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The Science and Literacy in Education (SLED) Curriculum Final Report

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THE SCIENCE AND LITERACY IN EDUCATION (SLED) CURRICULUM FINAL REPORT

In 2002, the Massachusetts Corporation for Educational Telecommunication (MCET) received a three-year continuation grant from the United States Department of Education's (DOE) Star School program to extend its Transitions through Telecommunications (TTT) project. At about the same time, MCET ceased to operate, so the DOE made arrangements for the JASON Foundation for Education (JASON) to become the overseeing institution for the three-year continuation award. Once the TTT project was transitioned to its new parent location, the original plan for the project was revised to take advantage of the existing educational resources newly available under JASON. The new project included the development of a science and literacy curriculum that would build off of the JASON Project science curriculum content and that would focus on explicitly teaching middle-school aged students how to read and understand non-fiction texts.

Goodman Research Group, Inc. (GRG), a research firm specializing in the evaluation of educational programs, materials, and services, served as the external evaluator for the original five-year grant. GRG was contracted again to conduct both formative and summative evaluation of the work conducted under the three-year project.

During the first project year (2002), GRG and the JASON team worked together to conduct a needs assessment of 22 teachers who agreed to take part in the three-year project. Later in that year, when a prototype of the Science and Literacy in Education (SLED) curriculum had been developed by the JASON team, GRG conducted formative interviews with teachers to learn their impressions of the prototype and to gather suggestions for curriculum revisions.

The JASON team responded to these data by revising the curriculum into a draft form that was pilot tested with teachers in Year 2 of the project. Also during the second project year, the JASON team developed a second curriculum unit and a professional development course that was added to the JASON Academy's list of professional development offerings in the spring of 2004. Finally, the JASON team worked with GRG to recruit additional sites that would take part in an experimental design study designed to validate the use of the SLED curriculum.

GRG conducted the experimental design study in the 2004-2005 school year, the final year of the project. This final report presents the Year 3 study. The following sections provide a more thorough description of the SLED curriculum itself and the JASON team's expectations for how teachers would implement the curriculum during this project year. Next, the research methods used for the experimental study are described. The Results section presents data to describe the implementation of the curriculum, teacher feedback on the curriculum, and the influence of the curriculum on students. The final sections of this report present the conclusions of the study and recommendations for the project team.

A DESCRIPTION OF THE SLED CURRICULUM

The SLED curriculum was designed to teach middle school students to effectively read non-fiction texts by using six reading comprehension strategies: Making Connections, Questioning, Visualizing, Inferring, Determining Importance, and Comprehending Information. The two SLED units, Rainforest and Wetlands, can be used together or as stand-alone pieces. Each unit was designed to be used in conjunction with a JASON Science Project curriculum unit focused on the same content area.

Each unit includes a series of non-fiction texts and related reading comprehension activities designed to teach students how to use the reading comprehension strategies. Audio versions of the texts, related video materials, and a poster highlighting the six strategies are also included. The materials also provided strategies for integrating the two SLED units with each other and for integrating individual SLED and JASON Project Science units. For example, the Wetlands curriculum included:

- an introduction to the SLED Wetlands Curriculum and suggestions for integrating it with the SLED Rainforest unit,
- a brief section on how to integrate the JASON XVI Unit with the SLED Wetlands curriculum,
- a suggested sequence of activities,
- 32 reading comprehension activities followed by a suggested text to use with the activity,
- four movies on DVD and a brief description of each cut,
- five audio CD-ROMs with recordings of 20 texts,
- information on accessing Team JASON Online, and
- a list of additional resources.

Over the three years of the project, the JASON team worked with teachers to establish a pedagogical sequence for implementing SLED lessons. By the third project year, this sequence had been finalized and was added as the overall structure for each lesson of the curriculum.

All SLED lessons begin with students reading a non-fiction text on their own and taking notes. Afterwards, students meet in small groups to discuss their notes with their peers. Next, students re-read the text and apply the codes for that lesson's reading comprehension strategy. Lessons end with a class discussion of how and where codes were assigned.

SLED IMPLEMENTATION EXPECTATIONS

To implement the SLED curriculum, teachers were expected to work together in teams consisting of one Language Arts and one Science teachers. Each team was expected to focus on explicitly instructing their students in how to read, understand, and digest non-fiction texts. The curriculum provided both sample activities and texts to use in this endeavor, but teachers were also given the opportunity to modify their use of the curriculum to fit their needs. The JASON team had the following expectations for how teachers would use the SLED curriculum in this final project year:

- Use the two curriculum units for a minimum of six weeks each,
- Modify the implementation sequence as needed,
- Use the SLED texts to teach reading comprehension strategies,
- Use at least one reading comprehension activity each week,
- Modify the number of reading strategies used, if needed, with a focus on the basic compared to complex strategies (i.e., focusing on strategies 1 – 4 compared to 5 and 6),
- Model the application of a reading comprehension strategy through "think-alouds" at least once a week.
- Use reading comprehension activities with non-SLED science texts,
- Communicate with their team teacher each week, and
- Collaborate with their team teacher to coordinate lessons as much as possible.

In addition to these teacher-focused expectations, the JASON team also expected that students would use the SLED reading comprehension activities in non-SLED contexts by generalizing SLED skills to other subjects and classes.

METHOD

EVALUATION PURPOSE AND DESIGN

The purpose of this year’s SLED evaluation was to validate the SLED curriculum through scientifically-based research. GRG modified the instruments and data collection procedures used in previous years of the project to incorporate the lessons learned from earlier evaluations into the final evaluation design. These changes are highlighted in the Instruments and Data Collection Procedures section below.

The Year 3 evaluation consisted of a pre-post experimental design in which teachers were randomly assigned to use (treatment) or not use (control) the SLED curriculum. Students of these teachers were tested with the Iowa Test of Basic Skills Reading Comprehension and Science sub-tests. In addition, students of seven Legacy teachers (those who participated in the program in all three project years) were also tested.

PARTICIPANTS

The sample of participating teachers for this year’s evaluation included 20 Legacy teachers as well as 32 teachers from 12 schools who were recruited to participate with their students in the experimental study. Teachers from five of these newly-recruited schools were randomly assigned to the SLED group (treatment) and the remaining seven schools were randomly assigned to non-SLED group (control). One treatment group school dropped out of the study prior to the beginning of the school year; this school was replaced by a school with a similar student population from the control group. A second treatment group school dropped out during the school year. In total, 26 treatment and control teachers were expected to participate in the study: ten classes from four schools

made up the treatment group and 16 classes from six schools made up the control group.

INSTRUMENTS AND DATA COLLECTION PROCEDURES

Three instruments were used to collect data from teachers about their implementation of the SLED curriculum, including a series of Web-based rating sheets, a Web-based unit feedback survey, and classroom observations. Student data were gathered using two sub-tests from a standardized instrument. Each instrument is described below including the data collection procedures used and the response rates for each.

Web-based Curriculum Rating Sheets

To gather ongoing data on teachers' implementation of the SLED curriculum, GRG modified the Curriculum Rating Sheet (CRS) booklet used during the Year 2 pilot study. Based on feedback provided by teachers at the end of the pilot year, the CRS was changed from a paper-based to Web-based format and it was administered on a biweekly rather than weekly basis.

The CRS was also streamlined for this final year, based on teachers' feedback, to be less repetitive and to focus less on teaching teams. The revised version continued to include both closed- and open-ended questions focused on tracking the strategies, texts, and activities used; the level of communication between team teachers; teachers' perceptions of the curriculum; and the perceived impact of the curriculum on students (see Appendix A for a sample CRS).

The CRS was hosted on the GRG survey Web site. All SLED teachers were emailed a link to the CRS every two weeks during their SLED implementation. For each CRS, teachers were asked to report on their use of SLED for each of the previous two weeks. Teachers were instructed to complete each CRS within one week of receiving it. If teachers did not complete the CRS within this time period, a reminder email was sent every week until the CRS was completed.

Teachers who did not have reliable Internet access were given the option of requesting a paper version of the CRS. Six teachers requested the paper version. Teachers who used a paper version of the CRS were contacted every two weeks to confirm that they were completing the CRS.

This administration procedure was used from December 2004 after student pre-testing had been conducted. Administration continued through March 2005 when GRG suspended data collection during an extended due diligence period that occurred as the JASON Foundation was under the stewardship of National Geographic. Once the acquisition of the JASON Foundation by National Geographic was completed and funds were released, data collection recommenced. Unfortunately, many schools (n=6) finished their SLED implementation during this time and those data could not be collected. (For a full description of how the cessation of data collection impacted the evaluation, see the Evaluator's Note at the end of this report.)

Other teachers did not complete the CRS due to personal reasons or because they dropped out of the program. For example,

- Two teachers (one Legacy and one Treatment) went on extended leave during their SLED implementation due to health reasons,
- Two teachers refused to complete the CRS,
- Two never returned their paper-based CRS despite a number of inquiries, and
- Three teachers dropped out of the program.

A total of 25 SLED teachers (83%) completed at least one CRS. Complete CRS data from the entire 12-week curriculum implementation were collected from only four teachers (13%). As seen in Table 1, the number of CRSs completed ranged from 7 to 15 across the implementation of the curriculum, with fewer completed CRSs submitted toward the end of each curriculum unit (see Table 1).

Table 1
Completed CRSs across SLED Implementation, by Unit

	CRS #1 (Weeks 1 & 2)	CRS #2 (Weeks 3 & 4)	CRS #3** (Weeks 5 & 6)
Rainforest Unit (n=14)*	12	10	7
Wetlands Unit (n=26)*	15	11	7

* Note: These numbers include the two teachers who left school for an extended absence after week 2 of their SLED implementation and thus were unavailable to complete later CRSs.

** Note: CRS#3 data collection coincided with the extended due diligence period described on the previous page. As a result, the opportunity to collect CRS#3 data from many teachers was lost.

Web-based Unit Feedback Survey

After completing each SLED unit, GRG emailed all Treatment and Legacy teachers a link to the Unit Feedback Survey. This Web-based survey was hosted on the GRG survey Web site. Questions were designed to assess teachers overall opinions of the unit they had just completed, as well as their opinion about the effectiveness of the materials, the value of the videos, and any suggestions they had for additional reading comprehension activities or general improvements to the curriculum (see Appendix B).

Teachers were instructed to complete the Unit Feedback Survey within one week. If they did not complete it within this time period, a reminder was emailed to teachers every week until the survey was completed. Fifteen of the 30 teachers (50%) completed the Unit Feedback Survey for the Wetlands Unit. Of the 14 teachers who used the Rainforest unit, 10 (71%) completed the Unit Feedback Survey. As with the CRS, some Unit Feedback Surveys were not collected during the spring of 2005. Once data collection recommenced, GRG attempted to collect

all remaining Unit Feedback Surveys; many teachers, however, did not respond to this request.

Classroom Observation Protocol

The observation protocol from Year 2 was used again in this final project year. The protocol recorded the following: the number and type of reading materials available in the classroom, teachers’ use of four general instructional strategies, and the activities that took place during the observation session. The use of two SLED-specific instructional strategies and a number of items related to teachers’ use of the SLED curriculum materials were also recorded (see Appendix C).

Using this protocol, GRG observed 12 teachers from eight teams as they implemented the curriculum with their students. Observations were conducted December 2004 through March 2005. Teachers were observed for one or two class periods, ranging from 30 to 90 minutes in length. All observations were scheduled during the Wetlands implementation. When possible, observations were conducted during the fourth week of the teams’ SLED implementation.

During each observation, the GRG researcher sat unobtrusively in the back of the classroom and completed the protocol. At the end of the observation, the researcher asked teachers to report how long they had been implementing the curriculum and if the class period observed was a typical SLED lesson. Teachers were also given the opportunity to provide general feedback about the curriculum.

A description of the observations conducted at each school is presented in Table 2.

Table 2
SLED Classroom Observations Conducted in Year 3

School	School Site Type	Week of SLED Implementation	Length of Observation	
			Science	Language Arts
Lancaster School - 5 th grade Lancaster, NH	Legacy	6	45	30
Lancaster School - 7 th grade Lancaster, NH	Legacy	6	90	--
Longwood Middle School Middle Island, NY	Legacy	6	--	90
Sullivan Middle School Worcester, MA	Legacy	6	45	45
JFK Elementary School Somerville, MA	Legacy	4	--	45
Thurgood Marshall – 8 th grade Philadelphia, PA	Treatment	4	--	60
Harlee – 8 th grade Bradenton, FL	Treatment	5	50	45
Lincoln – 7 th grade Palmetto, FL	Treatment	2	45	45

Note: One teacher at each of four sites was unavailable to participate on the day of the observation.

Iowa Test of Basic Skills

The Reading Comprehension and Science sub-tests from the Iowa Test of Basic Skills (ITBS) were used again in Year 3 to assess student knowledge before and after using the SLED curriculum. The ITBS is a nationally-normed achievement test that has been in use for over 70 years.

Pre-testing was conducted September through December 2004. Form A and Form B of the ITBS were used, and forms were counterbalanced within class. To standardize the administration of the assessment, a JASON researcher administered the ITBS in all classrooms this year. General administration instructions were provided by GRG. All tests were administered according to the ITBS Administration Manual.

GRG provided the JASON researcher with all the necessary test materials and, to maintain student confidentiality during the testing procedure, created individual student test packets for each student. Using modified class rosters, GRG created random identification numbers for each student.¹ Individual test packets consisted of a manila envelope with the student's name written on the outside; each packet included the appropriate test booklet for that student and an answer sheet identified only by ID number. Prior to beginning the test, the JASON researcher instructed students to remove their test materials from the envelope and throw away the envelope. Once students had completed the pre-test, test materials were collected by the JASON researcher and returned to GRG.

After completing the pre-testing, SLED teachers were expected to implement the SLED curriculum for a minimum of 12 weeks. Post-testing was conducted in February, April and May 2005, depending on when the teacher finished the SLED curriculum and state testing schedules. Post-tests were administered using the same procedure described above. Students who completed Form A in the Fall completed Form B in the Spring, and vice versa. In total, the ITBS was administered to 1,240 5th through 8th grade students; matching pre-post data were available for 887 students (72%).

The ITBS was scored by Riverside Publishing, the group who publishes the instrument. Pre-tests were scored in March 2005 and post-tests were scored in July 2005.

Although all participating schools were aware of the testing requirements prior to agreeing to take part in this project, teachers were not always supportive of having their students tested. Five of the 13 schools tested reacted negatively to the testing, according to the JASON researcher. Both teachers and students at these sites expressed negative reactions to taking the ITBS with many complaining that they did not want to do it.

¹ To maintain student anonymity as much as possible, teachers modified their class rosters to include only the students' first name and the first letter of their last name prior to sending the rosters to GRG.

Of the remaining eight schools, the researcher reported that teachers and students at six were positive and supportive of the testing and teachers and students at two schools had neither a positive nor negative reaction.

In addition to these overall reactions by students and teachers, there were significant distractions at four schools during the testing period. Distractions included malfunctioning heat, a Halloween parade through the school, and a drug bust that occurred just outside the school during testing.

SLED CURRICULUM IMPLEMENTATION

The CRS was developed to gather week-by-week data on teachers' SLED implementation. Complete data from the full 12-week curriculum implementation were available from only four teachers, representing a minority of those who used the curriculum this year.

GRG moved ahead with its strategy to report on curriculum implementation with the data that were available. As such, the number of teachers reporting on their implementation across weeks ranged from seven to 15. It should be noted that the extent to which these results are reflective of the overall implementation of the curriculum as a whole is unclear. There are, however, several consistencies between these results and those reported in Year 2 which adds some validity to the summary provided; consistencies between Year 2 and Year 3 results are noted where found.

OVERALL IMPLEMENTATION OF THE SLED CURRICULUM

Legacy teachers were expected to use the Wetlands curriculum for a minimum of six weeks and then continue using SLED strategies for at least six weeks more. Treatment group teachers were expected to implement both the Rainforest and Wetlands units for a minimum of six weeks each.

Teachers' implementation of the curriculum varied. Although the majority of teachers did use the curriculum over a 12-week period, the amount of time spent on each unit differed across teachers. The order in which the units were used varied across Legacy and Treatment teachers, as expected. Most teachers extended the length of time they used SLED such that their implementation was spread out over a greater number of weeks. For example:

- Thirteen teachers (all Legacy) used only the Wetlands Unit. Nine implemented the Wetlands unit for at least 12 weeks; the remaining four teachers used the Wetlands unit for approximately eight weeks.
- Two teachers first used the Wetlands unit and then used the Rainforest unit; both used SLED for at least 12 weeks
- Eleven teachers first used the Rainforest unit and then used Wetlands unit; all used SLED for at least 12 weeks.
- One teacher taught the strategies throughout the year, but used his own texts.

TEACHERS' WEEKLY USE OF THE SLED CURRICULUM MATERIALS

Results are presented below to describe how individual components of the SLED curriculum were implemented.

Use of Reading Comprehension Strategies

Teachers indicated how many days they taught reading comprehension strategies for each of the weeks during which they implemented the SLED curriculum. On average:

- Teachers taught reading comprehension between two and three days per week.
- General Classroom teachers or Language Arts teachers spent more time teaching reading comprehension than did Science teachers. This pattern of results is similar to the findings from Year 2 of the study.

As previously stated, teachers were also expected to model the use of the reading comprehension strategies as part of their SLED implementation. Teachers reported modeling reading strategies an average of 2.7 days per week.

To inform GRG of the specific reading comprehension strategies they used, teachers chose from a list, the strategy that was their primary focus for each week of their implementation (referred to as the primary strategy).

- Making Connections was the primary strategy used most often across both units.
- Inferring, Determining Importance, and Comprehending Information were used more often as primary strategies during teachers' implementation of the Wetlands, compared to the Rainforest unit.

In addition to the primary strategy, teachers also reported any additional reading comprehension strategies that were used each week. Teachers reported using one to two additional strategies each week, on average.

- Teachers used Making Connections throughout their implementation, regardless of primary strategy,
- Teachers also tended to use primary strategies that had been of focus in past weeks as additional strategies. For example, if Making Connections was the primary strategy in Week 1 of a teacher's implementation, she might use it as an additional strategy in Week 2 when the primary strategy had shifted to Questioning.

Use of SLED Activity Texts to Teach Reading Comprehension

Teachers reported the individual activity texts used for each week of their SLED implementation. GRG paired this information with the primary strategies used to learn if teachers consistently paired SLED activity texts with certain reading comprehension strategies. These data are presented below, by curriculum unit.

SLED Activity Texts Used With the Rainforests Unit

All teachers who completed a CRS for the Rainforest unit reported using a SLED activity text at some point during their implementation; eight of these 12 teachers (67%) reported using at least one activity text every week. On average, most teachers used one or two activity texts per week of their Rainforest implementation.²

To investigate which activity texts teachers used most from the Rainforest unit, GRG tallied the use of individual texts across all weeks of implementation. Twenty-seven of 35 activity texts were used by at least one teacher.³ The most frequently used texts from this unit included:

- *Army Ants* (used 13 times),
- *The Ants that Take Slaves* (9 times)
- *On the Rooftop of the World* (8 times),
- *Jerry's Botfly* (8 times)
- *Enjoying Insects in the Home Garden* (5 times)
- *The Daintiness of Ants* (4 times) and
- *A Treasure Hunt for Ants* (4 times).

GRG paired activity texts with the primary strategy used each week to learn if there was any consistency in how teachers used these curriculum resources. Overall, teachers paired activity texts with reading comprehension strategies based on suggestions made in the curriculum. For example, *Army Ants* was used several times with Making Connections, but was not often used with other strategies. *Jerry's Botfly* was the only text used with strategies other than suggested in the curriculum; this activity text was used by multiple teachers for both the Questioning and Visualizing strategies.

Teachers used a greater number of activity texts for the first three strategies of the Rainforest curriculum, compared to the latter three. These data seem to indicate that most treatment teachers focused on the basic compared to complex strategies when implementing the Rainforest curriculum. For example, SLED activity texts were used:

- 35 times to teach Making Connections,
- 23 times to teach Questioning,
- 12 times to teach Visualizing,
- 4 times to teach Inferring,
- 5 times to teach Determining Importance, and
- 7 times to teach Comprehending Information.

SLED Activity Texts Used With the Wetlands Unit

Thirteen out of the 14 teachers who completed a Wetlands CRS used SLED activity texts during their implementation. Compared to the Rainforest unit, a slightly larger percentage of teachers reported using a SLED activity text during

² These data exclude a teacher who chose not to use SLED texts after Week 1 of his implementation.

³ For a list of texts that were not used for each unit, see Appendix D.

every week of their Wetlands implementation; 11 of the 14 teachers (79%) indicated that they had used at least one text during each week they reported on their SLED implementation. On average, teachers used between one and three Wetlands activity texts per week.

At least one teacher used 26 of the 29 activity texts included in the Wetlands unit. Proportionally, teachers used a greater percentage of activity texts for the Wetlands compared to Rainforest unit. This difference, however, is likely due to the fact that a greater number of teachers implemented the Wetlands compared to Rainforest unit. The most frequently used activity texts used with the Wetlands unit are listed below:

- *A Death on the Water* (7 times),
- *A Writer's Reward* (7 times),
- *The Flood of 1927* (6 times),
- *Gift of the Mississippi* (6 times),
- *Goodbye to the Bayou* (6 times), and
- *The Greatest Untold Story* (6 times)

As with the Rainforest unit, teachers used texts in accordance with the suggestions provided in the curriculum. Exceptions were *Saving the Brown Marsh* which was used by two teachers to teach Inferring, and *The Flood of 1927* which was used by three teachers to focus on Determining Importance.

Teachers used the greatest number of Wetlands activity texts to teach Making Connections. A similar number of texts were used to teach each of the remaining strategies. For example, SLED activity texts were used:

- 28 times to teach Making Connections,
- 10 times to teach Questioning,
- 11 times to teach Visualizing,
- 9 times to teach Inferring,
- 10 times to teach Determining Importance, and
- 8 times to teach Comprehending Information.

Use of Non-SLED Texts to Teach Reading Comprehension

Eleven of the 12 teachers who completed a Rainforest CRS (92%) and 12 of the 14 who completed a Wetlands CRS (86%) reported using SLED strategies with non-SLED texts during their implementation of the curriculum.

- Five teachers reported using non-SLED texts to teach reading comprehension every week that they reported on their Rainforest implementation. Six reported using non-SLED texts some weeks.
- Nine teachers reported using non-SLED texts to teach reading comprehension during every week of their Wetlands implementation, while three used non-SLED texts during some weeks.

Teachers used a variety of non-SLED materials to teach reading comprehension to their students. Most were non-fiction. In addition, some teachers used the fiction books provided as part of the JASON Expedition curriculum to teach

reading comprehension. Non-SLED texts used with SLED reading strategies included the following:

- Fiction and Non-fiction books (Treasure Island, Polar Express, and “Rainforest books”),
- Science and Social Science Textbooks,
- Biographical books and sketches,
- Magazine and Newspaper articles (Owl Magazine),
- Map of the United States,
- Non-fiction material from the Internet,
- Rainforest software provided by DCPS,
- Skill sheets and workbooks on all subjects,
- JASON activities, and
- Mini science activity (Antwiches).

Use of the SLED Videos, Audio Texts, and Poster

GRG collected data on the use of the SLED videos and audio recordings through the CRS booklet and observations. Data on the use of the SLED poster was collected only during observation visits. The use of each of these SLED resources is described below.

The SLED Videos

Twenty-three of the 28 teachers who completed a CRS (82%) reported using at least one SLED video with their class. For both units, teachers reported using one SLED video per week, on average. The number of teachers who used each video is presented in Table 3.

Some videos were used on multiple occasions by individual teachers, while others were used only once. Videos used multiple times included: JASON in the Rainforest, Expedition Prologue, Meg Lowman at Marie Shelby, and JASON Expedition XVI.

Table 3
Number of Teachers Who Used SLED Videos by Title and Unit

Rainforests		Wetlands	
	# teachers		# teachers
JASON in the Rainforest	7	Mike Tidwell – author	7
Expedition Prologue	4	JASON Expedition XVI	6
Learning Reading Strategies	4	Deborah Schultz – educator	2
Meg Lowman at Marie Shelby	3	Gary LaFleur - scientist	1
Randy the Bug Man	3		
Writing about Science	0		

At the end of each unit teachers were asked to rate how valuable the videos were at supporting their SLED teaching. Using a five-point scale from 1 (*Not at all*) to 5 (*Extremely*):

- Teachers rated the videos from each unit as *generally valuable* (a rating of 3) in supporting their teaching of reading comprehension, on average.
- Teachers rated the Wetlands videos as more valuable than the Rainforest videos in supporting their science teaching. The Wetlands videos were rated between *generally* to *very valuable*, on average, while the Rainforest videos were rated *a little* to *generally valuable*.

The SLED Audio Texts and Poster

Across both the Rainforest and Wetlands units, 16 of 28 teachers (57%) used an audio text at least once. Eight teachers used an audio text as part of their Rainforest implementation and 10 used an audio text with Wetlands.

Few teachers had the SLED poster displayed in their classroom. Of the 12 classrooms observed, three (25%) displayed the poster.

Implementation of JASON Project Science

Although teaching reading comprehension was the primary focus of this project, teachers also reported on their use of the JASON and SLED materials to teach science. Results indicated an overall pattern of results similar to that found in Year 2.

- Science teachers used the JASON Project science curriculum approximately two days per week.
- General Classroom teachers taught JASON Project science less often, using the curriculum one day per week.
- Language Arts teachers rarely taught from the JASON Project science curriculum, and some did not use the curriculum at all.

Teachers were asked to indicate how often they used SLED texts to teach science each week. Similar to the use of JASON Project science, Science teachers used SLED texts to teach science one to two days per week, and they used the texts more often than did either General Classroom or Language Arts teachers.

The Coordination of SLED Implementation among SLED Teams

To gather data about the level of interaction among teams of SLED teachers, GRG asked teachers to indicate how often their team met during each week of their SLED implementation. Team teachers met one to two days per week, on average.

GRG's classroom observations confirmed that teachers were aware of each others' SLED lessons. During each pair of observations, the evaluator rated the extent to which the teaching team's lessons were coordinated. Of the five teams that could be rated, four were obviously in communication with each other about their SLED work. Three of the five had coordinated lesson plans that were implemented during the observation.

Legacy Teachers' Use of SLED across Time

GRG analyzed the data from eleven Legacy teachers who submitted CRS forms both last year, during the pilot phase of the study, and this year. Results are presented below to describe data from CRS questions that were the same across years.

Overall, teachers' implementation of the curriculum decreased slightly from Year 2 to Year 3. For example, in Year 3:

- Nine of the 11 Legacy teachers taught reading comprehension either just as often, or less often than they did in Year 2.
- Ten of 11 reported teaching JASON Project science equally or less often than in Year 2.

In contrast to these findings, Legacy teachers reported that they modeled the use of reading strategies slightly more in Year 3 compared to Year 2. As part of their Year 3 implementation, nine teachers modeled the use of reading strategies for their students to the same extent or more than they had in the previous year.

Finally, Legacy teachers reported meeting with their team teacher between one and two times per week to plan SLED activities during Year 3. This was slightly less often than the two times per week that teams met, on average, during Year 2.

CASE STUDY REPORTS OF SLED IMPLEMENTATION

As stated earlier in this report, complete CRS data were available for only four teachers. Two of those four were from a pair of 8th grade team teachers. To provide additional information about the implementation of the curriculum, GRG summarized across each teacher's CRS data to describe their implementation. It is unclear whether these data are representative of the curriculum's implementation as a whole. They do provide a picture, however, of how one team chose to implement the curriculum with their students.

A Language Arts Teacher's SLED Implementation

Michelle, a Language Arts teacher, began her implementation of the Rainforest Unit in late September 2004 and continued her implementation through November. While using the Rainforest unit she taught reading comprehension an average of two days per week, though her teaching of reading comprehension ranged from one to four days per week. Michelle focused on the first three reading comprehension strategies featured in the curriculum during her first unit.

She began her implementation by focusing on Making Connections for two weeks. She then moved on to the Questioning strategy for two weeks, used Visualizing for one week and then returned to Questioning for the final week of her implementation. She used only one strategy for the first four weeks of her implementation and then used an additional strategy during each of the last two weeks.

Once the Rainforest unit had been completed, Michelle moved directly to Wetlands. She continued using the Wetlands unit with her students until the end of December. Michelle taught reading comprehension more often while using this unit, teaching reading comprehension three days a week, on average. In contrast to the Rainforest unit, she focused on the more complex reading comprehension strategies for Wetlands, spending the first week on Determining Importance, the middle three weeks on Inferring, and the last two weeks using the Comprehending Information strategy. As additional strategies, Michelle used all three strategies covered in the Rainforest unit, as well as Comprehending Information and Determining Importance.

Michelle usually used a different SLED text each day she taught reading comprehension, using one to two Rainforest texts per week and two to three Wetlands texts per week, on average. During the Rainforest unit she also used JASON Rainforest articles and science articles from the Internet to teach reading comprehension. She did not use any non-SLED texts as part of her Wetlands implementation.

Throughout her use of the Rainforest unit, Michelle modeled the use of reading comprehension strategies. She modeled the use of strategies four days per week during the first week and then dropped down to one or two days per week for the remaining weeks. Michelle modeled reading comprehension strategies more often during the Wetlands unit, modeling two or three days every week.

In addition to teaching reading comprehension, Michelle occasionally used JASON Project science activities and SLED texts to teach science. She taught JASON Project science during four weeks of the Rainforest unit and during two weeks of her Wetlands implementation. Michelle also used SLED texts to teach science, using SLED texts in this capacity zero to four days per week during the Rainforest unit and zero to three days per week for the Wetlands unit.

Michelle occasionally used SLED and JASON videos to supplement her lessons. She used one video for two weeks of each unit.

A Science Teacher's SLED Implementation

Lisa, Michelle's team teacher, is an 8th grade science teacher. The timing of Lisa's SLED implementation was identical to Michelle's. That is, she began her Rainforest implementation in late September 2004 and continued her use of the unit through November. She then began using the Wetlands curriculum and continued using this unit through December.

Both teachers focused on the basic reading strategies during their Rainforest implementation and then added the more complex strategies as part of the Wetlands unit. Both also modeled the use of reading comprehension strategies each week. Not surprisingly, students received more instruction on reading comprehension from Michelle and more science instruction from Lisa. These teachers met once a week throughout their SLED implementation to discuss and plan their use of the curriculum.

Although their overall implementation schedule was the same, their individual implementations differed somewhat. Lisa used the Rainforest unit more consistently with her students, teaching reading comprehension two days per week for five weeks. She began her implementation by focusing on Visualizing and then moved on to Questioning and Making Connections in later weeks. While Michelle did not use multiple strategies until the fourth week of implementation, Lisa used multiple strategies each week to teach reading comprehension, mixing and matching across the three strategies as needed.

During the Wetlands unit, Lisa taught reading comprehension less often than did Michelle, and her implementation of this unit was more sporadic than her Rainforest implementation. Lisa varied the number of days devoted to teaching reading comprehension during this unit, using the curriculum one to three days per week. She focused on the more complex reading comprehension strategies for Wetlands, spending at least one week each focused on Determining Importance, Inferring, and Comprehending Information. She also re-visited Questioning and Visualizing as primary strategies and used all three strategies covered in the Rainforest unit as additional strategies throughout her Wetlands implementation. Throughout her implementation of both units, Lisa modeled the use of strategies between one and two days each week.

Lisa tended to use a different SLED text for each day she taught reading comprehension strategies, using two SLED texts per week while implementing the Rainforest unit and between zero and three SLED texts per week during her Wetlands implementation. She also used JASON research articles to teach reading comprehension at least once during each unit.

In addition to teaching reading comprehension, Lisa used JASON Project science activities and SLED texts to teach science. She usually taught JASON project science four or five days per week. SLED texts were used to teach science one to two days per week. Lisa's use of SLED texts to teach science mirrored the use of texts to teach reading comprehension; she used SLED texts one to two days per week to teach Rainforest science, and used texts between zero and three days per week to teach Wetlands science.

Lisa used SLED and JASON videos more regularly than Michelle to supplement her lessons. One to three videos were used each week as part of Rainforest lessons and one video was used during four of the six weeks of Lisa's Wetlands implementation.

TEACHERS' FEEDBACK ABOUT SLED

Teachers' Satisfaction with the SLED Curriculum

Teachers' overall satisfaction with the SLED curriculum was measured on a weekly basis and on the Unit Feedback Survey. Using a five-point scale from 1

(*Not at All*) to 5 (*Extremely*), teachers reported that they were *generally satisfied* (a rating of 3) with both units, on average.⁴

Teachers also rated their overall satisfaction with SLED on the Unit Surveys by reporting whether they would continue to use the curriculum in the future and explaining why or why not.

- Of the 10 teachers who reported on the Rainforest unit, 8 indicated they would continue to use the SLED curriculum with students.
- 13 of the 15 teachers who reported on the Wetlands unit indicated that they would continue to the unit.

Teachers also gave positive feedback about the curriculum when asked to describe their overall impressions. These responses are combined below with the reasons teachers provided for continuing to use the curriculum. Some teachers also provided feedback about how they would modify the curriculum for future use.

Students were very engaged in the program and it enhanced my overall curriculum.

I was excited because the strategies were so concrete. I am also glad it is non-fiction because that is usually what appears on the state test for Pennsylvania.

I would use them (and will continue to do many of these strategies with my kids) although I don't know if I would do them using all the same articles. As I said above, the kids tired of reading about the same topic for that long. I would choose texts (from SLED or other resources) that I thought best fit with the science topics I was teaching and then teach the strategies using the chose texts.

I like how the articles reinforce the reading strategies. However, I would supplement different articles of a more challenging nature.

I like the strategies and many of the text selections, although I wish more of the JASON aspects were addressed (versus just unit 2). Reading about bugs for six weeks was too much.

Teachers who said they would not continue to use the curriculum explained that their students did not like the curriculum and that it needed to be modified.

I like the materials, but it was wasting a lot of paper. Students did not like the articles too much because they were mostly about insects.

Much of the SLED curriculum is "borrowed" from the following texts: Mosaic of Thought, Strategies that Work, and Tribes. I read them years ago and have been incorporating these strategies since then.

⁴ One teacher consistently reported that he was not at all satisfied with the SLED materials and thus did not use them with his class. His ratings are excluded from averages for this question.

The Wetlands curriculum was too weak and quite frankly, dry to engage and sustain my 7th graders.

Teachers' Feedback about SLED Texts

Teachers also reported their level of satisfaction with individual SLED texts by indicated those that they would and would not use again and about the appropriateness of the SLED texts for their students' reading level. Results for each unit are described below.

Feedback about Rainforest Texts

Teachers indicated that they would use the 25 of the 35 Rainforest texts again. *Army Ants*, *The Ants that Take Slaves*, *Jerry's Botfly*, and *Sympathy for the Devil* were the texts most often selected as those that teachers would use again by multiple teachers. Only one teacher indicated that s/he would not use a Rainforests text again: *The Closest Thing to a Rainforest: Marie Selby Botanical Gardens*.

The majority of teachers (10 of 12) indicated that the Rainforests texts were at the appropriate reading level for their students. Across all weeks of implementation, one teacher each said that the following were not at the appropriate reading level: *Army Ants* and *On the Rooftop of the World*.

Feedback about Wetlands Texts

Teachers indicated they would use 18 of the 29 Wetlands texts again next year. Compared to Rainforest, there was lower consensus among teachers about articles that would definitely be used again. Two or three teachers each indicated that they would use *Gift of the Mississippi*, *Goodbye to the Bayou*, *A Death on the Water*, and *The Flood of 1927* with their class next year.

Two teachers indicated one text they would not use again with next year's class. The texts selected included *The Flood of 1927* and *Mixing Science and Art*.

Compared to the Rainforest unit, a larger number of teachers (n=5) reported that at least one Wetlands text was not at the appropriate level for their students. Collectively, these teachers indicated a large number of texts that were not at the appropriate level. Each of the following texts was listed between one and three times:

Gift of the Mississippi
Hurricane Jason
A Writer's Reward
Water Problem
A Death on the Water
Goodbye to the Bayou
Becoming a Writer

A Grass Roots Movement
The Greatest Untold Story
The Life and Death of Shrimp
Looking to the Future
Monitoring the Bayou
Saving Louisiana's Coast
The View from Above

Successful SLED Lessons

Across both units, teachers' perceptions of what went well during their SLED implementation were typically based on either student interest or student learning. Responses focused on students using a strategy successfully, students enjoying a SLED article, using art activities in conjunction with SLED, and on the success of student interactions. Representative responses include:

On the Rooftop of the World went well. The students found many connections in the text. They were finding all the types of connections and were able to share their connections easily with the class.

Our reading groups are a mixture of 6-8 grades and the use of the making connections was a big hit with them as they began to feel comfortable using the "this reminds me of..." as they read.

Teaching students the reading strategy of questioning with the article, "The ants that take slaves" went well. Students enjoyed reading that article because they learned something new about ants.

The lesson that went well was the visualization activity. Our students have nature journals and so they drew their sketch of the ants in the journal. It helps for them to see the strategies being used in other places in the curriculum.

Sharing their questions with partners went particularly well. Lots of sharing and also use of "reminds me of" language even though that was not the main focus of the activity.

SLED Lessons that were Challenging

When asked to describe challenges in their SLED implementation, the most consistent challenges mentioned across both units were a lack of student interest and/or motivation in the materials and student difficulty reading the texts or using the strategies. Representative responses include:

It was a challenge to get the kids interested in reading the materials at first. They seemed to have a hard time reading science during reading time. They are conditioned to periods so that science in the reading room seemed out of place at first.

It was challenging for the students to come up with questions that they had about activity text 16 (Rainforest). The reading was challenging for them so they had trouble with questions regarding the content. Most of their questions were about how to pronounce this word or that word.

Army Ants did not lend itself to finding natural connections for most of the students. They tended to copy examples and were somewhat unsure of what I was asking them to do.

The science projects are more challenging because they do not seem to be motivated through science. They like the reading part. I think if we had more time to do JASON more comprehensively, they would enjoy it more.

The inferring strategy was the hardest for students to understand. I had to do the entire activity with the students, so they could have a better understanding of it. They eventually had a better understanding of it.

Perceived Influence of the Curriculum on Teaching

After each unit, teachers were asked to rate how effective the SLED curriculum was at enabling them to teach reading comprehension skills to their students. Using a scale from 1 (*Not at all*) to 5 (*Extremely*), both units were rated as *generally effective*, on average.

Teachers also rated how effective the SLED curriculum was at enabling them to teach science content to their students. Using the same scale described above, both SLED units were rated as *generally effective* at enabling teachers to teach science content, on average.

Teachers' Suggestions for Improving the SLED Curriculum

At the end of each unit, teachers were asked to provide both general suggestions for improving the SLED curriculum content and specific suggestions for additional reading comprehension activities.

When asked to provide general suggestions for improving SLED, most teachers indicated the need for diverse focal topics and suggested that the topics added be of higher interest to middle school students. Others suggested reorganizing the articles, making the videos more interesting, providing more hand-outs for students, and making the reading passages shorter. For example, teachers suggested:

A broader variety of topics (go into the other units of the JASON curriculum).

Perhaps more on the animals of the area (nutria, oysters, etc.) Thank you for the hurricane addition (one of Ivan). Please incorporate this in the future.

Provide copies for all students as our photo-copy machine goes down all the time and we have to go to Kinko's and spend our own money to make copies.

Not enough time allotted to get most of the activities done. Reading passages could be a little shorter to allow all activities to take place during a class period.

When asked about specific recommendations for improving the reading comprehension activities, most teachers recommended adding more material to the curriculum, with a focus on adding more variety to the texts. For example, handouts, brochures, posters, newspaper articles, questions, a community involvement piece, and more group activities were all suggested. A few other teachers suggested creating articles for students of different ages and reading levels and correlating the reading comprehension activities with JASON science content or the general science curriculum. For example, teachers wrote:

More interesting topics about the Wetlands. Possibly some type of community involvement piece or becoming actively involved in a Wetland's cause.

More activities besides reading and sharing.

Provide a wide range of reading ability level articles so that even lower level readers could practice the strategies.

The reading comprehension activities were okay and there were enough articles to model each strategy. Could you integrate some of the SLED content with JASON Science content? Students would be able to see the correlation between SLED content and JASON Science.

SLED'S INFLUENCE ON STUDENTS

TEACHERS' PERCEPTION OF SLED'S INFLUENCE ON STUDENTS

On each CRS, teachers rated the effectiveness of the SLED curriculum at increasing both students' reading comprehension skills and their understanding of science. These items were rated on a scale from 1 (*Not at all*) to 5 (*Extremely*).⁵ Across both units, teachers indicated that the SLED materials were *generally effective* at increasing both students' reading comprehension skills and their understanding of science.

Teachers also rated the influence of the curriculum on students' reading comprehension behaviors. Every two weeks teachers were asked to indicate whether they had noticed students spontaneously engaging in four SLED-related behaviors. On average,

- Over three-quarters of the teachers reported that their students were using SLED terminology (e.g. this reminds me of, self to world, etc.) in other classes/subjects.
- Approximately half of the teachers noticed students using SLED activities such as writing in the margins or using post-it notes in other classes/subjects.

⁵ The teacher who did not use the SLED materials was excluded from this analysis.

- Over half of the teachers reported that their students spontaneously (i.e., not at part of an assignment) used previously-covered SLED strategies as new SLED strategies were introduced.
- Over two-thirds noticed students spontaneously (i.e., not as part of an assignment) sharing thoughts with each other about what they were reading.

At the end of each unit teachers rated how motivated students were to participate in the SLED activities using a scale from 1 (*Not at all*) to 5 (*Extremely*). Overall, teachers believed their students were *generally motivated* to participate in SLED.

THE INFLUENCE OF SLED ON STUDENTS’ TEST SCORES

Profile of Respondents

As previously stated, standardized test data were collected from 1,240 students in the 2004-2005 school year, and matching pre-post data were available for 887 students (72% of the sample). Table 4 shows the profile of respondents for whom pre-post test data were available, by grade experimental condition.

- Approximately half of the students in each experimental group were female.
- The treatment and control group were of similar races and ethnicity overall, with a larger percentage of African American students in the Treatment group and a larger percentage of White students in the Control Group. A much larger percentage of students in the Legacy group were White compared to either other experimental group.
- Grade level was not equally distributed across the three experimental groups.
- The treatment group had the greatest percentage of Special Ed students.

Table 4
Demographic Profile of Students with Complete Pre-Post Test Data, by Condition

		Treatment	Control	Legacy
Gender	Female	54%	55%	47%
	Male	46%	45%	51%
Race	American Indian	2%	3%	4%
	Asian	4%	2%	<1%
	African American	42%	21%	28%
	Hispanic	22%	26%	5%
	Native Hawaiian	<1%	<1%	1%
	White	35%	46%	63%
Grade Level	5 th grade	12%	19%	23%
	6 th grade	0	7%	52%
	7 th grade	51%	21%	25%
	8 th grade	37%	53%	0
Special Ed		17%	10%	6%

Students' Normal Curve Equivalent Test Scores

The influence of the SLED program on students' reading comprehension skills was investigated using two conversions of students' ITBS reading comprehension scores. First, differences in students' pre-post Normal Curve Equivalent test scores were examined.

A Normal Curve Equivalent (NCE) is a normalized test score. To calculate an NCE, students' raw scores are first converted into standard scores using a formula that creates a score reflective of an individual's achievement on a continuum from low to high. These scores are then converted again to make them normally distributed from 1 to 99, and with an average score of 50. The benefit of these scores is that, because they are normally distributed, they can be used in statistical analyses.

GRG used repeated-measures Analysis of Variance (ANOVA) to investigate differences in students' reading comprehension scores as a result of experiencing the SLED curriculum. The means and standard deviations for each group are presented in Table 5. The results for the ANOVA indicated an effect of condition by reading scores (Wilks $\Lambda = .98$, $F(1,597) = 7.43$, $p < .01$, multivariate $\eta^2 = .02$). This overall effect indicated that at least one of the experimental groups differed from the others in how student test scores changed from pre- to post-test. To learn how groups differed, paired-samples t-tests were conducted. These tests indicated that Legacy student reading test scores decreased significantly on the post test ($t(1, 184) = -1.5$, $p < .001$), while reading comprehension scores remained constant from pre to post for both the Treatment and Control groups.

A repeated-measures ANOVA was also calculated to investigate the influence of the SLED curriculum on students' science scores. There was no effect of condition on students' science scores (Wilks $\Lambda = 1.0$, $F(1,597) = .03$, $p = ns$). Scores remained fairly constant in each condition, with scores decreasing slightly in the Treatment and Control groups, and increasing slightly in the Legacy group.

Table 5
Means and Standard Deviations for Pre-Post NCE Reading Comprehension and Science Scores, by Experimental Group

	Reading Comprehension		Science	
	Pre-Test NCE	Post-Test NCE	Pre-Test NCE	Post-Test NCE
Treatment (n=234)	45.25 (19.91)	44.51 (18.08)	47.47 (18.78)	45.38 (19.18)
Control (n=363)	41.74 (17.53)	40.95 (19.34)	44.45 (16.92)	42.82 (19.92)
Legacy (n=182)	51.53 (20.75)	47.02 (21.37)	53.55 (20.53)	55.26 (20.78)

Students Test Score Performance Related to Grade Level

GRG also used students' Standard Scores to determine the number of students in each experimental group who were performing at, above, and below grade level in reading comprehension and science at the time of the pre and post test. As seen in Table 6, a minority of students in each experimental group were performing either at or above grade level in either reading comprehension or science. Further, the percentage of students performing at or above grade level in each subject did not change markedly from pre- to post-test.

Table 6
Percentage of Students Performing At or Above Grade Level by Experimental Condition and Sub-Test

	Reading Comprehension		Science	
	Pre-Test SS	Post-Test SS	Pre-Test SS	Post-Test SS
Treatment (n=291)	31%	30%	34%	40%
Control (n=400)	26%	15%	28%	29%
Legacy (n=196)	40%	34%	48%	48%

GRG conducted Wilcoxon tests for each experimental group to investigate whether students' scores moved in a positive or negative direction. For example, positive movement would have been indicated by students moving from below grade level to grade level or from grade level to above grade level. Conversely, negative movement would have been indicated by moving from above grade level to grade level or from grade level to below grade level.

As seen in Table 7, the majority of students showed no movement in either direction from pre- to post-test. For each experimental group, similar numbers of students moved in a positive and negative direction. Wilcoxon tests for each group indicated that there was no difference in the movement of students' test scores across time.

Table 7
Directional Movement of Pre-Post Test Scores, by Experimental Group and Sub-test

	Reading Comprehension			Science		
	Positive Movement	Negative Movement	No Movement	Positive Movement	Negative Movement	No Movement
Treatment	23	32	201	27	45	194
Control	41	40	294	60	47	278
Legacy	15	30	140	34	24	136

CONCLUSIONS

Based on the data available, teachers implemented the SLED curriculum according to the JASON team's expectations.

Of the 27 teachers who used the curriculum this year, the majority met the JASON team's 12-week implementation expectations. Teachers used at least one strategy with their students each week and modeled the use of reading comprehension strategies for their students on a weekly basis. SLED texts were used on a regular basis by most teachers. Teachers also used other (non-SLED) non-fiction texts to teach reading comprehension to their students. Finally, SLED team teachers communicated with each other regularly about their SLED lessons.

Students generalized their use of SLED reading comprehension behaviors to other subjects and texts.

Teachers reported that their students both used SLED terminology in other subjects/classes and used SLED skills (such as writing in the margins, and using post-it notes) to aid their reading comprehension in other classes and subjects. Similarly, teachers noted that students spontaneously used previously-covered SLED strategies throughout their use of the curriculum, and that they shared their thoughts about readings without prompting.

Teachers believed that the SLED curriculum was *generally effective* at meeting its teaching and learning goals.

Across each of the feedback questions GRG asked teachers to complete, the SLED curriculum was rated as *generally effective*. Teachers used this rating to describe the effectiveness of the curriculum at providing them with a context in which to teach both reading comprehension and science, at motivating students to participate in the SLED activities, and at influencing both students' reading comprehension skills and their understanding of science content.

The SLED curriculum did not influence students' reading comprehension or science scores on a standardized test.

Students' standardized test scores on the ITBS were not influenced by their participation in the SLED curriculum. Similarly, the majority of the students in both the Treatment and Legacy group showed no improvement in their grade-level reading comprehension or science scores.

RECOMMENDATIONS

Based on the results of the evaluation, GRG has three recommendations for the JASON team to consider as the SLED curriculum continues to be revised.

Across each year of the evaluation, teachers have requested more variety in the types of texts and activities included as part of the SLED curriculum. Teachers have indicated that they and their students grew tired of reading about the same content. They also indicated that the *content* of reading materials needs to be focused on topics that are of particular interest to middle school-aged students. Similarly, teachers have requested texts designed for a variety of reading levels. **GRG recommends that the JASON team revise the SLED curriculum to respond to these suggestions.** The more interested students are in interacting with the content of the curriculum, the more likely teachers will be to use the curriculum and its strategies.

While the standardized test results from the evaluation are disappointing, the extent to which they are an accurate indicator of the SLED curriculum's influence on students is still unclear. **GRG recommends that the JASON team work with teachers who participated in this study to obtain student-level reading comprehension and science test data from each classroom's 2004-2005 state test.** Given recent pressures to show adequate yearly progress, teachers and students were more likely to take seriously their preparation and completion of these tests, compared to the ITBS. It would be potentially useful to do a second analysis of these test data to learn if treatment and legacy students' scores were influenced by their SLED experiences.

Further, we recommend that future evaluation of SLED start on a small scale and then build up to an experimental design. The current evaluation was designed in compliance with evaluation requirements from the United States Department of Education. These regulations required that an experimental design study be conducted even though the curriculum was still early in its development. **For future evaluation efforts, we recommend that methods be used that are better aligned with the stage of this project's development than those used in the current evaluation.** For example, future evaluations might include behavioral assessments of students' use of specific reading comprehension strategies, an interview-based assessment of the meaning that students draw from a science-based text before and after SLED, a science assessment that focuses specifically on students' understanding of JASON Project science content before and after using the curriculum, and more intensive observations of a small number of teachers and students.

EVALUATOR'S NOTE

This evaluation research, as originally designed by GRG, was expected to provide a full picture of both implementation of the SLED curriculum and the curriculum's influence on student test scores. The JASON Foundation's period of due diligence in the Spring of 2005 forced GRG to cease temporarily all data collection activities. Therefore, we were unable to complete the collection of the CRS data for the full sample of teachers. Had these data been collected, GRG could have illustrated the diverse ways that the curriculum was used.

The suspension of data collection also compromised GRG's analysis of student test scores. GRG had originally planned to use the complete CRS data from each teacher to investigate the influence of different types of SLED implementation on

students' test scores. Because these data were not available, GRG was only able to analyze students' Reading Comprehension and Science scores by experimental group without further accounting for differences in how individual Legacy and Treatment teams' implementation influenced these scores.

APPENDIX

APPENDIX A
CURRICULUM RATING SHEET
RAINFOREST

WEEK 1

Science and Literacy in Education

Please answer the following 15 questions based on the materials you used during Week 1 of your implementation.

Your Implementation of the SLED Curriculum Unit:

How many days did you teach reading comprehension strategies this week?

- Zero One Two Three Four Five

Which reading comprehension strategy was your primary focus this week?

(Check one)

- Making Connections Questioning
 Visualizing Inferring
 Determining Importance Comprehending Information
 Other (Please specify) _____

Which other reading comprehension strategies (if any) did you use this week?

(Check all that apply)

- None
 Making Connections Questioning
 Visualizing Inferring
 Determining Importance Comprehending Information
 Other (Please specify) _____

Which Activity Texts did you use this week? (Check all that apply).

- | | |
|---|--|
| <input type="checkbox"/> I did not use any activity texts this week. | <input type="checkbox"/> Exploring on the Canopy Walkway |
| <input type="checkbox"/> The Ant and the Acacia Tree | <input type="checkbox"/> Getting to Know the Ants |
| <input type="checkbox"/> Investigating a UFO | <input type="checkbox"/> Insect Handling |
| <input type="checkbox"/> Jerry's Botfly | <input type="checkbox"/> Into the Treetops |
| <input type="checkbox"/> Ants as Dairy Farmers | <input type="checkbox"/> The Leafcutter Queen Reproduces |
| <input type="checkbox"/> The Ants that Take Slaves | <input type="checkbox"/> Mother and Sons |
| <input type="checkbox"/> Army Ants | <input type="checkbox"/> Murder by Narcosis |
| <input type="checkbox"/> Better Living through Chemistry | <input type="checkbox"/> On the Rooftop of the World |
| <input type="checkbox"/> The Closest Thing to a Rain Forest:
Marie Selby | <input type="checkbox"/> Out on a Limb |
| <input type="checkbox"/> Botanical Gardens | <input type="checkbox"/> Sharing Stories in the Garden |
| <input type="checkbox"/> Collecting Bullet Ants | <input type="checkbox"/> Sunburst Diving Beetles |
| <input type="checkbox"/> The Colony Divides | <input type="checkbox"/> Sympathy for the Devil |
| <input type="checkbox"/> Construction Cranes in the Canopy | <input type="checkbox"/> A Treasure Hunt for Ants |
| <input type="checkbox"/> The Daintiness of Ants | <input type="checkbox"/> Workers' Paradise |
| <input type="checkbox"/> Defending the Young Queen | <input type="checkbox"/> Working in the Greenhouse,
Herbarium, and Laboratory |
| <input type="checkbox"/> Displaying Bullet Ants | <input type="checkbox"/> The World of the Insect |
| <input type="checkbox"/> Enjoying Insects in the Home
Garden | <input type="checkbox"/> Writing about Science |
| <input type="checkbox"/> Everyday Miracles | <input type="checkbox"/> The View from the Ground |
| <input type="checkbox"/> Other Activity Text: _____ | <input type="checkbox"/> The Young Queen Takes Flight |

**Please indicate the Activity Texts used this week (if any) that were not at the appropriate reading level for most of your students.
(Check all that apply. If you select “Other,” specify below.)**

- | | |
|--|---|
| <input type="checkbox"/> All Activity Texts were at the appropriate reading level. | <input type="checkbox"/> Exploring on the Canopy Walkway |
| <input type="checkbox"/> The Ant and the Acacia Tree | <input type="checkbox"/> Getting to Know the Ants |
| <input type="checkbox"/> Investigating a UFO | <input type="checkbox"/> Insect Handling |
| <input type="checkbox"/> Jerry’s Botfly | <input type="checkbox"/> Into the Treetops |
| <input type="checkbox"/> Ants as Dairy Farmers | <input type="checkbox"/> The Leafcutter Queen Reproduces |
| <input type="checkbox"/> The Ants that Take Slaves | <input type="checkbox"/> Mother and Sons |
| <input type="checkbox"/> Army Ants | <input type="checkbox"/> Murder by Narcosis |
| <input type="checkbox"/> Better Living through Chemistry | <input type="checkbox"/> On the Rooftop of the World |
| <input type="checkbox"/> The Closest Thing to a Rain Forest: Marie Selby | <input type="checkbox"/> Out on a Limb |
| <input type="checkbox"/> Botanical Gardens | <input type="checkbox"/> Sharing Stories in the Garden |
| <input type="checkbox"/> Collecting Bullet Ants | <input type="checkbox"/> Sunburst Diving Beetles |
| <input type="checkbox"/> The Colony Divides | <input type="checkbox"/> Sympathy for the Devil |
| <input type="checkbox"/> Construction Cranes in the Canopy | <input type="checkbox"/> A Treasure Hunt for Ants |
| <input type="checkbox"/> The Daintiness of Ants | <input type="checkbox"/> Workers' Paradise |
| <input type="checkbox"/> Defending the Young Queen | <input type="checkbox"/> Working in the Greenhouse, Herbarium, and Laboratory |
| <input type="checkbox"/> Displaying Bullet Ants | <input type="checkbox"/> The World of the Insect |
| <input type="checkbox"/> Enjoying Insects in the Home Garden | <input type="checkbox"/> Writing about Science |
| <input type="checkbox"/> Everyday Miracles | <input type="checkbox"/> The View from the Ground |
| <input type="checkbox"/> Other Activity Text not at appropriate reading level: _____ | <input type="checkbox"/> The Young Queen Takes Flight |

Did you use any non-SLED texts to teach reading comprehension this week?

- Yes
- No

If yes, which texts did you use? _____

How many days this week did you model the use of reading strategies for your students?

- Zero
- One
- Two
- Three
- Four
- Five

How many days this week did you devote to teaching JASON Project science?

- Zero
- One
- Two
- Three
- Four
- Five

How many days this week did you devote to using a SLED text to teach science?

- Zero
- One
- Two
- Three
- Four
- Five

Which SLED videos, if any, did you use this week?

- I didn’t use any SLED videos this week.
- Expedition Prologue
- JASON in the Rainforest
- Learning Reading Strategies
- Meg Lowman at Marie Selby
- Randy the Bug Man
- Writing About Science

Did your students use any of the SLED audio recordings of the texts this week?

- Yes
- No

How often did you and your team teacher meet this week to plan SLED teaching?

- Zero
- One
- Two
- Three
- Four
- Five

Final Impressions

How satisfied were you with the SLED materials you used this week?

- Not at all
- A little
- Generally
- Very
- Extremely

How effective were the SLED materials used this week were at increasing students' reading comprehension skills?

- Not at all
- A little
- Generally
- Very
- Extremely

How effective were the SLED and JASON materials used this week at increasing students' understanding of science?

- Not at all
- A little
- Generally
- Very
- Extremely

WEEK 2

Science and Literacy in Education

Please answer the following 15 questions based on the materials you used during Week 2 of your implementation.

Your Implementation of the SLED Curriculum Unit:

How many days did you teach reading comprehension strategies this week?

- Zero One Two Three Four Five

Which reading comprehension strategy was your primary focus this week?

(Check one)

- Making Connections Questioning
 Visualizing Inferring
 Determining Importance Comprehending Information
 Other (Please specify) _____

Which other reading comprehension strategies (if any) did you use this week?

(Check all that apply)

- None
 Making Connections Questioning
 Visualizing Inferring
 Determining Importance Comprehending Information
 Other (Please specify) _____

Which Activity Texts did you use this week? (Check all that apply).

- | | |
|---|--|
| <input type="checkbox"/> I did not use any activity texts this week. | <input type="checkbox"/> Exploring on the Canopy Walkway |
| <input type="checkbox"/> The Ant and the Acacia Tree | <input type="checkbox"/> Getting to Know the Ants |
| <input type="checkbox"/> Investigating a UFO | <input type="checkbox"/> Insect Handling |
| <input type="checkbox"/> Jerry's Botfly | <input type="checkbox"/> Into the Treetops |
| <input type="checkbox"/> Ants as Dairy Farmers | <input type="checkbox"/> The Leafcutter Queen Reproduces |
| <input type="checkbox"/> The Ants that Take Slaves | <input type="checkbox"/> Mother and Sons |
| <input type="checkbox"/> Army Ants | <input type="checkbox"/> Murder by Narcosis |
| <input type="checkbox"/> Better Living through Chemistry | <input type="checkbox"/> On the Rooftop of the World |
| <input type="checkbox"/> The Closest Thing to a Rain Forest:
Marie Selby | <input type="checkbox"/> Out on a Limb |
| <input type="checkbox"/> Botanical Gardens | <input type="checkbox"/> Sharing Stories in the Garden |
| <input type="checkbox"/> Collecting Bullet Ants | <input type="checkbox"/> Sunburst Diving Beetles |
| <input type="checkbox"/> The Colony Divides | <input type="checkbox"/> Sympathy for the Devil |
| <input type="checkbox"/> Construction Cranes in the Canopy | <input type="checkbox"/> A Treasure Hunt for Ants |
| <input type="checkbox"/> The Daintiness of Ants | <input type="checkbox"/> Workers' Paradise |
| <input type="checkbox"/> Defending the Young Queen | <input type="checkbox"/> Working in the Greenhouse,
Herbarium, and Laboratory |
| <input type="checkbox"/> Displaying Bullet Ants | <input type="checkbox"/> The World of the Insect |
| <input type="checkbox"/> Enjoying Insects in the Home
Garden | <input type="checkbox"/> Writing about Science |
| <input type="checkbox"/> Everyday Miracles | <input type="checkbox"/> The View from the Ground |
| <input type="checkbox"/> Other Activity Text: _____ | <input type="checkbox"/> The Young Queen Takes Flight |

Please indicate the Activity Texts used this week (if any) that were not at the appropriate reading level for most of your students. (Check all that apply. If you select “Other,” specify below.)

- | | |
|---|---|
| <input type="checkbox"/> All Activity Texts were at the appropriate reading level. | <input type="checkbox"/> Exploring on the Canopy Walkway |
| <input type="checkbox"/> The Ant and the Acacia Tree | <input type="checkbox"/> Getting to Know the Ants |
| <input type="checkbox"/> Investigating a UFO | <input type="checkbox"/> Insect Handling |
| <input type="checkbox"/> Jerry’s Botfly | <input type="checkbox"/> Into the Treetops |
| <input type="checkbox"/> Ants as Dairy Farmers | <input type="checkbox"/> The Leafcutter Queen Reproduces |
| <input type="checkbox"/> The Ants that Take Slaves | <input type="checkbox"/> Mother and Sons |
| <input type="checkbox"/> Army Ants | <input type="checkbox"/> Murder by Narcosis |
| <input type="checkbox"/> Better Living through Chemistry | <input type="checkbox"/> On the Rooftop of the World |
| <input type="checkbox"/> The Closest Thing to a Rain Forest: Marie Selby | <input type="checkbox"/> Out on a Limb |
| <input type="checkbox"/> Botanical Gardens | <input type="checkbox"/> Sharing Stories in the Garden |
| <input type="checkbox"/> Collecting Bullet Ants | <input type="checkbox"/> Sunburst Diving Beetles |
| <input type="checkbox"/> The Colony Divides | <input type="checkbox"/> Sympathy for the Devil |
| <input type="checkbox"/> Construction Cranes in the Canopy | <input type="checkbox"/> A Treasure Hunt for Ants |
| <input type="checkbox"/> The Daintiness of Ants | <input type="checkbox"/> Workers' Paradise |
| <input type="checkbox"/> Defending the Young Queen | <input type="checkbox"/> Working in the Greenhouse, Herbarium, and Laboratory |
| <input type="checkbox"/> Displaying Bullet Ants | <input type="checkbox"/> The World of the Insect |
| <input type="checkbox"/> Enjoying Insects in the Home Garden | <input type="checkbox"/> Writing about Science |
| <input type="checkbox"/> Everyday Miracles | <input type="checkbox"/> The View from the Ground |
| <input type="checkbox"/> Other Activity Text not at appropriate reading level: _____ | <input type="checkbox"/> The Young Queen Takes Flight |

Did you use any non-SLED texts to teach reading comprehension this week?

- Yes
- No

If yes, which texts did you use? _____

How many days this week did you model the use of reading strategies for your students?

- Zero
- One
- Two
- Three
- Four
- Five

How many days this week did you devote to teaching JASON Project science?

- Zero
- One
- Two
- Three
- Four
- Five

How many days this week did you devote to using a SLED text to teach science?

- Zero
- One
- Two
- Three
- Four
- Five

Which SLED videos, if any, did you use this week?

- I didn’t use any SLED videos this week.
- Expedition Prologue
- JASON in the Rainforest
- Learning Reading Strategies
- Meg Lowman at Marie Selby
- Randy the Bug Man
- Writing About Science

Did your students use any of the SLED audio recordings of the texts this week?

- Yes
 No

How often did you and your team teacher meet this week to plan SLED teaching?

- Zero One Two Three Four Five

Final Impressions

How satisfied were you with the SLED materials you used this week?

- Not at all A little Generally Very Extremely

How effective were the SLED materials used this week were at increasing students' reading comprehension skills?

- Not at all A little Generally Very Extremely

How effective were the SLED and JASON materials used this week at increasing students' understanding of science?

- Not at all A little Generally Very Extremely

OVERALL IMPRESSIONS OF THE PAST TWO WEEKS

In the past two weeks, have you noticed...

Students using SLED terminology (e.g., this reminds me of, self to world, etc.) in other classes/subjects

- No
- Yes

Students using SLED activities such as writing in the margins or using post-it notes in other classes/subjects

- No
- Yes

Students spontaneously (i.e., not as part of an assignment) using previously-covered SLED strategies as new SLED strategies are being introduced

- No
- Yes

Students spontaneously (i.e., not as part of an assignment) sharing thoughts with each other about what they are reading

- No
- Yes

Which Activity Texts from the past two weeks would you use again next year? (Check all that apply. If you select "Other," specify below.)

- | | |
|--|---|
| <input type="checkbox"/> I would not use any Activity Texts from the past two weeks next year. | <input type="checkbox"/> Exploring on the Canopy Walkway |
| <input type="checkbox"/> All Activity Texts were at the appropriate reading level. | <input type="checkbox"/> Getting to Know the Ants |
| <input type="checkbox"/> The Ant and the Acacia Tree | <input type="checkbox"/> Insect Handling |
| <input type="checkbox"/> Investigating a UFO | <input type="checkbox"/> Into the Treetops |
| <input type="checkbox"/> Jerry's Botfly | <input type="checkbox"/> The Leafcutter Queen Reproduces |
| <input type="checkbox"/> Ants as Dairy Farmers | <input type="checkbox"/> Mother and Sons |
| <input type="checkbox"/> The Ants that Take Slaves | <input type="checkbox"/> Murder by Narcosis |
| <input type="checkbox"/> Army Ants | <input type="checkbox"/> On the Rooftop of the World |
| <input type="checkbox"/> Better Living through Chemistry | <input type="checkbox"/> Out on a Limb |
| <input type="checkbox"/> The Closest Thing to a Rain Forest: Marie Selby | <input type="checkbox"/> Sharing Stories in the Garden |
| <input type="checkbox"/> Botanical Gardens | <input type="checkbox"/> Sunburst Diving Beetles |
| <input type="checkbox"/> Collecting Bullet Ants | <input type="checkbox"/> Sympathy for the Devil |
| <input type="checkbox"/> The Colony Divides | <input type="checkbox"/> A Treasure Hunt for Ants |
| <input type="checkbox"/> Construction Cranes in the Canopy | <input type="checkbox"/> Workers' Paradise |
| <input type="checkbox"/> The Daintiness of Ants | <input type="checkbox"/> Working in the Greenhouse, Herbarium, and Laboratory |
| <input type="checkbox"/> Defending the Young Queen | <input type="checkbox"/> The World of the Insect |
| <input type="checkbox"/> Displaying Bullet Ants | <input type="checkbox"/> Writing about Science |
| <input type="checkbox"/> Enjoying Insects in the Home Garden | <input type="checkbox"/> The View from the Ground |
| <input type="checkbox"/> Everyday Miracles | <input type="checkbox"/> The Young Queen Takes Flight |
| | <input type="checkbox"/> Other Activity Text |

Other Activity Text you would use next year: _____

Which Activity Texts from the past two weeks would you NOT use again next year? (Select all that apply. If you select “Other,” specify below.)

- | | |
|--|---|
| <input type="checkbox"/> I would not use any Activity Texts from the past two weeks next year. | <input type="checkbox"/> Everyday Miracles |
| <input type="checkbox"/> All Activity Texts were at the appropriate reading level. | <input type="checkbox"/> Exploring on the Canopy Walkway |
| <input type="checkbox"/> The Ant and the Acacia Tree | <input type="checkbox"/> Getting to Know the Ants |
| <input type="checkbox"/> Investigating a UFO | <input type="checkbox"/> Insect Handling |
| <input type="checkbox"/> Jerry’s Botfly | <input type="checkbox"/> Into the Treetops |
| <input type="checkbox"/> Ants as Dairy Farmers | <input type="checkbox"/> The Leafcutter Queen Reproduces |
| <input type="checkbox"/> The Ants that Take Slaves | <input type="checkbox"/> Mother and Sons |
| <input type="checkbox"/> Army Ants | <input type="checkbox"/> Murder by Narcosis |
| <input type="checkbox"/> Better Living through Chemistry | <input type="checkbox"/> On the Rooftop of the World |
| <input type="checkbox"/> The Closest Thing to a Rain Forest: Marie Selby | <input type="checkbox"/> Out on a Limb |
| <input type="checkbox"/> Botanical Gardens | <input type="checkbox"/> Sharing Stories in the Garden |
| <input type="checkbox"/> Collecting Bullet Ants | <input type="checkbox"/> Sunburst Diving Beetles |
| <input type="checkbox"/> The Colony Divides | <input type="checkbox"/> Sympathy for the Devil |
| <input type="checkbox"/> Construction Cranes in the Canopy | <input type="checkbox"/> A Treasure Hunt for Ants |
| <input type="checkbox"/> The Daintiness of Ants | <input type="checkbox"/> Workers' Paradise |
| <input type="checkbox"/> Defending the Young Queen | <input type="checkbox"/> Working in the Greenhouse, Herbarium, and Laboratory |
| <input type="checkbox"/> Displaying Bullet Ants | <input type="checkbox"/> The World of the Insect |
| <input type="checkbox"/> Enjoying Insects in the Home Garden | <input type="checkbox"/> Writing about Science |
| | <input type="checkbox"/> The View from the Ground |
| | <input type="checkbox"/> The Young Queen Takes Flight |
| | <input type="checkbox"/> Other Activity Text |

Other Activity Text you would NOT use next year: _____

Describe one SLED lesson from the last two weeks that went particularly well (i.e., what Activity Text was used, what did you do, why did it go well).

Describe a SLED lesson from the last two weeks that was challenging (what Activity Text was used, what did you do, what was the challenge).

APPENDIX B
UNIT FEEDBACK SURVEY

SLED Unit Feedback Survey

Which SLED unit have you just completed?

- Rain Forest
- Wetlands
- Other: _____

What were your overall impressions of this SLED curriculum unit? _____

If given the choice, would you continue to use the SLED curriculum with your students?

- Yes; why? _____

- No; why not? _____

Overall, how effective do you think the SLED curriculum was at enabling you to teach reading comprehension skills to your students?

- Not at all
- A little
- Generally
- Very
- Extremely

Overall, how effective do you think the SLED curriculum was at enabling you to teach more science content to your students?

- Not at all
- A little
- Generally
- Very
- Extremely

How motivated were your students to participate in SLED curriculum activities?

- Not at all
- A little
- Generally
- Very
- Extremely

How valuable were the videos provided with the SLED materials for supporting the teaching of reading strategies?

- Poor
- Fair
- Average
- Good
- Excellent

How valuable were the videos provided with the SLED materials for supporting the teaching of science content?

- Poor
- Fair
- Average
- Good
- Excellent

What suggestions do you have for additional reading comprehension activities that you would like to see included in the SLED curriculum?

What general suggestions do you have for improving the SLED curriculum content? _____

APPENDIX C
OBSERVATION PROTOCOL

OBSERVATION PROTOCOL – Y3

Date: _____ Site: _____ Subject: _____
Number of students: _____ # Female: _____ # Male: _____ Grade level(s): _____

READING MATERIALS AVAILABLE IN CLASSROOM

Textbooks:

Fictional Text:

Non-Fictional Text:

Other Print Materials:

INSTRUCTIONAL STRATEGIES

Teacher instructs students on reading comprehension directly Yes No
Describe: (e.g., text used, skills covered)

Teacher uses 'real life' experiences as a reference point for teaching Yes No

Teacher uses student input (e.g., questions, comments) during instruction Yes No
Describe:

Teacher uses inquiry-based methods (i.e., encourages students to ask questions, to 'puzzle through' to an answer). Yes No

Teacher models thinking aloud while reading. Yes No

Teacher has students work as partners or in small groups. Yes No

USE OF CLASS TIME

Activity Description

Time Allotted to Activity

_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes
_____	_____ minutes

USE OF SLED MATERIALS

Is the **SLED reading strategies poster** displayed in the classroom? Yes No

Are there any **other display materials** that are related to reading comprehension or reading strategies or reading skills? Yes No

If yes, what are they?

Were any **SLED texts** that are **not part of a specific SLED reading comprehension activity** used for reading comprehension work during the observation period? Yes No

If yes, which one(s)?

Were any **audio versions of SLED texts** used during the observation period? Yes No

Were **other texts** used for reading comprehension work during the observation period?

Yes No

If yes, which ones?

Was any **fiction** used for reading comprehension work during the observation period?

Yes No

Were any **non-fiction** science text materials other than SLED texts used during the observation period?

Yes No

If yes, what science text materials were used?

Were **SLED reading comprehension activities** used during the observation period? Yes No

If yes, which ones?

Were **other reading comprehension activities** used during the observation period? Yes No

If yes, which ones?

Were **SLED video segments** used during the observation period? Yes No

If yes, which ones? (Provide a list?)

Was a **JASON Project science activity** used during the observation period? Yes No

If yes, which one(s)? (Provide a list?)

Were any **other science activities** completed during the observation period? Yes No

If yes, which one(s)?

APPENDIX D
SLED TEXTS THAT WERE NOT USED

Texts that Teachers Did Not Use, by Unit

Rainforests Unit	Wetlands Unit
Ants as Dairy Farmers	Efforts on All Fronts
Collecting Bullet Ants	Keeping New Orleans Dry
The Colony Divides	Paddling Bayou Lafourche
Defending the Young Queen	
Displaying Bullet Ants	
Insect Handling	
Sunburst Diving Beetles	
The World of the Insect	

