Snowy Mountains Project Kit

Congratulations! You're going to the snow! Use these project ideas to enrich your educational experience in the mountains. Read through them before you go to make sure you understand the terms and concepts, and to help you determine if you want to expand upon any of them. You'll find fun facts and printable worksheets at the end of this packet.

a- elementary level activity b- middle school level activity c- high school level activity

Language Arts

There is so much to do in the mountains and in the snow for people of all ages. Be observant and be prepared to write a report on your visit.

a. Draw a basic diagram of the place you stayed or a place you visited and label all of the areas including the ages those areas appeal to. Circle your favorite one and tell why.
b. Choose one attraction to do your report on. Detail five specific details of the attraction, like estimated height, description, queue condition, etc. Conclude your report with a recommendation for improvement.
c. Create a report on the types of activities that you did in the snow, who likes to do them and why. Choose three activities to give more details on including a brief description, age limits, exciting parts, etc.

Materials required: Notebook, pen/pencil
Submission: A copy of your writings/drawing, and any pictures/videos

Teaching or learning notes:

Applied Math

Math is everywhere! Every single activity or attraction in the mountains and in snow uses math. Take a look around and find examples of the math you know.

a. Identify and draw the shapes that you see and where you see them. See if you can find places where simple math equations were used. Document your findings.
b. Identify the math used to create one particular man made feature where you are. Outline the concepts and principles you see.
c. Identify the math used to create one particular man made feature you see there. Outline the concepts and principles, and use estimation to perform one of the calculations the builders would have used.

Materials required: Notebook, pen/pencil, calculator or smartphone (optional)
Submission: Your calculations, estimations, and conclusions, and any pictures/videos

Teaching or learning notes:

Science

Check out the physics of ski slopes! All slope designs utilize the principles of Conservation of Energy, inertia, friction, potential and kinetic energy, and gravity. What makes the faster slopes fast? Why do skiers/boarders slow down when they are going uphill? What is inertia and what effect does it have on ski/board physics? How do skiers/boarders use potential and kinetic energy to keep them going? How is energy “conserved” during the run? What parts do friction and gravity play? What are Newton’s three laws of motion and can you see them working on the slopes? How does weather change the slope’s physics?

a. Discuss some of the simpler concepts and try feeling the forces at play on some slopes. Compare different slopes and talk about what goes into building them. Draw one of the slopes.
b. Discuss the concepts and identify as many physics concepts as you can on some slopes. Compare slopes, and then pick one to diagram/map and include the forces you can identify to define how the layout affects the skier’s speed and overall run.
c. Discuss the concepts, identify them on some slopes, and diagram one of them including its use of physics. Design your own slope using the things you’ve learned.

Materials required: Notebook, pen/pencil
Submission: A copy of your drawings, diagrams, maps, or designs, and any pictures/videos

Teaching or learning notes:

Social Studies

Ski lodges and slopes are a great place to people watch and learn more about how people interact with one another. Take some time to watch people in line for a run or for food, around the free play areas, or in families.

a. Notice how many people are at the slopes or locations around you (ex. In line, waiting for ski rental, or at the place you are staying). Are some areas more crowded than others? How does behavior change in the crowded areas versus the non-crowded areas? Do people crowd together or spread out? Why? Discuss these ideas and draw or write about them.
b. Identify one behavior that you thought was kind, and one that you thought was rude. What was the response to that behavior? Write about your findings including where you saw the interaction and the details of the event.
c. Discuss crowd control and analyze the layout of the area. How does the layout or surroundings or even weather affect how people move and behave? Discuss the things you've seen in light of larger social environments you've been in. How universal are these techniques of managing people to improve experience? What are your ideas for improving the experience where you went for future events?

Materials required: Notebook, pen/pencil
Submission: A copy of your writings/drawings, and any pictures/videos

Teaching or learning notes:

Fun Facts

- The Earth is a closed system, meaning that it rarely loses or gains matter. The same water that exists today existed millions of years ago. You could be playing in the same snow Wooly Mammoths walked on!
- The word ‘ski’ originated from the Norwegian word ‘skíð’ which translates to mean a split piece of wood.
- The first downhill skiing race to ever be officially recorded was in Sweden, in 1879.
- ‘Skiing’ is the only six-letter word in the English language that has a double ‘i’ precisely in the middle.
- Skiing is one of the fastest sports on land that has no assistance from a motor. In 2006, Simone Origone set a world speed skiing record at 156.2 miles per hour!
- Astronaut Harrison Schmitt said that astronauts travelling to the moon should learn the art of cross-country skiing. Why? Well, he thought that the techniques used in skiing would help walking on the moon become easier. He also had visions of ‘lunar skiing holidays’ in the future, but I don’t think we’re quite ready for them just yet.
- Deep snow can often appear blue. This is because layers of snow can create a filter for the light, causing more red light to be absorbed than blue light. The result is that deeper snow appears blue—think about how your snowy footprints compare to the surrounding landscape.
- Snow can also sometimes appear pink. Snow in high alpine areas and the coastal polar regions contains cryophilic fresh-water algae that have a red pigment that tints the surrounding snow.
- Each winter in the U.S., at least 1 SEPTILLION ice crystals fall from the sky! That’s 1,000,000,000,000,000,000,000,000—24 zeros!

Snowy Mountains

1. Draw a picture of your favorite thing you did.

2. Describe your favorite activity and why you love it.

3. Which slope was the fastest? The shortest?

4. Draw or describe one example of engineering you saw.

5. Draw a simple replica of a map you saw including some labels.

6. What is inertia and when do you experience it?

BONUS:

Explain how an engineer uses math to map out and assess the difficulty level of a ski slope. What kind of math do they use? Why is it important that they are accurate?