

A Report on a Natural Hazard LEVEL 2

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Avalanches

A mass of white dust exploding above only takes seconds to reach the innocent that are down below. An avalanche is a mass of snow sliding down the side of a mountain, these can also be called mudslides in different areas around the world where soil is sliding. Avalanches have been recorded traveling at speeds up to 320km/h. The sounds of the tumbling avalanche has been described as hissing to the extreme of a freight train.

In Canada, there are many avalanches that occur in the Rocky Mountains. The number of avalanches has greatly decreased within the last 50 years. Avalanches can be discovered all over the world in mountainous regions. In order for an avalanche to occur, the slope of the mountain must be between 30 and 50 degrees. The hazard can be triggered by both nature and humans. The weather is a major condition that causes avalanches. If snow begins to accumulate and become heavy, it may break and roll down the mountain causing destruction to objects in its path (Look at picture for visual). Similar to volcanoes, earth tremors may be a cause for an avalanche to erupt. The movement of the earth breaks the packed snow into pieces and causes it to slide. Some avalanches are not caused naturally by the environment, but are caused by man. Rangers in the mountains plant explosives to break the packed snow and any loud noise may trigger the hazard to occur.

There are 3 main types of avalanches:

Dry Snow Avalanche: consists of powdery snow and air. Dry snow avalanches move faster than 160km/h down the mountain.

Wet Snow Avalanches: Avalanche is formed the same way as dry snow avalanches but it moves slower because it is wet.

Slab Avalanche: Portion of snow breaks loose and splits into tiny pieces as it rolls down the mountain.

Any of these avalanches may cause serious damage to property or tragedy to many families. The severity of an avalanche in British Columbia killed Michael Trudeau, the son of Pierre Trudeau, November 13, 1998. In the Rocky Mountains avalanches can block roads and railways and cause many serious problems for towns and ski resorts. Throughout history, whole populations of towns have been wiped out by avalanches.

In British Columbia, the highway ministry began a program to control avalanches and to prevent them from occurring. Since 1970 the number of avalanches has been reduced on railroads and roadways. Rangers test snow patterns and weather conditions frequently. The rangers pay special attention to areas near ski resorts and populated regions. One way rangers prevent huge avalanches from occurring is by planting explosives under the snow and breaking

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up the packed snow and sending little avalanches rolling down the mountains. They do this often enough so that there is no damage to property, instead of letting a lot of snow accumulate and causing massive damage.

Some long term strategies of preventing avalanches have been discovered by architects. In regions where many avalanches have occurred, they are constructing buildings that are formed like the prow of a ship to divert snow to either side of it to withhold pressure. Now they have begun to construct fences that are ranked along the sides of the mountains. These fences are made of wood, aluminium, steel and concrete. These walls have been replaced by trenches, ditches and stone walls that are used to protect people and property.

After an avalanche occurs there are search teams that go out and inspect the area, looking for any missing people. A person can survive underneath the snow for approximately 30 minutes. Search teams use dogs to help with their rescues because in an area of 100 square meters a dog can search the area within 20 to 30 minutes. A search team of 20 people can search the same area but it would take approximately 4 hours. Once the missing people are found, they are treated for any medical needs including hypothermia and frostbite. After the destruction of an avalanche, the town people come together and try to rebuild what is left and what can be repaired. After a major tragedy people must get back with society.

As government officials for the Rocky Mountain region, you might like to consider putting into place some of the strategies I have described.

Based on the knowledge of avalanches, they should be acknowledged with major precautions. Any sign of an avalanche occurring should be treated to prevent any harm of the innocent that are down below.

Bibliography

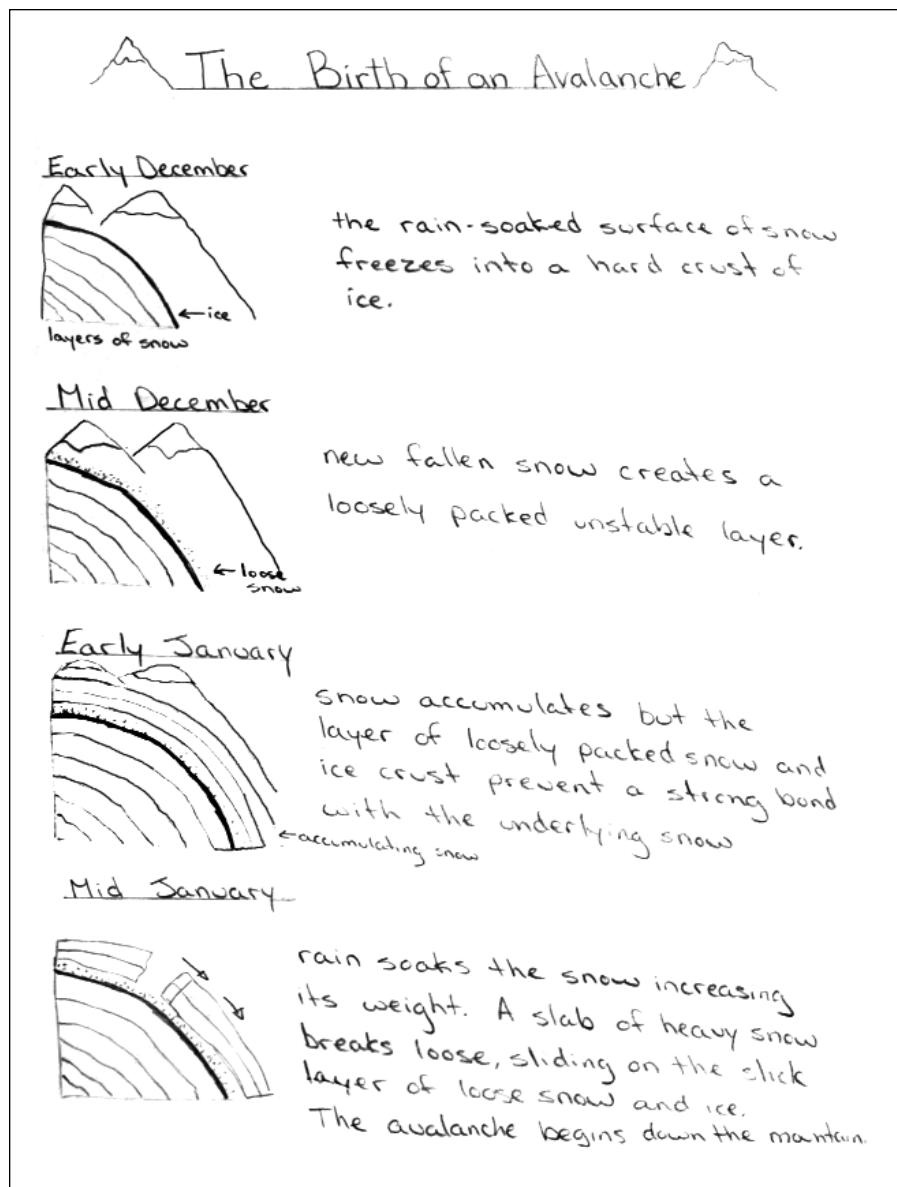
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Teacher's Notes

Knowledge/Understanding

- The student identifies and describes the mechanisms of change as they apply to avalanches with some accuracy. Although the student states that “the slope of the mountain must be between 30 and 50 degrees” and that “the weather is a major condition that causes avalanches”, he or she does not mention other aspects of the terrain that contribute to the formation of avalanches and does not elaborate on accumulation or temperature. The student seems to be identifying the Rocky Mountains as the specific location for the investigation of avalanches, but this reference is neither consistent nor clear.

Thinking/Inquiry

- The student provides advice on short-term preparation that is somewhat effective. The student states that “Rangers test snow patterns and weather conditions” and that “rangers pay special attention to areas near ski resorts and populated regions”, but provides insufficient detail about these activities. The student implies, but does not explicitly state, that the information is being offered as advice.
- The student provides advice on long-term preparation that is somewhat effective. The student describes how buildings have been designed to divert snow and how fences are constructed along the mountainsides, but it is not clear how the fences function or how they are an improvement over preparations already taken in the area. Rather than providing advice specifically targeted to the region, the student only describes steps that have been taken elsewhere.
- The student provides steps for dealing with the aftermath of a disaster that are somewhat useful (e.g., describes the use of search teams and dogs and the need for medical assistance), but concentrates only on the rescue of individuals and does not elaborate on the needs of the community (e.g., the need to clear roadways). The student describes past responses to avalanches rather than providing practical steps for dealing with the aftermath of a potential avalanche in the specified location.

LEVEL 2**Communication**

- The student writes a report that has some degree of clarity and logical organization. The sequence of ideas is generally logical, although subheadings are not used to indicate changes in topic and the information about the rangers planting explosives is presented in both the introductory and short-term preparation paragraphs. Some ideas are not clearly expressed (e.g., the use of walls and fences versus ditches is confusing), and errors in grammar and sentence structure further detract from the overall clarity of the report.
- The student uses a voice and language that are somewhat appropriate. The terminology used is appropriate to the topic (e.g., “dry snow”, “wet snow”, and “slab” avalanches; “hypothermia”) and the language is suitably formal, but the student does not adopt a voice appropriate to the specified audience.
- The student provides a visual that supports and enhances the written information to some degree. Although the visual accurately depicts the stages in the formation of an avalanche, it is not properly integrated into the text, which provides no corresponding reference to stages of avalanche formation.

Application

- The student evaluates the impact of the hazard on the local population with some effectiveness (e.g., refers to loss of life, damage to property, problems arising from blocked transportation routes). However, the report needs to be more specific about the impact on the people and economy of the Rocky Mountains region.

Comments

This work is representative of a solid level-2 performance. The student demonstrates some degree of achievement of the expectations in all four categories of knowledge and skills.

The result is a fairly well-researched informational text that is presented as a narrative rather than as a report directed to government officials.

Next Steps

In order to improve his or her performance, the student needs to:

- re-examine the task requirements and produce a report directed to the specified audience;
- sustain the focus on a specific location throughout the report;
- ensure that information on preparing for the hazard and dealing with its aftermath is presented as advice;
- conduct further research on the effects of avalanches.