Desert Solitaire: Using literature to develop a sense of place and stewardship of wilderness in high school students

Cindy Lee Falsken Zacks

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DESERT SOLITAIRE: USING LITERATURE TO DEVELOP A SENSE OF PLACE AND STEWARDSHIP OF WILDERNESS IN HIGH SCHOOL STUDENTS

A Project
Presented to the Faculty of California State University, San Bernardino

In Partial Fulfillment Of the Requirements for the Degree Master of Arts in Education: Environmental Option

by Cindy Lee Falsken Zacks

June 2000
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ABSTRACT

The Desert Solitaire curriculum was designed as a basis for exploring Edward Abbey's book, of the same name, in a high school field ecology class. Students read the book over a period of six weeks during the middle of the school year. Lessons were designed to aid students in exploring their home ecosystem, the Mojave Desert, via comparison with Arches National Monument as described in Desert Solitaire. This exploration fosters in students a sense of place and connection with their home environment. With little alteration, the curriculum can be used by students to examine their own ecosystem, even if it is not a desert. Furthermore, this curriculum can be used for delving into environmental issues, exploring environmental values and/or beliefs, or as an introduction to the genre of nature literature.
ACKNOWLEDGMENTS

I gratefully wish to thank the following people and organizations for their heartfelt assistance and support while completing this project.

• My husband Dan, for supporting me throughout this degree process and loving me always.

• Field Ecology students, Yucca Valley High School, for their enthusiasm and help in improving the lesson plans.

• Mr. Douglas Weller, Principal, Yucca Valley High School, for his continued support of my ideas, projects, and Field Ecology class.

• Darleen Stoner, Ph.D., California State University, San Bernardino, for her expertise and guidance in helping me organize my environmental education experiences into an integrated whole.

• Mr. Bruce Bridenbecker, Yucca Valley High School, for his support and encouragement to begin this master's degree.

• American Business Women’s Association, Morongo Basin Chapter, for their monetary grants allowing me to undertake this degree.
DEDICATION

Dedicated with love to my husband Dan,
who shares my love for wilderness;

Our daughter Sierra,
Who is growing in her love for and whose name comes from
our favorite wilderness;

My Field Ecology students,
who share their love for wilderness with me;

and Edward Abbey,
whose uncompromising defense of Mother Earth is an
inspiration to all.
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INTRODUCTION

Desert Solitaire is an emotion-filled literary text embodying Edward Abbey's deep sense of place. Because this book stirs controversy, shares adventure, and demands wilderness preservation, it is a perfect avenue for assisting high school students in discovering desert natural history while developing a sense of place and a healthy environmental ethic. One cannot read Desert Solitaire without a strong response. Whether agreeing or disagreeing with the attitudes, beliefs, and actions of Edward Abbey, students are forced to examine their own values and behaviors.

The following curriculum, Desert Solitaire: Using Literature to Develop a Sense of Place and Stewardship of Wilderness in High School Students, was designed to guide high school ecology students toward thoughtful reflection of their personal beliefs while learning about Arches National Monument's desert ecosystem. Furthermore, it challenges students to compare the natural history of their surroundings with that of the book. Not only do students often develop a desire to protect wilderness after reading Desert Solitaire, but many form a connection with and desire to experience the natural world through their own
wilderness trips. Finally, their excitement while reading the text encourages further exploration of nature literature - an effect many students never imagine. This is exhibited each year by the myriad of student requests for supplementary title suggestions. So many students wanted to read additional works that money was raised for a class library now including nearly fifty books ranging from nature adventure to wilderness careers.

The Field Ecology class for which this curriculum was designed is a full year course. Students learn basic ecological concepts, desert natural history, and field biology research techniques. In addition to the requisite science topics, major emphasis is placed on encouraging students to explore their own beliefs, values, and ethics with regard to wilderness. The Desert Solitaire curriculum allows for examination of many scientific and emotional aspects of the Field Ecology course.

A classic in environmental literature, Desert Solitaire was published in 1968 and is a chronicle of Edward Abbey's time working as a seasonal ranger in what was then Arches National Monument, Utah. Although Arches is now a national park, the term "monument" will be used for consistency with the book. While steeped in one of
Abbey's favorite topics, natural history, *Desert Solitaire* was also a forum for discussing his deepest feelings, attitudes, and beliefs regarding the natural world. Abbey was not one to walk delicately across controversial topics; therefore his writing alternates between inspirational and maddening. He dislikes tourists and their impact on Arches, yet he drives down the highway throwing beer cans out the window. Moreover, he would rather, "...kill a man than a snake," but then kills a rabbit with a rock as an experiment. Each reader will find in *Desert Solitaire* something to identify with and another to loathe. That is the nature of Edward Abbey.

As such, this book is an excellent medium for high school students to use while developing their own environmental ethic and connection with the natural world. Examining which events to applaud and which to detest provides a clear foundation for discovering one's own beliefs. One cannot ignore physical and emotional responses to literature. Because Abbey's writing can be so incendiary, students often cannot wait to voice their opinions, making for considerable exploration, evaluation and growth of their beliefs via class discussions and reflective writing.
Regardless of their feelings toward Abbey, students cannot help but be moved by his extraordinary attention to descriptive detail of wilderness. His deep love for the Arches' landscape, his sense of place, and desire to protect the desert environment, are inviolate. Reading *Desert Solitaire* provides students with a model from which they can begin developing their own sense of place. Identification with the natural world leaves students wanting to take care of remaining wild places.

This curriculum was designed to build on students' emotional responses to *Desert Solitaire*. Assisting students in developing their own sense of place is critical to producing a citizenry that will act sensitively toward the environment. It does not matter whether students live near wilderness or the city. In fact, it is imperative that individuals living within city boundaries develop a healthy sense of place for one does not destroy that with which they've made a connection. Whether a thousand acres of open space or a single tree, humans abhor seeing things they love destroyed. Development of such a bond goes a long way toward a healthier environment for future generations.
Creation of the curriculum's lesson plans took place over three years. After field-testing lessons each year, extensive review of curriculum components was undertaken. Student input and participation in idea brainstorming increased cohesion among lessons and created a literature experience that excites and challenges.
RATIONALE FOR USE OF NATURE LITERATURE IN FIELD

ECOLOGY CLASS

This is the most beautiful place on earth. There are many such places. Every man, every woman, carries in heart and mind the image of the ideal place, the right place, the one true home, known or unknown, actual or visionary. (Abbey, 1968, p. 1)

A sense of place, sense of belonging and protectiveness toward an area of wilderness, commitment — how many hold in their heart one "place" so dear that damaging it is akin to damaging their soul? In today's fast-paced, technological culture, more and more people are losing, or never developed, a connection to the natural world. This is a travesty. One could argue that the loss of a bond with nature translates into the loss of a bond with the self. Clifford Knapp's recent book, In Accord with Nature (1999), reviews the nature-as-self concept set forth by Neil Evernden in The Social Creation of Nature. Those that subscribe to this idea view humans as part of nature. As such, if we harm nature we harm ourselves. When one objectifies nature, viewing it as an entity separate from humanity, domination and destruction is easier. Considering nature and humankind part of one larger whole results in treating wilderness with a gentler
hand. Not wanting to destroy ourselves, we do not ruin that upon which we depend. Societies living closer to the land, recognizing a daily connection to and reliance on the earth, graphically demonstrate the nature-as-self worldview. Their sense of place is strong and intact (Knapp, 1999).

Edward Abbey had an extraordinary sense of place. He had a deep bond with all wilderness, but the place he called home was the American Southwest. Because he loved the desert so completely, he became a tireless crusader for its protection. It was Aldo Leopold, in 1949, who first acknowledged that love is an important attribute for those working with the land. "It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value" (p. 261). Environmental activists share a love and passion for the earth. How else could they maintain the energy and interest required to tirelessly campaign for wilderness preservation? Many continue their crusade for decades. These battles are not, however, of a global nature. They nearly always focus on one place, an area to which the activist feels most connected.
Paul Lindholdt (1999) recognized the importance of place to the development of passion for the natural world. He stated, "Activism calls for passion, and true passion cannot be garnered from a book. Passions adequate for activism begin in place" (p. 5). Passion is an emotional response to something we love. While we can teach basic ecological concepts from a book, we cannot teach passion. A textbook cannot teach any kind of emotion. Literature, however, written to excite, compel, or anger a reader can elicit feelings of passion. *Desert Solitaire* is that kind of book; it compels the reader to have a passionate response. Edward Abbey forces his reader to travel the gauntlet of emotions.

Carefully chosen and sensitively taught, nature literature can inspire individuals to move beyond reading into activism.

Literature has unique qualities that give it the potential to be extremely effective. It offers insights to humankind's relationship with nature not addressed in any other subject. Literature may present one man's or one woman's carefully worded interpretation of personal struggle in determining his or her place within the natural world. (Simpson, 1988, p. 26)
Desert Solitaire chronicles Abbey's struggle and encourages students to grapple with their sense of where they fit within the environment. It models Abbey's beliefs, feelings, and values regarding the natural world.

Because Abbey is a master of descriptive writing, his books create for students an emotional link to his sense of place. Based upon extensive reading of students' reflective journals, it is clear they feel, deep within themselves, Abbey's love for wilderness and his bond with Arches National Monument. The single most requested activity after reading Desert Solitaire is to visit Arches and experience Abbey's world. Well written nature literature can be the link between someone else's passion and the beginning of that for the student. When identifying with a writer's perspective or passion, students become willing to consider additional viewpoints presented in the piece. In other words, the author "...illustrates perceptions the reader already realizes and presents new perceptions that the reader has, to that point, never considered" (Simpson, 1988, p. 30). Exposing students to new ideas and feelings is a benchmark of education.
An effective environmental educator will use literature to foster growth in students' perceptions of the world around them. Discussions and reflective writing can then be used by students to examine personal changes in attitude and perception the literature piece may have ignited. Paul Lindholdt (1999) reinforces the idea that students should read literature from renowned nature writers to assist in the development of each student's own sense of place.

One way that teachers of writing and literature can begin to raise among students a place-based consciousness is to have them read writers who explored deeply the genius loci of beloved places and who worked to preserve them—for example, Sarah Orne Jewett (on late 19th-century Maine), John Muir (on Yosemite and the Sierra Nevada), Sigurd Olson (on Minnesota, Wisconsin, and the Great Lakes), Edward Abbey (on the desert Southwest), and Linda Hasselstrom (on South Dakota). Such writers can model the healthy desire to affiliate oneself with a region.... (Lindholdt, 1999, p. 6)

With this in mind the accompanying curriculum was created. Using Desert Solitaire as a starting point for developing a sense of place in learners, teachers can begin to create opportunities for each student's exploration of their own beliefs and values. Appropriate lessons will assist students in remembering places that have been special to them, just as Arches was special to Abbey.
Students can ponder their varied experiences, exploring why certain areas are remembered with greater fondness than others. What made their place special? Was it the location itself, an event that occurred there, or a memory of someone special with which they shared their place? Many students chose places they visited with family over the course of many years, or a place close to home. Fewer chose sites they visited only once. This is logical because of the ease in connecting with an area holding fond memories not only of fun times, but of loved ones as well. Once students create a conscious connection to their place, understanding the reasons for their emotions, they can begin to apply their feelings to the local environment. What's special about the area where they live? What can they learn about their own ecosystem?

Of course, it is easier to guide students toward a connection with their current surroundings if the teacher is knowledgeable about local natural history. When working to develop "...a sense of place, the teacher should know something about the regions in which he or she is teaching" (Lindholdt, 1999, p. 5). Affording young people the opportunity to develop a love and passion for their own "backyard" can provide "...meaning and value to places and
embed students in the processes of those places" (Sanger, 1997, p. 5). They begin to create a feeling of ownership for and identity with their community and its environs. "By learning to derive a portion of their identities from particular places, students learn to develop passions adequate to take on local issues, and they learn how to transmute those passions into action" (Lindholdt, 1999, p. 4).

Identification with and a desire to protect one's special place are the seeds of an environmental ethic encompassing the greater natural world. Combine emotion with scientific knowledge of species' importance and advocacy may result. One step further and students learn preservation of species is not enough. All species are interdependent and one cannot be positively or negatively affected without a similar effect upon the rest. Whole ecosystems must be taken care of for without habitat and its components, individual species are left bereft.

The development of a sense of place is not the end of a teacher's responsibility, however. There is much more. To be an effective educator one must design curricula that strive to meet the goals of environmental education. In the text Environmental Education: Teacher Resource
Handbook, John F. Disinger cites Bill Stapp's definition of environmental education as, "Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve those problems, and motivated to work toward their solution" (p. 35, italics original). Thus, students must be taught how to act on feelings of protectiveness, passion, and love for a special place. Along with enthusiasm, students must have the knowledge and critical thinking skills to follow through with a desired action. "Educators must also give students the skills to act, beliefs in their ability to act, reinforcement for action, and ownership in processes that impart intentions to act" (Sanger, 1997, p. 5). Young people must feel they have proper tools to carry out actions they deem necessary should a threat to their special place develop.

Project WILD's guide Taking Action (Stoner, 1995) outlines a series of steps educators may use to assist students in organizing their own action projects. The primary step is to determine which subject students are most interested in and then gather ideas for projects addressing the topic. It is important for students to
focus on a project that will accomplish their goal in a reasonable amount of time. They must choose an action within their capabilities and one in which they will experience a positive outcome. While some frustration is healthy and can lead to personal growth, too much will stagnate the project and dissuade students from attempting such a project again. Learners must determine if they are experienced in research procedures utilizing contemporary technology such as the Internet. Do they know how to locate appropriate town or city personnel to whom questions or concerns must be directed? Can they write formal letters in support or opposition to a proposed action? If the answer to any of these questions is no, then do the students have a capable adult who can lead them through these steps? After gathering necessary information, learners will need to create and follow through with their action plan. Finally, an assessment should be undertaken to determine if the goals of the project were met and each individual should reflect on what was learned from their experience. Individuals who undertake such projects with appropriate guidance and a positive outcome are more likely to have the confidence to attempt projects on their own when necessary. They have the tools to take positive steps
toward protecting special places when the need arises. Students in the Field Ecology class for which this curriculum was designed learn and apply these skills throughout the school year. Desert Solitaire is the crux of their opportunity to see how the lessons apply to real life thanks to Edward Abbey and his extraordinary connection with Arches National Monument.

If this curriculum is successful in achieving its goals, and students have internalized a strong sense of place, with all the love and passion of a true activist, they will have to act. For in the words of Edward Abbey, "Sentiment without action is the ruin of the soul" (Abbey, 1984, p.xvi).

For about five miles I followed the course of their survey back toward headquarters, and as I went I pulled up each little wooden stake and threw it away, and cut all the bright ribbons from the bushes and hid them under a rock. (Abbey, 1968, p. 67, in response to the government surveying a new road in Arches National Monument)
GOALS AND OBJECTIVES

The primary goal of this project was to develop a curriculum, based on the book Desert Solitaire, which would encourage students to develop a connection with wilderness, a sense of place, and a feeling of oneness with nature. Students must feel this bond before they can venture into the realm of developing an environmental ethic. Examination of various perspectives toward wilderness provides students with positive and negative models of environmental behaviour. A sound and well thought ethic does not disappear at the first hint of peer pressure or crumble when tested by those holding differing views. It becomes a cornerstone of one's life.

Additionally, this curriculum was created as an introduction for students to the genre of nature literature. It is but one example of the wealth of literature available. The idea that literature crosses all academic subjects is foreign to the teenage psyche. They have to be shown that literature can be captivating, inspiring, and fun. After researching, it became apparent that the use of literature in science education is painfully lacking in the teaching profession as well.
Utilizing an exciting and provocative book inspires students to seek further literary works.

Finally, a lofty but real goal of this project was to inspire students to follow paths toward careers in natural history and wilderness preservation. Students who choose careers in the out-of-doors should know the names of those whose passion laid the groundwork for the environmental movement. Without John Muir, Aldo Leopold, Rachel Carson, Henry Thoreau, Margaret and Olas Murie, Edward Abbey, Bob Marshall, David Brower, and many more, careers in the out-of-doors may have been significantly different than they are today. It would be remiss to send students into the academic or professional world without a foundation in the great works of nature literature, Desert Solitaire continues to be an inspiration for many in the environmental field.
DESIGN OF PROJECT

The *Desert Solitaire* curriculum was designed to be used with high school students, primarily juniors and seniors. While it can be used in both English and science classes, it was written for use by the Field Ecology class at Yucca Valley High School. The project can be used in its entirety, or individual chapters can be examined with accompanying lesson plans. For example, while studying predator-prey relationships in a basic biology class, students may complete the "Serpents of Paradise" lesson plan. This would provide an excellent series of activities demonstrating the need for predators in the natural world. Furthermore, each lesson is a composition of many smaller ideas. One does not need to complete each item to thoroughly teach the text. Instructors should utilize lessons in a manner consistent with their own goals and time frame. Completing the entire curriculum requires four to six weeks.

During the past three years successful lessons were fine-tuned and others were eliminated. Students reviewed each idea, providing opinions and suggestions for improvement. The basis for many lessons came from invaluable brainstorming sessions between the teacher and
students. An assortment of lesson types provides for integration of many subject areas as well as considerable variety throughout the curriculum. Students will find assignments to match their strengths and others designed to improve their weaknesses.
IMPLICATIONS FOR EDUCATORS

Literature should be a component of every class and subject matter. However, at the current time this is not the case. Educators and policy makers tout the importance of a literate society, yet in many cases are unwilling to create opportunities for sharing with students the joy of reading. In the author's experience, literature in high school is often something to be struggled through in English class, comprising works chosen by the teacher with the goal of exposing students to the "classics." While this exposure is important, applicability of the texts to the students' lives is frequently minimal. How can educators expect students to develop a desire for independent reading when they have not been shown that reading can be fun?

There are fascinating works of literature that can be applied to nearly every subject matter. A student who has no interest in Shakespeare may be very interested in an autobiographical piece by a famous sports personality. While the caliber of literary work obviously differs by considerable degree, the goal should be development of a love for reading. This is certainly not to say students shouldn't read Shakespeare, but today too many find reading
a chore, not an enjoyment. The use of Michael Crichton's Jurassic Park in freshman biology might be the critical link in exciting and connecting students with the subject of evolution and reading. The possibilities are endless.

Educators need to find ways to incorporate literature into their subject areas. This is arguably easier for those who find joy in reading, but is nevertheless a critical component of education. Desert Solitaire is a joy to read. Because of the emotional connection to the landscape Abbey engenders, the book motivates students to explore additional literary pieces. Is not the supreme goal of education to foster in students a lifelong love for learning? Without a willingness to read for enjoyment beyond the classroom walls, learning is stifled. Without Desert Solitaire and the accompanying curriculum included within these pages, students in the author's Field Ecology class may never have discovered that nature literature is exciting and provoking.
APPENDIX A:

LESSON PLANS
Author's Introduction:

Who was Edward Abbey and what is Arches National Monument?

Purpose

1. To provide students with an introduction to Edward Abbey.
2. To familiarize students with Arches National Park.
3. To foster a framework within which students can discuss and understand Desert Solitaire.
4. To encourage students to reflect their connections with special places in the out-of-doors.
5. To encourage sensitivity toward the preservation of wild places.

Preparing

1. Read aloud to students the first chapter of Desert Solitaire entitled "Author's Introduction."
2. Read aloud to students the third paragraph, beginning on page five, which starts, "What are the Arches?"

Finding Out

1. Students will explore, through oral discussion, their "first impressions" of Edward Abbey.
2. Students will create a color drawing depicting what they think Arches National Park looks like.

Student Lesson A

Students will watch the video, Edward Abbey: A Voice in the Wilderness. At the conclusion of the film they will write two reflective paragraphs discussing their feelings and impressions about the author and the landscape.

Finding Out

1. Students will view a map of Arches National Park.
2. Students will view a map of the United States as well as one of Utah.
3. Students will discover places noted throughout the book.
Student Lesson B

Obtain a class set of the brochure entitled, "Arches: Official Map and Guide," published by the National Park Service, U.S. Department of the Interior. This may be accomplished by contacting the Arches National Park Visitor Center. Also obtain maps of the United States as well as of Utah. Have students locate Utah on the United States map, then locate Arches National Park on the Utah map. This will provide a context of where the book takes place.

Next, hand out copies of the "Official Map and Guide." Review landmarks and locations mentioned by the author. This provides a spatial reference as the students read Desert Solitaire.

Bridging Lesson C

The first line of the book reads, "This is the most beautiful place on earth." After watching the film and reflecting on their feelings, students will have a basis from which to understand Edward Abbey's opinion. They will then create an image of their "most beautiful place" either in writing or through drawing. Those who wish may share their work, discuss the reasons for their choice, and describe how their special place makes them feel. The teacher should record noted "feelings" on the board so students can discuss any consistencies and contradictions shown in the terms. How do their responses compare/contrast with their interpretation of Abbey's feelings? Next, read aloud the third quote listed below. After discussing Abbey's meanings and intentions regarding the quote, have students write a reflective paragraph discussing their reactions should their special places be destroyed.

Newsworthy Notes

In "Cowboys and Indians Part II," Abbey mentions a place called Turnbow Cabin. On the Arches map, this site is now called Wolfe Ranch.

The site of Abbey's trailer is immediately across the park road from Balanced Rock. Park personnel indicate the "pit toilet" sign approximates the location (there is some internal joking about this). There is no actual marker.

The Willow Flats road is the one used to access the park in the book. The wash Abbey mentions is called Courthouse Wash and is near highway 191. The author in "Industrial Tourism and The National Parks" discusses development of the current park road.
Literature Quotes

"I would have returned the third year too and each year thereafter but unfortunately for me the Arches, a primitive place when I first went there, was developed and improved so well that I had to leave." Pg. IX

"I quite agree that much of the book will seem coarse, rude, bad-tempered, violently prejudiced, unconstructive - even frankly antisocial in its point of view. Serious critics, serious librarians, serious associate professors of English will if they read this work dislike it intensely; at least I hope so." Pg. X.

"Do not jump into your automobile next June and rush out to the canyon country hoping to see some of that which I have attempted to evoke in these pages. In the first place you can't see anything from a car; you've got to get out of the goddammed contraption and walk, better yet crawl, on hands and knees, over the sandstone and through the thornbush and cactus. When traces of blood begin to mark your trail you'll see something, maybe. Probably not. In the second place most of what I write about in this book is already gone or going under fast. This is not a travel guide but an elegy. A memorial. You're holding a tombstone in your hands. A bloody rock. Don't drop it on your foot - throw it at something big and glassy. What do you have to lose?" Pg. XII
The First Morning:
How the Arches Formed

Purpose

1. To familiarize students with the formation process of the arches in Desert Solitaire.
2. To view a variety of arches found in Arches National Park.
3. To foster a sense of awe toward the immensity of time required to create the arches.
4. To exhibit a clear understanding of arch formation through creation of a short story.

Preparing

1. Students will read the chapter "The First Morning."
2. Students will read the handout "How the Arches Probably Formed."
3. Students will view photos and slides of various arches mentioned in Desert Solitaire.

Finding Out

1. Students will explore the process by which natural stone arches develop over time.

Student Lesson A

After reading "The First Morning," students will also read the handout "How the Arches Probably Formed." They will then view a series of slides of various arches mentioned in the reading. As different arches are shown, the formation process will be reviewed. In addition, facts specific to each arch will be provided orally by the teacher.

Student Page A - "How the Arches Probably Formed"

Bridging Lesson B

Students will invent a short story describing the development of an arch. They may use an example reviewed in the slides or they may create a new arch. The story must be in booklet form, exhibit an understanding of arch formation, and include color illustrations. They are to explain the process in a manner that middle elementary students would understand.
How the Arches Probably Formed

Arches National Park lies atop an underground salt bed called the Paradox Formation, which is responsible for the arches, spires, balanced rocks, fins and eroded monoliths common throughout the park. Thousands of feet thick in places, the Paradox layer was deposited across the Colorado Plateau some 300 million years ago when a sea flowed into the region and eventually evaporated. Over millions of years, the salt bed was covered with the residue of floods and winds as the oceans returned and evaporated again and again. Much of this debris was compressed into rock. At one time this overlying layer of rock may have been more than a mile thick.

Salt under pressure is unstable, and the salt bed below Arches began to flow under the weight of the overlying sandstone. This movement caused the overlying rock to buckle and shift, thrusting some sections upward into domes, dropping others into surrounding cavities, and causing vertical cracks that would later contribute to the development of arches.

As the subsurface movement of salt shaped the surface, erosion stripped away the younger rock layers. Water seeped into cracks and joints, washing away loose debris and eroding the "cement" that held the sandstone together, leaving a series of freestanding fins. During colder periods, ice formed, its expansion putting pressure on the rock, breaking off bits and pieces, and sometimes creating openings. Many damaged fins collapsed. Others, with the right degree of hardness and balance, have survived as the world famous formations of Arches National Park. (National Park Service, 1996)
Solitaire:
The Importance of Observation and Descriptive Nature Writing

Purpose

1. To encourage students to observe the natural world in greater detail.
2. To foster an appreciation for descriptive nature writing.
3. To increase student use of detail and description in everyday writing.

Preparing

1. Students will read the chapter "Solitaire."
2. Students will review the definition of "adjective" in the English language.

Finding Out

1. Students will distinguish among examples of adjectives, nouns, and adverbs.
2. Students will discuss the importance of detailed descriptions in scientific and nature writing.

Student Lesson A

1. Before reading the chapter "Solitaire," students will be asked to find their favorite descriptive paragraph. In class they will share their choice through an oral reading. They will then discuss common features of all the choices. Does the author describe his surroundings well enough for the reader to picture Arches National Monument in their mind?

2. In groups students will find at least ten different descriptive phrases the author uses to describe the rock landscape. They will then go outside and create ten phrases to describe the landscape surrounding the school.

Finding Out

1. Students will listen to the story Stickeen by John Muir as read by Lee Stetson on audiotape.
2. Students will learn about and read an example of a "Muir Observation."
Student Lesson B

1. While listening to Stickeen, students will individually list at least thirty adjectives. At the conclusion of the audiotape students will compare and contrast the descriptive writing of John Muir and Edward Abbey.

2. Students will go outside to a natural area, find a place by themselves, and create a Muir Observation. Once everyone is finished, students who wish to may share their observation.

Student Page A - "Mormon Tea"

Bridging Lesson C

At home students will go outside and complete handout entitled "Observation is the Basis of all Science."

Student Page B - "Observation is the Basis of all Science"

Bridging Lesson D

Students will complete word-scramble worksheet as review of the information in the chapter "Solitaire."

Student Page C - "Solitaire"

Literature Quotes

"Out there, spread before me to the south, east, and north, the arches and cliffs and pinnacles and balanced rocks of sandstone (now entrusted to my care) have lost the rosy glow of sunset and become soft, intangible, in unnamed unnamable shades of violet, colors that seem to radiate from - not overlay - their surfaces." Pg. 13

"The odor of burning juniper is the sweetest fragrance on the face of the earth, in my honest judgment; I doubt if all the smoking censers of Dante's paradise could equal it. One breath of juniper smoke, like the perfume of sagebrush after rain, evokes in magical catalysis, like certain music, the space and light and clarity and piercing strangeness of the American West." Pg. 13
Mormon Tea

An Example of a "Muir Observation" by Patrick Hall (student)

Mormon Tea has a lot of different colors: green, yellow, black, brown, white, and tan. Most of it is green. It varies in size from one foot high and two feet wide to twenty feet wide and five feet high. It is a really thick bush; the whole plant is a bunch of stems branching out from one another in all different directions. It is quite waxy and smooth. It has a fairly potent odor to it. It is a stiff bush, which isn't much affected by the wind. On the edge of some of the branches there are reddish-brown buds. When they branch out they do so in clusters.

When I look at this bush it reminds me of my earlier years as a child, around the ages of five to twelve. My friends (then including my sisters) used to build elaborate forts in them, we spent all day making them and improving them with special seats and different places to hide stuff. We made traps around them to keep unfriendly people away. It was a place you could go to just hang out or to do things by yourself. The plant brought good protection from the weather.

When I look at the fort now I wonder how we could have fit three and four people in such a small plant and have such a great time decorating our little getaway place. Now it is just another bush in the desert, but back then it was an exciting, maybe even a protected place we could have fun.
Observation is the Basis of all Science

In **PART 1** of this activity you will observe, in detail, and precisely describe three different parts of a plant. You may use any or all of your senses, except taste.

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In **PART 2** of this activity you must make 40 observations of the plant's habitat. You are required to make at least 10 observations using each of the following senses: sight, hearing, touch, and smell. Your descriptions must be precise.

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1. Which sense was easiest for you to use? Why?
2. Which sense was hardest for you to use? Why?
3. Explain three ways living and non-living parts of this habitat depend upon one another.
4. How has this laboratory changed your feelings about the natural area you just observed?
Solitaire

Unscramble the Sentences

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   ALM

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10. APPE I CTE THE BALL AREAD AS SNOW PRED D DIS
The Serpents of Paradise:
Snakes? Important? Why?

Purpose

1. To develop an appreciation for predatory animals.
2. To articulate, in writing, the importance of snakes to an ecosystem.
3. To explore, through discussion, preconceived ideas about snakes.
4. To dispel false beliefs about snakes.
5. To properly interpret a food chain and/or food web.
6. To actively research information related to snakes utilizing the Internet.

Preparing

1. Read the chapter "The Serpents of Paradise."
2. Read aloud the literature quotes at end of lesson plan.
3. Discuss the author's views about snakes.
4. Discuss human attitudes toward predators in general.
5. Discuss human attitudes toward snakes in particular.

Finding Out

1. Distinguish among food chains, food webs, and food pyramids. The following definitions are adapted from Understanding Basic Ecological Concepts by A. Tomera (1989).
   A "food chain" shows the flow of energy from one organism to another.
   A "food web" shows the exchange of energy between organisms and is more complicated than a food chain. It shows how a number of food chains in an ecosystem are interrelated.
   A "food pyramid" is a concept describing the amount of energy that passes from one level to the next in a food chain or web. There is always a loss of energy as you go from one level to the next higher level.
2. Correctly define the terms: producer, first-order consumer, second-order consumer, herbivore, omnivore, carnivore, scavenger, and decomposer.
   A "producer" is any green plant that makes its own food using chlorophyll and light energy.
   A "first-order consumer" is an organism that eats producers.
   A "second-order consumer" is an organism that eats first-order consumers.
   A "herbivore" is an organism that eats plants.
   An "omnivore" is an organism that eats plants and animals.
   A "carnivore" is an organism that eats animals.
   A "scavenger" is an organism that eats dead or dying organisms.
A "decomposer" is an organism that breaks down the wastes and bodies of plants and animals into simpler chemicals.

3. Given a food web, identify the effects of population changes in one species on those remaining.

Student Lesson A

1. Divide students into teams of five. Provide each team a set of pictures including a producer, herbivore, omnivore, carnivore, and decomposer. Each student should receive one card, which they are not to look at until the signal is given. Pictures may be cut from magazines and laminated. When the signal is given, students in each team are to arrange themselves in proper food chain order. The first team to correctly re-order themselves wins the game.

2. Students will construct a human pyramid. Once arranged, discuss what would happen if the producers (bottom row) were removed. What would happen if the herbivores, omnivores, or carnivores were removed? This must be done very quickly because the pyramid often falls apart within ten to fifteen seconds. However, a weak link can be used to continue the discussion since students will have experienced a breakdown in the pyramid's structure.

3. Given a diagram of a food web, verbally provide students with examples of possible changes in population numbers. In groups they are to determine how this change may affect other species in the web. All groups will report their findings to the class. Ask students to determine the single most consistent effect of reducing predator numbers on prey species.

Finding Out

1. Students will read "Champion Rodent Control Specialists" written by Dr. Richard Plock of the San Diego Herpetological Society.
2. Utilizing the Internet, students will research the ecological importance of snakes.

Student Lesson B

After compiling sufficient information about the ecological role of snakes, students will write a "Letter to the Editor" reflecting why these animals should be respected and protected rather than feared and killed. Inclusion of factual information gathered during research is required. Students will review classmates' essays, and then revise letters until they are of printable quality.

Student Page A - "Champion Rodent Control Specialists"
Bridging Lesson C

Students will write a three part reflective essay. Part one is to discuss personal feelings about snakes prior to the preceding lessons. Part two requires that students review current feelings, specifying any changes in attitude and behavior. Finally, students are to examine the author's relationship with snakes and provide their opinion about his views.

Bridging Lesson D

Students will complete word search and fill-in-the-blank worksheet as review of the information in the chapter "The Serpents of Paradise."

Student Page B - "The Serpents of Paradise"

Literature Quotes

"In the long hot days and cool evenings to come I will not see the gopher snakes again. Nevertheless I will feel their presence watching over me like totemic deities, keeping the rattlesnakes far back in the brush where I like them best, cropping off the surplus mouse population, maintaining useful connections with the primeval." Pg. 23

"We are obliged, therefore, to spread the news, painful and bitter though it may be for some to hear, that all living things on earth are kindred." Pg. 24

"I'm not going to look for their lair, for that might frighten them away, and we need coyotes, need them badly, in Arches National Monument. As does the nation as a whole, for that matter. We need coyotes more than we need, let us say, more people, of whom we have already an extravagant surplus....." Pg. 236
Champion Rodent Control Specialists

Wild rodents are a major problem throughout the world. They not only consume vast quantities of food - thereby hurting both farmers and all who eat farm products - but also do a great deal of damage to structures and other property through their gnawing tendencies. (I know chipmunks are cute, and your pet mouse is lovable, but that does not change things.) In addition, they carry and serve as reservoirs for all manner of disease; Lyme disease and bubonic plague are only two examples. (Yes, the Black Death is still in existence, even here in the United States.)

One of the major controls on rodents is the serpent population. Keep in mind rodents are extremely prolific breeders (one pair of mice generating a colony of several hundred thousand in less than one year if unchecked), hence the need for natural predation. Many snakes eat rodents when available; however, a large number of these simply eat anything that comes in their power (e. g., an Indigo snake eats rodents, other mammals, birds, lizards, snakes, fish, frogs, etc.). In the United States, though, there are three genera of snakes that specialize in warm-blooded prey and are widespread. In principle, this includes other small mammals and birds, but in practice the main portion of the diet is rodents. These three genera are the rattlesnakes (*Crotalus*), the rat snakes (*Elaphe*) and the pine-bull-gopher snakes (*Pituophis*).

This specialization makes these animals extremely valuable and worthy of protection. Some people may object that an animal as dangerous to humans as a rattlesnake is not worthy of protection, but this is a questionable doctrine. In any event, that argument most definitely does not apply to the other two types mentioned - the rat snakes and the gopher snakes. These constrictors are most unarguably beneficial no matter where they are found. As an example, one adult bull snake is estimated to eat each year the equivalent of the gopher population on one and a half acres of the Mid-West grain belt. That is a lot of gophers. Note that cats, poisons, traps and other human-maintained controls do not deal as effectively with the problem as do the snakes, which actually penetrate to the nest area and wipe out whole colonies. An average adult rattlesnake is worth about $150.00 each year to a farmer; bull snakes are probably worth about $250.00 and rat snakes about $150.00 each. (Plock, ND)
The Serpents of Paradise

1. This chapter is about ________ s.
2. Rattlesnakes have lethal ________.
3. Snakes ________ along the ground.
4. Edward Abbey has problems with a ________ in his trailer.
5. ________ is a type of rattlesnake.
6. Abbey found a snake under his ________.
7. The snake Abbey let go under his house ________.
8. When the wind blows it kicks up a lot of ________.
9. Abbey approached the two ________ing snakes very ________.

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10. They were __________ and __________.
11. The snakes were performing their own __________.
12. The sound snakes make is called __________.
13. At night it is __________ in Arches National Monument.
14. __________ like to eat snakes.
15. Snake babies are called the adults' __________.
16. Wild snakes are also known as __________.
17. A roadrunner is a type of __________ that eats snakes.
18. Snakes have __________ color patterns.

BALLETTIMEDANCEMOUSESLEEKSNAKE
BEAUTIFULBIRDCOYOTESDIAMONDBACKDARK
DISAPPEAREDUSTDELEGANTOFFSPRINGHISSING
UNDOMESTICATED
Cliffrose and Bayonets:
An Exploration of Desert Plants

Purpose

1. To compare and contrast native vegetation of local environment to that of Arches National Park.
2. To correctly identify fifteen local native plants.
3. To exhibit proper skills in plant collecting, pressing, and identification.
4. To competently utilize botanical terms and references.
5. To create a personal plant collection of native plants.

Preparing

1. Read the chapter "Cliffrose and Bayonets."
2. Review the terms "native," "vegetation," "shrub," and "weed."
   "Native" refers to those plants or animals that are a natural part of an ecosystem.
   "Vegetation" refers to plants.
   A "shrub" is a "bush-like" plant.
   A "weed" is a non-native plant or a plant growing somewhere a person doesn't want it to grow. It is important to distinguish between these two definitions.
   Many people call native plants "weeds" because they are growing in areas where they are not wanted, such as in landscaped yards.
3. Discuss the term "introduced species" and provide examples.
   Introduced species are those plants or animals that were brought to an area where they do not naturally belong, such as starlings, ragweed, or tamarisk.
4. Review classification and scientific names.
5. Demonstrate plant-pressing technique.

Finding Out

1. Students will examine, in groups, various plant identification resources.
2. Students will distinguish between common and scientific names.
3. Groups will provide an example of the common and scientific names for one plant.
4. Students will distinguish between Latin and English versions of family names.
5. Given a common plant name, students will locate scientific and family names.
6. Students will examine list of local native plants.
Student Lesson A

While reading the chapter "Cliffrose and Bayonets" each student will make a list of plants included by the author. There are approximately sixty plants noted. In groups students will then compare their inventory with an official catalog or series of books of local native plants, highlighting species shared by the two communities. The teacher should obtain a list of plants native to their area for comparison.

Finding Out

1. Students will observe specimens of fifteen local native plants.

Student Lesson B

Students will sketch, in color and to the best of their ability, fifteen local native plants from actual cuttings. Specimens will be located around the room, accompanied by required information on an index card. They will copy onto each page the species' scientific, common, and family names. Additionally, they will write a detailed description of the specimen. This will be completed in a field journal. This activity will be followed by a practical exam to ensure students have learned to identify noted species.

Student Page A - "Learning the Names of 15 Common Desert Plants"

Bridging Lesson C

Students will create a personal collection of local native plants. Projects will include a minimum of fifteen correctly pressed, mounted, and identified plants. Collecting procedures are outlined on the following student page.

Student Page B - "How to Make a Plant Collection"

Student Page C - "Plant Collection Grade Record"

Bridging Lesson D

Students will complete word search and fill-in-the-blank worksheet as review of content in "Cliffrose and Bayonets."

Student Page D - "Cliffrose and Bayonets"
Literature Quotes

"For myself I hold no preference among flowers, so long as they are wild, free, spontaneous. (Bricks to all greenhouses! Black thumb and cutworm to the potted plant!)" Pg. 27

"Out of the core of this untouchable dagger's-nest rises a slender stalk, waist-high, gracefully curved, which supports a heavy cluster of bell-shaped, cream-colored, wascoated, exquisitely perfumed flowers. This plant, not a cactus but a member of the lily family, is a type of yucca called Spanish bayonet." Pg. 28
Learning the Names of 15 Common Desert Plants

**Directions:** Around the room are 15 different common desert plants. Each plant specimen has its correct scientific, common, and family name on the label. We will have a plant quiz later. When you describe each specimen remember that you want to be able to distinguish it from other plants that may be very similar. Many of these plants have compound leaves, tiny leaflets, thorns, etc. You want your "identifying descriptions" to be very specific.

You are required to do this assignment in your journal so the information is with you when we are in the field. You must draw the plant to the best of your ability - to scale and in color. Below the picture record the scientific, common, and family names in proper scientific format. On the next page write a detailed description of the plant.

### Plant Identification Quiz

**Directions:** You are to take this quiz individually. You may not consult with anyone. You will be provided with a few minutes before beginning to review your sketches and accompanying information in your journal. The fifteen plants you recorded are placed around the room for you to identify. They are not in the same order as in your journal.

Each identified plant, with its correctly spelled and written scientific, common, and family names, will earn 3 points. Incorrect spelling and lack of proper format will result in the loss of 1 point. This quiz is worth 45 points.

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How to Make a Plant Collection

Collecting

Collecting plant specimens is easy. However, to make a proper herbarium certain procedures must be followed. Please adhere to the following requirements.

1. Collect in the morning if possible. Plants are freshest at this time.
2. Take a large enough cutting to include flowers, leaves, and stem. A piece approximately five inches in length should be sufficient. Do not destroy the plant or remove critical parts. If there are additional items, such as seed pods, collect one or two as well. Try to gather from a location where there are a number of individuals of the species you are collecting. This helps preserve the population for reproduction in future years. A professional botanist would attempt to collect a sample of roots, but this is not required for your project.
3. Place the specimens in a container where they will not be crushed.
4. Record the date, exact location, habitat, and general description of plant when it is collected. You will be required to include this information for every plant in your collection.
5. Once cut, plants will begin to wilt. It is critical they be placed in the press immediately after arriving home.

Pressing

You will be provided with a plant press made by a local botanist. It must be returned in perfect condition with fresh, properly sized, newspaper.

1. Arrange the plant in a pleasing fashion between two layers of newspaper.
2. Place a piece of cardboard on top of the newspaper.
3. Arrange the next plant. In the end the press will look like a sandwich with layers of newspaper and cardboard.
4. Gently replace newspaper every few days. The plants will release water as they dry. Remaining between wet newspapers will result in molded specimens. You will not receive any points for molded plants.
5. It normally takes approximately two weeks to properly press plants.

Mounting

This takes some time and must be done neatly. You will be provided with fifteen sheets of heavy weight 8 1/2 x 11 white cardstock and slipcovers.

1. Leave room in bottom right-hand corner for label.
2. Using white glue (it will dry clear), carefully coat the side of the plant that will be face down on the paper. Do not allow any drips.
3. Arrange the plant neatly in the center of the paper.
4. Allow ample time for glue to dry before placing plants in slipcovers.
Identifying and Labeling

This is the most challenging part of the project. Your plants must be completely and properly identified. You will be given a sheet of herbarium labels.

1. Your labels must be placed in the bottom right-hand corner of the page. Use one tiny drop of glue to hold in place. Labels must be removable in the event your specimen is misidentified.

2. Labels must be complete, including the following information:

   a. Date
   b. Family
   c. Scientific Name
   d. Common Name
   e. Locality
   f. Habitat
   g. Collector

   Day, month, and year the plant was collected
   Latin version of the family name - almost always ends in "aceae"
   Must include Genus species in proper form (as shown here)
   English name you most likely recognize and can pronounce
   Name of the closest street and town to collecting site
   A short description of what the area looked like - do not write "desert"
   Your full first and last name
Plant Collection Grade Record

Each plant will be worth 15 points. Values for each required item are shown below. Be sure your plants are pressed, mounted, and identified correctly. Do not leave any portion of the label blank. Your plants must be presented in slipcovers and attached together in some fashion. You are required to include this grade record as the cover sheet.

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<th>Common Name (2)</th>
<th>Locality (1)</th>
<th>Habitat (1)</th>
<th>Collector (1)</th>
<th>Properly Pressed (2)</th>
<th>Properly Mounted (2)</th>
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46
Cliffrose and Bayonets

1. The ________ prints of the deer are in the sand.
2. The golden ________ of the monument are amazing.
3. The ________ in the desert are sharp and prickly.
4. The ________ River is the most wanted river for irrigation.
5. The ________ helps keep the population of rodents down.
6. The ________ runs off into the fast movement of the Colorado River.
7. Some ________ that you might see in desert are rare.
8. The ________ grows high in the cracks of the tallest mountains.
9. The ________ tree has dark turquoise-colored berries and can be up to three hundred years old.
10. The _______ pear is a common desert cactus.
11. The _______ is one of the nicest things to see in the desert in the morning.
12. _______ can grow up to six feet tall.
13. Most cacti are _______.
14. Most desert plants have _______ to protect them.
15. One doesn't see _______ in deserts in America.
16. There are many different species of _______ in the desert.
17. The _______ took many thousands of years to evolve.
18. _______ is one of the smoothest rocks.
19. Many different species of _______ rats live in the desert.
20. All flowers go into _______ in the spring.

ARCHES
COLORADO
KANGAROO
SUNFLOWERS

WILD ROSES
GOPHER SNAKE
MOUNTAIN SNOW
SUNRISE

BLOOM
GRAND CANYON
PRICKLY PEAR
CLIFFROSE

CACTUS
HEART-SHAPED
SANDSTONE
UNPLUCKABLE

THORNS
JUNIPER
SPECIES
BIRDS
Polemic: Industrial Tourism and The National Parks:

Creation of Arches National Park
Management Plan

Purpose

1. To provide students with an opportunity to explore their priorities with respect to national park rules and regulations.
2. To foster an understanding of the complex issues involved in creating a national park.
3. To encourage and practice compromise in group decision making.

Preparing

1. Students will read the chapter "Polemic: Industrial Tourism and The National Parks."

Finding Out

1. Students will view a topographic map of Arches National Park showing park boundaries and significant natural landmarks. Map should not indicate any current development such as roads, buildings, campgrounds, or parking areas. The author suggests use of the park map in the brochure "Arches: Official Map and Guide." The map should be photocopied with development notations deleted.
2. Students will write two reflective paragraphs comparing and/or contrasting their feelings with Abbey's regarding park development.

Student Lesson A

Given a map of Arches National Park showing park boundaries and significant natural landmarks, student teams will develop a management plan. Map should not indicate any current development such as roads, buildings, campgrounds, parking areas, or interpretive exhibits. Management plan will be presented orally to the class. The teacher and class may question the group's decisions and plan.

Student Page A - "Arches National Park: Management Plan"

Bridging Lesson B

In groups, each student shall discuss how closely the team's management plan aligned with their "ideal" plan. They will view a current map of Arches National Park. Students will also explore how Edward Abbey might have responded to their plan.
Creation of Arches National Park Management Plan

Overview

Given a map of Arches National Park showing park boundaries and significant natural landmarks, your team is to develop a park management plan. The map provided will not show actual development such as roads, buildings, campgrounds, parking areas, interpretive exhibits, etc. You are to determine where, if any, these items should be placed. Once your group has made these determinations, mark them on the map using logical symbols and a variety of colors. Create a legend indicating what each symbol or color represents. Below you will find a list of groups interested in utilizing the park as well as parameters that must be considered in your plan. Expect to present your management plan orally to the class, including a cohesive and detailed explanation for your choices. Be prepared to defend your decisions.

Interest Groups

Day use visitors  Backpackers
Photographers      Overnight car campers
Equestrian (horses) Disabled
Hunters            Fisherpersons
Overnight visitors - hotels Private inholders

Parameters to Consider

1. Arches National Park encompasses 73,000 acres or 115 square miles.
2. The desert environment is fragile and includes delicate cryptobiotic soil crust that is damaged for decades if disturbed.
3. There are 2,000 acres of private inholdings within the park that are in blocks of varying sizes and locations.
4. Other than the 2,000 acres of private land, the rest qualifies as wilderness under Department of the Interior guidelines. This does not mean it has been designated wilderness. Your group must determine this in your plan.
5. Your management plan needs to accommodate approximately 2 million visitors per year, with high concentrations in the spring and fall months.
6. Visitors need "relief" facilities.
7. There are historical Native American and pioneer sites within the park.
Cowboys and Indians:
An Exploration of Native American Rock Art

Purpose

1. To develop an appreciation for the complexity and artistry of Native American rock art.
2. To explore the relationship between indigenous people and the land on which they depend.
3. To distinguish between pictographs and petroglyphs.
4. To examine representational art using examples of Native American pictographs and petroglyphs.

Preparing

1. Read the chapters "Cowboys and Indians" and "Cowboys and Indians Part II."
2. Discuss the difference between pictographs, which are drawings on rock, and petroglyphs, which are etchings in rock.
3. Examine students' definition of "representational art."
4. Discuss students' views regarding the motivations behind Native American rock art.

Finding Out

1. Students will distinguish among rock art eras and examples of figures found in each era.
2. Students will view slides of rock art found in and around Arches National Park.
3. Students will view slides of rock art found locally.
4. Students will explore published resources showing examples of rock art and currently accepted interpretations of various figures.
5. Students will develop guidelines for viewing rock art, including appropriate rationale for chosen rules.

Student Lesson A

Students will view slides of rock art found in and around Arches National Park. Presenter will discuss each slide including its currently accepted age and, where possible, interpretation. Students will then view slides of art found in Joshua Tree National Park. Based on type of art and symbols, students will discuss the possible era during which art was made and what the artist was trying to convey. See "Newsworthy Notes" for outline of rock art eras.
Finding Out

1. Students will discuss types of surfaces and locations they believe artists would have chosen most often.
2. Students will develop their personal rock art style, imagery, and interpretation.
3. Students will create an example of their style.

Student Lesson B

Students will make a sample of rock art in their personal style. They will be given a piece of "rock." Rocks are made by filling small wax-lined cups with plaster-of-paris. After drying, spray paint plaster with terra-cotta colored paint, allowing it to dry for one to two days. Prepare rocks ahead of time. Using the end of an unbent paperclip, students then etch petroglyphs into their rock. Along with the actual rock art, a key must be provided explaining each symbol's meaning.

Bridging Lesson C

Each student shall choose one favorite quote from the chapter to share with the class. They will explain why it is their favorite and what, in their interpretation, the quote means.

Bridging Lesson D

At home, students will search through any appropriate published materials for examples of representational and/or symbolic art. They will then share their examples with the class, giving their interpretation of what the art means.

Bridging Lesson E

Students will complete word search and fill-in-the-blank worksheet as review of the information in the chapter "Cowboys and Indians."

Student Page A - "Cowboys and Indians"

Newsworthy Notes

Rock art is extremely fragile. It is absolutely imperative that the rock not be touched. Oils from human hands can cause damage. A very important part of this lesson involves the students creating their "rules" for visiting rock art sites. The instructor should ensure that students include not touching the art in any way, entering historic ruins, or removing artifacts. If damage to a site is found it should be reported to the managing agency.
Attempts to repair vandalism can actually result in greater damage and should only be done by an individual with proper training and expertise.

It is difficult to accurately date rock art. However, there are some images that have reliable clues as to the time they were made. For example, whenever a person on horseback is shown the image was created after A.D. 1540. This is the time when Spaniards first introduced the horse to North America. Additionally, it is generally accepted that bows and arrows didn't appear in the Moab area until after A.D. 500. The below chart includes generalized time periods relating to the people believed to have made them.

<table>
<thead>
<tr>
<th>Cultural Tradition Dates</th>
<th>Evidence of Rock Art</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCHAIC</td>
<td>ABSTRACT - zig zag and parallel lines, dots, circles</td>
</tr>
<tr>
<td>5,500 B.C. to A.D. 1</td>
<td>REPRESENTATIONAL - &quot;ghostlike&quot; body forms, headdresses, animal and plant forms</td>
</tr>
<tr>
<td>ANASAZI</td>
<td>REPRESENTATIONAL - a variety of human forms with earrings, headdresses, hand prints, paw prints, birds, spirals, bighorn sheep, shieldlike images, deer, Kokopelli's, some ABSTRACT designs</td>
</tr>
<tr>
<td>A.D. 1 to A.D. 1275</td>
<td>REPRESENTATIONAL - broad-shouldered human forms trapezoidal in shape with abstract interior body decorations, elaborate headdresses with ear bobs, facial decorations, bighorn sheep, deer</td>
</tr>
<tr>
<td>FREMONT</td>
<td>Overlap of Anasazi and Fremont styles</td>
</tr>
<tr>
<td>A.D. 450 to A.D. 1250</td>
<td>REPRESENTATIONAL - human forms on foot and mounted on horseback, hunting and warfare scenes, horses, bison</td>
</tr>
<tr>
<td>UTE</td>
<td>(Grand County Travel Council, ND)</td>
</tr>
</tbody>
</table>
"In style the inscriptions and paintings range from the crude and simple to the elegant, sophisticated and subtle. They seem to include the work of different cultures and a great extent of time: on a wall of rock near Turnbow Cabin in pictured a man on horseback, which must have been made after the arrival of the Spanish in North America; on another rock wall a few miles southwest of Moab is the petroglyph of what appears to be a mastodon - a beast supposedly extinct more than twenty thousand years ago." Pg. 114

"This speaks well of the food-gathering economy and also of its culture, which encouraged the Indians to employ their freedom in the creation and sharing of a durable art. Unburdened by the necessity of devoting most of their lives to the production, distribution, sale and servicing of labor-saving machinery, lacking proper recreational facilities, these primitive savages were free to do that which comes as naturally to men as making love - making graven images." Pg. 117
Cowboys and Indians

1. __________ is one of the many mountain peaks mentioned in Desert Solitaire.
2. __________ is Abbey's friend who is afraid of death.
3. Abbey's friend, __________, is a great cowboy and loves his work.
4. A cow that has not been branded by its owner is called a __________.
5. A container that holds water is called a __________.
6. __________ had a stroke while picking peaches in his backyard.
7. When riding a horse one normally uses a __________.
8. A large group of cows is called __________.
9. An animal in this chapter that makes milk is a __________.
10. Roy Scobie owns the ________, but he doesn't treat his customers and employees very well.

11. There are many side canyons in Arches. One is called ________.

12. A ________ is a large group of ungulate animals.

13. A cow sunk into ________ when she was being herded out of the canyon.

14. Cows graze in ________.

15. Abbey works seasonally at ________ National Monument.

16. The closest town to Arches National Monument is ________.

17. A horse's foot is called a ________.

18. It is said the ________ is softer than sand.

19. Viviano is negatively affected by ________d people.

20. Viviano, Roy, and Abbey herded the cattle in the month of ________.
Down the River:
To Dam or Not to Dam

Purpose

1. To examine the environmental impact of dams.
2. To investigate differing perspectives and opinions of an environmental issue.
3. To gain experience in using the Issue Investigation format and value descriptors as developed by Hungerford, Litherland, Peyton, Ramsey, and Volk, 1996.

Preparing

1. Students will read the chapter "Down the River."
2. Students will read the National Geographic article entitled "The Grand Managed Canyon" as found in Volume 192, No. 1, July 1997.
3. Students will view the video Cadillac Desert - Program 2 entitled "An American Nile: The Colorado."

Finding Out

1. Students will discuss their initial opinions regarding keeping or decommissioning the Glen Canyon Dam.
2. Students will distinguish among the following components of an Issue Investigation: problem, issue, players, positions, beliefs, and values.
3. Students will create various solutions to the Glen Canyon Dam issue.

Student Lesson A

Students will explore and learn the seven components of an Issue Investigation. The instructor should provide enough verbal information to guide students toward a determination of the problem and issue being discussed in this investigation. On a piece of paper each student will then make two columns, one for players and the other for positions. They will then make individual notes while reading and viewing the above items. After they have gathered all pertinent information, students will gather in groups, compare notes, and create one list of players with accompanying positions. Next, they shall determine the beliefs and values for each player. Finally, each group will decide on one or two solutions they feel come closest to respecting the players' needs. The class as a whole will discuss solutions.

Student Page A - "Issue Investigation: The Component Parts"

Student Page B - "Issue Investigation: Value Descriptors"
**Bridging Lesson B**

Students will choose an issue of their own to investigate using the above process. They will record the component parts and present to the class.

**Bridging Lesson C**

Students will complete crossword worksheet as review of the information in the chapter "Down the River."

**Student Page C - "Down the River"**
Issue Investigation

The Component Parts

Most interactions between you and the environment are complex. A simple task such as eating is the result of a long chain of events. Many of these events deal with the consumption of resources. These in turn deal with environmental concerns, which sometimes evolve into environmental issues.

Problem

A condition in which something we value or think is important is at risk. Environmental problems involve the interaction of humans and the environment and also threaten some aspect of human well being or something humans value. A problem might include what to do in the aftermath of a natural disaster such as a flood or earthquake, or what to do with the refuse of large metropolitan areas.

Issue

A problem, or its solution, for which differing beliefs and values exist, usually involving two or more parties who do not agree. In many cases, environmental problems remain unsolved because those involved are unable to agree on how to solve the problem. It is important to understand the different beliefs and values of the disagreeing parties; if you do not, you will not understand the concept of an environmental issue.

Players and Positions

The individuals and/or groups that are involved in an issue, and where they stand on the issue.

Beliefs

The ideas about an issue which are held to be true by the players. They do not have to be true; the players just need to believe they are. A belief is strongly tied to the player's values.

Values

The relative worth a player places on something. Values are often drawn from personal experiences and background. Value descriptors can be found on Student Page B. Each definition describes a specific value. The definitions, as well as the list itself, should not be considered complete.

Solutions

The various strategies proposed to resolve an issue. A solution is acceptable when the public is involved in the decision-making process, the interested public sectors reach a compromise, the compromise meets objectives for managing the resource, and the compromise conforms to law.

## Issue Investigation

### Value Descriptors

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetic</td>
<td>the appreciation of form, composition, and color through the human senses</td>
</tr>
<tr>
<td>Ecological</td>
<td>pertaining to natural biological systems and principles</td>
</tr>
<tr>
<td>Economic</td>
<td>the use and exchange of money, materials, and/or services</td>
</tr>
<tr>
<td>Educational</td>
<td>concerning the accumulation, use, and communication of knowledge</td>
</tr>
<tr>
<td>Egocentric</td>
<td>pertaining to a focus on self-centered needs and fulfillment</td>
</tr>
<tr>
<td>Environmental</td>
<td>pertaining to human activities in terms of quality of natural resources, such as plant and animal species, air, water, soil, etc.</td>
</tr>
<tr>
<td>Ethical/Moral</td>
<td>pertaining to present and future human responsibilities, rights and wrongs, and ethical standards</td>
</tr>
<tr>
<td>Ethnocentric</td>
<td>pertaining to a focus on the fulfillment of ethnic/cultural goals</td>
</tr>
<tr>
<td>Health &amp; Safety</td>
<td>the maintenance of positive human physical conditions</td>
</tr>
<tr>
<td>Legal</td>
<td>relating to national, state, or local laws; law enforcement; law suits</td>
</tr>
<tr>
<td>Political</td>
<td>the activities, functions, and policies of governments and their agents</td>
</tr>
<tr>
<td>Recreational</td>
<td>pertaining to human leisure activities</td>
</tr>
<tr>
<td>Religious</td>
<td>the use of belief systems based on faith or dogma</td>
</tr>
<tr>
<td>Scientific</td>
<td>concerning the process of empirical research; knowledge gained by systematic study</td>
</tr>
<tr>
<td>Social</td>
<td>pertaining to shared human empathy, feelings, and status</td>
</tr>
<tr>
<td>Technological</td>
<td>concerning the use of technology for human/societal goals</td>
</tr>
</tbody>
</table>
Across

1. 5000 undisturbed acres
4. mode of transportation
4. Abbey's companion on the trip
7. rock making up walls of Glen Canyon
12. Mormons blasted through to make this
14. reservoir formed by Glen Canyon Dam
15. heats up Escalante
17. what they see when arriving at the dam site
18. original explorer of the river
19. food

Down

2. Abbey's religion
3. side canyon Abbey explores
6. wind makes tunes here
8. what they eat out of the river
9. first big dam on the river
10. lake made by Boulder Dam
11. what they hit that almost flips them
13. culmination and last hike of trip
15. Chief of Reclamation Bureau
16. newest dam site
The Dead Man at Grandview Point:

Desert Survival Strategies

Purpose

1. To explore survival strategies of desert plants and animals.
2. To examine various desert adaptations.
3. To distinguish among structural, physiological, and behavioral adaptations. One may want to explain these terms in the following manner: Structural adaptations are those associated with how the body is shaped or formed, such as teeth, claws, or feathers. Physiological adaptations are those associated with how the body works or functions, such as warm-blooded, fast digestion, or absorption of water from food. Behavioral adaptations are those associated with how the body acts or behaves, such as flight, sleeping during the day, or calls of warning to group members.
4. To foster an appreciation for the complexity of desert ecosystems.
5. To facilitate discussion of desert survival strategies for the human traveler.

Preparing

1. Listen to audiotape of Edward Abbey reading the chapter entitled "The Dead Man at Grandview Point." This can be found on the audiotape Freedom and Wilderness by Edward Abbey.
2. Brainstorm survival methods/adaptations used by plants and animals of the desert.

Finding Out

1. Students will discuss their impressions regarding Edward Abbey's attitude toward the dead man.
2. Students will review what the dead man did wrong and, therefore, what he should have done to increase his chance of survival.
3. Students will complete a desert survival activity.

Student Lesson A

After listening to the author read "The Dead Man at Grandview Point," students will discuss their opinions regarding Abbey's attitude toward the dead man. They will explore the man's actions leading up to his death and what he man could have done to increase his chance of survival. In groups, students will then complete a "Desert Survival" activity created by Dr. Robert Moon of the National Park Service. After completing the activity, answers will be provided. Students will discuss their responses to the answers.

Student Page A - "Desert Survival Exercise"
Finding Out

1. Students will examine a variety of pictures and/or live desert animals and plants.
2. Students will identify primary limited resource in a desert environment.
3. Students will identify survival strategies and/or adaptations of plants and animals.

Student Lesson B

1. After identifying various desert adaptations, students will classify each as structural, physiological, or behavioral. The class will then visit a native desert area where they will make written observations of at least five organisms, plant or animal. These observations must include a minimum of three adaptations for each of the five organisms.

2. In groups, students will construct a "desert organism." They will be provided one common kitchen sponge "organism." Using only materials found in a native desert area, they must develop and carry out a plan for their "organism" to conserve as much water as possible. Groups will be required to saturate the sponge with a pre-measured amount of water and record its mass using an electronic scale. Sponges will remain exposed to the classroom environment for twenty-four hours. At the conclusion of the time period, the mass will again be determined. The "organism" with the smallest amount of water loss will be declared the best adapted. Groups will then share their organism, its adaptations, and their survival plan with class members. Students will discuss the benefits of each plan.

Bridging Lesson C

Read the below quote aloud. Students will write two reflective paragraphs, the first of which shall discuss their reaction to the quote. The second will delve into what they want to happen with their body when they die. How does their wish compare/contrast with Abbey's description of the dead man's final resting place?

Bridging Lesson D

Students will complete word-scramble worksheet as review of the information in "The Dead Man at Grandview Point."

Student Page B - "The Dead Man at Grandview Point"

Literature Quote

"Looking out on this panorama of light, space, rock and silence I am inclined to congratulate the dead man on his choice of jumping-off place; he had good taste. He had good luck - I envy him the manner of his going: to die alone, on rock under sun at the brink of the unknown, like a wolf, like a great bird, seems to me very good fortune
indeed. To die in the open, under the sky, far from the insolent interference of leech and priest, before this desert vastness opening like a window onto eternity - that surely was an overwhelming stroke of rare good luck." Pg. 240
Desert Survival Exercise

Put yourself in the following situation. You live in Southern California and a friend invites you to accompany her on an afternoon flight in her Cessna 182 to Las Vegas. It's a simple flight and she has done it many times. This is your chance for a scenic trip in mid-July and you'll be home for supper. Unfortunately, the routine nature of the flight has caused the pilot to become lax and she files no flight plan. Somewhere over the Eastern Mojave the plane develops engine failure and makes an emergency crash landing in rugged mountain terrain. The pilot is killed on impact, but you walk away without serious injuries. It is late morning, but already the temperature is over 100 F. The plane is destroyed (it does not burn) along with the radios and Emergency Landing Transmitter. You search through the wreckage and find no survival kit per se; however, there are a lot of miscellaneous materials that you do recover. Included in this stuff, you find a map and determine rather accurately your location to be thirty miles to the nearest development. What are you going to do?

Examine the equipment you have salvaged carefully. Think about your situation and make a decision to walk to safety or remain at the crash scene and wait for help. Indicate which decision you have made and then score the value you would place on each of the items lying before you. Each item must be scored. If you feel an item will play a critical role in your survival, score it with a 1. If an item is of some value, but not critical, score it with a 2. If an item is of little or no value, score it with a 3.

Decision: Stay with aircraft ___________ Walk out to safety ___________

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>remains of wrecked aircraft</td>
<td></td>
</tr>
<tr>
<td>map (flight chart for area)</td>
<td></td>
</tr>
<tr>
<td>compass</td>
<td></td>
</tr>
<tr>
<td>book on edible plants of the Mojave Desert</td>
<td></td>
</tr>
<tr>
<td>one pound of unsalted soy nuts</td>
<td></td>
</tr>
<tr>
<td>100 salt tablets</td>
<td></td>
</tr>
<tr>
<td>1 quart of water</td>
<td></td>
</tr>
<tr>
<td>one half pint of whisky (3/4 empty)</td>
<td></td>
</tr>
<tr>
<td>4 clear plastic trash bags</td>
<td></td>
</tr>
<tr>
<td>45 caliber pistol and ammunition</td>
<td></td>
</tr>
<tr>
<td>signal mirror</td>
<td></td>
</tr>
<tr>
<td>flashlight with batteries</td>
<td></td>
</tr>
<tr>
<td>automotive type tool kit</td>
<td></td>
</tr>
<tr>
<td>sunglasses</td>
<td></td>
</tr>
<tr>
<td>book on poisonous snakes of the Mojave Desert</td>
<td></td>
</tr>
<tr>
<td>box of steel wool</td>
<td></td>
</tr>
<tr>
<td>heavy wool overcoat</td>
<td></td>
</tr>
<tr>
<td>8 ounce bottle of SPF 15 sunscreen</td>
<td></td>
</tr>
<tr>
<td>one vial of rattlesnake antivenin</td>
<td></td>
</tr>
<tr>
<td>one package of chewing gum</td>
<td></td>
</tr>
</tbody>
</table>
# Desert Survival Exercise

## Answer Key

<table>
<thead>
<tr>
<th>Criticality Value</th>
<th>Salvaged Equipment or Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>remains of wrecked aircraft</td>
</tr>
<tr>
<td>1</td>
<td>map (flight chart for area)</td>
</tr>
<tr>
<td>1,2,3</td>
<td>compass</td>
</tr>
<tr>
<td>3</td>
<td>book on edible plants</td>
</tr>
<tr>
<td>3</td>
<td>unsalted soy nuts</td>
</tr>
<tr>
<td>3</td>
<td>100 salt tablets</td>
</tr>
<tr>
<td>1</td>
<td>1 quart water</td>
</tr>
<tr>
<td>3</td>
<td>one half pint whisky</td>
</tr>
<tr>
<td>1</td>
<td>4 clear plastic trash bags</td>
</tr>
<tr>
<td>3</td>
<td>pistol and ammunition</td>
</tr>
<tr>
<td>1</td>
<td>signal mirror</td>
</tr>
<tr>
<td>1</td>
<td>flashlight with batteries</td>
</tr>
<tr>
<td>1,2</td>
<td>automotive type tool kit</td>
</tr>
<tr>
<td>1</td>
<td>sunglasses</td>
</tr>
<tr>
<td>3</td>
<td>book on poisonous snakes</td>
</tr>
<tr>
<td>1</td>
<td>steel wool</td>
</tr>
<tr>
<td>1</td>
<td>heavy wool overcoat</td>
</tr>
<tr>
<td>3</td>
<td>sunscreen</td>
</tr>
<tr>
<td>3</td>
<td>antivenin</td>
</tr>
<tr>
<td>2,3</td>
<td>chewing gum</td>
</tr>
</tbody>
</table>

Count the number of items you **answered correctly**.  
Multiply the total number of correct answers by 5. 
This is your subtotal score.

Now, the impact of your initial critical decision:

- **If you stayed with the aircraft**, subtract no points. 
- **If you immediately walked out** toward safety, subtract 50 points. 
- **If you stayed with the aircraft until nightfall and then walked out** toward safety, subtract 30 points from your subtotal accumulated from correct answers.

A grand total of 70 or more points is considered surviving.
Desert Survival Exercise

Discussion Notes

Remains of wrecked aircraft may be disassembled and spread out over a broader area to make yourself more visible; seat cushions and tires may be burned for signaling; battery or landing light lenses may be used to start a fire; fuel or oil may be drained to enhance fire; and structural parts may be used for digging tools or shade construction.

Map may be used to orient yourself; to provide position of flight corridors or major highways to which signaling which prove beneficial.

Compass may be used to roughly triangulate your position to verify your crash site location on the map; to start signal fire if equipped with magnifier; to assist your travel should you choose to walk out at dusk.

Book on edible plants is not very useful for your survival, as you do not want to eat anything; you can survive for perhaps two weeks without food; food intake will only act to elevate your body temperature and draw upon precious water in your intestinal system to process it; cacti (contrary to movies) do not provide readily usable water and may actually cause you to vomit losing what crucial water you already possess internally.

Unsalted soy nuts is not useful for your survival as you do not want to eat anything; you can survive for perhaps two weeks without food; its intake will only act to elevate your body temperature and draw upon precious water in your intestinal system to process it.

100 salt tablets are not useful for your survival; and would draw upon precious internal water reserves to flush the salt from your system.

1 quart water is absolutely critical to your survival; it will replace part of your water loss to perspiration, urination, and expiration (breathing); it will assist in your body's natural cooling mechanism of perspiration by radiating heat outward from your body's core.

Whisky is not critical to your survival and will only serve to further dehydrate your body's tissues leaving you more vulnerable to death.

4 clear plastic trash bags may be used to make solar stills by capturing the moisture transpiring from plant tissues, thereby providing you with an additional water source.
Pistol and ammunition are not critical to your survival; you do not want to kill anything to eat (blood is high in proteins and proteins would require the much critical water you possess internally); sound travels very poorly in dry desert air and would be of little or no value as a signaling device.

Signal mirror may be used to signal your location by reflecting powerful solar rays of the sun for many miles.

Flashlight with batteries may be used to signal your location at night; the lens might be used as a fire starter; the small parabolic reflector might be used to assist fire starting in conjunction with the signal mirror; the batteries might be used to assist fire starting in conjunction with the steel wool by short circuiting several strands.

Automotive type tool kit may be used to dismantle parts of the aircraft to make your location more visible, especially from the air, by spreading wreckage pieces around a larger area at the crash site to "make yourself bigger;" for shade construction; and for digging tools.

Sunglasses worn by day will preserve your night vision.

Book on poisonous snakes is of little or no survival value; leave all snakes alone.

Box of steel wool may be used as fire starting tinder; or by short circuiting strands across aircraft or flashlight battery terminals (exercise care in this procedure).

Heavy wool overcoat may be used for shade; for conserving water evaporation from perspiration; for insulating against the heat, especially while burrowed beneath the surface sand and maximizing body surface area contact with cooler subsurface sand or rock.

Sunscreen is of little or no survival value; it reduces the efficiency of the body's natural perspiration mechanism by plugging skin pores; reduces heat loss causing body core temperature elevation.

Rattlesnake antivenin is of little or no survival value; chance of bite is small; leave all snakes alone.

Chewing gum is of little or no survival value; a sugarless gum may provide some mental comfort while keeping your mouth closed. (Moon, 1993)
The Dead Man at Grandview Point

Word Scramble

1. ceelonSonm is a heaviness in the air, a stillness in the atmosphere and a chill in the sunlight.
2. The lwolam gelbo are flowers of the summer.
3. August is the month when the desert is often called the curanfe.
4. Clouds form around the zirhoo in the afternoon.
5. The tumbleweed is also called nssruis sitehit.
6. The bullbat is another name for the gtnhi whka.
7. The igb epprdi is a summer constellation in the sky.
8. On a mesa's edge a twelve hundred-foot drop straight down is called thwie rmi hcien.
9. rlMee and Floyd are other members of the search party looking for the lost tourist.
10. The farthest reach of the mesa is called ndgyvraewi ionpt.
11. Gullies and ssusferi are enormous potholes in solid rock.
12. krenBo slabs are piled along the foot of the wall of the mesa.
13. "Gaze not too long into the ssyba, lest the abyss gaze into thee."
14. For tonreceaie admire the landscape and silence.
15. Vultures segrth in the air for a clue.
16. The country coroner comes from Moab in his white bualcnema.
17. eeBthna the little tree, in the shade, is the dead man.
18. The towns of Moab and vanllkhies are the only ones in this area.
19. The white ccliaclla is powdered with the red dust of Utah.
20. Beyond the earth is the world of sun and stars whose bound we cannot vredsico.
Final Evaluation:

What Would You Do if You Were Edward Abbey?

Purpose

1. To explore students' understanding of Edward Abbey's character in *Desert Solitaire*.
2. To determine whether students completed assigned readings.
3. To encourage students to reflect on their feelings about issues regarding development of remaining open space.

Preparing

1. Complete reading *Desert Solitaire*.
2. Discuss students' overall opinions about Edward Abbey as an individual as well as his views.
3. Review issues in book that relate to final exam.

Finding Out

1. Provide students with abbreviated scenario set forth in final exam.
2. Students will review book as needed for one night after learning the focus of the final exam.

Student Lesson A

Students will be provided a copy of the final exam. They are to write their responses as if they are Edward Abbey. They may use "colorful" language, as does Abbey, if it is within the context of their response and not gratuitous. Of the fourteen topics, students must choose a minimum of ten. They may respond to additional subjects for extra credit. The following rubric is suggested for grading.

4 (A) Student shows in depth understanding of Abbey's character
Student responds to topics in a manner consistent with Abbey's character
Student freely uses language, terms, and phrases from the book as support for responses

3 (B) Student shows an understanding of Abbey's character
Student responds to topics in a manner similar to Abbey's character
Student may use language, terms, phrases from the book as support for responses
2 (C)  Student shows some understanding of Abbey's character  
Student responds to at least half of the topics similar to Abbey's character  
Student may use some language similar to Abbey's character  

1 (D)  Student shows rudimentary understanding of Abbey's character  
Student responds to at least one quarter of the topics similar to Abbey's character  
Student lacks language, terms, phrases used by Abbey's character  

0 (F)  Student shows no evidence of having read required text  

Student Page A - "Desert Solitaire: Final Evaluation"  

Bridging Lesson B  

Students will complete same exam utilizing their own opinions. Again, they must choose at least ten of the fourteen topics. They are to include one reflective paragraph comparing and contrasting their views to Edward Abbey's as portrayed in Desert Solitaire.
Desert Solitaire - Final Evaluation

The Department of the Interior has decided to upgrade Joshua Tree National Monument to a national park. Pretend you are Edward Abbey. You have been given the responsibility for making the policy and procedure manual for the new park. You must address the below aspects of park management. As support for your policy decisions, you must include your personal opinion regarding the issues as well as justification of your decisions from an ecological perspective. In the event that you feel there is a conflict between these two aspects then you must explain why. Remember, write your essay as if you actually are Edward Abbey as portrayed in Desert Solitaire.

1. Building of new roads and improvement of existing roads
2. Flora and fauna
3. Rock climbing
4. Backpacking / hiking
5. Car camping & associated support resources (water, toilets, etc.)
6. Native American sites and artifacts
7. Pioneer sites and artifacts
8. Mines
9. Barker Dam
10. Disabled access
11. Concessions
12. Off-road vehicles
13. Park rangers
14. Interpretive programs

You are required to choose a minimum of ten of the fourteen above topics. You may use your book, but may not confer with any other students or teachers. Your essay should employ the proper use of grammar, spelling, essay structure, and gender-neutral language.
REFERENCES


Grand County Travel Council. (ND). *Moab area rock art auto tour* [Brochure].


