

**Project Bright IDEA 2: Interest Development Early Abilities**

**A Jacob Javits Gifted Education Program  
Funded by the US Department of Education  
2004-2009**



**Concept: Systems**

**Topic: Exploring Canyon Country**

**By: Anne S. Coln and Beverly C. Riley**

**Grade Level: 5**

**The North Carolina Department of Public Instruction  
Exceptional Children Division  
Academically or Intellectually Gifted Program**

**The American Association For Gifted Children at Duke University**

## Big Ideas Manifested

**Topic – Exploring Canyon Country**  
**Text – Down the Colorado**  
**Author – Deborah Kogan Ray**  
**Publisher/Date- Frances Foster Books/2007**

Concepts	Themes
Systems	Landforms, Ecosystems Conservation Persistence
Issues or Debates	Problems or Challenges
Preservation of natural spaces Government control vs. individual rights	How do we protect natural spaces? What resources are needed?
Processes	Theories
Inquiry into formation of landforms, ecosystems, exploration of Canyon Country, and human traits of persistence	Canyons are formed by the natural system of wind, ice, water and gravity. Natural lands should be protected. Exploration requires persistence.
Paradoxes	Assumptions or Perspectives
How will climate change affect Canyon Country? Can exploration and conservation co-exist?	Powell's character traits allowed him to accomplish his goals. Canyon Country is unique to US and deserves protection.



## **Concept: Systems**

## **Topic: Exploring Canyon Country**

### **Suggested Text Selection(s): Down the Colorado**

**This story is about John Wesley Powell's exploration of Canyon Country with its unique ecosystems and geology. Powell's early interest in nature and his persistence contributed to his overcoming many obstacles in order to achieve his dream.**

### **Look, Listen and Identify:**

#### **Intelligent Behaviors**

**Story Focus: Persistence, problem posing, flexible thinking, thinking about thinking, taking responsible risks, thinking interdependently, innovative, respond with wonderment and awe, learn from experience**

**Student Activities: Persistence, problem posing, flexible thinking, thinking about thinking, taking responsible risks, thinking interdependently, innovative, respond with wonderment and awe, learn from experience**

**NC Standards: 5<sup>th</sup> Grade Science Goal 1 (Obj. 1.1, 1.3, 1.4) and Goal 2 (Obj. 2.1, 2.2)**

**Local Pacing Guide Timeline: Quarters 1 and 2 students study ecosystems and landforms in regular class, so this unit would be more effective following these quarters.**

**Thinking Skills Focus: Revised Bloom's and Marzano**

**Topic Focus: Exploring Canyon Country**

**Concept Focus: Systems of Landforms and Ecosystems**

**Overarching Generalizations: Systems are complex. Systems can be man-made or natural. Systems can have aesthetic quality. Systems are composed of sub-systems and parts. Systems are interdependent. Systems can be influenced by other systems. Systems can work together to complete a mission.**

**More Complex Generalizations (Two or more concepts):**

Successful exploration depends on parts that work together to complete a task.

The system of exploration may be influenced by other systems.

Ecosystems survival is directly related to climate and geographic location.

Landforms evolve over time.

**Directions for Teachers:**

1. Teacher begins class discussion with Facet 1 and Facet 6 (comparing themselves to general category of explorers) (p.7) Teacher directs students to place one arm behind back and perform the following common tasks: putting on their shoes, put on a shirt or jacket with buttons. Students brainstorm tasks that an early western explorer may have had to accomplish that would have been almost impossible with only one arm.
2. Teacher reads aloud "Down the Colorado". Students individually complete the Open Compare/ Contrast form, comparing themselves to JWP. Share. Divide class into 4 groups. Each group is assigned either number 2, 3, 4, or 5 (p.7) for discussion. One student from each group reports to entire class. Students report in this order: 2, 4, 5, 3.
3. Then teacher gives a brief overview of learning styles and introduces Task Rotation (p.8). Student self-selects preferred task. Teacher may assign additional diagonal task if time allows.
4. Students present products from Task Rotation.
5. Teacher relates influence of systems of exploration to natural systems present in Canyonlands by using video or pictures of the geography and cultures of the area. This leads into discussion and activities on p. 12.
6. Teacher continues unit of study with ecosystems and landforms focus. (Select from activities on pages 10 and 12.)
7. Teacher may assign or students may select one of the Science and Social Studies Task Rotation activities on p.13. Page 13 and page 8 task rotation selection should be from different learning style areas.

(We will be adding more directions!)

### **Suggested Topics for Discussion:**

Characteristics of canyons

Early explorations of the West were made possible by persistence of pioneers.

The uniqueness of Canyon Country deserves to be conserved.

The interdependence of ecosystems is contingent upon preservation of natural order.

The future of Canyon Country, one of the last unexplored regions of US, is uncertain.

### **Suggested Vocabulary Words for Discussion:**

Culture, ecosystems, exploration, discoveries, expedition, landforms, observation, persistence, preservation, scientific

### **A Six-Step Process for Teaching Academic Vocabulary Terms:**

1. Provide a description, explanation or example of the new vocabulary term.
2. Ask students to restate the description, explanation or example in their own words using complete sentences.
3. Ask students to construct a picture, symbol or graphic representing the term or phrase.
4. Engage the students periodically in activities that help them add to their knowledge of the terms in a booklet that they have created (Keep it simple.)
5. Periodically ask students to discuss the terms with one another (**Think** of your favorite vocabulary words from the unit; **pair** with a vocabulary buddy, **share** by discussing the vocabulary terms with your vocabulary buddy.) Teacher should model process each time before students do the Think, Pair, Share with Vocabulary Buddy.
6. Construct games to periodically involve students and allow them to play with the terms.

Robert Marzano

**Vocabulary Extension:**

Discuss words, meanings, illustrations

Select a generalization(s) and essential questions. Introduce one or more of the following topics:

**Six Facets of Understanding**

<b>Facet 1 – EXPLANATION</b>
<ul style="list-style-type: none"><li>*What makes an explorer an explorer? Brainstorm explorers with whom you are familiar and list their common character traits.</li><li>*What is the variety and uniqueness of ecosystems in Canyonlands?</li><li>*What is unique about the formation and evolution of landforms in Canyonlands?</li></ul>
<b>Facet 2 - INTERPRETATION</b>
<ul style="list-style-type: none"><li>*How hard was it for JWP to accomplish his goal of exploring the Colorado River at that time in history? Read through <u>Down the Colorado</u> again and role-play one of the obstacles.</li><li>*What is the effect of climate on landforms and ecosystems in Canyonlands and the Grand Canyon area?</li></ul>
<b>Facet 3 - APPLICATION</b>
<ul style="list-style-type: none"><li>*How and when might you use the pioneer spirit of an explorer in your own life to overcome an obstacle? Make a class chart to show how the pioneer spirit could be used in the life of a fifth grader.</li><li>*Which areas of Canyonlands provide the necessary habitat for the most living organisms?</li><li>*What was the effect of oceans and millions of years of rock formation on the landforms of Canyonlands?</li></ul>
<b>Facet 4 - PERSPECTIVE</b>
<ul style="list-style-type: none"><li>*Think about Powell’s journey and discuss it from the perspectives of the team and their families left behind, or the canyon or government officials.</li><li>*What is the significance of man’s current and long-range influence on ecosystems and landforms in Canyonlands?</li></ul>
<b>Facet 5 – EMPATHY</b>
<ul style="list-style-type: none"><li>*What are your feelings about preservation of Canyon Country, its ecosystems and landforms, that may or may not be similar to JWP’s endeavors.</li></ul>

**Facet 6 – SELF-KNOWLEDGE**

**\*Compare yourself to an explorer. How are you alike or different? Use an Open Compare/Contrast graphic organizer.**

**\*How can you make a difference in the preservation of ecosystems and landforms? What skills will you need to enable you to do this?**

**Read:  
Task Rotation Learning Activities**

**Grade 5**

**All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.**

<p><b>Mastery Learner (A)</b> Sensing- Thinking</p>	<p><b>Interpersonal Learner (B)</b> Sensing-Thinking</p>
<p>John Wesley Powell lived a phenomenal life. Identify significant milestones and achievements for construction of an illustrated timeline of John Wesley Powell's life.</p> <p>V _ L _ * _ S _ M _ B _ P _ I _ N _</p>	<p><b>What makes an explorer an explorer?</b> <b>Research the life of JWP to determine and list characteristics necessary for him to accomplish his goals.</b> <b>Explain to a classmate who also selected this activity, the significance of those characteristics related to his life events. Create 5 journal entries, which Powell may have written anytime during his life, which illustrate the impact of these characteristics.</b></p> <p>V _ * _ L _ S _ M _ B _ P _ * _ I _ N _</p>



**Understanding Learner (C)**  
**Intuitive-Thinking**

**How hard was it for JWP to accomplish his goal of exploring the Colorado River at that time in history? What are the end results of his exploration long ago? Write a newspaper article explaining the impact of his exploration on people and geography.**

**V \_ \* \_ L \_ S \_ M \_ \* \_ B \_ \* \_ P \_ I \_ N \_**

**Self-Expressive Learner (D)**  
**Intuitive-Feeling**

**How and when might you use the pioneer spirit in your own life? Create and perform a skit to demonstrate that spirit.**

**V \_ \* \_ L \_ S \_ M \_ B \_ P \* \_ I \_ N \_**

**Real World Connections With Products:**

Timeline, journal, newspaper article and skit

**Real World Applications:**

Study US National Parks in Grand Canyon and Canyonlands

**Real World Terms:**

Brainstorm, discuss, share, compare, research, explain, create, write, perform

**Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.**

**Concept Focus: Systems of Landforms and Ecosystems**

**Overarching Generalizations: Systems are complex. Systems can be man-made or natural. Systems can have aesthetic quality. Systems are composed of sub-systems and parts. Systems are interdependent. Systems can be influenced by other systems. Systems can work together to complete a mission.**

**More Complex Generalizations (Two or more concepts):**

**Within Canyonlands systems exist which are interdependent upon one another and form symbiotic relationships. A system may be influenced by other systems.**

**Essential Question**

**What is the influence of systems on ecosystems, landforms, and human behavior with relation to Down the Colorado and Canyon Country?**

**Materials Needed for Task Rotation and/or Task Rotation Menu**

Down the Colorado, paper, markers, internet



## **MetaCognitive Discussion (Essential Questions):**

**(Whole Group)**

### **Conceptual Perspectives:**

1. Was exploration and eventual settlement of Canyon Country beneficial or detrimental?
2. What are the existing ecosystems in Canyon Country and what are the variations among them?
3. Should this area be totally protected by government for future generations?
4. Why is this region and its landforms so unique?

**Intelligent Behaviors: : Persistence, problem posing, flexible thinking, thinking about thinking, taking responsible risks, thinking interdependently, innovative, respond with wonderment and awe, learn from experience**

### **Literary Perspectives:**

1. What systems are modeled in Down the Colorado?
2. Did this book inspire you to want to learn more about early western exploration? If so, what print resources would you use?
3. What books could you use to explore the ecosystems/landforms within this region?
4. What primary sources could you use to solidify your understanding of Canyon Country landforms and ecosystems?

### **Student/Teacher Reflections**

**Science and Social Studies Task Rotation Learning Activities  
Grade 5**

**All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.**

<p align="center"><b>Mastery Learner (A)</b> <b>Sensing- Thinking</b></p> <p>Identify and analyze the role of water, ice, wind, and gravity on the geography of Canyonlands. Make a chart showing landforms within Canyonlands with information on their process of formation.</p> <p align="center"><b>V * L * S * M * B * P * I * N *</b></p>	<p align="center"><b>Interpersonal Learner (B)</b> <b>Sensing-Thinking</b></p> <p>Each group selects a region of the Canyon Country and identifies and analyzes the functions of organisms within the population of the ecosystem. Information will be shared using the Resident Expert model. Each group will draw a view of the life cycle system in their region. Drawings will be placed on a class mural.</p> <p align="center"><b>V * L * S * M * B * P * I * N *</b></p>
<p align="center"><b>Understanding Learner (C)</b> <b>Intuitive-Thinking</b></p> <p>Evaluate how humans use this area and predict the future impact of that usage on landforms and ecosystems. Pretend that you are a park ranger making a presentation to a visiting school group in Canyon Lands National Park. You have only 15 minutes to convince the students of the delicate balance of life in this system and the importance of conservation efforts.</p> <p align="center"><b>V * L * S * M * B * P * I * N *</b></p>	<p align="center"><b>Self-Expressive Learner (D)</b> <b>Intuitive-Feeling</b></p> <p>Each year more and more people discover Canyon Country. Make a decision on whether the area should be more protected or more utilized. Write an informative song or rap to convince others of your viewpoint.</p> <p align="center"><b>V * L * S * M * B * P * I * N *</b></p>

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**(Refer to page 10.)**

**Real World Connections With Products:**

**Real World Applications:**

**Real World Terms:**

**Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.**

**Concept Focus:**

**Overarching Generalizations:**

**More Complex Generalizations (Two or more concepts):**

**Essential Question(s):**

**(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)**

**Materials Needed for Task Rotation and/or Task Rotation Menu**

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**(Refer to page 12.)**

**MetaCognitive Discussion (Essential Questions):**

**(Whole Group)**

**Conceptual Perspectives:**

**Intelligent Behaviors:**

**Literary Perspective:**

**Student/Teacher Reflections**



**Concept: Systems**

**Topic: Ecosystems**

**Generalization(s): Ecosystems survival is directly related to climate and geographic location.**

**Essential Question(s): What makes each Canyonland ecosystem unique?**

**Task Rotation Menu**

<b>Level</b>	<b>Mastery</b>	<b>Understanding</b>	<b>Self-Expressive</b>	<b>Interpersonal</b>
<b>1</b>	<b>Collect information on one ecosystem existing in Canyon Country.</b>	<b>Group and label components of a Canyonland ecosystem.</b>	<b>Make a word web using the word “ecosystem”.</b>	<b>Prioritize 10 parts of a Canyonland ecosystem.</b>
<b>2</b>	Use a Venn diagram to compare 2 ecosystems within Canyon Country.	<b>Demonstrate how and why each part of the ecosystem is unique and necessary.</b>	<b>Predict what would happen if one part of a Canyonland ecosystem was missing.</b>	<b>Write a descriptive paragraph to paint a picture of Canyonlands.</b>

3	Create a new ecosystem which could exist given Canyonland conditions.	What impact would the removal of one part of an ecosystem of Canyonlands have? Write a persuasive essay in order to encourage conservation efforts.	How is an ecosystem like a school, a factory, a community or a computer? Write a poem to convey your ideas.	Discuss the impact of humans on the ecosystems of Canyonlands. Create a political cartoon to share.
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(Refer to page 12.)

**MetaCognitive Discussion (Essential Questions):**

**(Whole Group)**

**Conceptual Perspectives:**

**Intelligent Behaviors:**

**Literary Perspective:**

**Student/Teacher Reflections:**

**Student Reflections and Assessments  
Task Rotation Learning Experience  
Grade 5**

**All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.**

<p align="center"><b>Mastery Learner (A)</b> <b>Sensing- Thinking</b></p> <ol style="list-style-type: none"> <li>1. Explain the geologic process of the formation of Canyon Country by constructing a flow chart.</li> <li>2. Describe and compare 2 ecosystems in Canyon Country. Use a Venn diagram.</li> <li>3. How many times did the intelligent behavior of persistence play an important role in John Wesley Powell's life? List the events as related in <u>Down the Colorado</u>.</li> </ol> <p align="center"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p align="center"><b>Interpersonal Learner (B)</b> <b>Sensing-Thinking</b></p> <ol style="list-style-type: none"> <li>1. Taking into consideration landforms resulting from geologic change throughout millions of years. Prepare a lesson to teach a younger student how Canyonlands was formed.</li> <li>2. Discuss the impact of humans on ecosystems in Canyonlands. Create a political cartoon to share with your partner and then display.</li> <li>3. What gifted intelligent behaviors did JWP and his team exhibit? Write a one-act play to show how the behaviors were evident in the expedition.</li> </ol> <p align="center"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>
<p align="center"><b>Understanding Learner (C)</b> <b>Intuitive-Thinking</b></p> <ol style="list-style-type: none"> <li>1. Identify and analyze why water and ice, wind and gravity have changed landforms in Canyon Country over time. Write an opinion paper about why the same geologic changes did not occur in NC.</li> <li>2. Choose one ecosystem within Canyon Country that</li> </ol>	<p align="center"><b>Self-Expressive Learner (D)</b> <b>Intuitive-Feeling</b></p> <ol style="list-style-type: none"> <li>1. Create a PowerPoint/Webquest/PhotoStory to convey your understanding of Canyonlands geologic structures and their formation.</li> <li>2. How is an ecosystem like a factory, school, community or a computer? Write a poem to convey your ideas.</li> </ol>

<p>you consider most fragile or significant. Make a conservation poster for that ecosystem.</p> <p>3. What gifted intelligent behaviors must successful explorers possess? Write a testimonial for JWP or another explorer of your choice.</p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p>3. While you were exploring/learning about Canyonlands, what gifted intelligent behaviors did you use? Design a t-shirt displaying these behaviors in a creative way.</p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>
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**Concept Focus:**

**Overarching Generalizations:**

**More Complex Generalizations (Two or more concepts):**

**Essential Question:**

**(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)**

**Materials Needed for Task Rotation and/or Task Rotation Menu**

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(Refer to page 12.)

**MetaCognitive Discussion (Essential Questions):**

**(Whole Group):**

**Conceptual Perspectives:**

**Intelligent Behaviors:**

**Literary Perspective:**

**Student/Teacher Reflections**




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**Materials Needed for Task Rotation and/or Task Rotation Menu**

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**MetaCognitive Discussion (Essential Questions):**

**(Whole Group)**

**Conceptual Perspectives:**

**Intelligent Behaviors:**

**Literary Perspective:**

**Student/Teacher Reflections:**

**Additional Support Materials:**

1. **A River Running West: The Life of John Wesley Powell** Donald Worster
2. **Exploration of Colorado River and Its Canyons** JW Powell, ISBN-13 9780486 200941
3. **First Through the Grand Canyon Being the Record of the Exploration of Colorado River** ISBN 1436848164
4. **John Wesley Powell: Explorer of the Grand Canyon** Roger A. Bruns Enslow Publ. 1997
5. **Down the Great Unknown** Edward Dolnick 2001
6. **A Grand Canyon Journey: Tracing Time in Stone** Peter Anderson 1997
7. **The Grand Canyon** Jenny Markert 1992
8. **Behind the Hundredth Meridian: JWP and the Second opening of the West**  
Wallace Earl Stegner

**Websites:**

<http://www.nps.gov/cany> Search: JWP, landforms, ecosystems,  
video of Inside Canyonlands

<http://www.nps.gov/grca> Search: JWP, slideshow of JWP photographs

[www.powellmuseum.org/MajorPowell.html](http://www.powellmuseum.org/MajorPowell.html)

[www.pbs.org/wgbh/amex/canyon/timeline/index.html](http://www.pbs.org/wgbh/amex/canyon/timeline/index.html)

[www.desertusa.com/Colorado/intro/du\\_introcr.html](http://www.desertusa.com/Colorado/intro/du_introcr.html)

[www.nps.gov/history](http://www.nps.gov/history)

## **Teacher Reflections**

1. What were the strengths of the task rotations and/or other activities?
  
  
  
  
  
  
  
  
  
  
2. How did the task rotations and/or activities reveal students' Intelligent Behaviors? Please discuss how each Intelligent Behavior manifested it self.

3. What would you change or add the next time you taught this lesson?

4. What opportunities for growth does the resource unit have?

5. What were “ah ha’s?” for the students? For teachers?

**“Additional Comments**

## **APPENDIX**

### **A**

#### **Additional Instructional Concept-Based Activities**