were required to analyze, synthesize, or evaluate material.

### *Grade Level Materials, Activities, and Contexts*

After identifying each type of science content and DOK at which the target students were taught, teachers were also asked to identify the grade band or grade from which activities, materials, and contexts were adapted to teach the corresponding science content. The table below summarizes the distribution of responses to items within each science topic. (Respondents could identify more than one grade band if applicable to the target student.)

More than half of science materials, activities, and contexts were adapted from elementary grade bands in Earth and Space Science and Physical Science. Very little of the science content taught incorporated grade-neutral materials.

*Percent of CIS items taught to target student with materials, activities, contexts in each grade band*

	pK-2			3-5		6-8		9-12		No grade band		Specific grade	
	N	n	%	n	%	n	%	n	%	n	%	n	%
Earth and Space Science	34	10	29.4	8	23.5	13	38.2	1	2.9	2	5.9	0	0.0
Life Science (Biology)	94	21	22.3	25	26.6	35	37.2	7	7.4	6	6.4	0	0.0
Physical Science (Chemistry & Physics)	47	16	34.0	11	23.4	19	40.4	0	0.0	0	0.0	1	2.1
Technology/Engineering	12	2	16.7	3	25.0	5	41.7	1	8.3	1	8.3	0	0.0
History/Nature of Science	21	7	33.3	3	14.3	11	52.4	0	0.0	0	0.0	0	0.0
Science as inquiry	14	4	28.6	2	14.3	7	50.0	1	7.1	0	0.0	0	0.0

### ***Other Science Instruction Information***

Tables S.2 – S.5 in the appendix provide additional results related to science instruction. Highlights of these findings are as follow:

- **Instructional activities:** The most frequently reported instructional method used recently with the target students in science was small group instruction (20% moderate amount of coverage). Science instruction may not have a large emphasis in target students’ overall educational program, as evidenced by the high rates at which science methods were reported to have been used one hour or less in the past week, or not at all. When certain science instruction methods were used, the expectation for the target student tended to include some level of support or limited participation, rather than independent, active performance within the lesson.
- **Resources:** Teachers most often reported using teacher-made materials, website materials, or commercially prepared materials adapted from general education in order to teach science lessons. Slightly more than half of respondents said their students received science instruction in an inclusive setting. Fewer than half of the teachers reported using the support of school support staff or nondisabled peers to assist with science instruction.
- **Instructional influences:** The strongest influences on teachers’ choices about science instruction are student needs as documented in IEPs (86% moderate or strong influence), classroom assessment results, science materials, and state curriculum frameworks (each 79% moderate to strong influence). The items most often rated as having minimal to no influence on respondents’ science instructional choices were national science standards and previous alternate assessment results.
- **Classroom assessment:** For the purpose of assessing their students in science, teachers reported using observational data most frequently (67% once per week or more frequently). Slightly fewer reported frequent use of performance on-demand and objective tests (n = 8, once per week or more often) and objective tests (n = 4, once per week or more often).

## CONCLUSIONS

Teachers who completed the CIS are teaching a broad range of content in English language arts, math, and science. In ELA the emphasis appears to be in reading and literature. The content of math instruction is balanced across several topics (number sense, measurement, geometry, and algebra). In science the emphasis appears to be on life science, although that emphasis may be due to the fact that most target students were enrolled in middle or secondary grade levels (where the state's Life Science/Biology standards may be more extensive). Teachers reported performance by their students at levels ranging from attention to application in ELA and math, while the expectations tended to be slightly lower in science. The frequency of instruction in science also tended to be lower than in ELA or math. As science assessments are newer for this population of students, teachers may still be learning how to create a range of instructional approaches and develop higher expectations for student performance in those areas.

The Michigan Department of Education may want to further consider discrepancies between the symbolic communication skills of students in the sample and evidence of high expectations in instruction. For example, while the majority of target students in the sample reportedly had symbolic communication systems, teachers frequently reported teaching content at the "attention" level – requiring only eye gaze, vocalization, or some other form of minimal, intentional response. Similarly, there were low rates of expected independent, active participation of these students in most instructional activities.

According to federal guidelines, alternate assessments judged against alternate academic achievement standards are supposed to be aligned to grade level expectations. However, the activities, materials, and contexts teachers report using during instruction tend to be adapted from elementary grades (pK-2 or 3-5) while the target students were primarily enrolled in grades 6-12. The frequency with which materials were adapted from high school was not consistent with the composition of the target student group identified for this study. In order to provide instruction that is more consistent with the content of MI-Access assessments aligned to grade level expectations, teachers may require more professional development on how to adapt materials and activities from grade levels that match the chronological age of their students.

Finally, teachers' responses to survey questions about instructional influences suggest that there may be room for growth in their ways of building access to the general curriculum. There was not a widespread indication that state academic standards have a strong influence on the academics they teach, nor did it appear that teachers relied extensively on their general education counterparts for assistance in developing curriculum access or teaching academic skills. Increasing student access to the general education curriculum and better aligning instruction in order to increase academic achievement may require more professional development and strengthened relationships with general educators in the same schools.

## Appendix: Supplemental Tables

### English Language Arts

- E1** Distribution of ELA Content Taught, by Depth of Knowledge
- E2** ELA Instructional Methods and Level of Student Participation
- E3** Frequency of Teachers Using Various Resources to Teach ELA
- E4** Teacher-Reported Influences on ELA Instruction
- E5** Frequency of Use of Classroom Assessments – ELA

### Math

- M1** Distribution of Math Content Taught, by Depth of Knowledge
- M2** Math Instructional Methods and Level of Student Participation
- M3** Frequency of Teachers Using Various Resources to Teach Math
- M4** Teacher-Reported Influences on Math Instruction
- M5** Frequency of Use of Classroom Assessments – Math

### Science

- S1** Distribution of Science Content Taught, by Depth of Knowledge
- S2** Science Instructional Methods and Level of Student Participation
- S3** Frequency of Teachers Using Various Resources to Teach Science
- S4** Teacher-Reported Influences on Science Instruction
- S5** Frequency of Use of Classroom Assessments – Science

In each subject, the first two tables are based on academic section of CIS (Part 3, 4, or 5; referenced to the target student), while the last three are based on Part 1 (General classroom information; not about a specific target student).

Table E.1. Distribution of ELA Content Taught, by Depth of Knowledge (N = 14)

Item	LANGUAGE	N	Attention		Mem/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
			n	%	n	%	n	%	n	%	n	%	n	%
A1	Discussion (discussion rules, group interactions)	13	1	7.7	1	7.7	4	30.8	1	7.7	5	38.5	1	7.7
A2	Questioning, Listening, and Contributing (class discussion contributions, gathering information)	13	2	15.4		0.0	3	23.1	4	30.8	4	30.8		0.0
A3	Oral Presentation (presentation elements and techniques, presentation preparation)	11	2	18.2		0.0	4	36.4	2	18.2	2	18.2	1	9.1
A4	Vocabulary and Concept Development (antonyms, synonyms, compound words, prefixes, suffixes, dictionary use, use in context)	12	1	8.3	2	16.7	5	41.7	3	25.0	1	8.3		0.0
A5	Structure and Origins of Modern English (grammar, mechanics, parts of speech)	11	2	18.2	2	18.2	4	36.4		0.0	3	27.3		0.0
A6	Formal and Informal English (standard vs. conversational language)	10	3	30.0	2	20.0	3	30.0		0.0	2	20.0		0.0
	<b>Total</b>	<b>70</b>	<b>11</b>	<b>15.7</b>	<b>7</b>	<b>10.0</b>	<b>23</b>	<b>32.9</b>	<b>10</b>	<b>14.3</b>	<b>17</b>	<b>24.3</b>	<b>2</b>	<b>2.9</b>
<b>READING AND LITERATURE</b>														
B1	Beginning Reading (letters, handling of a book, phonemic awareness, letter/sound combinations, decode words)	12	1	8.3	1	8.3	3	25.0	1	8.3	3	25.0	3	25.0
B2	Understanding a Text (predictions, retell stories, cause/effect, story elements, imagery, symbolism)	13	1	7.7	3	23.1	2	15.4	6	46.2	1	7.7		0.0
B3	Making Connections (compare authors, illustrators, settings)	12	3	25.0	3	25.0	4	33.3	1	8.3	1	8.3		0.0
B4	Genre (forms of literature- poetry, prose, fiction, nonfiction, drama)	13	6	46.2	3	23.1	2	15.4	2	15.4		0.0		0.0
B5	Theme (lessons of folktales, fables, myths, theme identification)	12	4	33.3	5	41.7		0.0	2	16.7	1	8.3		0.0
B6	Fiction (plot, character, setting identification of stories)	13	1	7.7	3	23.1	3	23.1	4	30.8	1	7.7	1	7.7
B7	Nonfiction (meaning, prediction, and fact identification of informational material)	12	2	16.7	3	25.0	2	16.7	3	25.0	1	8.3	1	8.3
B8	Poetry (rhythm and rhyme, repetition, imagery, figurative language)	13	6	46.2	4	30.8		0.0	1	7.7	2	15.4		0.0



Item	READING AND LITERATURE (cont.)	N	Attention		Mem/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
			n	%	n	%	n	%	n	%	n	%	n	%
B9	Style and Language (words that appeal to the senses, imagery, figurative language, flow)	10	5	50.0	1	10.0	2	20.0	2	20.0		0.0		0.0
B10	Myth, Traditional Narrative, and Classical Literature (characters in mythology, adventures/exploits of characters)	7	2	28.6	2	28.6	1	14.3	1	14.3	1	14.3		0.0
B11	Dramatic Literature (elements of dialogue, elements of drama, role play)	7	1	14.3	4	57.1	1	14.3		0.0	1	14.3		0.0
B12	Dramatic Reading and Performance (rehearsal and performance of stories, plays, poems, voice inflection)	8	1	12.5	3	37.5	2	25.0		0.0	2	25.0		0.0
	<b>Total</b>	<b>132</b>	<b>33</b>	<b>25.0</b>	<b>35</b>	<b>26.5</b>	<b>22</b>	<b>16.7</b>	<b>23</b>	<b>17.4</b>	<b>14</b>	<b>10.6</b>	<b>5</b>	<b>3.8</b>
<b>COMPOSITION</b>														
C1	Writing (use of pictures, letters, words to write stories, poems, letters, reports)	13		0.0	1	7.7	5	38.5	2	15.4	5	38.5		0.0
C2	Consideration of Audience and Purpose (language to match audience and purpose-entertain, persuade, inform)	10	5	50.0		0.0	1	10.0	2	20.0	1	10.0	1	10.0
C3	Revising (clarification/rethinking for logic and expression)	9	3	33.3		0.0	2	22.2		0.0	3	33.3	1	11.1
C4	Standard English Conventions (legible print/cursive, spacing of words, spelling, end marks, punctuation)	10	3	30.0		0.0	2	20.0	1	10.0	3	30.0	1	10.0
C5	Organizing Ideas in Writing (order of events, details, logical progression)	13	3	23.1	1	7.7	5	38.5	1	7.7	2	15.4	1	7.7
C6	Research (gather information about a topic, steps of conducting research)	9	1	11.1	4	44.4	2	22.2	2	22.2		0.0		0.0
C7	Evaluating Writing and Presentations (decisions and judgments about writing; use of scoring rubrics)	7	2	28.6		0.0	3	42.9	2	28.6		0.0		0.0
	<b>Total</b>	<b>71</b>	<b>17</b>	<b>23.9</b>	<b>6</b>	<b>8.5</b>	<b>20</b>	<b>28.2</b>	<b>10</b>	<b>14.1</b>	<b>14</b>	<b>19.7</b>	<b>4</b>	<b>5.6</b>

Item	MEDIA	N	Attention		Mem/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
			n	%	n	%	n	%	n	%	n	%	n	%
D1	Analysis of Media (text/film/play/website comparison)	9	4	44.4	3	33.3		0.0	2	22.2		0.0		0.0
D2	Media Production (powerpoint or other technological presentation, video/audio tape)	10		0.0	3	30.0	5	50.0	1	10.0		0.0	1	10.0
	<b>Total</b>	<b>19</b>	<b>4</b>	<b>21.1</b>	<b>6</b>	<b>31.6</b>	<b>5</b>	<b>26.3</b>	<b>3</b>	<b>15.8</b>	<b>0</b>	<b>0.0</b>	<b>1</b>	<b>5.3</b>

Table E.2. ELA Instructional Methods and Level of Target Student's Participation (N = 14)

ELA/reading instructional time during the <b>past week</b> in which the target student engaged in each of the following						Level of Student Participation			
	0 None	1 Little (1 hour or less last week)	2 Some (2-4 hours last week)	3 Moderate (5-7 hours last week)	4 Considerable (8 or more hours last week)	N No Partici- pation	P Passive Partici- pation	AS Active Participa- tion with Supports	IA Independent Active Participation
Receive individualized instruction	21.4	7.1	42.9	14.3	14.3	14.3	7.1	71.4	7.1
Receive instruction in a small group	7.1	14.3	14.3	28.6	35.7	7.1	14.3	50.0	28.6
Collect, summarize, or analyze information	14.3	50.0	21.4	14.3	0	21.4	28.6	50.0	0
Engage in writing process	7.1	28.6	14.3	35.7	14.3	14.3	0	71.4	14.3
Learn to use resources	21.4	50.0	21.4	7.1	0	14.3	42.9	42.9	0
Use hands-on or manipulatives	7.1	7.1	21.4	28.6	35.7	7.1	7.1	64.3	21.4
Receive instruction with prompts or scaffolded support	7.1	7.1	28.6	14.3	42.9	21.4	7.1	71.4	0
Use computers or other assistive technology	7.1	21.4	35.7	7.1	28.6	7.1	7.1	78.6	7.1
Work independently	7.1	28.6	42.9	21.4	0	14.3	28.6	50.0	7.1
Perform assessment skills for data collection/grading	28.6	35.7	21.4	14.3	0	21.4	14.3	42.9	21.4
Take a test	28.6	64.3	7.1	0	0	28.6	7.1	50.0	14.3
Practice skills in different setting	28.6	7.1	21.4	35.7	7.1	21.4	14.3	57.1	7.1
Practice skills with a variety of similar materials	21.4	14.3	28.6	28.6	7.1	14.3	21.4	64.3	0
Engage in read aloud activities	14.3	14.3	35.7	28.6	7.1	14.3	14.3	71.4	0
View multi media presentations	35.7	28.6	21.4	7.1	7.1	35.7	28.6	28.6	7.1
Engage in speech or presentation	50.0	35.7	0	7.1	7.1	50.0	14.3	35.7	0
Use work center	28.6	35.7	28.6	7.1	0	28.6	21.4	42.9	7.1
Learn/demonstrate skills in repeated opportunity/direct instruction trials	14.3	14.3	28.6	35.7	7.1	14.3	14.3	71.4	0

*Table E.3. Frequency of Teachers Using Various Resources to Teach ELA (N = 15)*

	Used to teach <b>ELA/Reading</b>
<b>Materials</b>	
Commercially made materials adapted (by you or someone else) from general education	73.3
Commercially made manipulatives adapted (by you or someone else) from general education	46.7
Age-appropriate, commercially made print or text materials <i>designed for this type of student</i>	60.0
Age-appropriate, commercially made manipulatives <i>designed for this type of student</i>	53.3
Other commercially made print or text materials <i>designed for this type of student</i>	40.0
Other commercially made age-appropriate manipulatives <i>designed for this type of student</i>	40.0
Teacher-made books, workbooks, materials	66.7
Teacher-made manipulatives	73.3
Materials or lessons from websites	86.7
Computer	93.3
Assistive technologies (e.g., CheapTalk, Big Mac, Dynavox, text reader, talking calculator, etc.)	46.7
<b>Settings</b>	
Real life or natural setting materials (e.g., coins, community signs, telephones)	40.0
Inclusive class setting	46.7
Other settings in my school	53.3
Other settings in the community	26.7
<b>People</b>	
Nondisabled peers	33.3
Teachers from other disciplines (e.g., academic or special subject areas)	40.0
Another staff member at the school (e.g., speech/occupational/physical therapist)	86.7
Other special education teachers	60.0

*Table E.4. Teacher-Reported Influences on ELA Instruction (N = 15)*

	No influence	Minimal influence	Moderate influence	Strong influence
State curriculum framework or content standards	6.7	13.3	46.7	33.3
Instructional materials	7.7	15.4	23.1	53.8
State alternate assessment requirements	6.7	20.0	33.3	40.0
State alternate assessment results from previous years	20.0	46.7	0	33.3
National ELA standards	28.6	42.9	14.3	14.3
ELA content, materials, and/or activities used by general education teachers in my school	26.7	6.7	40.0	26.7
Training from my degree program (undergraduate or graduate)	26.7	20.0	33.3	20.0
Students' needs as documented on IEPs	0	0	0	100.0
School or district initiatives or priorities	13.3	20.0	20.0	46.7
Principal or other administrator expectations	20.0	40.0	13.3	26.7
Professional development experiences	6.7	20.0	33.3	40.0
Classroom assessment results	6.7	0	20.0	73.3

*Table E.5. Frequency of Reported Use of Classroom Assessments – ELA (N = 15)*

	Not at all	< 1 time per month	1-4 times a month	1-4 times a week	> 4 times a week
Objective questions (e.g., true/false, multiple choice, yes/no)	6.7	20.0	26.7	40.0	6.7
Performance on-demand (e.g., task analysis steps, repeated trials, incidence recording)	6.7	13.3	20.0	26.7	33.3
Teacher observation (e.g., anecdotal or descriptive data)	6.7	0	20.0	46.7	26.7

Table M.1. Distribution of Math Content Taught, by Depth of Knowledge (N = 15)

Item	Number Sense and Operations	N	Attention		Mem/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
			n	%	n	%	n	%	n	%	n	%	n	%
A1	Number Sense (whole numbers, fractions, odd & even, sorting, matching, grouping, ordering; money)	15	1	6.7	2	13.3	5	33.3	2	13.3	4	26.7	1	6.7
A2	Operations (+, -, x /, commutative properties, order of operations)	13	1	7.7	2	15.4	4	30.8	3	23.1	3	23.1		0.0
A3	Computation and Estimation (comparisons, rounding, properties of addition, subtraction, multiplication, division)	13	2	15.4	2	15.4	4	30.8	3	23.1	2	15.4		0.0
	<b>Total</b>	<b>41</b>	<b>4</b>	<b>9.8</b>	<b>6</b>	<b>14.6</b>	<b>13</b>	<b>31.7</b>	<b>8</b>	<b>19.5</b>	<b>9</b>	<b>22.0</b>	<b>1</b>	<b>2.4</b>
<b>Patterns, Relations, and Algebra</b>														
B1	Patterns, Relations, and Functions (identify, reproduce, create, count in patterns)	13	2	15.4		0.0	5	38.5	2	15.4	3	23.1	1	7.7
B2	Algebra (symbolic representations, variables, algebraic equations)	8	1	12.5	3	37.5	2	25.0	2	25.0		0.0		0.0
B3	Relationships and Mathematical Models (equivalent measurements, mathematical relationships, proportions)	9	2	22.2	2	22.2	4	44.4	1	11.1		0.0		0.0
B4	Variables and Change (process and rates of change, linear equations)	5	1	20.0	2	40.0	1	20.0		0.0	1	20.0		0.0
	<b>Total</b>	<b>35</b>	<b>6</b>	<b>17.1</b>	<b>7</b>	<b>20.0</b>	<b>12</b>	<b>34.3</b>	<b>5</b>	<b>14.3</b>	<b>4</b>	<b>11.4</b>	<b>1</b>	<b>2.9</b>
<b>Geometry</b>														
C1	Characteristics of Geometric Shapes (two and three dimensional shapes, congruent shapes)	14	2	14.3	4	28.6	4	28.6	3	21.4		0.0	1	7.1
C2	Spatial Relationships/ Coordinate Geometry (coordinates, points on a line)	9	1	11.1	4	44.4	2	22.2	1	11.1	1	11.1		0.0
C3	Transformation/Symmetry (flipped, turned shapes, line and rotational symmetry)	6		0.0	4	66.7	1	16.7	1	16.7		0.0		0.0
C4	Visualization/Spatial Reasoning/Geometric Modeling (assembled and disassembled shapes, use of tools (e.g., ruler, compass) to create geometric figures)	7		0.0		0.0	5	71.4	1	14.3	1	14.3		0.0
	<b>Total</b>	<b>36</b>	<b>3</b>	<b>8.3</b>	<b>12</b>	<b>33.3</b>	<b>12</b>	<b>33.3</b>	<b>6</b>	<b>16.7</b>	<b>2</b>	<b>5.6</b>	<b>1</b>	<b>2.8</b>

Item	Measurement	N	Attention		Mem/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
			n	%	n	%	n	%	n	%	n	%	n	%
D1	Measurement Tools (clock, calendar, cylinder, tape measure, ruler)	15	2	13.3	1	6.7	4	26.7	1	6.7	6	40.0	1	6.7
D2	Concepts and Attributes of Measurement (length, weight, volume, capacity)	14	3	21.4	4	28.6	1	7.1	1	7.1	5	35.7		0.0
D3	Formulas of Measurement (area, perimeter, radius, diameter, circumference)	9	2	22.2	3	33.3	3	33.3		0.0	1	11.1		0.0
	<b>Total</b>	<b>38</b>	<b>7</b>	<b>18.4</b>	<b>8</b>	<b>21.1</b>	<b>8</b>	<b>21.1</b>	<b>2</b>	<b>5.3</b>	<b>12</b>	<b>31.6</b>	<b>1</b>	<b>2.6</b>
<b>Data Analysis, Statistics, And Probability</b>														
E1	Data and Statistics (data collection and organization, mean, median, mode, use of plots and graphs)	8	3	37.5	2	25.0	1	12.5	1	12.5	1	12.5		0.0
E2	Probability (cause/effect, probabilities, combinations of potential outcomes)	4	2	50.0	2	50.0		0.0		0.0		0.0		0.0
	<b>Total</b>	<b>12</b>	<b>5</b>	<b>41.7</b>	<b>4</b>	<b>33.3</b>	<b>1</b>	<b>8.3</b>	<b>1</b>	<b>8.3</b>	<b>1</b>	<b>8.3</b>	<b>0</b>	<b>0.0</b>

Table M.2. Math Instructional Methods and Level of Target Student's Participation (N = 15)

How much of math instructional time during the <b>past week</b> did the target student engage in each of the following?	0 None	1 Little (1 hour or less last week)	2 Some (2-4 hours last week)	3 Moderate (5-7 hours last week)	4 Considerable (8 or more hours last week)	level of student participation with each instructional activity			
						N No Participation	P Passive Participation	AS Active Participation with Supports	IA Independent Active Participation
Receive individualized instruction	6.7	6.7	73.3	6.7	6.7	6.7	6.7	80.0	6.7
Receive instruction in a small or large group	13.3	20.0	26.7	26.7	13.3	20.0	0	66.7	13.3
Collect, summarize, or analyze information	46.7	40.0	13.3	0	0	40.0	13.3	46.7	0
Complete symbolic math problems	26.7	20.0	33.3	13.3	6.7	26.7	6.7	60.0	6.7
Learn to use resources	20.0	60.0	13.3	6.7	0	6.7	26.7	66.7	0
Use hands-on or manipulatives to count or solve mathematical problems	0	20.0	40.0	20.0	20.0	0	6.7	66.7	26.7
Receive instruction with prompts or scaffolded support	6.7	13.3	46.7	20.0	13.3	6.7	20.0	66.7	6.7
Use computers, calculators or other assistive technology	6.7	6.7	46.7	26.7	13.3	6.7	13.3	46.7	33.3
Work independently	20.0	33.3	33.3	13.3	0	20.0	26.7	33.3	20.0
Perform assessment skills for data collection/grading	26.7	46.7	20.0	6.7	0	13.3	33.3	46.7	6.7
Take a test	40.0	53.3	6.7	0	0	33.3	20.0	40.0	6.7
Practice skills in different setting	26.7	20.0	33.3	20.0	0	20.0	33.3	46.7	0
Rote count	26.7	40.0	6.7	20.0	6.7	13.3	26.7	40.0	20.0
Practice skills with a variety of materials	0	40.0	33.3	20.0	6.7	0	33.3	60.0	6.7
Apply mathematical concepts to real world applications	6.7	26.7	46.7	13.3	6.7	0	20.0	73.3	6.7
Use work center	53.3	26.7	13.3	6.7	0	46.7	13.3	26.7	13.3
Learn/demonstrate skills in repeated opportunity/direct instruction trials	6.7	46.7	33.3	13.3	0	13.3	13.3	66.7	6.7

\* Rated only for target students who received little, some, moderate, or considerable instruction using this method.



*Table M.3. Frequency of Teachers Using Various Resources to Teach Math (N = 15)*

	Used to teach <b>Math</b>
<b>Materials</b>	
Commercially made materials adapted (by you or someone else) from general education	66.7
Commercially made manipulatives adapted (by you or someone else) from general education	66.7
Age-appropriate, commercially made print or text materials <i>designed for this type of student</i>	73.3
Age-appropriate, commercially made manipulatives <i>designed for this type of student</i>	60.0
Other commercially made print or text materials <i>designed for this type of student</i>	40.0
Other commercially made age-appropriate manipulatives <i>designed for this type of student</i>	46.7
Teacher-made books, workbooks, materials	66.7
Teacher-made manipulatives	73.3
Materials or lessons from websites	73.3
Computer	80.0
Assistive technologies (e.g., CheapTalk, Big Mac, Dynavox, text reader, talking calculator, etc.)	40.0
<b>Settings</b>	
Real life or natural setting materials (e.g., coins, community signs, telephones)	80.0
Inclusive class setting	46.7
Other settings in my school	66.7
Other settings in the community	33.3
<b>People</b>	
Nondisabled peers	33.3
Teachers from other disciplines (e.g., academic or special subject areas)	46.7
Another staff member at the school (e.g., speech/occupational/physical therapist)	73.3
Other special education teachers	60.0

*Table M.4. Teacher-Reported Influences on Math Instruction (N = 15)*

	No influence	Minimal influence	Moderate influence	Strong influence
State curriculum framework or content standards	6.7	26.7	26.7	40.0
Instructional materials	0	26.7	46.7	26.7
State alternate assessment requirements	0	20.0	33.3	46.7
State alternate assessment results from previous years	13.3	26.7	26.7	33.3
National math standards	26.7	40.0	13.3	20.0
Math content, materials, and/or activities used by general education teachers in my school	20.0	20.0	40.0	20.0
Training from my degree program (undergraduate or graduate)	13.3	40.0	33.3	13.3
Students' needs as documented on IEPs	0	0	6.7	93.3
School or district initiatives or priorities	13.3	33.3	13.3	40.0
Principal or other administrator expectations	13.3	40.0	20.0	26.7
Professional development experiences	13.3	26.7	20.0	40.0
Classroom assessment results	0	6.7	13.3	80.0

*Table M.5. Frequency of Reported Use of Classroom Assessments – Math (N = 15)*

	Not at all	< 1 time per month	1-4 times a month	1-4 times a week	> 4 times a week
Objective questions (e.g., true/false, multiple choice)	13.3	13.3	40.0	13.3	20.0
Performance on-demand (e.g., data collected on student performance of task analysis steps)	0	6.7	20.0	20.0	53.3
Teacher observation	0	0	26.7	26.7	46.7

Table S.1. Distribution of Science Content Taught, by Depth of Knowledge (N = 15)

Item	Earth and Space Science	Attention			Memorize/Recall		Perform		Comprehend		Apply		An/Syn/Eval		
		N	n	%	n	%	n	%	n	%	n	%	n	%	
A1	Structure and energy in the Earth's system. (Weather, minerals, rocks)	11		0.0	6	54.5	1	9.1	2	18.2	1	9.1	1	9.1	
A2	History, origin, and evolution of the earth and the universe. (Changes in the Earth's surface, Big Bang Theory)	6	1	16.7	2	33.3		0.0	2	33.3	1	16.7		0.0	
A3	Earth, the Solar System, and objects in the sky. (Moon phases, tides, tilt of the earth, motion of the Earth)	9	2	22.2	4	44.4	1	11.1	1	11.1	1	11.1		0.0	
	<b>Total</b>	<b>26</b>	<b>3</b>	<b>11.5</b>	<b>12</b>	<b>46.2</b>	<b>2</b>	<b>7.7</b>	<b>5</b>	<b>19.2</b>	<b>3</b>	<b>11.5</b>	<b>1</b>	<b>3.8</b>	
<b>Life Science (Biology)</b>															
B1	Characteristics of organisms (Organ systems, plants and animals, plant structures)	12	1	8.3	1	8.3	6	50.0	4	33.3		0.0		0.0	
B2	Life cycles of organisms (birth, development, reproduction, death)	8		0.0	2	25.0	3	37.5	3	37.5		0.0		0.0	
B3	Organisms and environments, populations, and ecosystems (extinction, food web, changes in ecosystems)	9	2	22.2	1	11.1	3	33.3	3	33.3		0.0		0.0	
B4	Cellular and molecular basis of life. (animal cells, multicellular organisms, organic molecules, types of cells, organelles)	7	3	42.9	2	28.6		0.0	2	28.6		0.0		0.0	
B5	Reproduction and heredity, diversity, adaptations, and evolution of organisms. (traits and genes, reproduction, Mendel, Punnett squares, DNA, natural selection, biodiversity)	5	1	20.0	1	20.0	2	40.0	1	20.0		0.0		0.0	
B6	Regulation and behavior of organisms (Instinct and learned behavior, animal and plant behaviors, interaction with the environment)	8	3	37.5	2	25.0		0.0	3	37.5		0.0		0.0	
B7	Matter, energy, and organization in living systems	7	1	14.3	1	14.3	3	42.9	2	28.6		0.0		0.0	
B8	Personal and Community Health (diseases, nutrition, fitness, environmental hazards)	11	1	9.1	3	27.3	3	27.3	1	9.1	2	18.2	1	9.1	
	<b>Total</b>	<b>67</b>	<b>12</b>	<b>17.9</b>	<b>13</b>	<b>19.4</b>	<b>20</b>	<b>29.9</b>	<b>19</b>	<b>28.4</b>	<b>2</b>	<b>3.0</b>	<b>1</b>	<b>1.5</b>	

Item	Physical Science (Chemistry and Physics)	Attention			Memorize/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
		N	n	%	n	%	n	%	n	%	n	%	n	%
C1	Properties of matter (size, shape, color, states of matter, weight and mass, elements and compounds, periodic table)	9	2	22.2	4	44.4	2	22.2	1	11.1		0.0		0.0
C2	Chemical and physical changes in matter. (changes in state, boiling and melting points, bonding, reactions, chemical equations, acids and bases)	9	5	55.6	2	22.2	1	11.1	1	11.1		0.0		0.0
C3	Motion and forces (speed and velocity, mass and inertia, vectors, Newton's laws, waves)	7	4	57.1	1	14.3		0.0	2	28.6		0.0		0.0
C4	Energy (conservation of energy, forms of energy, electricity, magnets, light, sound, heat, potential and kinetic energy, temperature)	10	2	20.0	2	20.0	2	20.0	4	40.0		0.0		0.0
C5	Atomic theory (Atoms and molecules, fission and fusion, nuclear reactions, Lewis dot structures)	1		0.0		0.0	1	100.0		0.0		0.0		0.0
	<b>Total</b>	<b>36</b>	<b>13</b>	<b>36.1</b>	<b>9</b>	<b>25.0</b>	<b>6</b>	<b>16.7</b>	<b>8</b>	<b>22.2</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>
<b>Technology /Engineering</b>														
D1	Materials and Tools (uses of materials, proper uses, machines, technology, invention)	11	2	18.2	3	27.3	2	18.2	2	18.2	1	9.1	1	9.1
	<b>Total</b>	<b>11</b>	<b>2</b>	<b>18.2</b>	<b>3</b>	<b>27.3</b>	<b>2</b>	<b>18.2</b>	<b>2</b>	<b>18.2</b>	<b>1</b>	<b>9.1</b>	<b>1</b>	<b>9.1</b>
<b>History/Nature of Science</b>														
E1	Science as a human endeavor. (diversity among scientists, talents and skills of scientists)	5	3	60.0	1	20.0		0.0	1	20.0		0.0		0.0
E2	Nature of science (scientific method, hypotheses, laws, and theories)	8	5	62.5		0.0	1	12.5		0.0	2	25.0		0.0
E3	History of science (Science in different cultures, rate of advancement, scientific revolutions)	4	2	50.0	1	25.0		0.0	1	25.0		0.0		0.0
	<b>Total</b>	<b>17</b>	<b>10</b>	<b>58.8</b>	<b>2</b>	<b>11.8</b>	<b>1</b>	<b>5.9</b>	<b>2</b>	<b>11.8</b>	<b>2</b>	<b>11.8</b>	<b>0</b>	<b>0.0</b>

Item	Science as Inquiry	N	Attention		Memorize/Recall		Perform		Comprehend		Apply		An/Syn/Eval	
			n	%	n	%	n	%	n	%	n	%	n	%
F1	Understanding of and abilities necessary to do scientific inquiry. (Asking questions, forming hypotheses, conducting experiments)													
		11	3	27.3	4	36.4	1	9.1	1	9.1	2	18.2		0.0
	<b>Total</b>	<b>11</b>	<b>3</b>	<b>27.3</b>	<b>4</b>	<b>36.4</b>	<b>1</b>	<b>9.1</b>	<b>1</b>	<b>9.1</b>	<b>2</b>	<b>18.2</b>	<b>0</b>	<b>0.0</b>

Table S.2. Science Instructional Methods and Level of Target Student's Participation (N = 15)

						Level of student participation			
	0 None	1 Little (1 hour or less last week)	2 Some (2-4 hours last week)	3 Moderate (5-7 hours last week)	4 Considerable (8 or more hours last week)	N No Partici- pation	P Passive Partici- pation	AS Active Participa- tion with Supports	IA Independent Active Participation
Receive individualized instruction	26.7	33.3	20.0	6.7	13.3	0	9.1	90.9	0
Receive instruction in a small group	20.0	33.3	6.7	40.0	0	0	16.7	75.0	8.3
Collect, summarize, or analyze information	46.7	26.7	26.7	0	0	0	50.0	50.0	0
Engage in inquiry processes	46.7	26.7	20.0	6.7	0	0	50.0	50.0	0
Learn to use resources	26.7	46.7	6.7	20.0	0	18.2	27.3	54.5	0
Use hands-on materials or manipulatives	20.0	40.0	20.0	13.3	6.7	20.0	0	73.3	6.7
Receive instruction with prompts or scaffolded support	20.0	40.0	26.7	6.7	6.7	20.0	26.7	46.7	6.7
Use computers or other assistive technology	40.0	26.7	13.3	20.0	0	33.3	6.7	46.7	13.3
Work independently	40.0	33.3	26.7	0	0	33.3	40.0	13.3	13.3
Perform assessment skills for data collection/grading	46.7	40.0	13.3	0	0	46.7	13.3	33.3	6.7
Take a test	53.3	40.0	6.7	0	0	60.0	13.3	20.0	6.7
Practice skills in different setting	66.7	26.7	6.7	0	0	60.0	2.0	20.0	0
Practice skills with a variety of similar materials	46.7	40.0	13.3	0	0	26.7	40.0	33.3	0
Engage in read aloud activities	20.0	53.3	13.3	6.7	6.7	26.7	20.0	46.7	6.7
View multi media presentations	40.0	40.0	6.7	13.3	0	33.3	33.3	26.7	6.7
Engage in speech or presentation	73.3	20.0	0	6.7	0	86.7	0	13.3	0
Use work center	66.7	26.7	0	6.7	0	60.0	20.0	20.0	0
Learn/demonstrate skills in repeated opportunity/direct instruction trials	33.3	33.3	26.7	6.7	0	26.7	26.7	46.7	0

*Table S.3. Frequency of Teachers Using Various Resources to Teach Science (N = 15)*

	Used to teach Science
<b>Materials</b>	
Commercially made materials adapted (by you or someone else) from general education	80.0
Commercially made manipulatives adapted (by you or someone else) from general education	53.3
Age-appropriate, commercially made print or text materials <i>designed for this type of student</i>	26.7
Age-appropriate, commercially made manipulatives <i>designed for this type of student</i>	20.0
Other commercially made print or text materials <i>designed for this type of student</i>	33.3
Other commercially made age-appropriate manipulatives <i>designed for this type of student</i>	26.7
Teacher-made books, workbooks, materials	60.0
Teacher-made manipulatives	66.7
Materials or lessons from websites	66.7
Computer	60.0
Assistive technologies (e.g., CheapTalk, Big Mac, Dynavox, text reader, talking calculator, etc.)	40.0
<b>Settings</b>	
Real life or natural setting materials (e.g., coins, community signs, telephones)	46.7
Inclusive class setting	53.3
Other settings in my school	53.3
Other settings in the community	26.7
<b>People</b>	
Nondisabled peers	33.3
Teachers from other disciplines (e.g., academic or special subject areas)	53.3
Another staff member at the school (e.g., speech/occupational/physical therapist)	46.7
Other special education teachers	53.3

*Table S.4. Teacher-Reported Influences on Science Instruction (N = 15)*

	No influence	Minimal influence	Moderate influence	Strong influence
State curriculum framework or content standards	14.3	7.1	28.6	50.0
Instructional materials	7.1	21.4	50.0	21.4
State alternate assessment requirements	28.6	14.3	14.3	42.9
State alternate assessment results from previous years	53.8	23.1	7.7	15.4
National science standards	23.1	53.8	0	23.1
Science content, materials, and/or activities used by general education teachers in my school	14.3	7.1	35.7	42.9
Training from my degree program (undergraduate or graduate)	35.7	35.7	21.4	7.1
Students' needs as documented on IEPs	14.3	0	28.6	57.1
School or district initiatives or priorities	21.4	14.3	21.4	42.9
Principal or other administrator expectations	21.4	35.7	14.3	28.6
Professional development experiences	21.4	14.3	35.7	28.6
Classroom assessment results	21.4	0	14.3	64.3

*Table S.5. Frequency of Reported Use of Classroom Assessments – Science (N = 15)*

	Not at all	< 1 time per month	1-4 times a month	1-4 times a week	> 4 times a week
Objective questions (e.g., true/false, multiple choice, yes/no)	13.3	13.3	13.3	46.7	13.3
Performance on-demand (e.g., task analysis steps, repeated trials, incidence recording)	13.3	6.7	20.0	46.7	13.3
Teacher observation (e.g., anecdotal or descriptive data)	13.3	6.7	13.3	53.3	13.3