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ABSTRACT

This document records a study made on the amount of time students spend on academic learning. Data were collected in two different ways: (1) Teachers kept logs of the content of instruction and the amount of time spent in different content areas. Records of individual students were kept throughout the year, first on a daily basis and later on a weekly basis. These logs provided a detailed record of the time allocated to different skill areas. (2) Observers recorded the amount of time students spent actually engaged in learning. Engaged or active learning time is that subset of the allocated time when a student appears to be attending to the learning task. Teacher logs were collected at two grade levels, the second and the fifth, and in two subjects, reading and mathematics. A comparison was made between time allocations and use and student academic achievement. The conclusion was reached that monitoring the use of time in the classroom is an important factor teaching effectiveness. (JD)

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ALLOCATED AND ENGAGED TIME IN DIFFERENT CONTENT AREAS OF SECOND AND FIFTH GRADE READING AND MATHEMATICS CURRICULUM

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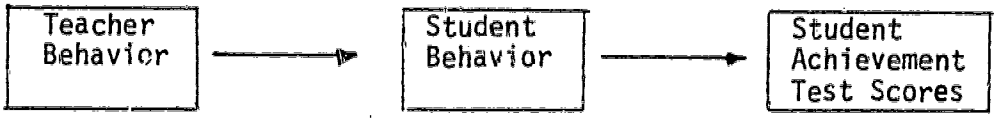
Introduction

An enduring question in educational research is "What instructional variables influence student achievement?" In addressing this question, the Beginning Teacher Evaluation Study (Far West Laboratory, 1975, 1976) has focused on the pivotal role of student classroom behavior. Student learning is a phenomenon that takes place in classrooms over time. Student achievement test scores provide an imperfect, distal measure of this learning. In order to influence achievement, the teacher must first influence classroom learning. A diagram of this model is shown below.



One facet of student behavior that has been of particular interest is the amount of time students spend on academic learning. In each elementary school day, around 240 to 300 minutes are available for student instructional activities. Teachers (and students) allocate this time to different subject matter areas. The amount of time allocated to a particular area places a boundary on the amount of learning that can take place in that area, thus influencing student achievement.

Variability in time allocation across different classes is surprisingly high, even in common areas of instruction. In grade 2, it is generally agreed that one high priority goal is to teach the students basic skills in reading and mathematics. Virtually all students receive direct, concentrated

reading and mathematics instruction throughout the year. Yet when one looks beyond this uniform goal, there is considerable diversity in how much classroom time is actually allocated to instruction in basic skills. And within "reading" time or "math" time, there is variability in the amount of time spent on different skills. Even for classes using the same curriculum materials, time allocations may vary.

Allocated time places an upper bound on the amount of learning time that can take place. Within this time period, a student will spend part of the time actively engaged in learning and part of the time not engaged. The proportion of allocated time that is converted into real engaged learning time also varies dramatically from class to class and from student to student within a class. Engaged learning time is the variable hypothesized to relate most closely to student achievement.

The purpose of this paper is to present descriptive data on classroom learning time. Both allocated and engaged time will be reported. Data will be presented at the classroom level, showing differences between classes, and at the level of individual students, showing differences between students within a class. Comparisons will be made between time distributions in narrowly defined specific content areas and time distributions in more general content areas.

Data Collection Procedures[1]

Data were collected in two different ways: 1) Teachers kept logs of the content of instruction and the amount of time spent in different content areas. Records were kept throughout the year, first on a daily

[1]For a more complete description of procedures see Marliave, Fisher, and Filby (1977), or Filby and Dishaw (1976).

basis and later on a weekly basis. Information was recorded for individual students. These logs provide a detailed record of the time allocated to different skill areas. 2) observers recorded the amount of time students spent actually engaged in learning. Engaged or active learning time is that subset of the allocated time when a student appears to be attending to the learning task. Observation took place in six grade two classes, for approximately seven continuous days in each class. Observed engaged time provides the best estimate of the actual learning time put in by a student. Engaged time can be compared to allocated time to determine the engagement rate for individual students and for classes.

Teacher Logs of Allocated Time. As part of the research carried out in Phase III-A of the Beginning Teacher Evaluation Study (Far West Laboratory, 1975), teachers were asked to keep records of time spent on reading and mathematics. For a period of eight weeks, during October and November, teachers kept daily lesson-plan type logs which accounted for all periods of reading and mathematics instruction. For instance, if students worked on reading from 9:00 to 9:40, the teacher would mark off this time block and indicate the skills in reading each student or group of students worked on. A number of specific content areas, such as decoding consonant blends, compound words, comprehension of events, or oral reading practice, were listed and defined for teachers. Teachers chose from this list in describing the content of reading instruction. Reading-related areas such as spelling, grammar, creative writing, or dictionary skills, were also included on the list. Lists of content areas in mathematics were also provided.

From these records it was possible to estimate the amount of time spent on different skills by individual students in the class. Each day's log

was broken up into a series of events for each student with each event corresponding to one specific content area. Time in each content area was then summed up over the whole eight-week period. These total time figures give a picture of how instruction accumulates over time for different students in different classes.

During the period from January through March, teachers kept a weekly checklist log. This log used the same time categories as the earlier lesson-plan logs. Teachers were asked to draw on their familiarity with time allocations and estimate the approximate amount of time spent on each content area in each weekly period. Again, logs were processed to give total time estimates for each student in each content area over the whole 10-week period.

Observation of Engaged Time. Engaged learning time was assessed by direct observation. In each of six grade two classes, an observer was present for seven continuous days in the October-November period. Observers recorded time in general content areas. Engagement was judged on the basis of behavioral cues. Clear off-task behavior or lack of attention resulted in subtracting time from the total possible. Tasks involving a non-academic component, such as a math ditto which requires coloring, also resulted in subtracting time, since time spent coloring is not time spent engaged in learning mathematics content.

Observers completed a log (analogous to the teacher log) at the end of each day of observation. For each student, the total time allocated to reading (from the observer logs) and the total engaged time in reading (from direct observation) were calculated. An observed engagement rate for

reading was then computed for each student by taking the ratio of total engaged time in reading to total time allocated to reading. A second engagement rate was calculated for each student by performing the analogous calculation for engaged and allocated time in mathematics.

Sample. Teacher logs were collected at two grade levels - second and fifth - and in two subjects - reading and mathematics. Approximately eight teachers participated in each cell of this 2 X 2 design. All teachers were volunteers in the San Francisco Bay area. Observation took place in six grade two classes where teacher logs were also being kept.

Allocated Time Data

Consider first the overall amount of time allocated to instruction in reading and mathematics. Summary data for six grade two classes from the October-November period are shown in Table 1.

Insert Table 1 Here

Each of these classes had about the same amount of time in the school day. The way the time was used differed from one class to another. In class 2, there was a heavy overall emphasis on the basic skills. This class spent more time in reading than any other class and was tied for top in mathematics. Almost two-thirds of the school day in class 2 was spent on basic skills. In contrast, class 5 spent only about half as much time in reading and was also lower in mathematics. Over the course of eight weeks of school, a student in class 2 received 39 more hours of instruction in the basic skills than a student in class 5. Saying the same thing another way, class 2 received as much instruction in 6 weeks as class 5 got in 8 weeks.

Table 1

Proportion of the Day Allocated to Reading and Mathematics

in Grade 2 Classes

Class	Length of school day for students (minutes)	Average minutes per student per day allocated to reading and reading-related instruction	Proportion of school day allocated to reading and reading-related instruction	Average minutes per student per day allocated to mathematics instruction	Proportion of school day allocated to mathematics instruction
1	255	87.8 (5.8)[a]	.34	35.6 (5.1)	.14
2	240	108.8 (6.1)	.45	47.6 (2.5)	.20
3	250	94.9 (7.7)	.38	48.8 (4.4)	.20
4	235	70.8 (6.0)	.30	26.1 (3.3)	.11
5	250	60.7 (14.7)	.24	37.8 (3.6)	.15
6	255	93.3 (6.5)	.37	24.1 (1.8)	.09
Average of class means (unweighted)	248	86.1	.35	36.7	.15

[a]Standard deviations are shown in parentheses.

Within reading and mathematics, differences in time allocation are equally striking. Tables 2 through 5 show frequency distributions for six grade two classes of the amount of time allocated to specific content areas in reading and mathematics. Additional tables showing time allocation to specific content areas in grades 2 and 5 are located in Appendix A.

Insert Tables 2, 3, 4, and 5 Here

Tables 2 and 3 show time allocations in two areas of grade 2 mathematics - subtraction without regrouping, and place value. Differences between classes are readily apparent in these tables. In subtraction without regrouping, all classes received instruction; but class average time allocations differed by as much as 4 to 1. In place value, the differences are even greater. Some classes received almost no instruction in place value while one class received up to 300 minutes.

One particularly interesting comparison in Tables 2 and 3 is between class 2 and class 3. These two classes spent almost exactly the same amount of time overall on mathematics (as shown in Table 1). Moreover, they used the same basic textbook in both classes (Modern School Mathematics, published by Houghton Mifflin). The math program as implemented differed from one class to the other. Class 2 emphasized basic computation while class 3 allocated a great deal of time to place value. Curriculum materials may provide a starting point in determining the content of instruction; but, at least at grade 2, teachers seem to pace and/or supplement the program in different ways.

Differences between classes are also apparent in reading. Tables 4 and 5 show time allocated to practice reading and to compound words. It

Table 2

Allocated Time in

Subtraction without Regrouping

Allocated Time (minutes)[a]	Number of Students						
	Overall	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
0-50							
51-100	6				6		
101-150	7				7		
151-200	3				1		2
201-250	15	1		2			12
251-300	13	12		1			
301-350	6			4		2	
351-400	18	1		13		3	1
401-450	3					3	
451-500	24	1	2			18	3
501-550	7	1	6				
551-600	10		10				
Median	369	289	555	362	115	470	240
Mean	357	311	546	347	109	453	275
S.D.	143	76	35	50	34	48	95

[a]Rows represent different amounts of total allocated time in subtraction without regrouping accumulated over a period of approximately 37 days. Data are based on teacher logs.

Table 3

Allocated Time in Place Value

Allocated Time (minutes)[a]	Number of Students						
	Overall	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
0-25	19	1					18
26-50	15	15					
51-75	2		1		1		
76-100	4		1		3		
101-125	7				2	5	
126-150	16		3		3	10	
151-175	28		13		4	11	
176-200	1				1		
201-225	1			1			
226-250	1			1			
251-275	4			4			
276-300	14			14			
Median	133	30	156	283	130	140	12
Mean	127	30	146	272	127	139	15
S.D.	88	2	26	21	34	15	3

[a]Rows represent different amounts of total allocated time in place value accumulated over a period of approximately 37 days. Data are based on teacher logs.

Table 4

Allocated Time in Practice Reading

Allocated Time (minutes)[a]	Number of Students						
	Overall	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
201-300	1					1	
301-400	1					1	
401-500	13					12	1
501-600	12	5			2	2	3
601-700	21	11			2	2	6
701-800	16		1		4	7	4
801-900	12		5	1	2	1	3
901-1000	11		5	2	3		1
1001-1100	8		4	3	1		
1101-1200	6		3	3			
1201-1300	5			5			
1301-1400	6			6			
Median		612	978	1222	788	486	663
Mean		604	977	1178	803	549	693
S.D.		37	108	151	153	147	117

[a]Rows represent different amounts of total allocated time in practice reading (oral and silent, words and stories) accumulated over a period of approximately 37 days. Data are based on teacher logs.

Table 5

Allocated Time in

Compound Words

Allocated Time (minutes)[a]	Number of Students						
	Overall	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
0-30	47		18			13	16
31-60	20			1	12	7	
61-90	34	10		15	2	6	1
91-120	5			4			1
121-150	4	4					
356	2	2					
Median		90	13	83	52	20	5
Mean		131	13	80	52	34	17
S.D.		91	4	16	8	30	26

[a]Rows represent different amounts of total allocated time in compound words accumulated over a period of approximately 37 days. Data are based on teacher logs.

is particularly interesting to look at the amount of time spent in practice reading (Table 4). This category includes drill on reading sight words, oral reading of reading textbooks, reading along while another student reads aloud, silent reading of reading textbooks, and silent reading of library books or other reading "for pleasure." Counting all these activities where students engage in sustained reading, total time is remarkably low in some classes. As little as 600 minutes, an average of 15 minutes per day, may be spent actually reading. This is at most one-fourth of the day's time in reading and reading related activities. Some reading experts question the value of many of the activities that are labeled "reading." It is at least informative to see how much (or how little!) time is spent reading in different classes.

The frequency distributions in Tables 2 through 5 also allow one to examine within-class variation in time allocations. The range of time allocations within a class is considerably less than the range across classes. In many cases, particularly for narrowly-defined content areas, within-class allocation is strikingly uniform. In subtraction without regrouping, place value, and compound words, the most common pattern is one where most of the students in the class fall in the same time category. Within-class variability increases in a general category like practice reading, where a number of more specific activities are combined.

Differences in time allocation within a class come from several sources. A major source of differences is student absences. The place value data for classes 1, 2, and 3 show cases where student absences cause stragglers in the distribution. Other than this variability due to absence, the same amount of place value instruction has been provided

for all students in these classes. Classes 4 and 5 show a different pattern in place value allocation. Here, within-class differences reflect real differences in allocation. Class 5 has small group instruction in mathematics. Apparently the groups spent somewhat different amounts of time on place value. In class 4, students work at stations and have considerable choice about which stations to attend. Under these conditions, the spread in time allocation increases, as a reflection of different student preferences. One final source of differences is illustrated in Tables 2 and 5. Here there are classes which have positive outliers. A few students in classes 1 and 6 received extra practice in basic computation. A few students in these same classes also received special instruction in compound words. Most often these positive outliers occur in situations where extra personnel are available for tutoring or where individualized programs are implemented school-wide and students are traded across classes.

Engagement Rates

Although time allocations are relatively similar within a class, students spend quite different amounts of time actively engaged in learning. For the students in the six grade two classes reported above, observed active learning time was compared to observed allocated time in a seven-day period. Overall engagement rates were calculated for reading and for mathematics. The engagement rate represents the percentage of allocated time that the student spent actually working. Frequency distributions of engagement rates in mathematics are shown in Table 6.

Insert Table 6 Here

Table 6

Engagement Rates in Mathematics

for Grade 2 Students

Engagement Rate	Number of Students						
	Overall	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
0-9%							
10-19%							
20-29%	7					7	
30-39%	27	6		5	3	11	2
40-49%	32	6		11	2	5	8
50-59%	16	2	1	4	2	3	4
60-69%	14	1	4		7		3
70-79%	11	1	8				1
80-89%	3		3				
90-100%	2		2				
Mean		47%	74%	44%	54%	37%	51%

The observed engagement rate was calculated by taking the ratio for each student of engaged time in mathematics (direct observation) and allocated time in mathematics (observer logs).

In general, engagement rates averaged about 50%. This rate causes one to reevaluate the magnitude of the allocated time figures given previously. Classes 4 and 6 allocated an average of 25 minutes a day to mathematics. This figure seems low enough. If only 50% of this time was real learning time, this means that only about 13 minutes a day were spent actually learning mathematics. No wonder it takes a full school year to generate noticeable gains in achievement.

Engagement rates varied considerably both within and between classes. The lowest engagement rate for an individual student was 23%; the highest was 91%. Within each class, there was at least a 30% difference between the lowest and the highest rates. Thus, the biggest source of variability in time within a class tends to be in the rate of engagement rather than in allocated time.

Note that class 2 had a generally higher rate of engagement than the other classes. In reading, the engagement rate for class 2 went up to 85%. The most interesting thing about this is that class 2 was also highest in allocated time. Combining high allocated time with a high engagement rate, class 2 had much more learning time than the other classes. Those teachers who believe that second graders cannot concentrate on academics for very long should visit class 2. This class seems to exemplify the pattern of direct instruction and academic press discussed by Berliner and Rosenshine (1976).

Implications

The differences reported above indicate that instructional time must be taken into account in any description of classroom processes. One important area of study is the relationship between time and achievement.

One way to approach this question is in terms of direct effects - does time in content X produce learning in content X. We also need to examine indirect or transfer effects. Time in X may contribute to the learning of Y, either through transfer of knowledge or through the facilitation of later learning. This concept of facilitation suggests the need to study the sequence of instruction. Whether a skill is learned before, after, or at the same time as another skill may influence the effectiveness of the learning time.

A focus on instructional time also calls attention to a particular set of teacher behaviors. How teachers decide what to spend time on becomes a critical factor. Teachers must decide when to introduce a skill, what entering characteristics are needed before the time will be productive. Teachers must also decide when to stop instruction. This applies in both the short term and the long term. Teachers must pace weekly lessons, and decide when to continue work in the same skill and when to introduce variety. They must know when students have received enough instruction in an area to reach an acceptable level of mastery.

In addition to deciding how to spend time, teachers need to monitor the use of time in the classroom. Time is often lost through transitions or waiting for instruction. Features of the classroom schedule, organization, or atmosphere may influence engagement rates. Specific monitoring behaviors such as timely reminders to get back to work may also play a role in maintaining engagement.

A thorough investigation of the factors that influence and are influenced by instructional time could contribute greatly to our understanding of how students learn.

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APPENDIX A

Eight tables of time allocation data are included. Cell entries in each table are class means in minutes per student allocated to instruction in a specific content area over several months of instruction. Tables labeled "A-B" report time accumulated over approximately 8 weeks in October and November. Tables labeled "B-C" report time accumulated over approximately 10 weeks in January through March.

Class Average Allocated Time
Grade 2 Reading, A to B

	CONTENT		CLASS 1	2	3	4	5	6	7	8	9
DECODING	Single consonants	1.	106	9	185	41	71	51	174	357	186
	Consonant blends and digraphs	2.	74	151	55	103	64	29	24	104	234
	Variant consonants (c,g)	3.	129	16	3	25	34	10	4	17	1
	Vowels--short	4.	236	209	122	75	96	267	79	202	200
	Vowels--long with final e	5.	151	32	141	62	54	137	29	18	130
	Vowels--digraphs	6.	110	26	16	33	62	34	15	33	114
	Vowels-dipthongs	7.	138	8	0	8	7	23	15	10	12
	Vowels--with r (car)	8.	84	15	12	12	52	14	0	5	6
	Complex, multisyllabic	9.	19	0	0	0	0	0	1	0	6
	Silent letters	10.	43	0	2	11	3	0	0	0	6
	Sound substitution, rhyming	11.	143	11	115	79	140	62	137	102	9
	Automaticity of decoding	13.	16	196	218	190	32	30	196	99	43
CONTEXT CLUES	Any use of format where child must choose a word to fill a blank	15-20.	200	24	117	107	76	78	143	88	220
WORD STRUCTURE	Compound words	21.	131	13	80	52	34	17	47	9	104
	Identification of root words	22.	136	4	5	0	8	115	29	0	0
	Prefixes--meaning and use	23.	13	9	0	0	3	5	7	0	0
	Suffixes--meaning and use	24.	135	30	10	5	168	7	53	68	117
	Contractions	25.	150	0	0	0	10	17	0	0	0
	Syllables	26.	66	37	1	3	32	20	0	11	2
WORD MEANING	Synonyms	28.	14	0	0	0	2	6	13	0	95
	Vocabulary (definitions)	30.	71	0	62	118	24	163	53	77	25
	Pronoun reference	31.	9	0	0	8	0	0	0	8	0
	Multimeaning words in context	32.	0	0	5	0	0	4	7	0	0
	Unfamiliar words in context	33.	39	3	0	71	0	55	0	6	0
COMPREHENSION OF TEXT	Understanding event detail	36.	13	85	32	51	64	15	61	20	51
	Understanding descriptions	37.	0	0	7	59	36	1	66	7	30
	Understanding relationships	38.	24	0	47	0	44	4	33	16	4
	Understanding main ideas	39.	11	78	109	111	15	3	70	25	18
	Direct recall of information	40, 41.	46	85	22	74	23	29	75	3	76
	Inference, interpretation	42, 43.	15	0	0	0	0	21	39	22	0
APPLICATION	Understanding directions	46.	2	0	38	102	14	7	47	28	35
	Picture interpretation to aid comprehension	47.	7	0	19	66	0	0	17	18	0
	Table of contents	49.	0	0	34	0	0	6	0	10	0
	Understanding of signs	51.	2	0	7	0	0	0	0	27	0
	Understanding letters	52.	1	0	0	0	0	0	0	7	0
GENERAL ACTIVITIES	Sight words (general practice at reading single words; no specific decoding emphasis)	12.	73	4	196	154	10	134	255	130	12
	Spelling (use specific code, if applicable)	58.	168	1007	449	75	96	594	369	330	232
	Oral reading of text	56.	302	224	293	77	145	52	153	104	64
	Silent reading of text +55 +57	62.	182	245	470	382	206	280	249	312	229
	Creative writing	60.	71	568	0	109	19	201	74	2	0
	Penmanship and copying	64.	7	143	62	0	39	333	159	33	631
	Listening (to story or tape)	63.	15	326	262	57	126	342	85	267	252
	Grammar	59.	49	0	43	0	33	39	64	20	634

Class Average Allocated Time
Grade 2 Reading, B to C

	CONTENT		CLASS 8	10	11	12	14	16	9	13	17
DECODING	Single consonants	1.	49	24	360	70	12	84	230	222	164
	Consonant blends and digraphs	2.	114	69	175	280	129	156	120	293	150
	Variant consonants (c,g)	3.	71	9	249	5	77	4	38	155	46
	Vowels--short	4.	371	84	198	105	24	107	285	325	396
	Vowels--long with final e	5.	427	40	100	135	109	141	165	230	207
	Vowels--digraphs	6.	120	16	60	85	232	91	78	270	193
	Vowels-dipthongs	7.	63	13	60	45	83	151	58	223	100
	Vowels--with r (car)	8.	107	4	38	15	17	16	0	225	0
	Complex, multisyllabic	9.	57	0	0	0	8	13	0	93	0
	Silent letters	10.	89	0	0	70	73	82	0	175	17
	Sound substitution, rhyming	11.	141	0	176	50	203	68	268	225	143
	Automaticity of decoding	13.	60	71	60	50	32	41	150	415	6
CON-TEXT CLUES	Any use of format where child must choose a word to fill a blank	15-20.	66	96	329	610	11	372	460	138	549
WORD STRUCTURE	Compound words	21.	136	60	95	25	147	41	90	60	0
	Identification of root words	22.	164	33	129	0	45	166	75	30	11
	Prefixes--meaning and use	23.	26	42	0	0	67	24	0	0	0
	Suffixes--meaning and use	24.	43	60	0	0	163	147	225	150	107
	Contractions	25.	214	38	218	15	145	13	120	0	0
	Syllables	26.	137	4	0	5	367	124	30	128	37
WORD MEANING	Synonyms	28.	163	33	60	30	59	8	85	60	106
	Vocabulary (definitions)	30.	129	20	238	30	36	41	188	153	40
	Pronoun reference	31.	86	0	0	155	0	0	73	50	0
	Multimeaning words in context	32.	120	0	18	0	5	12	108	60	0
	Unfamiliar words in context	33.	137	20	20	45	36	113	63	163	0
COMPREHEN-SION OF TEXT	Understanding event detail	36.	131	253	235	245	399	236	223	200	266
	Understanding descriptions	37.	0	24	0	55	11	13	210	113	186
	Understanding relationships	38.	29	246	20	10	11	71	228	133	197
	Understanding main ideas	39.	51	293	238	228	3	208	222	250	391
	Direct recall of information	40, 41.	86	253	149	135	107	149	210	80	600
	Inference, interpretation	42, 43.	51	60	0	10	9	111	208	65	14
APPLICATION	Understanding directions	46.	167	0	145	370	84	12	160	143	240
	Picture interpretation to aid comprehension	47.	43	0	40	140	0	17	163	118	11
	Table of contents	49.	137	0	0	0	0	5	65	33	0
	Understanding of signs	51.	0	0	0	0	0	0	5	0	0
	Understanding letters	52.	0	0	0	0	0	1	0	68	0
GENERAL ACTIVITIES	Sight words (general practice at reading single words; no specific decoding emphasis)	12.	40	73	305	180	120	120	575	293	186
	Spelling (use specific code, if applicable)	58.	247	811	271	495	209	0	595	344	450
	Oral reading of text	56.	229	413	709	315	317	360	420	218	151
	Silent reading of text	62.	46	1006	249	1250	347	330	435	278	337
	Creative writing	60.	283	616	133	450	20	480	225	60	251
	Penmanship and copying	64.	267	240	505	215	149	1000	185	148	327

Class Average Allocated Time
Grade 2 Mathematics, A to B

CONTENT	CLASS 1	2	3	4	5	6	7	8
I COMPUTATION								
1. Addition without regrouping	284	285	271	210	278	363	124	344
2. Addition with regrouping	50	25			186	638		2
3. Subtraction without regrouping	226	219	178	93	373	271		187
4. Subtraction with regrouping		11			239	1		
5. Multiplication					98			
6. Speed tests in addition	34					15		52
7. Speed tests in subtraction	29			3		15		
8. Number sentences involving <, >, =, +, −.	29	119	10	122	13	66	306	20
9. Family of facts	62	206	83	291	96	36		172
10. Number patterns	67	75		12	96	134		184
25. Missing addends	56	36	132	178	102	46		66
II CONCEPTS AND APPLICATION								
12A. Numerals 12B. Ordinals	9	111	15	78	137	11	481	65
13. Place value	42	45		25	70	318	96	63
14. Fractions	69			40		24	66	74
15. Properties	10			127	29	90		7
16. Associative property with expanded notation	34					12		17
17. Money	14	64		67	3	16	15	91
18. Linear measurement	43			61		3		108
19. Measurement concepts	9			48				54
20. Geometric figures	103		36	42		2	65	30
21. Curves and points	33			76	27			20
26. Developmental activities			548	57		43	51	70
23. Word problems	11			25		108	141	33
11,22,24 - Other content	85	14	33	53	125	101	124	101

Class Average Allocated Time
Grade 2 Mathematics, B to C

CONTENT	CLASS 1	2	3	4	5	6	7	8
I COMPUTATION								
1. Addition without regrouping	174	266	108	715	465	252	470	227
2. Addition with regrouping	579	480	35	106	249	447		310
3. Subtraction without regrouping	97	94	248	422	365	172	464	150
4. Subtraction with regrouping	366	102		63	253	690		180
5. Multiplication	60	80		61	60	222	119	50
6. Speed tests in addition	110	112		58			196	119
7. Speed tests in subtraction	91	12		39			196	99
8. Number sentences involving $<, >, =, +, -$.	19		105	23	20	45	64	149
9. Family of facts		168		126	233		8	128
10. Number patterns		28	8	153	149	97		140
25. Missing addends			70	87	267	20	166	258
II CONCEPTS AND APPLICATION								
12A. Numerals				98	215		13	69
12B. Ordinals			170	20				9
13. Place value	60	542	70	337	69	20	219	417
14. Fractions	100			3		208	238	60
15. Properties	100			1	26			
16. Associative property with expanded notation	79			433		20		317
17. Money	189	46		24	37	138	23	120
18. Linear measurement				3	20	153	20	30
19. Measurement concepts		8		2	24	120		30
20. Geometric figures	50	76	45	18	29	18		100
21. Curves and points		6		13	74	38		50
26. Developmental activities		20	865	2	273	13		160
23. Word problems		24		119		193	427	159

Class Average Allocated Time
Grade 5 Reading, A to B

	CONTENT		CLASS 1	2	3	4	5	10	12	15
DECODING	Variant consonants (c,g)	3.	0	0	6	0	4	0	6	12
	Vowels--short	4.	0	0	7	7	21	19	0	2
	Vowels--long	5.	0	0	26	27	56	12	0	2
	Vowels--with r	8.	0	0	104	53	6	0	0	2
CON-TEXT CLUES	Any use of format where child must choose a word to fill a blank.	15-20.	37	25	174	179	185	81	79	81
WORD STRUC-TURE	Identification of root words	22.	0	0	35	12	3	0	2	30
	Prefixes--meaning and use	23.	0	7	97	8	2	14	23	106
	Suffixes--meaning and use	24.	0	7	112	33	22	43	37	85
	Syllables	26.	35	17	1	38	8	226	19	9
WORD MEANING	Synonyms	28.	0	35	15	19	40	0	0	5
	Vocabulary (definitions)	30.	21	106	262	270	16	86	171	75
	Pronoun reference	31.	0	33	53	62	0	0	0	0
	Multimeaning words in context	32.	11	15	9	0	7	6	11	39
	Unfamiliar words in context	33.	0	25	48	0	64	6	9	87
	Figurative language	34.	30	17	60	18	1	0	10	23
COMPREHENSION OF TEXT	Understanding event detail	36.	11	85	136	22	44	27	17	34
	Understanding description	37.	0	9	181	0	45	11	68	23
	Understanding relationships	38.	124	36	207	137	44	16	20	61
	Understanding main ideas	39.	113	122	145	317	48	107	183	52
	Literal recall	40.	127	40	49	77	33	105	8	44
	Translation of ideas, paraphrase	41.	85	34	111	99	71	21	14	19
	Synthesis of ideas, inference	42.	50	28	205	76	13	0	35	71
	Going beyond the text, prediction	43.	79	23	135	64	8	6	19	6
	Recognizing facts and opinions	44.	53	13	98	0	44	0	5	7
	General comprehension	45.	10	33	73	348	100	147	42	129
APPLICATION	Understanding directions	46.	12	20	29	8	39	30	0	64
	Reference sources in books (table of contents, index, glossary)	49.	218	9	69	78	0	0	7	0
	Choosing reference sources (dictionary, encyclopedia, card catalog)	50.	413	120	124	73	30	0	113	394
	Understanding signs	51.	69	0	0	0	0	6	0	0
	Understanding letters	52.	0	1	0	21	0	0	0	0
	Understanding maps	53.	111	3	65	650	102	133	0	46
GENERAL ACTIVITIES	Oral reading	56.	90	92	88	60	148	368	85	370
	Silent reading	55+57+ - 62.	178	266	404	545	265	225	129	810
	Spelling (use specific code, if applicable)	58.	513	10	361	169	627	707	285	214
	Grammar	59.	167	37	194	236	88	61	156	314
	Creative writing	60.	275	92	144	227	518	244	109	0
	Reading in content areas (for science and social studies, use this code only)	61.	178	104	502	511	33	210	155	155

Class Average Allocated Time
Grade 5 Reading, B to C

	CONTENT		CLASS 1	2	3	4	5	10	15
DECODING	Variant consonants (c,g)	3.	0	20	120	0	0	0	18
	Vowels--short	4.	0	4	20	20	2	40	7
	Vowels--long	5.	0	64	60	0	12	40	7
	Vowels--with r	8.	0	23	0	40	0	0	17
CON-TEXT CLUES	Any use of format where child must choose a word to fill a blank.	15-20.	0	51	586	160	120	327	120
WORD STRUC-TURE	Identification of root words	22.	77	60	100	58	0	58	80
	Prefixes--meaning and use	23.	59	108	54	38	0	82	16
	Suffixes--meaning and use	24.	59	227	54	58	83	58	71
	Syllables	26.	39	59	114	38	25	118	65
WORD MEANING	Synonyms	28.	57	16	60	38	0	40	80
	Vocabulary (definitions)	30.	98	833	464	320	53	213	190
	Pronoun reference	31.	20	24	20	0	285	58	25
	Multimeaning words in context	32.	275	76	40	0	285	78	122
	Unfamiliar words in context	33.	295	96	211	40	20	38	70
	Figurative language	34.	176	76	163	60	5	0	122
COMPREHENSION OF TEXT	Understanding event detail	36.	210	188	151	60	287	40	330
	Understanding description	37.	175	3	171	20	285	0	119
	Understanding relationships	38.	158	184	211	96	127	20	38
	Understanding main ideas	39.	154	548	251	641	27	663	267
	Literal recall	40.	592	516	40	160	77	226	210
	Translation of ideas, paraphrase	41.	40	40	111	153	68	36	238
	Synthesis of ideas, inference	42.	120	12	154	142	40	18	162
	Going beyond the text, prediction	43.	99	117	94	200	17	18	35
	Recognizing facts and opinions	44.	191	169	251	98	42	0	51
	General comprehension	45.	714	4	340	527	0	1115	825
APPLICATION	Understanding directions	46.	117	115	37	38	0	98	46
	Reference sources in books (table of contents, index, glossary)	49.	274	8	100	0	80	107	140
	Choosing reference sources (dictionary, encyclopedia, card catalog)	50.	195	92	60	410	40	268	298
	Understanding signs	51.	155	16	20	0	0	36	0
	Understanding letters	52.	116	0	0	0	0	0	0
	Understanding maps	53.	274	12	20	0	20	433	238
GENERAL ACTIVITIES	Oral reading	56.	116	212	271	89	55	573	636
	Silent reading	62.	1006	676	1044	1336	37	513	899
	Spelling (use specific code, if applicable)	58.	1324	227	704	340	495	499	651
	Grammar	59.	472	454	684	433	223	80	288
	Creative writing	60.	780	555	380	207	405	447	205
	Reading in content areas (for science and social studies, use this code only)	61.	627	1274	1044	946	215	1026	791

Class Average Allocated Time
Grade 5 Mathematics, A to B

CONTENT	CLASS 1	2	3	4	5	6
I WHOLE NUMBERS						
1. Addition	115	38	156	189	96	100
2. Subtraction	200	71	320	145	311	103
3. Multiplication	1379	140	451	149	563	262
4. Division		571		83	145	74
30. Speed tests in addition		37		15		6
31. Speed tests in subtraction		16		15		6
32. Speed tests in multiplication	10	4		49	25	6
33. Speed tests in division		1		49		6
II FRACTIONS AND DECIMALS						
7. Equivalent fractions					21	
8. Addition of fractions		71			10	
9. Subtraction of fractions					10	
10. Addition and subtraction of decimals	88	45	24			
III CONCEPTS AND APPLICATION						
12. Place value: decimals				17		
13. Place value: whole numbers		35		1	18	33
14. Properties		5	21	1		42
15. Factors				8		
16. Perimeter				65		48
17. Area				40		71
18. Volume				39		
19. Lines, angles, etc.				173		22
20. Geometric figures			10	112		22
21. Line and bar graphs				38		13
22. Number pairs		12		42		93
23. Statistics: compute average		75		2		
24. Number patterns		12	9	41		3
26. Word problems: one step	20		39	53	174	18
27. Word problems: two step	20		9	11	117	3
28. Word problems: common measures		7	77	53		1
6,11,25, and 29. Other Content		186	12	182		128

Class Average Allocated Time
Grade 5 Mathematics, B to C

CONTENT	CLASS 2	3	4	5	6
I WHOLE NUMBERS					
1. Addition	200	15	60	28	66
2. Subtraction	122	22	60	79	75
3. Multiplication	329	304	60	667	428
4. Division	396	775	380	148	295
30. Speed tests in addition					135
31. Speed tests in subtraction					135
32. Speed tests in multiplication			199		160
33. Speed tests in division			40		135
II FRACTIONS AND DECIMALS					
7. Equivalent fractions		381	337	451	325
8. Addition of fractions	68	192	396	208	180
9. Subtraction of fractions	43	57	396	165	120
10. Addition and subtraction of decimals	10			8	398
III CONCEPTS AND APPLICATION					
12. Place value: decimals	10				2
13. Place value: whole numbers				24	20
14. Properties					
15. Factors	150		40		39
16. Perimeter	120			20	211
17. Area	20		120	20	249
18. Volume			120		
19. Lines, angles, etc.	170		80		20
20. Geometric figures	100				38
21. Line and bar graphs	60		20		
22. Number pairs	60			20	88
23. Statistics: compute average					44
24. Number patterns		18			
26. Word problems: one step		35		73	45
27. Word problems: two step				102	6
28. Word problems: common measures					
6,11,25, and 29. Other Content					