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Red Rock Desert Learning Center: Evaluation of Curriculum: Final Report

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Final Report

Red Rock Desert Learning Center
Evaluation of Curriculum

Submitted by:

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June 23, 2006

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Executive Summary

The UNLV Center for Evaluation and Assessment developed an assessment instrument to evaluate curriculum for the proposed Red Rock Desert Learning Center science school's fifth grade program. A 25-item Likert-type scale was created and administered before and after 68 pre-service and in-service teachers participated in each of five curriculum pilot sessions. The survey consisted of questions related to knowledge, pedagogy, and attitudes. Two open-ended questions were included on the post-survey.

Findings revealed significant gains in knowledge, pedagogy, and attitudes in each of five events from pre- to post-test. Gains over time were greatest for knowledge. Some events were rated more highly than others, although all events were rated high in an absolute sense.

We conclude that the piloted curriculum is effective. In addition, the instrument used to evaluate the curriculum is reliable and valid. Three recommendations for the full implementation of the desert learning center curriculum are provided.

Introduction

On behalf of the Bureau of Land Management, the Public Lands Institute at the University of Nevada, Las Vegas was charged with designing and developing curriculum for the proposed Red Rock Desert Learning Center (RRDLC) science school for southern Nevada children. The intent of the program is to encourage and facilitate lifelong stewardship on the public lands among diverse school-aged children. The Public Lands Institute has an interest in assessing the effectiveness of the curriculum designed for the desert learning center to ensure that the goals as outlined by the Bureau of Land Management and the Southern Nevada Public Land Management Act (SNPLMA) are being met efficiently and effectively.

Prior to full implementation of the curriculum, Dr. Jeanne Klockow, the Education Curriculum Coordinator for the Public Lands Institute, proposed to the Bureau of Land Management a preliminary implementation of selected lesson plans through a series of five teacher trainings for two distinct sets of participants: University of Nevada, Las Vegas pre-service teachers and Clark County School District in-service teachers.

The pre-service teachers experienced one session as part of their undergraduate course on teaching science. For the other four sessions, in-service teachers were enrolled in a one-credit, repeatable, graduate-level course titled "Topics in Teacher Education," for which they received professional development credits for Desert Ecology, Teaching Models and Gifted Education, and Instructional Methods in Elementary School Science. In total, five groups of participants (n = 68) were involved in the curriculum trainings.

Our research team developed a comprehensive assessment plan to document the effectiveness of the curriculum. Teachers participating in the pilot phase of curriculum implementation completed surveys designed to elicit their perceptions of the curriculum.

The purpose of this report is two-fold:

1) to describe the development of the assessment instrument, and,
2) to provide results of the analysis based on completed assessments.

Context

The Red Rock Desert Learning Center (previously called the Oliver Ranch Science School) is envisioned as a residential fifth-grade science school that will be located on a parcel of land acquired by the Bureau of Land Management in the Spring Mountains outside Las Vegas, Nevada. The stated mission of the Red Rock Desert Learning Center is "to instill stewardship and respect by increasing knowledge and understanding of the Mojave Desert ecosystems and cultures through a unique experiential discovery program."

The role of the university's Public Lands Institute is to provide educational themes and activities for fifth grade outdoor environmental curriculum appropriate for the school. The Institute, with the guidance of community stakeholders and local schoolteachers, developed

curriculum in five core areas – Cultural Connections, Green Building Technology, Historical Figures, Night Sky, and Wild Horse and Burro. A separate committee, composed of local school teachers and researchers from the Desert Research Institute, developed curriculum in the area of Ecosystems Science under the auspices of a separate federal grant. Each curriculum was designed using a specific framework that included the following components:

1) *Introduction*: Provides a review and link to previous experiences and poses the essential question.
2) *Exploration*: Provides students with the opportunity to have first-hand experiences with the materials.
3) *Concept development*: Students share observations and understandings, vocabulary is developed in context, teacher asks probing questions, and formative assessment is conducted.
4) *Application/Further questions*: Students apply understanding to a new but similar situation, students and/or teacher asks new questions.

Selected lessons plans from three curriculum strands were chosen for piloting: Ecosystems Science (air pollution, geology, and water), Historical Figures, and Wild Horse and Burro.

Ecosystems Science Pilot Curriculum

The curriculum for eight ecosystem science strands was developed by a committee consisting of Clark County School District teachers and researchers from the Desert Research Institute. This curriculum was designed to correlate to school district goals, standards, and instructional materials. Essential questions were formulated that were supported by experiential activities.

Three of the eight essential questions in the ecosystems science strand were selected for piloting over three sessions:

1. *What causes air pollution at RRDLC and in Las Vegas?*
2. *Where should we live to avoid geological hazards in Las Vegas?*
3. *How does water control the abundance and distribution of plants and animals in the desert?*

Wild Horse and Burro Pilot Curriculum

The wild horse and burro curriculum consists of five essential questions and was developed by a committee of various local, state, and national stakeholders. The curriculum was approved by state and national WHB groups. The focus for the piloted curriculum was related to understanding and sustaining healthy ecosystems. One essential question was selected from this strand: *"How do the wild horse/burro populations affect their environment?"*

Historical Figures Pilot Curriculum

The historical figures curriculum consists of five essential questions and was developed by a committee consisting of university and community stakeholders. The topic for the piloted curriculum was explorers and historical figures in southern Nevada. The essential questions selected for piloting were:

1. *What has been the influence of explorers and historical figures in Nevada?*
2. *What are the influences early inhabitants of the Las Vegas area had on southern Nevada historically and today?*

These three curricula were implemented with pre-service and in-service teachers. All teachers experienced the curriculum developed for fifth graders and then provided an assessment of the curriculum.

Instrument Development

We began by meeting with Dr. Jeanne Klockow, the Education Curriculum Coordinator at the Public Lands Institute, in order to develop an understanding of the purpose of the evaluation. Because the three different curricula were being piloted with five separate groups of participants, we decided that the most feasible evaluation option would be a pre- and post-survey administered to participants immediately before and immediately after the curriculum implementation.

We reviewed existing assessments in the literature such as the Compendium Evaluation Tool (California Regional Environmental Education Community), a teacher survey developed by the Place-based Education Evaluation Collaborative, and recommendations by Environmental Education Materials: Guidelines for Excellence (North American Association for Environmental Education). Existing assessments were Likert-type instruments and consisted of items related to knowledge, pedagogy, and attitudes.

The *Guidelines for Excellence*, developed by the North American Association for Environmental Education, outlines six key characteristics of high quality environmental education materials. For the purposes of constructing a survey to measure teachers' perceptions about the piloted curriculum, we focused on the key characteristic of "Instructional Soundness." Instructional soundness includes the following components: learner-centered instruction, different ways of learning, connection to learners' everyday lives, expanded learning environment, interdisciplinary, goals and objectives, appropriateness for specific learning settings, and assessment (NAAEE, p. 4).

These components of instructional soundness are related to both the content of the curriculum (knowledge) and to the ways that the content is delivered (pedagogy). The Compendium Evaluation Tool (California Regional Environmental Education Community) also indicates criteria for instructional materials. Notably, both general content and pedagogy

are included as criteria. The next section of the report describes the knowledge, pedagogy, and attitude items that were developed (see Appendix A for the complete pre-survey).

Knowledge Items

Knowledge items were related to the content, goals, and objectives of the curriculum. Content-specific items (e.g., *"Students' understanding of environmental concepts, conditions, and issues will increase as a result of participation in this site-based activity"*), as well as more general content items were included. Content-general items were related to how well the curriculum was aligned to classroom activities and school district standards (e.g., *"The content of this activity is aligned to the Curriculum Essentials Framework"*). Nine knowledge items (items 1, 4, 5, 9, 10, 13, 15, 18, and 21) were included in the survey.

Pedagogy Items

Environmental education, according to the North American Association for Environmental Education, is "learner-centered, providing students with opportunities to construct their own understandings through hands-on, minds-on investigations. Learners are engaged in direct experiences and are challenged to use higher-order thinking skills" (NAAEE, p. 1). Pedagogy items were designed to reflect this view of instructional soundness and to elicit teachers' views about the appropriateness of the instructional activities. Eight pedagogy items (items 6, 7, 11, 14, 19, 20, 22, and 23) asked teachers to think about how learners might respond to the activities: (e.g., *"The activity will engage fifth grade learners,"* and *"Important concepts are conveyed in several ways so that all students can understand them"*).

Attitude Items

In addition to assessing teachers' perceptions of the components of knowledge and pedagogy, we developed questions related to teachers' attitudes. As Thomson and Hoffman (2005) note, one of the objectives of environmental education is directly concerned with attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment. Attitude items included attitudes about the piloted curriculum (e.g., *"I would bring my fifth grade science class to the Red Rock Desert Learning Center"*) and personal attitudes about the environment (e.g., *"I am in favor of saving wilderness areas"*). Eight attitude items (items 2, 3, 8, 12, 16, 17, 24, and 25) were included in the survey.

All knowledge, pedagogy, and attitude items were constructed as Likert-type items. Additionally, two open-ended questions were included in the post survey: 1) *What suggestions do you have related to deepening the content experience of fifth grade students?* and 2) *What are your past experiences with Environmental Education?* See Appendix B for the complete post-survey.

Implementation

Teachers completed the initial survey prior to participating in a particular curriculum strand. The post-survey was completed on-site immediately following the final activity of the curriculum strand, with the exception of Pilot Session 5 on May 6, 2006. In this session, in-service teachers were allowed to complete and return their surveys via the school district mail system, rather than before they left the site. As a result, only 14 post-surveys were returned, and many of these participants completed their post-assessment up to one week after the curriculum implementation.

Data were collected from two distinct sets of participants. One group, pre-service teachers, experienced the Wild Horse and Burro curriculum as part of their undergraduate course on teaching science. The second group of participants consisted of in-service teachers from the local school district. These teachers were enrolled in a one-credit, repeatable, graduate-level course titled "Topics in Teacher Education," for which they were receiving professional development credits for Desert Ecology, Teaching Models and Gifted Education, and Instructional Methods in Elementary School Science. In total, five groups of participants (n = 68) were involved in the curriculum pilot and completed the pre- and post-surveys. Table 1 lists the dates that each curriculum strand was presented and the participant group involved in the implementation.

Results

Three separate analyses were conducted. The first examined composite scores for pre- and post-tests. The second examined short answer responses to open-ended Question 1. The third examined short answer responses to open-ended Question 2.

Regarding the analysis of composite scores, Table 2 shows data for four different curricula that were assessed using post-tests that occurred immediately after the completion of the curriculum implementation. The Science II curriculum data shown in Table 2 was analyzed separately because, as noted previously, post-test data was collected one week after the implementation of the curriculum.

Survey Analysis

Composite scores were created for the knowledge, pedagogy, and attitudes survey questions. The pre- and post-knowledge composite scores included nine items, each with an internal consistency index of .90 and .91 based on Cronbach's alpha. The pre- and post-pedagogy composite scores included eight items with an internal consistency index of .85 and .86. The pre- and post-attitudes composite scores included eight items with an internal consistency index of .73 and .80. All of these scores exceeded the recommended value of .70.

Each composite score was created by summing the scores for each item, then dividing by the number of survey questions it was based on, to create a mean composite score ranging from 1 to 5. This yielded an average score for knowledge, pedagogy, and attitudes for each

participant. A preliminary analysis of the five curriculum pilot events revealed that the Pilot Session 5 (Science II) data was significantly lower than the four remaining curricular areas at post-test. This difference appears to be due to the fact that, as previously noted, post-test data was collected one week later rather than immediately after the session. For this reason, the Science II data was analyzed separately from the four remaining data sets.

We conducted an analysis on the first four groups. We conducted a 4 (*type of curriculum*: Wild Horse and Burro, Science Session I, Historical Figures, Science and Historical Figures) X 3 (*type of question*: Knowledge, Pedagogy, Attitudes) X 2 (*time of survey*: Pre versus Post) mixed model repeated measures analysis of variance (ANOVA). The *type of curriculum* variable was a between-subjects measure, whereas the *type of question* and *time of survey* variables were repeated within subjects.

Table 2 shows the means and standard deviations for each group. There was main effect for the *time of survey* variable: $F(1, 102) = 31.54$, $p < .001$. Scores at the post-test were significantly higher than scores on the pre-test, indicating that teachers gained substantially between pre- and post-tests. There was a significant main effect for *type of question* variable: $F(2, 102) = 135.36$, $p < .001$. Scores were higher for attitudes than for knowledge and pedagogy, while scores for pedagogy were higher than scores for knowledge.

In addition, there was a significant two-way interaction between the *time of survey* and *type of question* variables: $F(2, 102) = 3.45$, $p < .05$. This effect is due to the fact that knowledge scores increased more between pre- and post-tests than attitude scores, although all scores increased significantly.

The main effect for *type of curriculum* was significant: $F(3, 51) = 3.18$, $p < .05$. Scores for Pilot Session 2 (Science I) were higher than the remaining three events (Wild Horse and Burro, Historical Figures, Science and Historical Figures).

We conducted a separate 3 (*type of question*: Knowledge, Pedagogy, Attitudes) X 2 (*time of survey*: Pre versus Post) repeated measures analysis of variance (ANOVA) on 13 participants. Means and standard deviations are shown in Table 3. The type of question variable was significant: $F(2, 24) = 15.14$, $p <.05$. Scores for attitudes were higher than scores for pedagogy, which, in turn, were higher than scores for knowledge. The outcome was identical to the analysis of the remaining four groups. The *time of survey* variable was marginally significant as well: $F(2, 24) = 4.63$, $p = .05$. Scores at post-test were significantly higher than scores at the pre-test. No other effects reached significance.

Conclusions

The survey results lead to two conclusions. The first is that there are significant gains in knowledge, pedagogy, and attitudes from pre- to post-test. This suggests that the events are very successful in each of the three targeted areas. The second conclusion is that some events receive higher ratings than others even though all events receive high ratings. The Science I event yielded the highest scores, whereas the Science II event received the lowest scores.

This suggests that the success of an event may depend on the instructor in addition to the content or timing of post-test assessment.

Open-ended Question #1

Nineteen participants provided responses to open-ended question #1 (*What suggestions do you have related to deepening the content experience of fifth grade students?*). All comments provided were very positive in nature and were related primarily to pedagogical aspects of the curriculum. Participant comments were placed into four categories.

1) Category One: Background Knowledge

Six teachers provided comments that suggested fifth graders might not be prepared for the curricular activities because of a lack of background knowledge. One participant suggested that a review session could "gear students up for what they'll be doing and seeing when they get out into the field." One teacher thought that developing background knowledge was especially important for urban students and suggested that "curriculum materials could be provided to teachers planning to take their classes [to the desert learning center]."

2) Category Two: Constructing Knowledge

This category refers to suggestions teachers provided for enhancing the opportunities for fifth grade students to learn more about the content. Four comments were provided. Teachers' suggestions included providing time for additional student discussions and allowing for increased student decision-making during the activities.

3) Category Three: Hands-on Activities

Six responses from teachers were categorized as *Hands-on Activities*. In this category, teachers provided comments that related to ensuring that the curriculum remained student-centered and included ample opportunities for students to participant in hands-on learning. One participant commented, "anything that is tactile is beneficial to the students" and another teacher noted, "Keep up the great work. Nothing educates and stays with the learner as much as real, meaningful, hands-on experiences."

4) Category Four: Not Applicable

Three comments were not related to deepening the content knowledge for fifth graders. For example, one comment categorized as Not Applicable was, "We need more of these opportunities for teachers."

Open-ended Question #2

Twenty-six teachers provided responses to open-ended question #2 (*What are your past experiences with Environmental Education?).* These responses were categorized into three groups that included formal experiences, informal experiences, and limited experiences.

1) Category 1: Formal Experiences

Experiences coded as *formal* included courses that participants had taken in college, high school, or elementary school (e.g., "I have taken a college environmental science course"). Six teachers noted that their past experiences were in the form of formal schooling experiences. Also coded as *formal* were teacher in-service programs such as those provided by the Las Vegas Valley Water District and Red Rock Canyon National Conservation Area. Seven teachers participated in such training programs. In all, 13 teachers indicated formal experiences with environmental education.

2) Category 2: Informal Experiences

Three teachers indicated ways in which they had experienced the topics of environmental education in informal ways, such as travels, visiting museums, and personal reading.

3) Category 3: Limited Experiences

Ten teachers indicated that they had none or very little experience with environmental education. One participant noted, for example, "I had no previous experience with Environmental Education, but going through this short program has helped increase my knowledge."

Conclusions

Two main findings can be drawn from the results of the open-ended questions. First, teachers who included comments were overwhelmingly positive. They provided excellent suggestions for deepening the content knowledge for fifth graders. The most frequently appearing comment was related to including additional activities to develop background knowledge of fifth graders. The second conclusion that can be drawn is that fifth grade science teachers have little background in environmental education. Overall, only 23 percent of the participants indicated previous formal or informal experiences with environmental education.

Summary Conclusions

The purpose of this report was to describe the assessment program, including the development of assessment instruments specifically for the purpose of documenting the

effectiveness of the curriculum developed for the Red Rock Desert Learning Center from the perspectives of both pre-service and in-service teachers.

Results support four conclusions. The most important is that each of the five events produced substantial increases in knowledge, pedagogy, and attitudes. Knowledge increased the most, indicating that the events had significant instructional benefit. A second conclusion is that all events received high ratings, although some events were rated higher than others. Table 2 shows that the Science I curriculum was especially strong. A third conclusion is that teachers demonstrated through their responses to the open-ended questions very favorable attitudes about the curriculum. A fourth conclusion is that only 23 percent of the participants indicated previous formal or informal experiences with environmental education. This may affect teachers' ability to implement the curriculum successfully.

Recommendations

The following recommendations are offered as ideas to consider prior to full scale implementation of the desert learning center curriculum.

1. The pilot test suggests that the assessment instruments are suitable for teachers. These instruments were reliable and sensitive to growth over time in knowledge, pedagogy, and attitudes. We recommend that the pre/post assessment strategy be continued for the full implementation phase. Additionally, we recommend that all students complete the pre- and post-surveys. We believe that data collected from fifth grade students would provide a direct measure of growth in addition to teacher judgments of student growth.

2. Continue to focus on growth over time as indexed by gain in pre- and post- test scores. Consider adding a delayed maintenance measure (e.g., a post-test follow-up conducted one week later).

3. The framework used for developing the desert learning center curriculum is effective. Introductory activities, however, could include additional activities related to developing background knowledge, as noted by teacher comments to open-ended question 1.

4. It is important to administer the post-test immediately after implementation. A substantial delay appears to lower scores significantly on the post-test compared to the remaining four groups that completed the post-test immediately.

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Table 1: Summary of Desert Learning Center Curriculum Implementation

Pilot Session	Date	Curriculum Experienced	Participant Group	Number of Participants Responding
1	Feb. 23, 2006	**Wild Horse & Burro**	Pre-service teachers	11
2	March 18, 2006	**Science I**	In-service teachers	19
3	March 25, 2006	**Historical Figures**	In-service teachers	9
4	April 1, 2006	**Science & Historical Figures**	In-service teachers	16
5	May 6, 2006	**Science II**	In-service teachers	13

Table 2: Means and Standard Deviations for Survey Data

	Type of Curriculum							
	Wild Horse and Burro (n = 11)		**Science I (n = 19)**		**Historical Figures (n = 9)**		**Science & Historical Figures (n = 16)**	
Type of Survey Item								
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Knowledge								
Pre-test	3.34	.18	4.00	.58	3.48	.55	3.71	.55
Post-test	4.41	.40	4.41	.42	4.45	.40	4.51	.40
Pedagogy								
Pre-test	3.68	.37	4.05	.58	3.72	.45	3.89	.57
Post-test	4.48	.45	4.65	.38	4.61	.29	4.64	.29
Attitudes								
Pre-test	4.15	.23	4.55	.33	4.15	.41	4.30	.41
Post-test	4.59	.37	4.73	.30	4.51	.30	4.70	.30

NOTE: Data for Science II curriculum were analyzed separately. See Table 3.

Table 3: Means and Standard Deviations for the Science Session II Group

Type of Survey Item	Mean	Standard Deviation
Knowledge		
Pre-test	3.62	.60
Post-test	3.93	.54
Pedagogy		
Pre-test	3.74	.37
Post-test	4.15	.45
Attitudes		
Pre-test	3.97	.45
Post-test	4.35	.45

NOTE: Science II data were analyzed separately due to different data collection procedures. Science II responses were collected one week after the activity. In contrast, for the remaining four groups shown in Table 2, data were collected immediately after the activity.

Appendix A: Pre-survey

Red Rock Desert Learning Center
Curriculum Pilots – Evaluation (Pre)

1. This site-based activity will increase my content knowledge

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

2. I would bring my fifth grade science class to the Red Rock Desert Learning Center

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

3. Students will want to participate in this activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

4. The site-based activity is related to standards-based work within my fifth grade classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

5. The content of the activity is aligned to the Curriculum Essentials Framework

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

6. The activity can offer students opportunities to practice critical thinking processes such as problem solving, forming hypotheses, collecting and analyzing information, drawing conclusions

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

7. The site-based activity could improve my teaching in the classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

8. The activity will promote respect and caring for the environment

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

9. The activity could be easily integrated into an established curriculum

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

10. The content of the activity is developmentally appropriate for fifth grade students

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

11. The needs of diverse learners can be met by this activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

12. Participation in informal venues increases teacher knowledge

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

13. My understanding of environmental concepts, conditions and issues should increase as a result of participation in this site based activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

14. The activity will engage fifth grade learners

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

15. Students' understanding of environmental concepts, conditions and issues should increase as a result of participation in this site based activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

16. I am in favor of saving wilderness areas

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

17. As a teacher, I am enthusiastic about learning in settings beyond the classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

18. Depth of conceptual understanding is a core element of this activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

19. The activity can encourage students to develop awareness and knowledge of environmental responsibility

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

20. Learning is based on students constructing knowledge to gain conceptual understanding

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

21. The content of the activity is interdisciplinary

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

22. Students are enthusiastic about learning in settings beyond the classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

23. Important concepts are conveyed in several ways so that all students can understand them

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

24. If I had to choose between protecting a natural area and creating homes for humans I would choose to protect the area

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

25. I am interested in spending time working to help the environment

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

Appendix B: Post-survey

Red Rock Desert Learning Center
Curriculum Pilots – Evaluation (Post)

1. This site-based activity increased my content knowledge

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

2. I would bring my fifth grade science class to the Red Rock Desert Learning Center

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

3. Students will want to participate in this activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

4. The site-based activity is related to standards-based work within my fifth grade classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

5. The content of the activity is aligned to the Curriculum Essentials Framework

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

6. The activity offers students opportunities to practice critical thinking processes such as problem solving, forming hypotheses, collecting and analyzing information, drawing conclusions

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

7. The site-based activity will improve my teaching in the classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

8. The activity will promote respect and caring for the environment

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

9. The activity is easily integrated into an established curriculum

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

10. The content of the activity is developmentally appropriate for fifth grade students

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

11. The needs of diverse learners can be met by this activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

12. Participation in informal venues increases teacher knowledge

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

13. My understanding of environmental concepts, conditions and issues increased as a result of participation in this site based activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

14. The activity will engage fifth grade learners

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

15. Students' understanding of environmental concepts, conditions and issues should increase as a result of participation in this site based activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

16. I am in favor of saving wilderness areas

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

17. As a teacher, I am enthusiastic about learning in settings beyond the classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

18. Depth of conceptual understanding is a core element of this activity

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

19. The activity encourages students to develop awareness and knowledge of environmental responsibility

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

20. Learning is based on students constructing knowledge to gain conceptual understanding

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

21. The content of the activity is interdisciplinary

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

22. Students are enthusiastic about learning in settings beyond the classroom

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

23. Important concepts are conveyed in several ways so that all students can understand them

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

24. If I had to choose between protecting a natural area and creating homes for humans I would choose to protect the area

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

25. I am interested in spending time working to help the environment

Strongly agree	Agree	Not Sure	Disagree	Strongly Disagree
5	4	3	2	1

Open-ended Questions
What suggestions do you have related to deepening the content experience of fifth grade students?

What are your past experiences with Environmental Education?