CENTER FOR Children & Technology

The JASON Project's Multi-media Science Curriculum Impact on Student Learning

Final Evaluation Report Year One

September 2001

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Executive Summary

Introduction

The goal of the JASON Project is to engage students in lifelong learning through a unique opportunity to learn about earth systems, life on earth, and technologies used to study the earth-space system. The project aims bring educators and students together to construct their own knowledge base by putting science concepts and skills to work in a media-based anchor. It provides teachers with instructional tools that bring together academic standards, the rich research environment of a new curriculum topic each year, and student performance measures that support state standards and assessment initiatives. It aspires to help teachers meet two kinds of learning objectives: (1) to increase student learning of content-specific information, and (2) to engage students in complex, difficult tasks that lead to the development of scientific thinking and problem-solving skills.

The JASON Project has been growing steadily in the last twelve years, today reaching a diverse population of approximately 25,000 teachers and 1 million students around the country. These two populations are diverse in terms of ethnicity, community profile (geography and income), teaching experience, number of years in the JASON program, students' achievement levels, as well as teachers' and students' experience with technology and science.

Based on JASON multimedia resources, the diversity of its population, and the JASON Project's long-term presence (12 years) in the education field, the Center for Children and Technology (CCT), with the JASON Foundation for Education's (JFE) staff, decided to focus directly on demonstrating JASON's impact on diverse populations of students and teachers across the country in the coming years. We agreed that it was important to develop a pre-planning evaluation phase, a one-year evaluation of JASON's impact on a small representative sample of students and teachers, and a multi-year large-scale evaluation of the impact of the various JASON resources on students and teachers. The purpose of the pre-planning evaluation and one-year pilot evaluation study is to help us design a multi-year evaluation program responsive to the needs of JFE.

Research Design and Methodologies

To develop an evaluation study, CCT staff conducted a pre-planning evaluation phase (June 1 to July 31, 2000). During this time we:

- Attended the JASON National Educators Conference on June 21-23, 2000, in Milwaukee

- Met with JASON staffs
- Familiarized ourselves with the JASON curriculum and web site.

We observed the training of trainers and teachers for the JASON XII curriculum. We learned more about the JASON on-line learning community and the varied on-line resources and activities available to both students and teachers, and we developed an understanding of the kinds of assessments that will yield relevant information about students' learning. Based on this pre-evaluation, it was CCT's understanding that JFE was most interested in demonstrating JASON's impact on diverse populations of students and assessing student's inquiry skills over time.

The one-year comprehensive evaluation of student learning in the JASON multimedia environment used the following assessment techniques:

- Administration of a pre/post-science inquiry problem-solving task
- Videotape assessment of students' year-end project presentations
- Administration of school/district demographic questionnaires
- Teacher and student surveys
- Interviews with teachers and administrators
- Classroom observations.

Findings

School, Teacher, and Student Profiles

We worked with nine science teachers and 269 students from eight middle schools located around the country: in Arkansas, Texas, Michigan, Ohio, California, New York, Wisconsin, and Pennsylvania. These eight schools reflect the diversity of learning contexts in which Jason is being implemented such as student background and ability and teachers' experience in using JASON.

Schools

- Serve 6th, 7th and 8th grades
- Mainly low and middle income families
- Range in student/teacher ratio
- Vary in achievement levels from below average to above average

Teachers

- All teach science, though some teach other subject as well.
- Mainly white and female
- Average 20 years of teaching experience
- Average 8 years technology experience
- Average 5 years JASON experience

Students

- 269 JASON students participated in this study
- Diverse socio-economic and ethnic backgrounds
- Most identify science as their favorite subject (82%)
- Have participated in JASON for one year (55%), two years (17%), three years (5%), four years (4%), and five years (3%)

Based on our students' surveys (N=262), we found that the JASON students learned about the following topics this year:

- Volcanoes (260)
- Lava tubes (211)
- Plate tectonics (201)
- Hawaiian culture (196)
- Animal adaptation (186)
- Weather/climate (182)
- Hawaiian ecology (169)

JASON classes engaged in the following scientific activities:

- Lab experiments (209)
- Library research (207)
- Group projects (206)
- Data collection (203)
- Internet research (200)
- Live science broadcast (191)
- Built models (181)

- Made posters (179)
- Drew conclusions based on data (178)
- Developed hypothesis (174)
- Went on field trips (155)

Contextual Issues and Challenges

Based on interviews with teachers and administrators as well as on our own observations, we identified a number of common themes characterizing participants' experience with the JASON Project across multiple study sites.

The JASON curriculum is adaptable.

- Teachers pick and choose activities from the curriculum.
- Teachers select activities that support state and district standards.
- Teachers reuse activities.
- However, variable topics mean that JASON may or may not support a grade's required curriculum in any given year.

The success of JASON depends on the teacher.

- The project attracts teachers who take a hands-on approach to science and enjoy learning new subjects.
- The project gives teachers ideas for labs and activities.
- The project requires dedication and innovation on the part of teachers.
- The curriculum is often adopted through a bottom-up process.
- When the curriculum is imposed on teachers they are not enthusiastic about it.
- The project does not suit all teachers' teaching styles.
- Teacher enthusiasm can inspire other teachers to make use of the curriculum.

District and School constraints impede the process.

- Teachers sometimes pay out of pocket for training and supplies.
- Even inexpensive materials add up in cost when used with many students.
- Teachers need to be very organized to assemble all the necessary materials.
- Changing topics require teachers to purchase new materials each year.
- Schools/districts do not always pay for training for all JASON teachers.

- Teachers have no time to coordinate interdisciplinary projects with other teachers.
- Class periods are too short to conduct JASON activities and field experiments.
- Lack of access to technology prevents teachers from taking advantage of online resources.
- High-stakes testing prevents teachers from using the curriculum if JASON content does not appear on the test.
- Stressed teachers cannot integrate new material into existing curriculum.

JASON Impact on Teachers

JASON changes teaching practice.

- JASON promotes the use of alternative assessments, such as presentations and portfolios.
- JASON encourages project-based learning.
- Collaboration among teachers increases.
- The project supports and interdisciplinary approach to learning.

JASON increases teachers' use of technology.

- JASON serves as an impetus to use a variety of digital tools.
- The JASON Web site provides a wealth of resources to teachers.
- JASON spurs the development technology infrastructure in schools.
- Teachers see how to take advantage of technology available to them.
- JASON encourages the use of scientific instruments as well as computers.
- However, some teachers' access to technology is still limited.

JASON Impact on Student Learning

Based on site visits as well as teachers' and principals' interviews, we found that the JASON curriculum helps students make concrete their learning of complex and abstract scientific concepts through rich hands-on activities; and make real-world connections.

Hands-on learning

- Keeps students engaged

- Appeals to diverse learning styles
- Involves the creation of tangible products
- Is especially effective with at-risk students.

Making real-world connections

- Makes science real and relevant to students
- Allows students to interact and identify with scientists
- Exposes students to experiences they would never otherwise have
- Helps students ask better questions
- Inspires an interest in science that can extend beyond the JASON experience.

Inquiry Test Results

Based on the results of a pre- and post-inquiry test that asked students to answer questions by interpreting data and building an argument, we found that

- Most JASON students (66%) made overall gains (from 1 to 10 points).
- More than half of the JASON students in each classroom made some gains on the test with the exception of students in one classroom.
- The average JASON classroom gains were all positive (from .44 to 2.45 points).
- Most JASON students did better in process (66%) than in content (46%).
- Average classroom gains in process skills were positive (from .16 to 1.55 points) for all classrooms.
- Average class scores for content were negative in two classrooms and positive in seven classrooms (from .28 to .91 points).
- JASON students who scored at or above average (87%) did much better in process than in content.
- Half of the JASON students in all three grades made significant gains, especially in 6th and 7th grades.
- Students who worked in small groups (72%) on a regular basis in their classrooms also made significant gains in the inquiry test.

In the cases where the inquiry test was administer to a control group, we found that

- JASON students (52%) did better (1 to 7) than the control group (38%) in the inquiry test.

- JASON students specifically performed better in the area of process/scientific argument building.

Video Assessment Results

Based on inter-scorer reliability analysis, we found that the overall reliability of the scores given to JASON students' videotaped presentations of their projects was 88 percent. Relative to other research projects using similar assessment techniques, these scorers achieved an extremely high level of reliability (Frederiksen, 1994a).

Based on cluster analysis determined as groupings in which the three dimensions of scoring (understanding, critical thinking, and communications skills) have maximally distinct means and the coding of each assessment dimension on a scale of 1 to 5, we found that

- Fifty percent (50%) of the sample fell into the High Cluster (from 3.6 to 3.7 points). These scores were high and consistent across the three assessment dimensions.
- Thirty-one percent (31%) of the sample fell into the Middle Cluster (from 2.4 to 2.6 points). Scores for this cluster were average.
- Nineteen percent (19%) of the sample was in the Low Cluster (from 1.7 to 2.1 points).

A further analysis of the videotaped presentations reveals that:

- The overall score of more than half of the students' videotaped presentations were high (3.8).
- Of the students' videotaped performances scoring at or above three (56%) across three assessment dimensions, most of them did better (66%) in critical thinking.
- Ten presentations (31%) from Texas, Long Island, Arkansas, Michigan, and Wisconsin scored high (at or above 3) consistently across the three dimensions of scoring. Inferential statistics from the student's survey data indicate that most of the students from these five states knew the general goals of the JASON Project, and the topic of this year's JASON curriculum.
- Three presentations from Arkansas and Wisconsin scored very high (at or above 4) across the three dimensions. All three projects addressed topics from the JASON curriculum: plate tectonics, cultures and history of Hawaii, and volcanoes.

Team JASON Online Results

Based on descriptive analysis of the Team JASON Online (TJO) databases, we found little change in participating students' use of TJO resources at the beginning and end of the school year. Seven percent of the student sample (N=269) posted 33 messages out of 4,089 messages present in the TJO's database, which were submitted by a total of 121 JASON students.

The topics posted by our sample of JASON students were mainly about science experiments. Our analysis of teacher survey and interview data indicate that the JASON teachers in our study use print and video materials more than the Team JASON Online (TJO) resources.

Conclusion and Recommendations

The findings above provide us with a broad overview of some of the issues relevant to the implementation of the JASON Project in diverse classroom settings, and of the impact of the program on students and teachers. However, the relatively small scale of the study allows us to draw only tentative conclusions. One of the main purposes of this first-year in-depth study of the JASON Project was to inform our design of a large-scale study of the Project, which will yield useful marketing information as well as a variety of inquiry assessment tools for JFE. Under these circumstances, we propose a comprehensive two-year evaluation program about teaching and learning in the JASON multimedia environment. We will develop (1) typologies of JASON teachers' use of the various JASON curriculum components in the first year, and (2) a repertoire of JASON students' inquiry-based measures in the second year. The specific tasks in this multi-year study are to:

- Identify the typologies of teachers' use of the JASON multimedia curriculum, and the extent to which they use different components of the curriculum.
- Examine how the teachers use the curriculum components in their classroom, and what they expect the students to learn from each of these components.
- Develop a repertoire of diagnostic assessment tools which are aligned to national and state standards, and informed by the teachers' typologies of use of the JASON curriculum.
- Use these assessment tools to test a variety of students' inquiry-based learning outcomes.

Introduction

In the last twelve years, the overall goal of the JASON Project has been to offer a diverse population of students and teachers a unique opportunity to learn about earth systems, life on earth, and technologies used to study the earth-space system. These three goals are attained through a model for the delivery of science which is inclusive of technology, focuses on scientists doing science in the context of a research expedition, relates science to other subject domains, and provides for interactive learning. The JASON Project aims to bring educators and students together to construct their own knowledge base by putting science concepts and skills to work in a media-based anchor. Its ultimate goal is to engage students in lifelong learning.

The JASON Project works towards these goals by providing teachers with instructional tools that bring together academic standards, the rich research environment of a new curriculum topic each year, and student performance measures that support state standards and assessment initiatives. The Project tries to build into its very structure a way to manage and align various technology components. JASON's multimedia curriculum model comprises the following resources: print curriculum, prologue and update videos, live broadcast, and Team JASON Online. The **print curriculum** is designed to mirror researchers' work in the field or lab. The **prologue and update videos** help students recall and visually organize information and reinforce learning. The **live expedition Tele-presence** helps students become a part of the research team, experience the expedition firsthand, and relate their work to that of the researchers. **Team JASON Online** (TJO) is a set of integrated online interactions (e.g., teacher-directed exercises, discussion groups, chat sessions, additional curriculum exercises, assessment tools, online journals, etc.) used to help students articulate and share their understanding of concepts, skills, vocabulary, and projects with the larger JASON community of learners.

In order to take students to a high level of mindful engagement, the JASON Project's media-based research expedition provides an authentic, complex problem-solving environment to work in. The educational goals and objectives that are central to student learning in the JASON curriculum emphasize the acquisition of thinking and problem-solving skills, as well as core science content appropriate for the middle grades. Students engage in hands-on research that requires them to pose hypotheses, then devise methods and procedures for solving problems. Student experiments are central to the JASON curriculum; they require a broad range of competencies, are often interdisciplinary in focus, and require student initiative and creativity.

The JASON Project has been growing steadily in the last twelve years. In 2001, the JASON Project reaches a diverse population of approximately 25,000 teachers and 1 million students around the country. Both populations are diverse in terms of ethnicity, community profile (geography and income), teaching experience, number of years in the JASON program, students' achievement levels, as well as teachers' and students' experience with technology and science.

Based on JASON multimedia resources, the diversity of its population, and the JASON Project's long-term presence (twelve years) in the education field, the Center for Children and Technology (CCT), with the JASON Foundation for Education's (JFE) staff, decided to focus directly on demonstrating JASON's impact on various populations of students and teachers across the country in the coming years. We agreed that it was important to develop a pre-planning evaluation phase, a one-year in-depth evaluation of JASON's impact on a small representative sample of students and teachers, and a multi-year large-scale evaluation of the impact of the different JASON resources on students and teachers. The purpose of the pre-planning evaluation and one-year pilot evaluation study is to help us design a multi-year evaluation program responsive to the long-term needs of JFE.

Because student learning is a focus of the evaluation, CCT established the first-year pilot study to create assessment tools that can both reliably determine what students are learning and be used with confidence by JASON teachers in the future. As is widely known, one of the biggest challenges facing teachers is state-mandated assessment. For example, eighth grade is targeted as a high-stakes testing year in the majority of states in this country. Many teachers face rapidly mounting pressures to demonstrate student competencies. Caught on the horns of an assessment dilemma, they are increasingly held accountable for preparing their students to do well on the standardized achievement tests, but expected at the same time to teach their students how to think critically, explore deep content, and use technology to create project work. Most teachers are reluctant to spend a great deal of time on test preparation, recognizing that it impoverishes the curriculum, but feel they have little choice. They would like their students to engage in the kind of deep project work the new regional and national subject matter standards demand, but there is little time, less preparation, and few assessment techniques that would allow them to justify to school administrators the time and effort spent on such explorations.

A constructive response to this dilemma is multimedia projects that engage students in real science explorations and help teachers who have not yet become deeply familiar with inquiry-based pedagogical methods to learn along with their students how to manage and guide such projects. Such projects provide intellectual and material scaffolding for new teaching with new media in an educational climate that demands old accountability measures of teachers while also insisting that they integrate technology into new ways of teaching.

Accountability remains the sticking point, even for teachers who feel competent and comfortable with new media and new pedagogical approaches. There is a need to find ways to demonstrate the value of inquiry-based education in an age of high-stakes standardized testing.

CCT further recognized that assessments developed for the JASON evaluation will need to provide teachers not only with information about what their students are learning, but also with confidence that such learning is relevant to local assessments. The inquiry-based and analytical skills that students are asked to develop in the JASON program are not effectively measured by traditional paper-and-pencil tests. Instead they require a form of assessment that enables students to demonstrate their understanding of the complexity of the task they have undertaken, that moves beyond the recall of facts and concepts toward demonstration, as well as documentation of the processes and procedures used to solve particular problems. This type of assessment, called "authentic," records and judges the qualities of actual performances, rather than inferring an ability to perform from indirect and de-contextualized measures such as multiple-choice tests. Treating student projects as comprehensive demonstrations of their skills and knowledge (see Honey et al., 1996; Hawkins et al., 1993; Herman et al., 1992; Linn, 1993; Rudner & Boston, 1994; Wiggins, 1990), the authentic assessment approach was selected for the purposes of the JASON evaluation. It enabled us to develop grounded assessment tools that yield reliable and relevant information on JASON student learning.

CCT's evaluation of the impact of the JASON project on students has focused more on inquiry than on content skills. Inquiry as an activity or concept allows students to develop critical and flexible ability to query, explore widely, integrate, and apply knowledge to a specific task. The inquiry learning skills, which typically include observing, ordering, measuring, categorizing, predicting, inferring, isolation and control of variables, collecting and organizing data, experimenting, and communicating, are developed through use. The National Science Education Standards (NSES) uses the term inquiry in at least three different senses: scientific inquiry, inquiry teaching, and inquiry learning. Scientific inquiry refers to the means scientists use to study nature and formulate explanations of what they observe. It deals with how science proceeds and can be considered independently of educational processes. Inquiry teaching as used in the NSES has no precise operational definition but is understood to embrace methods that promote inquiry learning. Inquiry learning refers to the active processes in which students are engaged as they pursue increased understanding of content areas.

Inquiry, however, is not exclusively a cognitive concept. Its expert practice has been inextricably tied to the social organization of professional communities. Learning how to inquire depends on social circumstances and interpersonal relationships that help students to learn not only information and skills but also an esthetic about knowledge and their own learning powers (see Kuhn, 1962; Latour & Woolgar, 1986; Toulmin, 1982).

Based on the nature of the JASON multimedia curriculum, the reasoning outlined above, and the request of JFE, the Education Development Center's Center for Children and Technology (CCT) proposed to study the impact of the JASON Project on a diverse population of student's science experiences and learning (see Figure 1). CCT undertook a one-year comprehensive evaluation of student learning in the JASON multimedia environment. CCT designed and conducted the following assessment techniques: administration of a pre/post-science inquiry problem-solving task; videotape assessment of students' year-end project presentations; administration of school/district demographic questionnaires; teacher and student surveys; interviews with teachers and administrators; and classroom observations. (These methods are discussed further below.)

This report is a summary of findings and recommendations that can provide a foundation for more extended integration of the JASON multimedia curriculum into schools and classrooms around the country that JFE might undertake in the future. The data were analyzed to address the impact of the JASON curriculum on the learning of a diverse population of students, and the findings are organized into four sections: contextual information about schools and teachers; contextual issues and challenges; the JASON Project impact on teachers; and the JASON Project impact on students. Recommendations for future directions JFE might take are highlighted in the conclusion section.

Research Design and Methodologies

CCT was contracted by JFE to investigate the impact of the JASON Project on student learning in specific science content areas and student science inquiry skills. This task was divided into two main phases: a two-month pre-evaluation phase; and a one-year evaluation phase.

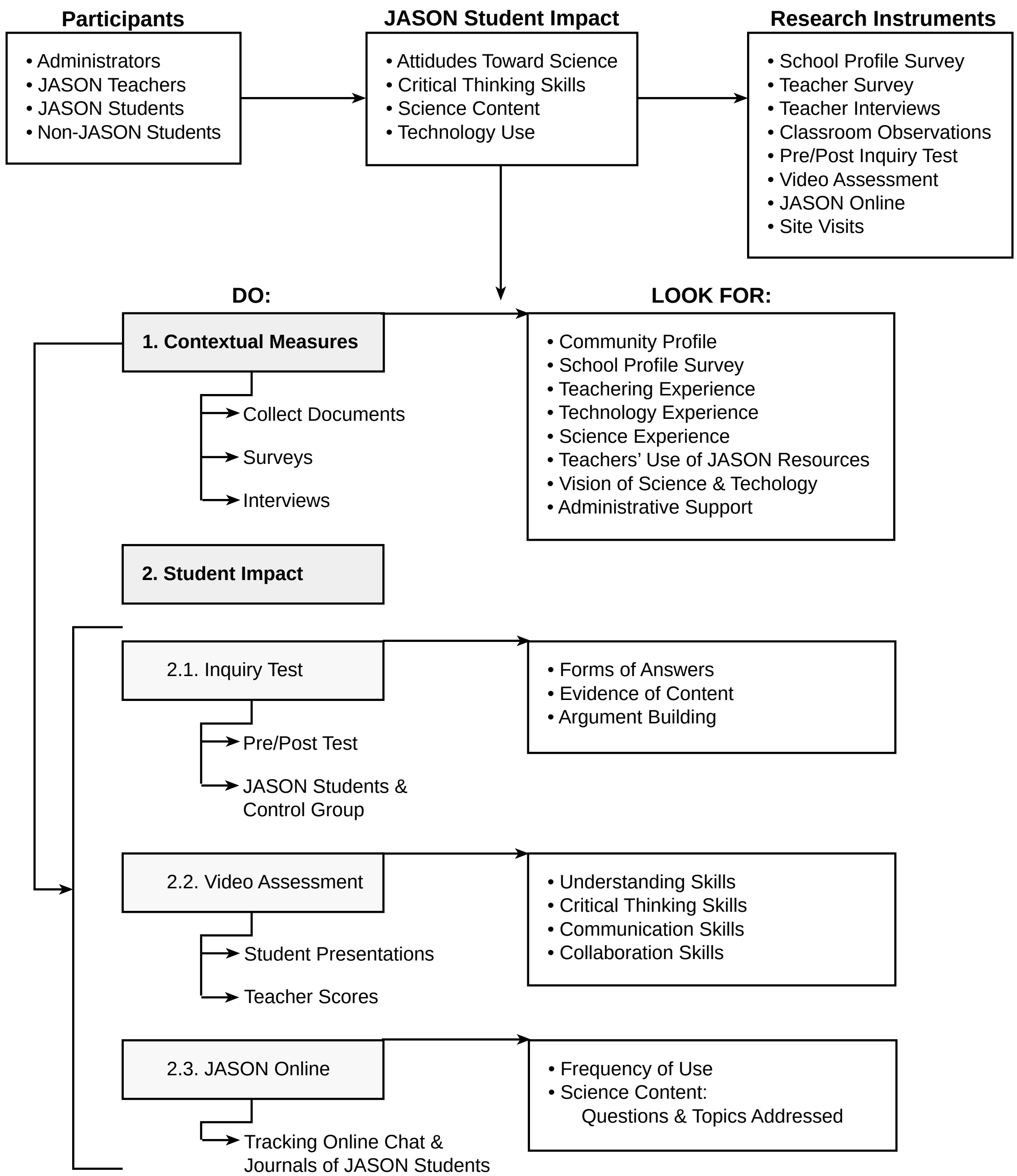
1. Pre-Evaluation Phase

To develop an evaluation study CCT staff conducted a pre-planning evaluation phase (June 1 to July 31, 2000). During this time we:

- Attended the JASON National Educators Conference on June 21-23, 2000, in Milwaukee
- Met with JASON staff
- Familiarized ourselves with the JASON curriculum and website.

We observed the training of trainers and teachers for the JASON XII curriculum. We learned more about the JASON online learning community and the varied online resources and activities available to both students and teachers, and developed an

Figure 1: Major Components of JASON Year One Study



understanding of the kinds of assessments that will yield relevant information about students' learning. Based on this pre-evaluation, it was CCT's understanding that JFE was most interested in demonstrating JASON's impact on diverse populations of students, and the assessment of student's inquiry skills over time. This initial undertaking allowed us to identify the most effective methodologies for use in undertaking a comprehensive analysis of student learning in JASON. These methods include:

- Administration of school/district demographic questionnaires
- Teacher and student surveys
- Interviews with teachers and administrators
- Classroom observations
- Administration of a pre/post-science inquiry problem-solving task
- Videotape assessment of students' year-end project presentations.

2. Evaluation Phase

2.1 Selection and description of participating schools

Since October (2000) CCT and JASON staff have been working to develop a set of criteria to select participating schools. One of the most important was based on the JASON Foundation's interest in learning how their program works for all kinds of students.

Because the JASON project has been under way for a number of years and already supports a large, committed community of educators, we worked with JASON teachers who have various degree of experience with the JASON curriculum and serve different population of students. Based on preliminary observations and conversations with JASON staff and teachers, it seems to take a JASON teacher approximately three years to get "comfortable" with implementing the JASON curriculum. Therefore, experienced users can be defined as those who have been involved in JASON for at least three years (as of August 2000) and are using the JASON curriculum extensively in their classrooms. Non-experienced users are those who are participating for the first time in the JASON Program this year or have been involved in JASON for fewer than three years and have not been using the JASON curriculum extensively in their classrooms. With this guiding criterion, we selected an initial pool of 20 to 30 JASON schools. JASON PIN site coordinators were asked to send a letter of participation to all potential participants in their area (see Appendix). The entire selection process took two months. With the help of JFE staffs, we identified the initial 30 schools and the final eight (8) school sites selected to participate in the study. These eight schools reflect the diversity of learning contexts in which Jason is being implemented in such categories as student background and ability and teachers' experience in using Jason. Furthermore, the participants in this study come from eight schools around the country: in Arkansas, Texas, Michigan, Pennsylvania, Ohio, California, New York, and Wisconsin.

2.2 Data collection phase

The data collection focused on (1) contextual information about school and community as well as participating teachers and students; (2) students' science inquiry task-based activities; (3) videotaping of JASON students' project presentations; and the use of JASON online resources by teachers and students. There were a total of twenty visits to school sites. At each site, two CCT researchers conducted classroom observations, interviews with teachers and principals, and a student inquiry test. They also collected data using a school profile questionnaire, a teacher survey, and a student survey. Finally, they videotaped students' presentations of their work in each site.

Background information: Using an administrator questionnaire, teacher survey, student survey, and collection of school documents, we were able to develop profiles of participating schools, communities, classrooms, teachers, and students (see Appendix). In order to compare student data across school sites, for example, we needed to determine what variables were similar and different across participating schools. For example, we focused on such variables as percentage of students receiving free or reduced-price lunch, size of school, type of school community (e.g., urban, suburban, rural), teacher-student ratio, and ethnic representation of students and teachers.

To interpret the student learning data, we collected demographic and background information about the participating teachers and students using surveys. These data aided in the interpretation of the student performance data. Previous educational research indicates that factors such as teachers' prior experience with technology, number of years teaching, experience with project-based work, content area expertise, and ways of interpreting and implementing a new curriculum can make a critical difference in the effectiveness of technology-rich educational programs (Becker, 1992; Brunner, 1992; Sheingold & Hadley, 1990).

Student's pre/post-science inquiry problem-solving task: CCT's evaluation of the impact of the JASON project on students has focused more on inquiry than on content knowledge. This is because there was no consistency across sites regarding what specific content from the JASON project was taught. Moreover, the JASON XII Curriculum provides activities and tips about the scientific method, conversion procedures, taxonomy/classification, and writing a scientific report in a format that scientists have established to help themselves communicate and collaborate effectively. Science inquiry skills are primarily taught in units 2 and 4 of the curriculum, which focus specifically on "local field investigation" and "expedition research." Some of these units' investigation components are correlated to the National Science Education Standards [standard A is related to science as inquiry]. Another helpful item was the set of student self-assessment tools contained in these units. Reviewing these two units allowed us to identify five key inquiry skill areas provided to students: data interpretation; instrument design and measurement; experimental design; classification; and research design. All of the above inquiry dimensions helped shape the development of our pre- and post-inquiry test, which is an essential focus of this evaluation.

This test presented students with a table of data on characteristics of different planets, including a new planet that they discovered, and asked them to interpret these data in order to answer two questions (see Appendix). These data were ambiguous, so the questions had no obvious answers. Instead students had to make the best argument they could using the data available to them. This pre- and post-test approach helped us assess students' inquiry skills through specific problem-solving activities, comparing the changes in JASON students' performance over time.

CCT staff administered this pre/post-inquiry problem-solving task to students at the beginning and end of the school year, which ensured at least six months between the administration of the two tests. Whenever possible we also identified a control sample of students at the participating school sites or in other surrounding schools to administer the same inquiry task.[1] Control groups were matched with JASON students on grade and general ability levels. The same inquiry problem was given to all participating students. They were asked to work individually on the problem. No guidance was given as to how the student might solve the problem, although students were allowed to ask questions in order to clarify the task and the data presented in the test. Students were informed that their answers to the tests would not be seen by their teachers, that their test scores would have no impact on their grades, and that there were no right or wrong answers to the inquiry test. Students were not given a time limit to complete the tests. Usually the entire class completed the test in fifteen minutes.

CCT staff scored the student inquiry activity along three dimensions: (a) the form of the answer, (b) use of data provided, and (c) argument building. The form of the answer focused on whether students answered the question and if so if they

[1] Where possible, CCT attempted to administer the inquiry test to control groups as well as JASON students. In some cases, how-ever, this was not possible. Some schools had entire grades participating in the JASON Project—so it was impossible to match the JASON students with non-JASON students in same school—and there were no other schools in the district similar enough to the test group to serve as a control group. In four cases, however, we were able to find a control group. In Arkansas and California we administered the inquiry test to a class or classes of students in the same school as the study class. In Arkansas we administered the test to two classes, totaling 51 students. In California we administered the test to a class of 26. In Texas we found a teacher in another school in the district who was willing to have his 20 students take the pre- and post-inquiry test. In Michigan teachers in two schools in the same or nearby districts allowed CCT to administer the inquiry test to some of their students as well (20 students in total).

explained their answer. The second dimension dealt with the degree to which students made use of the data from the table and the sophistication of their understanding of the limitations of those data. The argument-building dimension characterized students' ability to support their answers and suggest additional data required to answer the question more definitively. (See Appendix for the system used to score the inquiry tests.)

Two CCT researchers scored the inquiry tests. The data collected were analyzed in a variety of ways, including analysis of student gains in general, by site, and by dimension (answer form, use of data, and argument building), as well as analyses of these gains in correlation to certain characteristics of the different sites.

The final analysis of the data only includes two of the four control groups — Arkansas and California. Because these were the two groups with the same demographic characteristics from the same school, a more valid comparison can be made between the study and control groups. We did not use the control data from the other states for reasons specific to each case. With the Texas control group, the post-inquiry test was not administered to the same group of students as the pre-inquiry test, so assessing change in individual students over time was impossible. With the Michigan control group, CCT researchers decided that the sample was too patchwork to be valid. Because parents of students at the control schools had no investment in the JASON Project, few gave permission for their children to participate in the study. Some of the control students who had taken the pre-test were absent for the post-test, which made the sample even smaller. In addition, the conditions under which the test was administered (students were pulled out of the regular class and took the test in a separate room) differed sufficiently from test administration in the study classes to make comparisons questionable. Therefore, we discarded the data from the Texas and Michigan control groups and used only the data from the Arkansas and California control groups.

Videotaping of JASON students' project presentations: In accordance with the standard techniques of performance assessment (Frederiksen, 1994a; Frederiksen 1994b; Hawkins et al, 1993; Herman et al, 1992), one component of the evaluation program was structured to document student projects by videotaping students as they present their project to a group of peers and their teachers. Formal presentations give students the opportunity to explain in depth both the content and process of their work, and allow for questioning by a CCT staff member and/or their teachers. The assessment questions were consistent with program goals and key standards, and were given to all participants in advance (see Appendix).

In the spring semester CCT staff videotaped students' project presentations. The videotaping process of students' presentations was determined in collaboration with the nine JASON teachers who participated in the evaluation. These teachers had their students undertake projects that centered around a core inquiry area. In most cases the presentation topics came from the JASON curriculum, but in two cases students presented experiments unrelated to JASON content. Most students worked in groups on their projects, but in three cases students worked independently. These variations were a result of the evaluation team's wish not to interfere with participating teachers' planned curricula and activities

The videotaped presentations allowed for in-depth analysis of students' performances by coders familiar with the curriculum. Two CCT staff and a selected group of six JASON teachers trained by CCT staff served as paid coders of all the videotape materials. These teacher-scorers participated in an intensive two-day training workshop at CCT in New York City. The training focused on hands-on experience using the coding rubric, on discussion to develop teachers' understanding of the goals and structure of the coding rubric, and the development of standard interpretations across coders. Four student presentations, from the classrooms of two teachers not present at the training workshop, were selected for training purposes. . The presentations were chosen to reflect a range of project formats as well as grouping configurations (i.e., single or multiple presenters). They were also selected to present the teachers with some kind of dilemma to contend with, for example, by demonstrating knowledge in different ways so that teachers had to work through how they would approach different presentation skills and how that relates to their own content knowledge. The video selection process gave us an opportunity to reflect on the variation in student work and its implications for the development of a shared assessment tool.

At the New York training workshop, we began by explaining the benefits of and limitations of video assessment (see Appendix for workshop agenda). We then introduced the assessment rubric and the glossary of rubric terms, discussed how to define the terms used in the rubric, and tried to arrive at a common understanding of what the key assessment terms mean (see Appendix for Video Assessment Rubric and Glossary). We then conducted an initial read of a videotaped student presentation with the whole group. The teachers did not score the presentation, but instead documented examples from the performance that reflected elements of the rubric categories, and the group discussed why they chose these examples and how they would score the different aspects of the presentation. After the initial read teachers worked in pairs to view and score individual student presentations. Once the scoring was completed the teachers came together to discuss their responses to the presentations and determine how to code them appropriately. Group discussions after each coding session focused on defining the terms used in the rubric and understanding the importance of citing concrete evidence to support the scores assigned to different aspects of the students' performances. Coders were encouraged to reach group consensus for each presentation used in training.

After the training, each pair of coders returned to their homes to code the same 8 student presentations. CCT staff made sure no teacher would score his or her own students' presentations. The 6 teachers each scored 24 presentations. Two CCT researchers scored the remaining 8. All student presentations were scored except those with technical problems (such as poor sound quality). In total, there were 32 video presentations, and seventy-five JASON students participated in the videotape sessions.

The coding rubric is based on criteria developed for videotaped, performance-based assessments (Frederiksen, 1994a; Frederiksen, 1994b; Frederiksen, 1994c; Frederiksen & Collins, 1989; Hawkins, Bennett, & Collins, unpublished manuscript) developed at CCT. Once collected, videotape documents were coded according to a set of student learning criteria: Critical Thinking (Analytic Ability and Research Process), Understanding (Depth and Scope of Information), and Communication/Presentation (Organization and Presentation Materials). Each of these dimensions was coded on a scale of 1 to 5, with 1 representing poor work and 5 representing outstanding work. Based on input from the JASON teachers as they used the tool in the training session, we revised the rubric. All coders used an identical rubric and coding template for assessing all project tapes (see Appendix).

Scores on students' videotaped performances were subjected to an inter-scorer reliability and cluster analysis. The goals of these analyses were to determine how students' scores can be grouped into clusters that describe different types of performances; and the reliability of scores given by scorers scoring the same student videotaped presentations.

Team JASON Online (TJO): In collaboration with TJO staff, we collected data about the participating teachers and students use of JASON online resources. We looked at frequency of use and content at the beginning and end of the school year.

Findings

1. JASON Schools and Teacher Profiles

This first-year study showed that the JASON Project is used in diverse ways in diverse contexts. This variety of use significantly influences how teachers and students experience the JASON multimedia curriculum. The schools participating in our study differed along numerous dimensions, including type of community, ethnic makeup of students, socioeconomic status, number of students and teachers in the school, grade levels in the school, school achievement, and number of teachers and students involved in JASON (see Tables 1 – 3).

Table 1: Community background

States	Community	White	Black	Latino	Asian	Other
Arkansas	Rural (middle and low income)	74%	1%	21%	2%	2%
Texas	Suburban (middle and low income)	88%	1%	10%	—	1%
Michigan	Rural (middle-upper and low income)	98%	1%	1%	—	—
Ohio	Rural (middle and low income)	96%	—	—	—	4%
California	Suburban (middle and low income)	19%	13%	58%	2%	8%
New York	Suburban (upper middle, middle and low income)	55%	18%	16%	3%	8%
Wisconsin	Rural (middle-upper middle income)	98%	1%	—	—	1%
Pennsylvania	Urban (primarily low income)	>1%	99%	>1%	>1%	—

We worked with eight middle schools with the following characteristics: grades 6 to 8; low student/teacher ratio; and average to above-average school achievement. The schools have an average of 400 JASON students. Most of the schools serve mainly white low-to-middle-income students. However, one of our JASON classrooms consists of academically at-risk black students, and another classroom has mainly low-income Hispanic students (see Tables 1 – 3).

All of the articipating teachers (9) taught science. They are mainly white and female; and have an average teaching experience of 20 years, technology experience of 8 years, and JASON experience of 5 years. These teachers are not the only JASON teachers in their school. There is an average of 5 JASON teachers per school participating in this study (Tables 2 – 3).

Table 2: School background

School Locations	School Organization	Number of Teachers	Number of Students	Student/ Teacher Ratio	Free and Reduced Lunch	School Achievement Relative to State Norm
Rogers, AR	6–7	53	940	13/1	42%	Above Average
Canyon, TX	6–8	39	633	16/1	11%	Above Average
Hartland, MI	5–6	40	741	18/1	3%	Above Average
LaRue, OH	K–6	22	418	19/1	14%	Average
Fontana, CA	6–7	52	1279	35/1	38%	Below Average
West Hempstead, NY	6–8	38	498	13/1	35%	Average
Singer, WI	6–8	39	676	17/1	4%	Above Average
Philadelphia, PA	6–8	42	970	23/1	99%	Below Average

The diversity of the eight sites in the study, however, extended beyond demographic and school characteristics. There was also significant variation at the classroom level, and the ways in which the JASON curriculum was used by students and teachers. In terms of classroom variation, one of the most important differences among the eight sites was the way in which class schedules were organized. Two of the study schools—Philadelphia and Michigan—had very flexible schedules, which allowed the teachers to engage their students in extended labs and activities. The school in Wisconsin had some flexibility as well, but the teachers could have extended periods only a few times a year. All of the other schools had standard class periods of about 45-50 minutes, except for the school in Ohio, which had very short 35-minute class periods.

Another noteworthy difference among the sites was the extent to which JASON was integrated in the grade and/or the school. In a few cases—California, Wisconsin, Arkansas—JASON had become a required element of the district curriculum for at least one grade. In other cases—New York, for example—the JASON Project was not a particularly integral part of the school's curriculum. Some schools took more of an interdisciplinary approach to the JASON Project than others. In Wisconsin teachers of every subject in the grade level worked together to find ways to integrate JASON into their lessons and projects. In California and New York, teachers had little opportunity to collaborate across subjects. In terms of ability grouping, all but one of the classes were heterogeneously grouped. The Philadelphia class consisted of a special group of students who had behavioral problems and had been left back at least one year. The seven other schools had special education programs that pulled students out of some classes for extra help or had special education teachers working with individualstudents. Some schools, such as those in Ohio and Arkansas, had a gifted and talented program that pulled students out of classes for enrichment. (See the Site Reports document for expanded descriptions of each of the study sites.)

Table 3: JASON teachers and students

School Locations	Number of JASON Teachers in School	Gender of JASON Teachers in Study	Teaching Experience of Teachers in Study	JASON Teachers in Study Use of Computer	JASON Teachers in Study Use of Internet	Number of JASON Students in School	Number of Students in School	Grade Levels Studied
Rogers, AR	6	1 female	5 years	10+ years	6-10 years	600	40	6
Canyon, TX	6	1 female	27 years	6-10 years	3-5 years	400	19	6
Hartland, MI	9	1 female	6 years	6-10 years	3-5 years	180	52	6
LaRue, OH	2	1 female	23 years	10+ years	3-5 years	125	20	6
Fontana, CA	16	1 male	7 years	6-10 years	1-2 years	900	30	7
West Hempstead, NY	3	1 female	35 years	10+ years	1-2 years	180	26	6
Singer, WI	2	2 females	31 years	10+ years	3-5 years	450	47	7
Philadelphia, PA	12	1 female	27 years	10+ years	3-5 years	420	35	mixed
TOTAL	**55**	**9**	**Average: 20 years**	**Average: 8 years**	**Average: 3 years**	**3,255**	**269**	

2. Common Contextual Issues and Challenges

All of the contextual elements that distinguish the different sites join to create distinct JASON experiences for students in these environments. However, based on our interviews with teachers and administrators and classroom observations, we were able to identify a number of common themes that seemed to characterize participants' experience with the JASON Project across multiple study sites.

2.1 The JASON curriculum is adaptable

Teachers found the flexibility of the JASON curriculum valuable. It adapted to the needs of their classroom. They characterized their use of the JASON Project as "picking and choosing" topics and activities that were consistent with their existing curriculum. Moreover, some teachers also reuse activities from previous years that they have found particularly effective. Teachers gave different reasons for choosing certain JASON activities and content to integrate. The determining factors included the state or district standards; the nature of the JASON labs and activities; and preparing for the Tele-presence.

> "I have never taken the curriculum and taught every single lesson. I probably never will. It's too much. You pick and choose activities that

you can connect to your state curriculum, making sure you hit your district benchmarks."

"We start off with the letter from Dr. Ballard, then they keep adding the information about the different scientists to their portfolio so they'll eventually know all the different research scientists before we go to the live broadcast. When they go and see the scientists on the screen, they can relate."

The fact that meeting standards is such a central part of a teacher's responsibility, and some states have narrower standards or higher-stakes testing than others. means that some teachers cannot pull in the same JASON content and activities from year to year as the curriculum changes.

2.2 The success of JASON depends on the teacher.

Most participants in our study described JASON as an innovative and evolving curriculum. Such a curriculum attracts and inspires certain kinds of teachers. After visiting the eight participating JASON schools two or three times over the year, observing the classes, and talking to the teachers and administrators, it became apparent that, although they taught in very different environments, the teachers in our study shared certain characteristics. They all were identified in some way as leaders in their school or as particularly innovative teachers, they all mentioned that they took an experimental, hands-on approach to teaching science, and they all welcomed the challenge that JASON's changing curriculum offered.

One teacher felt that learning new topic each year "keeps [the JASON Project] fresh. If it became second nature we wouldn't have the same excitement to put into it. I learn as I go along. That's good for me." Another teacher agreed.

Although some of these teachers claimed to use a hands-on approach to science even before they became involved with JASON, many admitted that JASON made doing this kind of work much easier and helped them to organize their teaching around a theme. "JASON gives you more ideas and gives you a focus. You have topics for the year and then you can expand from there."

Participants felt JASON offered compelling classroom experiences. However, they understood that it required a considerable effort on their part to make JASON work in their classrooms.

"The curriculum itself isn't going to do anything unless you have the right people working with it. If you're excited about it then that will excite the kids and they're going to do well with it."

> "I think in most cases for the JASON project to go it takes a person who is willing to champion the thing. . . . [The study teacher from that school] really is Mrs. JASON in the building. The kids do things that attract attention. They have this huge space station and it's up on the stage so the kids get curious about it. Teachers say, 'You know, I'm seeing the value of this.' So I think that she has championed it and other people are seeing that it can work and it's growing for that reason."

In most cases in this study, JASON became a part of the school through a bottom-up process. In some instances a teacher who believed in the curriculum would use it, then other teachers would become interested and want to get involved; in other instances a PIN site coordinator would offer it to a school and teachers could opt to participate. In a few cases, after enough teachers became involved, the curriculum became part of the school's required curriculum for a certain grade level. In one case, however, the impetus to bring JASON to the school came from the top down, with the district's requiring its use rather than from teachers choosing to participate.

Teachers often have to be resourceful or pay out of pocket in order to take part in JASON activities and workshops. Although JASON designs activities and labs that use inexpensive, everyday materials, the costs can add up for teachers who have a large study body and limited school/district financial support.

2.3 District and School constraints that limit successful implementation of JASON

The conditions under which teachers work can impede them from taking full advantage of the JASON Project. The most significant limitations included training and supplies, time, technology, and state standardized test requirements.

Supplies and training are expensive for some teachers. Schools and districts offer teachers varying levels of support for their participation in the JASON Project. One district that requires all of its sixth-grade teachers to use JASON pays for training and supplies, but in most other cases, the funding for supplies and training is inconsistent, and sometimes nonexistent.

One of the most significant limitations imposed on teachers was the lack of time they had, both with colleagues and, more important, with students. The lack of time with colleagues made it difficult and sometimes impossible for a few teachers to initiate interdisciplinary projects. The lack of time with students meant that some teachers were unable to do complete labs or take them on field expeditions.

> "The main problem here is that I teach 35-minute classes. It's hard to get everything in and accomplished. That's just what they've come up with to get all of our specials in and to get all the state requirements of so many minutes per subject area. It's tough that way."

> "A lot of the activities, say they take an hour to two hours, with the way our school is set up that's not possible. Just trying to modify the activities so that we can still use them is challenging."

Among the group of teachers we studied, those who seemed most dedicated to the JASON Project were those who had more flexible schedules and could take the time either on a regular basis or on special days to do the longer activities.

Another limitation was a lack of access to technology, which prevented some teachers from making use of Team JASON Online. All but one of the teachers had at least one computer lab in their schools, but depending on how many students there were in the school and how those labs were used, it could be difficult for teachers to incorporate technology use into their students' JASON experience.

The most serious constraints placed upon teachers, however, involve covering the material that will appear on the state standardized tests. Although a number of teachers felt that the JASON material was in line with their state standards, the specificity of some state tests can mean that from year to year JASON may have more or less relevance in a classroom.

> "In terms of fitting in specific areas of the curriculum," said one principal, "the JASON Project changes each year. It would just be happenstance that it would match what we're supposed to teach in the sixth-grade or fifth-grade level."

In sum, all three contextual issues and challenges outlined above helped shape how teachers and students experienced the JASON multimedia curriculum. The information gathered in our study indicates that the JASON Project has impact specifically on teachers' practices as well as students' learning.

3. JASON Impact on Teachers

3.1 Changes in teaching practice

A number of teachers mentioned that their teaching practices have changed as a result of their participation in JASON. The areas of change in teaching practices are about collaboration, project-based learning, and alternative assessment.

Teachers noted that JASON lends itself to project-based learning. All of the teachers had their students do project presentations as part of their JASON work; some teachers stated that they have their students do more active group work. One teacher described how she took the presentation idea one step further.

> "Last year we had all the students teach part of the JASON curriculum for about a week. They all had to have some type of poster or display or PowerPoint presentation to get the information across. They presented

> to their classmates. Each group had a specific topic that they had to research and they knew they were responsible for teaching that information. . . . They looked at it differently from doing a book report, because they were actually using the overhead or the VCR or the computer to share information. Most were really excited about it. One of the biggest benefits was that, whatever their topic was, I'm sure they remember that information. They were amazed at how much they learned just having to put together a lesson."

Another significant change in teaching practice that both teachers and administrators noticed was that a school's involvement with JASON often led to an increase in collaboration among teachers in and across grade levels. More often, however, teachers and administrators found that JASON inspired collaboration among teachers who taught different subjects within the same grade. Along with modeling teamwork and problem-solving, the study participants noted that collaboration among teachers enabled them to take an interdisciplinary approach to a single large topic. One principal observed that although her school theoretically encouraged collaboration among teachers, she realized that "You need something like a JASON to make it happen." Another principal described the way JASON is used in his school:

> "I don't want to teach JASON in isolation. We do JASON in science, and then the math teacher might talk about the metric system in terms of volume of ocean water or she might be teaching percentages of salt and water in different parts of the ocean. When [students] go to social studies, there are social implications of shipping on the ocean and how does that affect the ecology of the Great Barrier Reef and what would happen if the temperature changed? So it all ties together. I think JASON is an integrative approach of looking at things. I don't see JASON as a science class. I see JASON as a way of getting the kids' interest so we can learn to be better writers, so we can be more aware of what's going on politically with the ocean or rain forest. It creates a central focus where you can sneak in some writing and some creative thought and artistic things. It gives us a whole brain approach to it. It's better for the kids."

Some teachers mentioned using more varied methods to evaluate student performance. One teacher said that she uses "more alternate assessments where I'm looking at [students'] projects and their presentations rather than giving them tests." Another said her involvement with JASON encouraged her to try new assessment techniques. "I had heard about portfolios in other workshops, but I hadn't thought of incorporating them until JASON. It lends itself to the portfolio because of the activities, they're usually building something or graphing or sketching something."

3.2 Increased use of technology

Teachers claimed their involvement with the JASON Project has pushed them to make greater use of technology than they did previously. Although not all teachers were able to take advantage of Team JASON Online because of limited access to computers in their classrooms or a lack of training in the TJO environment, a number of teachers have said that TJO has given them the impetus to use computers in their teaching. Even one teacher who has not been able to take advantage of Team Jason Online with her students observed that JASON prompted her to use other kinds of technologies in her classroom. Teachers noted that the impact of JASON on technology use extends beyond the classroom.

> "JASON probably forces us to use more technology. It has made me much more aware of technology and how students can use it. JASON Online, journaling online, posting messages, Ask an Expert, all of those things. I think it gives you some good guidelines. The kids are exposed to more and they become much more comfortable with technology as well."

> "I've heard parents over the years say one of the main reasons they got the Internet at home was because of the Jason Project. They saw what their kids were learning and they were talking about what they did online and decided to get the Internet."

4. JASON Impact on Students

4.1 JASON student profiles

We worked with 269 JASON students with different socioeconomic and ethnic backgrounds (see Table 3). More than half (60%) were in sixth grade. They were 44% female and 55% male. They had different achievement levels, with one entire "at-risk" class. Most of these students consider science their favorite subject (82%), work in small groups (56%), have access to computers at different places in their school (70%), and have access to computers at home (74%). They have been in JASON for one year (55%), two years (17%), three years (5%), four years (4%), and five years (3%).

4.2 Survey, interview, and observation results

Based on our students' surveys (N=262), we found that the JASON students learned about the following topics this year: Volcanoes (260), lava tubes (211), plate tectonics (201), Hawaiian culture (196), animal adaptation (186), weather/climate (182), and Hawaiian ecology (169). They engaged in the following scientific activities lab experiments (209), library research (207), group project (206), data collection (203), Internet research (200), live science broadcast (191). They also worked with people besides teachers and classmates (183), built models (181), made posters (179), drew conclusions based on data (178), developed hypothesis (174), and went on field trips (155).

Based on site visits as well as teachers' and principals' interviews, we found that the JASON curriculum helps students engage in hands-on learning activities and connect their science learning to real-world issues. As a result, they are able to grasp concretely complex and abstract science concepts.

Hands-on learning: Both teachers and administrators cited the hands-on activities as the most effective tools in the JASON Project curriculum. They felt the labs, activities, and field investigations offered by JASON held students' interest more than standard teaching methods. According to the teachers, middle school students in particular are in need of a hands-on approach to learning, which fits their learning styles and identities.

> "These kids need something that's going to keep them engaged for a longer period of time.... It doesn't have to be teacher directed all the time. That's what they like and need. We've just seen the excitement."

> "With hands-on activities not only do they have to put [what they're doing] in writing they have to explain a concept to me or to a group member. They're seeing the concept in so many different ways that it hits every student's way of learning."

Not only did teachers mention that JASON's hands-on projects kept students engaged as they did the activities, they also appreciated the fact that students come away from most JASON activities with a tangible product. This combination is especially effective with students that may otherwise be difficult to reach academically.

Making real-world connections: Apart from the hands-on activities, the other component of JASON that teachers and administrators felt was compelling for students was the fact that each year it follows an actual expedition and allows students to see science being done by real-world scientists. This makes science more relevant to students, and helps them make connections between what they are learning in school and the larger world.

JASON gives students different ways to experience the scientific research going on each year. Not only do they see the videos and attend the JASON Tele-presence, they can also talk directly to the scientists online. Some teachers suggested that these kinds of contact encourage students to ask good questions.

> "Last year we did so much work with the international space station," said one teacher." Anything that they're hearing in the news, they understand.... They can connect to the real world. School is not an isolated place anymore. That's a big part of JASON. It puts them right out there

> where things are happening and going on right now. They would go outside at night and watch the space station go by. We'd tell them where it was going to be. They just make connections, and then it goes from child to parent. We see a lot of that at conference time. They're talking about this at home. That means that they're learning something and they feel it's important enough to share."

According to one longtime JASON teacher, the interest in science that JASON can inspire in students because of the connections they make with real scientists sometimes endures longer than their exposure to the curriculum. Because she has done JASON for so many years, she is in a position to see what her former students are doing. She gave the example of one of her students.

> "He's a freshman in high school taking sophomore-level science courses and the main reason for that is that JASON got him going. He got perfect scores in his ACT in science as an eighth grader. I remember his question about how dinosaurs became extinct and he researched it and delved into that question. He just got so hooked on science. There's something there for everyone. Everyone's going to get hooked somewhere down the line. I think we had several students go into marine biology because of JASON."

4.3 Inquiry test results

JASON students' inquiry test results: The inquiry tests were scored by two CCT researchers. The inter-scorer reliability for the entire test was 90%. The reliability for answer form was 100%, the reliability for use of data was 90%, and the reliability for argument building was 80%. Most of the JASON students (79%) engaged in both a pre- and post-inquiry test.

We found that most of the JASON students (66%) made overall gains (from 1 to 10 points) on the pre- and post-inquiry test. More than half of the JASON students in each classroom made some gains on the test with the exception of students in one classroom (6*), which had 44 percent of its student showing some gains (see Table 4). However, the average JASON classroom gains were all positive (from .44 to 2.45 points).

Table 4: Total Gains in Pre-Post Tests

Classrooms	Lost (–5 to –1)	No change (0)	Gains (1 to 10)
1 (N=18)	3	1	14
2 (N=23)	1	3	19
3 (N=16)	5	5	6
4 (N=44)	5	3	36
5 (N=27)	6	5	16
6* (N=25)	10	4	11
7 (N=15)	2	4	9
8 (N=18)	4	1	13
9 (N=22)	3	5	14
TOTAL (N=208)	**N=39 (19%)**	**N=31 (15%)**	**N=138 (66%)**

When we looked at how the JASON students fared on content (the types of scientific evidence present in their answers) and process (argument-building skills), we found that overall they did better in process (66%) than in content (46%). The class average gains about process skills were positive (from .16 to 1.55 points) for all classrooms, and the class average scores for content were negative in two classrooms and positive for the remaining 7 classrooms (from .28 to .91 points). These findings indicate that most of the JASON students learn and are familiar with inquiry-based and analytic approaches (see Table 5).

Moreover, the JASON students who scored at or above average (87%) did much better in process than in content areas under the two questions they were asked to answer. In content, the percentages increased from 32% to 38% for question one and 28% to 44% for question two. In process, the percentages increased from 24% to 56% for question one and 21% to 58% for question two.

Table 5: Total Content versus Process Gains in Pre-Post Tests

	Content			Process		
Classrooms	**Lost (–4 to –1)**	**No Change (0)**	**Gains (1 to 5)**	**Lost (–3 to –1)**	**No Change (0)**	**Gains (1 to 5)**
1 (N=18)	4	4	10	1	2	15
2 (N=23)	3	5	15	—	4	19
3 (N=16)	7	5	4	3	4	9
4* (N=44)	3	21	20	4	3	37
5* (N=27)	11	7	9	3	5	19
6 (N=25)	7	7	11	9	6	10
7 (N=15)	1	7	7	—	8	7
8 (N=18)	4	5	9	2	6	10
9 (N=22)	6	6	10	2	6	14
Total (N=208)	**N=46 (22%)**	**N=67 (32%)**	**N=95 (46%)**	**N=24 (12%)**	**N=44 (21%)**	**N=140 (67%)**

We also conducted inferential statistics to examine if there was any correlation between the student's survey and the pre- and post-inquiry data. Half of the students in all three grades registered significant gains, especially in sixth and seventh grades (see Table 6). Students who worked in small groups (72%) on a regular basis also made significant gains in the inquiry test.

Table 6: Total Gain Pre-Post Test by Grade

Grades	Lost (–1 to –4)	No Change (0)	Gains (1 to 10)
6th (N=115)	23%	11%	66%
7th (N=58)	16%	16%	76%
8th (N=10)	10%	40%	50%

JASON and Non-JASON students' inquiry test results: When we compared JASON with non-JASON students, we found that the JASON students (52%) did better than the control group (38%) in the inquiry test (see Table 7). They did better specifically in the area of process/scientific argument building. In addition, the JASON students (59%) did better in both content and process than the control group (20%) in the two schools where the control group was in the same school as the JASON group (see Table 8).

Table 7: JASON and Non-JASON Students' Overall Inquiry Test Results

Participants	Lost (–1 to –5)	No Change (0)	Gains (1 to 7)
JASON Students (N=63)	25%	23%	52%
Control Group (N=43)	40%	22%	38%
JASON Students (N=27)	22%	19%	59%
Control Group (N=20)	50%	30%	20%

Table 8: JASON and Non-JASON Students' Overall Inquiry Test Results in One School

Participants	Lost (–1 to –5)	No Change (0)	Gains (1 to 7)
JASON Students (N=27)	22%	19%	59%
Control Group (N=20)	50%	30%	20%

4.4 Video assessment results

Six JASON teachers and two CCT staff scored a total of 32 videotaped student presentations. A total of 75 students presented their projects.

Inter-scorer reliability analysis: Scores on students' videotaped performances were subjected to an inter-scorer reliability and cluster analysis. These analyses were used to determine respectively (1) the reliability of scores given by scorers scoring the same student videotaped presentations; and (2) how students' scores can be grouped into clusters that describe different types of performances.

The overall reliability of the scores given to JASON students' videotaped presentations of their projects was 88%. This result was calculated based on the number of pairs of scores that matched or were off by one point. Of the remaining pairs of scores, 12% were off above 1 and below 2.5 points. Relative to other research projects using similar assessment techniques, these scorers achieved an extremely high level of reliability (Frederiksen, 1994a).

Cluster analysis: The cluster analysis resulted in a three-cluster distribution of the 75 participating JASON students. Clusters were defined by determining those groupings which had maximally distinct means across the three dimensions of scoring: Understanding, Critical Thinking, and Communication (see Table 9). Our findings show that

- Fifty percent (50%) of the sample fell into the High Cluster. These scores were high and consistent across the three assessment dimensions.
- Thirty one percent (31%) of the sample fell into the Middle Cluster. Scores for this cluster were average.
- Nineteen percent (19%) of the sample were in the Low Cluster.

Table 9: Cluster analysis

Cluster Distribution	Understanding	Critical Thinking	Communication
High Cluster (n=16)	3.61	3.63	3.72
Middle Cluster (n=10)	2.45	2.83	2.60
Low Cluster (n=6)	1.75	1.54	2.13

The overall score of more than half of the students' videotaped performances was high (3.8). More than half of the students' videotaped presentations (56%) received a score at and/or above 3 across the three dimensions of scoring: Understanding (50%), Communication (56%), and Critical Thinking (66%).

Ten presentations (31%) from Texas, Long Island, Arkansas, Michigan, and Wisconsin scored high (at or above 3) consistently across the three dimensions of scoring. Using inferential statistics on the student's survey data, we determined that the above findings are consistent with the fact that most of the students from these five states knew the general goals of the JASON Project, and the topic of this year's JASON curriculum. They also said that they liked the JASON curriculum.

Among these ten presentations, three presentations from Arkansas and Wisconsin scored very high (at or above 4) across the three dimensions of scoring. We believe that these high scores are due to the fact that all three projects addressed topics from the JASON curriculum: plate tectonics, cultures and history of Hawaii, and volcanoes. The scoring evidence below provided by scorers of each of these projects support this conclusion.

The scoring evidence for the project titled "The Types of Volcanoes" indicates that the students showed examples of each of the different types of volcanoes presented; made connection between shield volcanoes, hot spots, and formation of islands; and understood that a shield volcano would give them more time to react. According to the scorers, the students obtained a high score for Understanding/Concept because they were clearly able to relate what they learned in class to real-world problems.

The group who presented on plate tectonics used a jigsaw puzzle metaphor to explain how plate tectonics work; and could answer all the questions asked about the topic during the presentation session. The scorers gave these students a high score for Critical Thinking/Analytic Ability because they did not just present facts but showed how scientists use archeological data to explain how continents were connected.

High Communication and Presentation scores resulted from students' telling a coherent story connected to relevant and nicely made presentation materials. The scorers used two types of evidence: the organization of the presentation and the material supporting the presentation process. The students made sure that every piece of information built on previous information, covered the main topic areas, summarized the subject at the end of the presentation, had index cards to organize presentation, made relevant poster, and pointed to pictures on the poster throughout the presentation.

4.5 Team JASON Online results

Based on descriptive analysis of the Team JASON Online (TJO) databases, we found little change in students' participating in our study use of TJO resources at the beginning and end of the school year. Seven percent of the student sample (N=269) posted 33 messages out of 4089 messages present in the TJO's database, which were submitted by a total of 121 JASON students. The topics posted by our sample of JASON students were mainly about science experiments (e.g., cricket, Winogradsky). A typical message board read: "I never thought that the crickets would like the dry parts of the tube. I assumed that they would all be in the wet section because I thought the caves were damp. This was a cool experiment especially when we had to chase the crickets when they came out of the tube."

The teachers did not use these resources much either. Our findings based on teachers' surveys and interviews show that the JASON teachers in our study use print and video materials more than the Team JASON Online (TJO) resources. This pattern also holds true for their students.

Conclusion and Recommendations

The JASON multimedia curriculum is bringing teachers and students together to construct their own science knowledge base. The JASON Project engages students in hands-on learning activities and helps them connect their science learning to real-world issues. The JASON students in our study learned to grasp complex and abstract science concepts. Over the course of a year in the JASON Program they demonstrated an increased ability to understand scientific concepts, draw conclusions based on data, and build arguments on the inquiry tests administered to them. Not only were most students' post-test scores higher than their pre-test scores, in those cases where a control group was used, JASON students showed higher gains over time than non-JASON students. When given the opportunity to present their own work, most JASON students showed that they could understand scientific concepts, think critically about these concepts, and communicate their ideas effectively.

The information we gathered in our study indicates that the JASON Project has an impact not only on students' learning but on teachers' practices as well, particularly in the areas of collaboration, project-based learning, technology use, and alternative assessment approaches. Each year when they receive the new JASON curriculum topic and materials, teachers participating in JASON must find ways to creatively revise and refine their curriculum in order to align the JASON content and activities to their state standards. For this reason, teacher commitment to the program is crucial to the successful implementation of the JASON Project at the school and district levels.

The findings from this year's JASON evaluation provide us with a broad overview of some of the issues relevant to the implementation of the JASON Project in diverse classroom settings, and of the program's impact on students and teachers. To enhance the JASON Project and make it stronger, we are proposing the recommendations below grounded in the evaluation findings.

To avoid a one-size-fits all mentality without jeopardizing what makes the JASON Project a strong program, JASON staff might want to build different portals of entry for individual users of their print curriculum materials such as 'at-risk' students, team teachers, and first time JASON users. This can be done via a booklet or online interactions focused on the identified needs of the audience being served.

Further, JASON staff need to explore not only who their audience is but also the needs of the audience are beyond the delivery of the given year expedition exercises and content. How to address this professional development issue should be part of the modes of delivery (face-to-face or online) of the curriculum and testing. The JASON Project can provide opportunities for teachers to discuss their practice with experts in the teaching field in the area of accountability in chat sessions or online message boards. These opportunities should be well structured.

JASON should provide an opportunity for students to share their work with a larger audience of learners. An example might be an online science fair.

JASON communicates with all of the JASON community in the same way in its e-mail messages to keep participants informed. JASON might implement various scenarios of partnerships to meet the needs of the audience.

Teachers need a way to use past JASON expeditions. Once they have learned to do the experiments and have bought the equipment, and feel comfortable with engaging students, they may want to repeat this with a new class. This will give teachers a chance to explore their practice using the same curriculum more than once.

On the research side, we recommend a multi-year large-scale study grounded in this year's small and in-depth investigation of the JASON Project on student learning. This two-year evaluation project will yield useful marketing information as well as a variety of inquiry assessment tools for JFE. We will develop (1) typologies of JASON teachers' use of the various JASON curriculum components in the first year, and (2) a repertoire of JASON students' inquiry-based measures in the second year. The specific tasks in this multi-year study are to:

- Identify the typologies of teachers' use of the JASON multimedia curriculum, and the extent to which teachers use different components of the curriculum.
- Examine how teachers use the curriculum components in their classroom, and what they expect the students to learn from each component.
- Develop a repertoire of diagnostic assessment tools which are aligned to national and state standards, and informed by the teachers' typologies of use of the JASON curriculum.
- Use these assessment tools to test a variety of students' inquiry-based learning outcomes.

Using large-scale surveys, focused surveys, and interview instruments, our study will focus on the development of JASON teacher profiles in the first year. These profiles will be based on teachers' teaching practices including use of technology in the classroom, use of the JASON curriculum, expectations of what students should be learning from the different JASON curriculum components, and thinking about how those components are supporting students' inquiry learning.

The assessment inquiry tools will be tailored to the specific teacher typologies of use outlined in the first year study. These tools will help us identify the range of inquiry-based learning outcomes that the JASON students master from the various classroom implementations of the JASON multimedia curriculum. These tools will be useful for testing the impact of the JASON Project on student learning. As we refine the assessment tools, we anticipate working closely with relevant JASON Foundation staff to incorporate these tools into the curriculum.

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Appendix

The JASON Project Final Evaluation Report
Year One

Table of Contents

School Profile Checklist

Name of school____

Date of visit ____________________

Do you have literature that describes the following (if not, please provide me with information about):

General School Demographics

1. Number of students in school.
2. Teacher/student ratio
3. Spending per pupil
4. Spending on instructional materials
5. Spending on staff development
6. Class size
7. Number of classrooms
8. Number of students in free/reduced price lunch program
9. Drop out rate of students
10. Attendance records
11. Ethnic make-up of student body
12. Ethnic make-up of faculty
13. Average number of years teaching of faculty
14. Students with physical or learning disabilities

Community

15. General income levels of families in the community
16. Population
17. Rural, Urban, Suburban
18. Numbers of students attending school from local community vs. number of students bused in
19. Extent of parental involvement

Technical Infrastructure

20. Number of computers in the school
21. Location of computers in school/classrooms
22. Type and distribution of internet connectivity (i.e. only in library/lab, in classes, in some classes
23. Staff development in technology

Assessment

24. Overall test scores/ranking of school in state according to test score data
25. Any new standards/tests implemented
26. Any new/significant initiatives or reforms being implemented

Administrator Interview

1. How did Jason come to your school?
2. How long has it been used?
3. Can you describe the technical infrastructure of your school?
    a. Present state
    b. Funding
    c. History
    d. Future goals
4. Has involvement in the Jason Project spurred tech infrastructure development?

School and Community

5. What makes your school special?
    a. Special advantages?
    b. Special challenges?
6. Can you describe the technical professional development in your school?
7. Can you describe the community your school serves?
    a. Rural/urban/suburban
    b. Ethnic
    c. Income levels
    d. Parental involvement with school
    e. Students' family lives
    f. Are students all from local community or are some bused in?
    g. Other
8. What has been the reaction to Jason in the school?
    a. Administrators
    b. Jason teachers
    c. Non-Jason teachers
    d. Jason Students
    e. Non-Jason Students
    f. Parents

Evaluation

9. How does your school district/state evaluate schools?
10. Has this been constant for a while or recently changed?
11. Describe any new initiatives, reforms etc. that have been implemented in your school.
12. Have these initiatives, or forms of evaluation had an impact on the implementation of Jason? (i.e. is it more difficult for teachers to integrate Jason and partake in new initiatives?)
13. How does your school stand in terms of performance?
14. How does the school rate in relation to other schools in district?
    Is the school:
    a. Improving
    b. Declining
15. Has involvement with Jason had an impact on performance (i.e. do Jason classrooms perform better or worse?

Standards

16. Briefly describe the kinds of standards your school and students are required to meet.
17. Is it more or less difficult for teachers to integrate Jason and meet district or state standards?

Teacher Interview

1. How long have you been using the Jason Project?
2. How did you get involved in Jason?
3. What made you decide it was a curriculum you wanted to use?
4. Can you describe how you integrate the Jason curriculum into your teaching?
5. Did your use of the Jason Project change your teaching practice in any way?
    a. Assessment
    b. Group work/collaboration
    c. Hands-on activities/field experiments
    d. Use of technology (TV and computer)
    e. Student presentations
    f. Other
6. Describe a typical working day with Jason (look for: collaborative opportunities, occasions for independent and group work, student-directed discussions and presentations, open-ended questioning, authentic tasks)
    a. How would you say this day differs from a typical day prior to your Jason participation?
    b. What do you want your students to understand about science?
    c. How does Jason support your approach to the teaching of science?
    d. Tell us about a significant success in your teaching that you think may be somehow related to Jason?
    e. Tell us about a significant challenge in your teaching that you think may be somehow related to Jason?
    f. Can you describe your students (ethnicity, background, gender, language, SES, achievement level, learning styles, other)
7. What are the ways that you've seen your students learn best?
8. How does Jason play into this?
9. If you were the evaluator, where would you look to find evidence of Jason's impact on students?
10. Have you used the following Jason materials in your classroom? Explain how you used them.
    a. The print materials
    b. The activities
    c. The videotapes
    d. The Tele-presence broadcasts
    e. Team Jason Online Chats
    f. Journals
    g. Message boards
    h. Teacher message boards
    i. Digital labs
    j. Other
11. Anything else you want to tell us about Jason?

Teacher Survey

1. What is your name? ______________________________
2. What is the name of your school? ______________________________
3. In which classroom do you teach?______________________________

Teaching Practices and Standards

4. Including the current school year, how many years have you been working as a teacher? __________ years.
5. Including the current school year, how many years have you been at your current school? __________ years.
6. How many students are in your class? ______________________
7. For which grade level(s) do you offer instruction? ______________________
8. Which of the following best describes your position
   a. ❐ Teacher of general curriculum
   b. ❐ Teacher of special needs
   c. ❐ Teacher of honors students
   d. ❐ Teacher of specialized subject matter
   c. ❐ Other______________________
9. What is your current primary teaching assignment, that is, the field in which you teach or instruct the most classes? *Please check ONE:*

   Special Areas

   a. ❐ Art
   b. ❐ Basic skills and remedial education
   c. ❐ English/language arts
   d. ❐ ESL/Bilingual education
   e. ❐ Foreign language
   h. ❐ Vocational education
   i . ❐ Mathematics
   j. ❐ Science
   k. ❐ Social studies/social sciences
   l. ❐ Other (please specify): ______________________
10. Including the current year, how long have you taught this subject? __________ years.
11. Do you have a degree, certification, job experience or specialization in the subject area you teach?
    a. ❐ Yes   b. ❐ No
    *If yes, please specify*______________________________
12. What standards do you strive to meet in your classroom?
13. Do you align your classroom standards with the following standards? *Check all that apply*

	Science	Math	Language Arts	Social Studies	Geography
National					
State					
District					

Please give examples of how you align your classroom practice to the above standards.

14. Please indicate how often you engage in any of the following teaching practices.

	Never	A few times a year	1-2 times a month	Weekly	Daily
a. Schedule class time by content area	1	2	3	4	5
b. Teach basic skills and facts in a specific sequence	1	2	3	4	5
c. Focus instruction on community-based issues	1	2	3	4	5
d. Implement project-based learning activities	1	2	3	4	5
e. Make use of primary source data	1	2	3	4	5
f. Use cooperative group work and learning	1	2	3	4	5
g. Use individualized learning	1	2	3	4	5
h. Use interdisciplinary activities	1	2	3	4	5
i. Use learning centers in the classroom	1	2	3	4	5
j. Plan collaboratively with other staff	1	2	3	4	5
k. Have students present what they have learned in front of the class.	1	2	3	4	5

15. What kinds of assessment techniques do you use in your classroom? *Check all that apply*.

a. ❒ Essay exams b. ❒ Student presentations c. ❒ Multiple-choice tests
d. ❒ Reports e. ❒ Portfolios f. ❒ Peer assessment rubric
g. ❒ Self-assessment rubric h. ❒ Assessment by outside experts i. ❒ Other________________

If 'Other' please specify: ________________________________

Computer Experience

16. I have access to a computer: *Check all that apply*
   a. ❒ At home
   b. ❒ In my classroom
   c. ❒ In the school library
   d. ❒ In the school computer lab/media center
   e. ❒ Other (please specify________________)
   f. ❒ I do not have access to a computer

17. I have Internet access: *Check all that apply*
   a. ❒ At home
   b. ❒ In my classroom
   c. ❒ In the school library
   d. ❒ In the school computer lab/media center
   e. ❒ Other (please specify________________)
   f. ❒ I do not have Internet access

18. How many years have you been doing the following? *Circle the best choice for each item*

a. Years using the computer in any way	None	>1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs	10+ yrs.
b. Years doing computer activities at school	None	>1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs	10+ yrs.
c. Years doing computer activities at home	None	>1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs	10+ yrs.
d. Years using telecommunications (e.g., email, Internet) at school	None	>1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs	10+ yrs.
e. Years using telecommunications (e.g., email, Internet) at home	None	>1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs	10+ yrs.

19. How often do you engage in computer activities for your classes?
   a. ❐ Every day
   b. ❐ A few times a week
   c. ❐ A few times a month
   d. ❐ Once a month
   e. ❐ Every few months
   f. ❐ Never
20. Which of the following types of software do you use in your classes? *Check all that apply*
   a. ❐ Word processing (e.g. MS Word, Word Perfect)
   b. ❐ Database software (e.g. FileMaker, MS Access)
   c. ❐ Spreadsheet software (i.e. Excel)
   d. ❐ CD-ROM software (e.g. encyclopedias, educational games)
   e. ❐ Drawing or painting software (e.g. Flash; KidPix)
   f. ❐ Desktop publishing (e.g. Quark, PageMaker)
   g. ❐ Presentation tools (e.g. PowerPoint, HyperStudio)
   h. ❐ Image-editing (e.g. PhotoShop)
   i. ❐ Programming language (e.g.HTML, Java, C++)
   j. ❐ Authoring software (e.g. AuthorWare, MacroMedia Director)
   k. ❐ Web Page Editors (e.g. MS FrontPage, Claris HomePage)
   l. ❐ Internet Browsers (e.g. Internet Explorer, Netscape Communicator)
   m.❐ Email (e.g. MS Outlook, Eudora)
   n. ❐ VCR
21. If you use the above applications in your teaching please describe how you integrate this technology into your curriculum.

JASON Experience

22. What do you think the Jason Project is about?
23. How does it compare to other science curricula you are familiar with?
24. How many teachers in your school teach with Jason? ______________________
25. Approximately how many students are involved with Jason at your school? ________________
26. Including the current school year, how many years have you been involved with the Jason Project? _______ years.

The last time you used the Jason Project:

27. How many weeks throughout the year did you use the Jason materials?
    a. ❒ 1-2
    b. ❒ 3-5
    c. ❒ 6-10
    d. ❒ 10-20
    e. ❒ More than 20
28. For those weeks, how many times per week did you use the Jason materials?
    a. ❒ Every day
    b. ❒ 3 to 4 times per week
    c. ❒ 1 to 2 times per week
29. For how many hours during the day did you use the Jason Project?
    a. ❒ Less than 1
    b. ❒ 1-2
    c. ❒ 3-4
    d. ❒ 5 or more
30. Are you involved in Team Jason Online?
    a. ❒ Yes b. ❒ No
    If yes, please explain: ____
31. Are your students involved in Team Jason Online?
    a. ❒ Yes b. ❒ No
    If yes, please explain: ____
32. If you participate in Team Jason Online, which tools do you use? *Check all that apply*
    a. ❒ Student Journal
    b. ❒ Chat Rooms
    c. ❒ Digital Lab
    d. ❒ Ask an Expert
    e. ❒ Link Library
    f. ❒ Expeditions
    g. ❒ Student/Teacher Message Boards
    h. ❒ Teacher Message Boards
    i. ❒ Other __________________________________
33. In which subjects did you use the Jason materials? *Check all that apply*
    a. ❒ Science
    b. ❒ Math
    c. ❒ Social Studies
    d. ❒ Language Studies
    e. ❒ Art
    f. ❒ Other__________________________________
34. How did you make use of the Jason materials in your classroom?
    a. ❒ I integrated portions of the Jason materials into my existing curriculum
    b. ❒ I taught the Jason lessons as they appear in the printed materials, as complete curricular units
    c. ❒ I used a combination of the above approaches

35. Please give a brief description of how you used the Jason materials in your classroom.
36. Do you feel your teaching practices have changed as a result of participating in the Jason Project?
    a. ❒ Yes b. ❒ No
    If yes, please explain. If no, why not? ______________________________________
37. Do you feel that the Jason curriculum is aligned to your class's curricular standards?
    a. ❒ Yes b. ❒ No c. ❒ In some cases
38. Please explain how you align your use of the Jason curriculum with the standards you are required to address.
39. Who has been particularly supportive of the Jason Project in your school? Please check all that apply, or leave blank if there has not been support.
    a. ❒ Principal, Vice principal or other school administrator
    b. ❒ School computer or technology coordinator or media specialist
    c. ❒ Myself
    d. ❒ Another teacher
    e. ❒ District-level technology coordinator
    f. ❒ District-level curriculum coordinator
    g. ❒ Specific parents
    h. ❒ Corporate sponsor or professional person in your community
    i. ❒ Government official
    j. ❒ A provider of network software, educational content or computer retailer
    k. ❒ Educational consultants
    l. ❒ Other (please describe): ______________________________________
40. Which of the following professional development activities have been most useful to your efforts to integrate the Jason Project into your classroom?

	Not Useful	Somewhat Useful	Very Useful	Did not Attend
a. National Educators' Conference	1	2	3	—
b. NSTA Regional Conference	1	2	3	—
c. Jason At-Large Online	1	2	3	—
d. Online Credit Course	1	2	3	—
e. Local Professional Development Workshop	1	2	3	—
f. Instruction by colleague of fellow teacher	1	2	3	—
g. JASON Video Conferencing	1	2	3	—
h. Other ____________________	1	2	3	—

41. Which, if any, of the following were barriers as you implemented The Jason Project this year? *Check all that apply,*

a. ❑ Lack of access to technical support	b. ❑ Lack of project goals and vision	c. ❑ Insufficient curricular support
d. ❑ Lack of curriculum alignment with standards	e. ❑ Lack of time for field experiments	f. ❑ Lack of project alignment with curriculum
g. ❑ Lack of participation from other teachers at my school.	h. ❑ Lack of Conflicting under-standings of JASON at school	i. ❑ No common planning time for teachers collaborating on JASON
j. ❑ Lack of confidence with technology	k. ❑ Lack of resources/funds	l. ❑ Lack of time to plan for JASON integration
m. ❑ Lack of coordination among teachers & administration	n. ❑ Lack of coordination with JASON people	o. ❑ Other ____________

or leave blank if none apply

42. What kind of support do you feel you will need in the coming year to successfully implement The Jason Project in your classroom?

43. How are you collaborating with other Jason teachers in your school?
   a. ❒ I am co-teaching the class with another teacher
   b. ❒ I am teaching my classes independently but coordinating with other Jason teachers
   c. ❒ I am the only teacher in my school using the Jason Project
   d. ❒ Other ______________________________

44. How many weeks throughout the year do you plan to use the Jason materials?
   a. ❒ 1-2
   b. ❒ 3-5
   c. ❒ 6-10
   d. ❒ 11-20
   e. ❒ More than 20

45. How many times per week do you plan to use the Jason materials?
   a. ❒ Every day
   b. ❒ 3 to 4 times per week
   c. ❒ 1 to 2 times per week

46. How many hours during the day do you plan to use the Jason materials?
   a. ❒ Less than 1
   b. ❒ 1-2
   c. ❒ 3-4
   d. ❒ 5 or more

47. Are you planning to make use of Team Jason Online?
   a. ❒ Yes b. ❒ No

48. Are you planning to have your students make use of Team Jason Online?
   a. ❒ Yes b. ❒ No

49. In which subjects do you plan to use the Jason materials? *Check all that apply*
   a. ❒ Science b. ❒ Math
   c. ❒ Social Studies d. ❒ Language Studies
   e. ❒ Art f. ❒ Other ______________________

50. How will you make use of the Jason materials in your classroom this year?
    a. ❒ I will integrate portions of the Jason materials into my existing curriculum
    b. ❒ I will teach the Jason lessons as they appear in the printed materials, as complete curricular units
    c. ❒ I will use a combination of the above approaches
51. Please give a description of how you will use the Jason materials in your classroom this year.

Demographic Information

52. Are you:
    a. ❒ Female b. ❒ Male
53. Please indicate your ethnicity:
    a. ❒ African American
    b. ❒ American Indian or Alaskan Native
    c. ❒ Asian or Pacific Islander
    d. ❒ Caucasian
    e. ❒ Hispanic
    f. ❒ Other ______________________________
54. Please tell us the highest degree you have earned:
    a. ❒ Associate degree or diploma
    b. ❒ Bachelor's degree
    c. ❒ Master's degree
    d. ❒ Education specialist (at least one year beyond Master's level)
    e. ❒ Professional degree (e.g. MD, LL.B., JD, DDS)
    f. ❒ Doctorate (Ph.D. or Ed.D)
    g. ❒ Other ____

Student Survey

Your School Experience

1. What is your name? ______________________
2. Are you a: ❑ Girl ❑ Boy
3. What is the name of your school? ______________________
4. Which classroom are you in? ______________________
5. Teacher's name: ______________________
6. What grade are you in? ______________________
7. Including the current school year, how long have you been at this school? ____________
8. ______________________
9. Please rank the following subjects according to how much you enjoy studying them (1=enjoy the most, 5=enjoy the least. Don't rank those subjects you don't study)

   __ Math __ Art __ Foreign Language

   __ Science __ Language Arts (*i.e.,* English) __ Social Studies
10. Which of the above are your best subjects? *You may list as many subjects as you like.*

    ____________ ____________ ____________

    ____________ ____________ ____________
11. Which topics have you studied in your classes? *Check all that apply*

    ❑ Science
    ❑ Biology
    ❑ Chemistry
    ❑ Earth Science/Geology
    ❑ Astronomy
    ❑ Physical Science
    ❑ Environmental Studies
    ❑ Social Studies
    ❑ Algebra
    ❑ Arithmetic
    ❑ Geography
    ❑ Geometry
    ❑ History
    ❑ Pre-Algebra
    ❑ Government
    ❑ World Cultures
    ❑ Language Arts
    ❑ Vocabulary
    ❑ Creative Writing
    ❑ Literature
    ❑ Reading Comprehension
    ❑ Foreign Language
    ❑ Math

12. How often do you do any of the following in your classes?
Please circle the choice that is closest to your experience:

	Never	Rarely	Monthly	Weekly	Daily
a. Work in small groups	1	2	3	4	5
b. Work on projects that require you to do research on your own	1	2	3	4	5
c. Give presentations in front of the teacher and the rest of the class	1	2	3	4	5
d. Learn about things that relate to the community in which you live	1	2	3	4	5
e. Study the same subject in different classes *(for example, learn about World War II in both English and Social Studies)*	1	2	3	4	5
f. Do science experiments in class	1	2	3	4	5
g. Memorize facts	1	2	3	4	5
h. Take multiple choice tests for grades in class *(as opposed to the state-wide multiple choice tests)*	1	2	3	4	5
i. Have classes in which more than one teacher is teaching	1	2	3	4	5

Computer Experience

13. I have access to a computer: *Check all that apply*
    a. ❑ At home
    b. ❑ In my classroom
    c. ❑ In the school library
    d. ❑ In the school computer lab/media center
    e. ❑ Other (please specify________________________)
    f. ❑ I do not have access to a computer

14. I have Internet access: *Check all that apply*
    a. ❑ At home
    b. ❑ In my classroom
    c. ❑ In the school library
    d. ❑ In the school computer lab/media center
    e. ❑ Other (please specify________________________)
    f. ❑ I do not have Internet access

15. How many years have you been doing the following? *Circle the best choice for each item*

a. Using the computer in any way	none	<1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs.	10+ yrs.
b. Doing computer activities at shool	none	<1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs.	10+ yrs.
c. Doing computer activites at home	none	<1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs.	10+ yrs.
d. Using telecommunications *(*e.g., email, *Internet)* at school	none	<1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs.	10+ yrs.
e. Using telecommunications *(*e.g., email, *Internet)* at school	none	<1 yr.	1-2 yrs.	3-5 yrs.	6-10 yrs.	10+ yrs.

16. How often do you use the computer in your classes?
  - a. ❑ Every day
  - b. ❑ A few times a week
  - c. ❑ A few times a month
  - d. ❑ Once a month
  - e. ❑ A few times a year
  - f. ❑ Never
17. Which of the following types of software and related technologies do you use in your classes? *Check all that apply*
  - a. ❑ Word processing (e.g., MS Word, Word Perfect)
  - b. ❑ Database software (e.g., FileMaker, MS Access)
  - c. ❑ Spreadsheet software (i.e., Excel)
  - d. ❑ CD-ROM software (e.g., encyclopedias, educational games)
  - e. ❑ Drawing or painting software (e.g., Flash; KidPix)
  - f. ❑ Desktop publishing (e.g., Quark, PageMaker)
  - g. ❑ Presentation tools (e.g., PowerPoint, HyperStudio)
  - h. ❑ Image-editing (e.g., PhotoShop)
  - i. ❑ Programming language (e.g., HTML, Java, C^{++})
  - j. ❑ Authoring software (e.g., AuthorWare, Flash)
  - k. ❑ Web Page Editors (e.g., MS FrontPage, Claris HomePage)
  - l. ❑ Internet Browsers (e.g., Internet Explorer, Netscape Communicator)
  - m.❑ Email (e.g. MS Outlook, Eudora)
  - n. ❑ VCR
18. If you use the above applications in your classes, can you give an example of an activity or assignment you did recently that involved this software?

Jason Experience

19. Including the current school year, how long have you been participating in The Jason Project? ______________
20. What do you think the Jason Project is about?
21. So far, what do you and/or don't you like about the Jason Project?
(If this is your first year doing the Jason Project, go to Question 23.)

22. In which classes did you use The Jason Project last year? *Check all that apply*
    - a. ❑ Science
    - b. ❑ Math
    - c. ❑ Art
    - d. ❑ Language Arts
    - e. ❑ Social Studies
    - f. ❑ Foreign Language
    - g. ❑ Other ____________________
23. How frequently did you do Jason activities in your classes last year?
    - a. ❑ A couple of times
    - b. ❑ For a few weeks
    - c. ❑ For a few months
    - d. ❑ Throughout the year
24. If you feel the statement is true about your Jason experience compared to your regular classes, please check the box.

    While working on the Jason Project:
    - a. ❑ I used the library and/or media center, more often than in my other classes.
    - b. ❑ I communicated more with students outside of my school than in my other classes.
    - c. ❑ I presented my work in front of my teacher and classmates more than in my other classes.
    - d. ❑ I spent more time working after school and during free periods than in my regular classes.
    - e. ❑ I used e-mail more often to communicate with people about my work than in my other classes.
    - f. ❑ I worked with other students to complete projects more than in my other classes.
    - g. ❑ I used the Internet more than in my other classes
    - h. ❑ I participated in class more than in my other classes.
    - i. ❑ I engaged in more scientific experiments than in my other classes
    - j. ❑ I did more hands-on activities than in my other classes.
    - k. ❑ I learned more about real world world issues than in my other classes.
    - l. ❑ I learned more data analysis and interpretation than in my other classes.
    - m. ❑ I chatted online with scientists.
    - n. ❑ I wrote in an online journal.
25. In which classes are you using The Jason Project this year?
    - a. ❑ Science
    - b. ❑ Math
    - c. ❑ Art
    - d. ❑ Language Arts
    - e. ❑ Social Studies
    - f. ❑ Foreign Language
    - g. ❑ Other ____________________
26. What have your teachers told you about The Jason Project? *(What do you think The Jason Project will be like?)*

    ____

    ____

    ____
27. What topics did you learn about this year while doing the Jason Project?
    - a. ❑ Volcanoes
    - b. ❑ Lava Tubes
    - c. ❑ Plate Tectonics
    - d. ❑ Animal Adaptation
    - e. ❑ Hawaiian Culture
    - f. ❑ The Ecology of Hawaii
    - g. ❑ Weather/Climate
    - h. ❑ Other ________________________

28. What kinds of activities did you do this year while taking part in the Jason Project?
    - a. ❑ Went on field trips
    - b. ❑ Did lab experiments
    - c. ❑ Built models
    - d. ❑ Made posters
    - e. ❑ Developed a hypothesis to test
    - f. ❑ Collected data
    - g. ❑ Drew a conclusion based on data
    - h. ❑ Conducted library research
    - i. ❑ Conducted internet research
    - j. ❑ Worked on a group project
    - k. ❑ Attended the tele-presence
    - l. ❑ Shared your work with people besides your teachers and classmates
    - m. ❑ Other ____________________
29. Which of the following technologies did you use while you did the Jason Project?
    - a. ❑ Jason Videos

    From the Jason Web Site:
    - b. ❑ Ask an Expert
    - c. ❑ Chat Groups
    - d. ❑ Links Library
    - e. ❑ Student Journal
    - f. ❑ Online Expeditions
    - g. ❑ Message Board
    - h. ❑ Digital Lab
30. What was the most interesting thing you learned from the Jason Project?

    ____

    ____

    ____
31. Explain what you understand about that subject.

    ____

    ____

    ____

Some Basic Information about You

32. How old are you? __________
33. Are you:
    - a. ❑ African American
    - b. ❑ Asian or Pacific Islander
    - c. ❑ Caucasian /White
    - d. ❑ Hispanic
    - e. ❑ Native American or Alaskan Native
    - f. ❑ Other ____________________

Science Inquiry Task

Name: ______________________________

Date: ______________________________

Grade: ______________________________

Classroom: ______________________________

School: ______________________________

City: ______________________________

EDC/Center for Children & Technology • 96 Morton Street • New York, NY 10014

Instructions

You are a scientist who has just discovered a new planet.

You are part of a NASA expedition to study whether your planet has active volcanoes.

The ultimate purpose of your mission is to determine whether (or not) humans can live on your planet.

The data chart on the next page gives you information about Mars, Earth, Mercury and your new planet. After you look over the data on this chart, come up with the best answers you can to the questions on the last page of this activity.

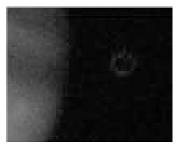
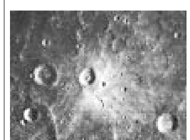
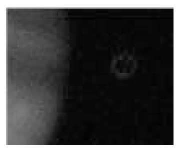
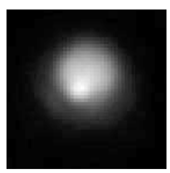
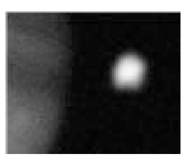
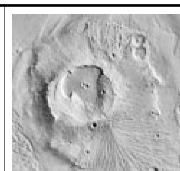
Instruments

INFRARED TELESCOPE:
The infrared telescope tracks patterns of heat on a planet. Flashes of light reveal bursts of heat, which may indicate a volcanic eruption, but may also indicate other heat-producing events. The telescope must be focused on a planet at the time of a volcanic eruption for it to register that heat outburst. If the telescope is not focused on a planet when a volcano erupts, no light flash will register.

SPACE PROBE:
This is a spacecraft that travels to the planet it studies. Space probes are equipped with a variety of instruments for collecting data, including cameras for taking pictures of the planet's surface and devices for measuring the planet's temperature.

Data chart

Compare the data for your planet with the data gathered for other planets to answer the questions on the next page. Can you make any judgments about volcanic activity on your planet based on this data?

	Surface Gravity	Temperature (in ° F)	Infrared Telescope Image (taken during a two-week observation)	Space Probe Image (taken over two months of orbiting the planet)	Volcanic Activitiy
Mercury	.38	354° F			No longer
Earth	1.0	46.1° F			Yes
Mars	.38	–9.67° F			Probably
Your Planet	1.50	12° F			

Questions

1. Is your planet volcanically active? Explain your answer?
2. Can humans live on your planet? Explain your answer?
3. If you would like to, give a name to your planet: ________________________________

Inquiry Task Scoring Guide

Answer form

1. Student does not answer question
2. Student gives only a yes or no answer to question
3. Student fully answers question

Use of data

1. Student does not refer to data provided in answer
2. Student refers to one piece of data provided to answer question
3. Student uses more than one piece of data to make argument
4. Student talks about limitations of data provided/refers to the contradictory nature of data
5. Student suggests additional data needed to answer question properly.

Argument Building

1. Student gives an answer but *does not* draw on any information.
2. Student gives an answer and draws on information.
3. Student gives an answer, draws on information, and explains the relationship between the information and the conclusion.
4. Student also weighs relative values of different types of evidence.
5. Student also questions the data and/or suggests further investigation needed.

Video Assessment Training Workshop

for

JASON Teachers

Agenda

June 27 – 28, 2001

Education Development Center
Center for Children and Technology
96 Morton Street, 7th Floor
New York, NY 10014

Agenda
Jason Teacher Workshop
June 27-28

DAY ONE

Wednesday, June 27

9:00 a.m.	*Breakfast*
9:15 a.m.	Workshop Overview Brief introductions and an explanation of the goals of the workshop.
10:00 a.m.	Understanding Video as an Assessment Tool Presentation by Senior Scientist Dorothy Bennett
10:30 a.m.	Introduction to the Scoring Rubric and Coding
11:15 a.m.	*Break*
11:30 a.m.	Video Exercise 1 (Initial Read) The entire group views a student presentation. We then discuss our observations and assessments of the presentations and examine how these correspond to the rubric.
1:00 p.m.	*Lunch*
2:30 p.m.	Video Exercise 2 Teachers work in pairs to score a presentation.
3:30 p.m.	Review Scores and Coding Process The whole group talks about the scores given and attempts to resolve conflicts in scores.
4:30 p.m.	*Break*
4:45 p.m.	Finalize Rubric
5:30 p.m.	End of Day 1 Workshop
6:30 p.m.	*Dinner*

DAY TWO

Thursday, June 28

9:00 a.m.	*Breakfast*
9:15 a.m.	Debriefing from Previous Day
10:00 a.m.	Video Exercise 3 Teachers work in (different) pairs to score a presentation.
10:45 a.m.	Review Scores and Coding Process
11:45 a.m.	*Break*
12:00 p.m.	Review Scores and Coding Process
1:00 p.m.	*Lunch*
2:30 p.m.	Video Exercise 4 Teachers work in (different) pairs to score a presentation.
3:15 p.m.	Review Scores and Coding Process
4:15 p.m.	*Break*
4:30 p.m.	Workshop Debriefing and Plan for Coding over the Summer
5:30 p.m.	*End of Day 2 Workshop*

Video Assessment
Steps for Scoring Work

1. **Familiarize yourself with the criteria:**
   Connect an idea with each of the six subcategories in the scoring rubric.

2. **View the presentation**
   Get a feeling for the assignment and students

3. **Look for examples of the criteria in the presentation**
   Go over the presentation carefully and pick out specific episodes that exemplify a criterion.

4. **Give the presentation a score for each of the criteria**
   Base the score on the examples you found in the presentation. Use the scoring rubric to give a score (1 to 5) in each subcategory.

5. **Write your evidence**
   Use the examples you found in the presentation to write a few sentences of explanation of what the evidence for.

6. **Discuss your scores and evidence with another person**
   Make sure you are seeing the things that another teacher is seeing and that you have noticed everything.

Video Assessment Rubric Glossary

Understanding

Concept

Students' ability to connect what they've learned about their research topic to larger scientific, historical or cultural concepts.

Scope

The degree to which information that students have included in their presentation is accurate, covers their research topic, explores their topic from different angles.

Critical Thinking

Analytic Ability

Students' abilexperiments to other contexts or real-life situations.

Research Process

The students' ability to talk about how they did their work (whether it's a research project or an experiment) and demonstrate an understanding of why they used certain resources and chose to investigate certain subjects.

Communication/Presentation

Organization

Students' ability to structure their presentation coherently and organize their information.

Presentation Materials

Students' ability to take advantage of the medium (a live presentation) they are using to illuminate their topic and engage audience members by using audio, visual displays and models, or active demonstrations.

Video Assessment
Evidence

Evidence of Understanding

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?)			
	Concept (What did she do to show she understand sthe concept of?)		Scope (What did she do to demonstrate the scope of her understanding of?)	
	What?	Why?	What?	Why?

Video Assessment Evidence

Evidence of Understanding Concept

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?)	
	Concept (What did she do to show she understansd the concept of?)	
	What?	Why?

Video Assessment Evidence

Evidence of Understanding
Scope

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?)	
	Scope (What did she do to demonstrate the scope of her understanding of?)	
	What?	Why?

Video Assessment Evidence

Evidence of Critical Thinking (Analytic Ability)

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?)	
	Analytic Ablity (What did she do to show that she was able to provide explanations and relate knowledge to other contexts?)	
	What?	Why?

Video Assessment
Evidence

Evidence of Critical Thinking (Research Process)

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?) Research Process (What did she do to show that she was able to talk about how they did their work and to demonstrate an understanding of why she choose certain resources?)	
	What?	Why?

Video Assessment
Evidence

Evidence of Communication and Presentation (Organization)

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?) Organization (What did she do to show her ability to structure her presentation and coherently organize her information?)	
	What?	Why?

Video Assessment
Evidence

Evidence of Communication and Presentation (Presentation Materials)

Scorer:

Project

Tape Entry	Evidence (What does the evidence exemplify?) Presentation Materials (What did she do to show her ability to take advantage of the "live" presentation? What did she do to engage audience members?)	
	What?	Why?

Video Assessment Scoring Rubric

Understanding (Content)

	1	2	3	4	5
Concept	Students present incomplete information.	Students present their information but do not draw connections between the information they present and larger scientific, historical or cultural concepts.	Students present their information and give examples drawing connections that relate to their topic in a very narrow way. (They give an example within the context of their topic.)	Students draw connections between the information they present and larger scientific, historical or cultural concepts.	Students draw connections between the information they present and larger scientific, historical or cultural concepts and also connect their information to real world experience or another knowledge domain.
Scope/ Depth	Students' information is largely incorrect or irrelevant to topic.	Students' information is partially correct, and/or only partially explores the research topic.	Students' information is generally correct and adequately covers research topic (superficial without depth).	Students' information is mostly correct, and covers elements of the research topic in detail (in depth).	Students' information is correct, and covers elements of the research topic in detail from multiple angles.

Video Assessment Scoring Rubric

Critical Thinking

	1	**2**	**3**	**4**	**5**
Analytic Ability	Students have difficulty answering any questions about their project.	When asked questions, students reiterate what they presented.	When questioned students can clarify what they presented and/or provide factual information about their topic beyond what was presented.	When questioned students can provide explanations for the facts they present (answer why and how questions).	When questioned students can provide explanations for the facts they present (answer why and how questions) and relate those facts/explanations to other contexts or real life situations.
Research Process	Students cannot describe their research process	Students equate the research process with the physical product they are presenting.	Students describe research process in procedural terms (i.e. what resources they used, when they did their work, who did which tasks, who helped them find information).	Students describe their research process as not only gathering information, but making choices about what information to present and how to present it.	Students can articulate the connection between their research question/topic and the choices they made about what resources to use and what subject to investigate.

Video Assessment Scoring Rubric

Communication and Presentation

	1	2	3	4	5
Organization	Students do not appear to have had any plan about how they would present their project. (If group: students have not assigned roles of group members.)	Students appear to have some plan for their presentation but there is no unifying structure. (If group: students may have assigned roles but don' t relate to what others have said.)	The presentation has a beginning (or at least a clear topic on their board or stated verbally), a middle and an end, though students may present information that is not directly relevant to the stated premise of the project. (If group: students play different roles that relate to each other.)	The presentation is structured so that the different pieces of information presented relate/connect to each other and to the overall topic (i.e., the information flows together, like a 5 paragraph essay). (If group: students play different roles that relate to each other and all contribute to the presentation.)	The presentation is structured so that the information presented relates to the overall topic and each component builds on the previous component so by the end the students can summarize the topic. (If group: students play different roles that relate to each other and all contribute to the presentation.)
Presentation Materials	Presentation materials (including models, graphs, and illustrations) are irrelevant to project, or students use no presentation materials.	Presentation materials (including models, graphs, and illustrations) are not well-integrated onto the project and/or are poorly made.	Presentation materials (including models, graphs, and illustrations) are well-made and/or are integrated into the presentation.	Presentation materials (including models, graphs, and illustrations) are well-made, integrated and used to illustrate the students' topic/ experiment.	Presentation materials (including models, graphs, and illustrations) are well-made and integrated, and actively used to illustrate the students' topic/ experiment.

Video Assessment
Final Scores

Presentation #	Score

JASON Foundation for Education
MEMORANDUM

Date: October 24, 2000
To: JASON Project Site Coordinators
From: Caroline Joyce and Bram Duchovnay
Subject: Evaluation

The JASON Foundation for Education (JFE) believes that the JASON Project's multimedia curricular approach develops content and process skills among a diverse population of students. In order to understand whether (or not) the JASON Project is meeting this goal, the JASON Foundation has asked an outside organization, EDC's Center for Children and Technology (CCT) to conduct an evaluation of the impact of the JASON Project on student learning and the development of science inquiry skills.

This one year long evaluation will allow CCT staff to collect data from eight JASON classrooms across the country. This study will also be comprised of five integral data collection methods: demographic surveys, interviews, classroom observations, assessment of videotaped student presentations, and a science inquiry assessment task. With the support of JFE staff, CCT is currently in the process of identifying eight JASON classrooms to participate in this evaluation.

In order to answer JFE's question about whether the JASON Project works for all kinds of students, it would also be beneficial to have a range of classrooms across several dimensions, such as:

- Student achievement level
- Socio-economic status
- Geographic diversity
- Teacher experience with the JASON Project
- Students with disabilities
- Diverse settings (public and private, urban and rural)

Please identify **two or three** possible classrooms from your site that you think may meet the requirements *(listed on the next page)* and may be interested in participating in this evaluation. We will need the teacher's name and contact information, as well as a two or three sentence description of the classroom and school by **this Thursday or Friday morning**, if possible.

Thanks so much for your time and commitment!

School Requirements

- Within each school, there must exist a single grade in which some teachers teach with JASON and others do not (CCT is planning to work with 7th graders).
- There cannot be a distinction in ability level between these JASON and non-JASON classes. (These classes should as similar as possible in terms of achievement, demographics, etc.).
- There must teachers who plan to have students give presentations of their JASON work (Presentations can be anytime between January and June. Each presentation should last between 5 and 10 minutes.)

Teacher Commitment

This commitment is approximately 35 hours of work for the entire project and teachers will be compensated $2000.

Teachers will:

- Take a short survey (20 minutes)
- Be interviewed (45 minutes)
- Permit CCT to conduct classroom observations (no time)
- Allow us to administer the inquiry test and student demographic survey
(30-45 minutes of class time in the fall and spring, teacher can be interviewed, too)
- Attend two day workshop in New York City (two days including travel)
- Code 4 videotaped presentations (8 hours)

Project Calendar

In **November and December**, CCT staff will visit each school (twice or three times) to collect demographic data about participating schools through informal interviews with school principals, and the collection of records/documents about schools. During this first visit, they will interview JASON teachers and conduct classroom observations. They will also administer a demographic survey to students, and the pre-inquiry test.

Between February and May, depending on when the teachers schedule student presentations, CCT staff will make a second visit and videotape student presentations. Out of the eight participating teachers, CCT will select six to assess the students' videotaped performances. The development of the selection criteria for participation in this phase of the evaluation is ongoing throughout the school year.

During June of 2001, the six selected teachers will come to the CCT offices in New York City for a two-day workshop to learn how to score student presentations using a CCT coding tool (CCT will provide them with airfare, lodging and food during these two days). Once the participating teachers have been trained at CCT, they will be asked to code the videotape data in **July**, and send the score back to CCT for analysis.

Inquiry Assessment Task

The Inquiry Assessment Task is a problem-solving activity that CCT will administer to students two times during the year. This task will be based on an investigation drawn from the JASON curriculum, and will be used to assess whether or not the JASON Project helps students improve their science inquiry skills. This Inquiry Assessment Task will not only be given to JASON students, but also to a control group of non-JASON students.

The responses to the Inquiry Task will be scored by the teacher participants along 2 dimensions: (1) The number and variety of inquiry skills they use, and (2) the completeness and sophistication of the solutions. This scoring rubric will be developed during the three-day workshop described above. Once the inquiry task data have been scored by the teachers, the CCT staff will look at changes in skill levels over time and the differences between the skill levels of students in JASON and non-JASON classrooms.

Coding
The teachers will code all student videotapes in July. There are 8 classrooms and 6 coders. We expect each classroom to provide us with approximately 10 videotaped presentations. We will randomly select 3 videotaped presentations from each class. The videotaped presentations should not last more than 10 minutes. Each teacher will code 4 videotaped presentations (approximately 8 hours). CCT staff will score the inquiry assessment task for both groups.

Control Group
In each selected school, we will need a control group (one classroom) similar in demographics, achievement and grade level to the JASON classroom that will participate in the study. The only two things that the control group teacher needs to do are allow CCT to administer the inquiry task to his or her students once in the Fall and once in the Spring and have students take the demographic survey. (This should take approximately a half-hour for each). There is no compensation planned for the non-JASON teachers and students. That is why CCT has tried to make their involvement as minimal as possible.

Teacher Consent Form

The Jason Foundation for Education has contracted with the Center for Children and Technology (CCT) to conduct an evaluation of the impact that its program has on the educational experience of students. We would like you to help the Jason Foundation and CCT understand whether the Jason Project is making a difference in your students' education.

All information obtained in this evaluation will remain confidential. Your interview statements may be quoted anonymously in the final evaluation report. You will not be identified by name or described in such a way that you can be identified. The results of the study, and therefore excerpts of interviews, may be presented at scientific meetings and in published reports for educational, policy and scientific purposes.

Your signature indicates that you have read the information provided above and agree to participate in the Jason Evaluation. Should you choose to discontinue your participation in the study, you can withdraw without prejudice after signing this form. If you have any questions or concerns, please feel free to call Harouna Ba at (212) 807-4226 and/or Wendy Martin at (212) 807-4287. Thank you very much for your cooperation.

____

Name *(please print or type)*

____ ________________

Signature Date

Student Consent Form

Some of the teachers in another school in your child's school district utilize an interdisciplinary middle school curriculum, called 'The Jason Project.' The Jason Foundation for Education, creators of The Jason Project, an interdisciplinary middle school curriculum, are conducting an evaluation to assess the impact that their program has on the educational experience of participating students. The Foundation has asked researchers from the Center for Children and Technology (CCT) to perform the evaluation. We would like your child to help us understand whether the Jason Project is achieving its educational goals. The best way to assess the quality of educational programs is to ask for feedback from the students and teachers who use them, to compare the experiences of both the students who have participated in the program and those students who have not. Your child is in a class in which the Jason Project curriculum is not used. For the purposes of comparison, your child's input would serve as a valuable contribution to the overall evaluation enterprise.

If your child participates in the Jason Project evaluation, he/she will be asked to complete a short science activity in the fall and spring of the 2000-2001 academic year. Participation in this activity will have no impact on your child's grades or academic standing in the school. In fact, all information obtained in this evaluation will remain confidential. Your child will not be identified by name or described in such a way that he/she can be identified. The results of the study may be presented at scientific meetings and in published reports for educational, policy and scientific purposes.

Your signature indicates that you have read the information provided above and agree to your child's participation in the Jason Project evaluation. Should you choose to discontinue your child's participation in the study, you can ask him or her to withdraw without prejudice after signing this form. If you have any questions or concerns, please feel free to call Harouna Ba at (212) 807-4226 and/or Wendy Martin at (212) 807-4287.

Thank you very much for your cooperation! We look forward to working with your child!

Name *(please print or type)*	City
Name of child *(please print or type)*	School name
Signature	Date

Please return this form to your child's teacher as soon as you can, but no later than ____________________, 2000.

TIMELINE: October 2000 – September 2001	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept
Identify potential JASON school sites across the country	◆											
Work with JASON staff to select 10 candidate JASON schools	◆	◆										
Identify 8 JASON classrooms in each PIN area that agree to participate in the videotaping of students project presentations												
Classroom site visits (Fall)		◆	———	◆								
Administer the pre-inquiry test		◆	———	◆								
Administer teacher survey		◆	———	◆								
Administer student survey		◆	———	◆								
Interview/Classroom observation		◆	———	◆								
Classroom site visits (Spring)								◆	◆			
Classroom observation								◆	◆			
Videotaping of student project presentations								◆	◆			
Administer the post-inquiry test								◆	◆			
Plan a two-day workshop in New York City					◆	———	———	———	———	———	———	◆
Training of teacher-scorers										◆		
Data analysis											◆	◆
Final Report delivered												◆