

## 6th Grade Science Plan: Erosion at Rocky Face Ridge



### Standards:

S6E5: Obtain, evaluate, and communicate information to show how Earth's surface is formed.

- Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition.

S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.

b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.

### Essential Question:

How can we conserve the natural resources of Rocky Face Ridge, and how does human activity contribute to changes in global temperatures?

### Time:

50 minutes

### Background Information:

Rocky Face Ridge is a valuable local natural resource, providing clean water, healthy soil, and diverse ecosystems. However, human activities such as land development, deforestation, and recreational use can threaten these resources. Additionally, rising global temperatures due to greenhouse gas emissions affect ecosystems like Rocky Face Ridge, altering weather patterns, water cycles, and vegetation. Understanding these changes is crucial for developing conservation strategies.

### Materials:

- Stream, soil, and air quality data sheets (differentiated for varied reading levels)
- Photos of Rocky Face Ridge
- Poster board, markers, and printed templates for group presentations

### Introduction (10 minutes):

- Display photos of Rocky Face Ridge and highlight key features (e.g., exposed rock, erosion).
- Explain weathering, erosion, and deposition with local examples:
  - Weathering: Rocks breaking apart due to plant roots or freeze-thaw cycles on the ridge.
  - Erosion: Rainwater carrying sediment downhill.
- Discuss how human activities, such as development, can speed up these processes.

### **Activity (40 minutes):**

Poster Session: The main goal here is the presentation not the poster. The poster is an aid to support the presentation.

### **Setup:**

- Divide students into 4 groups, each focusing on one of the following topics:
  - (Team Water) Water Quality: Examining a healthy stream to a polluted one and the impact of each.
  - (Team Earth) Soil Quality: Examining stable soils vs. eroded soils and the impact of each
  - (Team Air) Air Quality: Examining clean vs. polluted air quality and the impact of each
  - (Team Human) Quality of Life: Examining benefits and costs to living in a town with a healthy vs polluted environment (stream, soil, earth)

### **Group Work:**

- Provide each group with differentiated materials (photos, data sheets, and simple diagrams) to ensure all students can participate.
- Groups analyze their topic and create a poster that includes:
  - Team Name and Topic
  - Written and Pictorial Observations of their scenarios
  - Observations from their own neighborhoods
  - Recommendations for the City of Dalton and Whitfield County

### **Each group receives:**

- Differentiated materials (maps, photos, and data tailored to different reading levels).

- A template to guide their poster creation, including these sections:
  - Key threats to their resource or issue.
  - Proposed conservation strategies.
  - Connection to Rocky Face Ridge.

Groups use visuals, data, and creativity to make a compelling poster. Encourage creativity with drawings, charts, and bullet points.

### **Poster Session Presentations (5 minutes per group):**

- Each group nominates one or two “presenters” to speak about their poster. The other members are on the “committee” to evaluate posters.
- When time is called, organize a rotation of the committee members around the room so that they can see each group’s poster. It is ok if they don't get to every poster. Set a timer for 3 minutes.
- The presenter should begin speaking. Once finished, the committee should thank the presenter and then begin the question portion. They can ask original questions or ask from the provided list of questions.
- During this time, the teacher is silently observing the presentations and making personalized notes or filling out rubrics. It often works best if you announce that you will be looking for a specific behavior like eye contact, active listening, asking questions, smiling, etc.
- Once the timer goes off, the committee thanks the presenter and moves to the next group to repeat the above steps.

### ***Suggested Questions for Poster Session***

- How did you collect your data? Why did you use that method? Why did you collect those data?
- How did your group analyze the data? Why did you decide to do it that way? Did you check your calculations?
- Is that the only way to interpret the results of your analysis? How do you know that your interpretation of your analysis is appropriate?
- Why did your group decide to present your evidence in that way?
- What other claims did your group discuss before you decided on that one? Why did your group abandon those alternative ideas?
- How does the issue your team studied (e.g., poor soil quality, polluted water) speed up the process of erosion on Rocky Face Ridge?

- Where on the ridge would we see the most deposition happening as a result of the problems your team identified?
- Besides rain and wind, what other agents of erosion might be at work on Rocky Face Ridge due to human activity (like ATV use or hiking)?
- If we ignore your group's recommendations, what might Rocky Face Ridge look like in 50 years? (Focus on the exposed rock, soil, and vegetation).
- Your recommendations are aimed at the City of Dalton. What is one small action a 6th grader could take today to support your conservation strategy?
- How would implementing your proposed solution help conserve (protect and save) the soil and water resources on the Ridge?
- What is the biggest challenge or potential cost (money, time, or effort) in making your conservation strategy happen?
- If your recommendation fixes the problem for one resource (like water), could it accidentally cause a new problem for another resource (like air or soil)? Why or why not?
- How does the health of the resource your team studied (water, soil, air) affect the amount of greenhouse gases in the atmosphere? (For example: healthy soil holds carbon, healthy forests absorb carbon dioxide).
- If global temperatures continue to rise, how would that increase the threat to the resource your team is studying at Rocky Face Ridge? (E.g., more intense rain causes more erosion).
- What part of your recommendation helps us better prepare for or adapt to the impacts of changing weather patterns caused by global temperature rise?
- In your poster, which observation or recommendation is an example of an action that helps both the local environment (Rocky Face Ridge) and the global climate?
- If the local environment improves due to your plan, how will that directly benefit the health and economy of the people in Dalton and Whitfield County?
- Do the effects of air pollution impact all neighborhoods equally?
- Do the effects of flooding impact all neighborhoods equally?
- Do the effects of water pollution impact all neighborhoods equally?
- Do the effects of development impact all neighborhoods equally?
- How can the city make sure that any new development or land use protects the health of Rocky Face Ridge for future generations?

**Differentiation:**

- Provide leveled materials for study in each group.
- If needed, assign roles in each group to foster responsibility and tailor tasks aligned to students' skills.

**Extension:**

Visit Rocky Face Ridge park and look for examples of good or bad ridge management in person.

**Lesson developed by:**

The Dalton Resilient Community Group with Keep Dalton-Whitfield Beautiful, Whitfield County 4-H, Sarah Ott, and the Dalton-Whitfield Solid Waste Authority.

