

Collaborative Sciences Project - Group Prework and Planning Document

Group #: 6

Group Names & Disciplines:

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Colorado Extreme Weather Event: 2020 Colorado Avalanche Season

Prework:

This section must be completed prior to the field trip on September 3rd. You have been assigned a specific Colorado extreme weather event. Use credible sources (news articles, scientific journals, government reports, historical archives - *cite them*) to research the event. Prepare a detailed analysis addressing the following areas:

Part 1: Event Overview (~10 minutes)

- Provide a concise summary (3–5 sentences) including:
 - Nature of the event
 - Date and location
 - Key statistics (e.g., rainfall, wind speed, casualties, property damage)
 - Why it qualifies as an extreme weather event

Part 2: Connect with Climate Change (~10 minutes)

- What role (if any) did climate change play in the extreme weather event?
- Is climate change expected to change the frequency or intensity of these kinds of extreme weather events in the future? Explain.

Part 3: Interdisciplinary Analysis (~25 minutes) - complete the questions related to your scientific discipline(s).

1. **Physics / Chemistry:**
 - What atmospheric or chemical processes contributed to this event?
 - Identify and explain the energy transfers, forces, or reactions involved.
2. **Biology / Environmental:**
 - Analyze the impact on humans, animals, and ecosystems.
 - Were there any observable adaptations, resilience strategies, or ecological shifts as a result?
3. **Design Technology/Computer Science:**
 - How did people predict, measure, respond to, or mitigate the event?

- Critically evaluate existing technologies or infrastructures. Suggest one evidence-based improvement.

Part 4: Critical Thinking / Synthesis (~15 minutes)

- Identify **key scientific principles** illustrated by this event (e.g., thermodynamics in tornado formation, hydrology in floods).
- Discuss how multiple disciplines intersect to explain or manage this event.
- Optional: Create a diagram, flowchart, or model summarizing your interdisciplinary analysis so far.

Submission:

Be prepared to explain:

- How your assigned event demonstrates extreme weather principles
- Connections between scientific, ecological, and technological perspectives

Citations: *Feel free to use a tool like Noodletools while creating your citations.*

Field Trip:

As you participate in the field trip on September 3rd, reflect on the questions below. Write your responses in your individual notebook.

1. What is NCAR's mission? How does NCAR carry out its scientific research?
2. What tools and technologies does NCAR use to collect different kinds of data?
3. Why is knowledge from your science discipline(s) important for the work being done at NCAR?
4. How is your team working together? What behaviors are helping your teamwork, and what behaviors are making it harder?
5. How can what you learned at NCAR help you better understand extreme weather events in Colorado?

Poster:

Step 1: Identify a design solution to your assigned Colorado extreme weather event.

1. Brainstorm possible design solutions (at least 5) to prepare for similar future severe weather events.
2. What possible design solution would you like to expand upon as a group? Why are you choosing this design solution?
3. Evaluate the design solution you chose:
 - *Effectiveness:* Does the design actually reduce the risks or impacts of the extreme weather event? How do you know?
 - *Feasibility:* Can the design be realistically built and used with the available resources, time, and technology?
 - *Trade-offs:* What are the possible costs, limitations, or unintended consequences of this design? Do the benefits outweigh them?
4. Describe how possible solutions to your assigned weather event connect to your science/engineering subject areas.
 - Subject Area #1:
 - Subject Area #2:

- Subject Area #3:
- Subject Area #4:
- Subject Area #5:
- Subject Area #6:

Step 2: With your team, create a poster explaining the weather event, identifying the role each science plays in understanding the event and its solutions, and sharing your design solution. The poster will be professionally printed and posted in the hall at Centaurus.

Your poster should include:

- A clear explanation of your assigned Colorado extreme weather event
- The role of your science discipline in understanding the event
- Your proposed design solution to address the event
- Visuals such as images, diagrams, or charts
- Proper citations for all information and images used

Make a copy of [this template](#) and share it with everyone in your team. Add an editable link of your template to [this shared document](#). Complete your poster on or before September 12th!

Reflection:

You will have an opportunity to fill in this form in TOK. (<https://forms.gle/C1MCowKhbuxoNHa96>)