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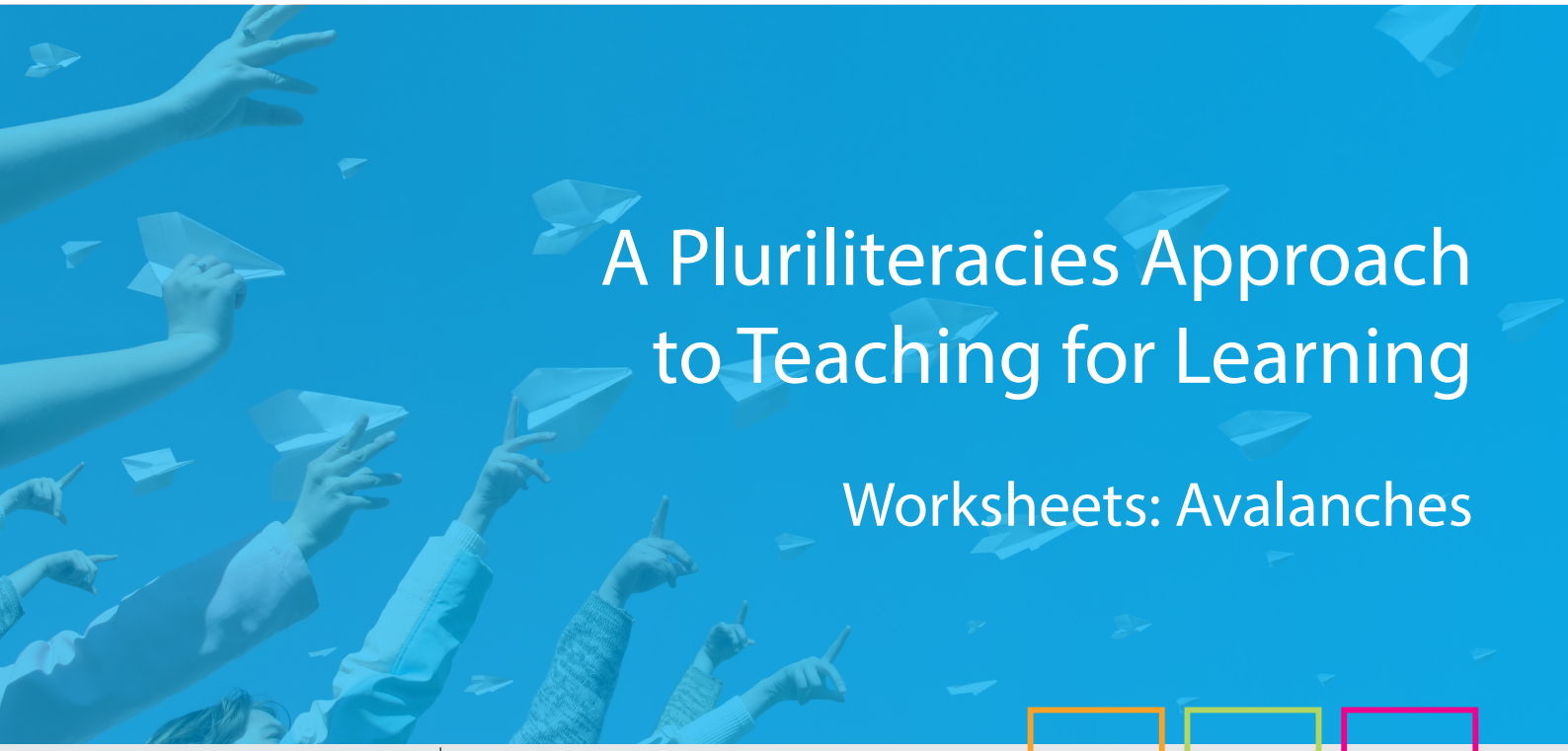

A Pluriliteracies Approach to Teaching for Learning

Worksheets: Avalanches

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EUROPEAN CENTRE FOR MODERN LANGUAGES
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Worksheet 1: Avalanches

1. Put sentences A-E in the right order. The image on the right might help you.
2. Look for causes and effects in the explanation of how an avalanche forms. Underline causes with a blue pen and effects with a brown pen.
3. Record the causes and effects in a table. The provided table may help you (see worksheet 2).
4. Translate the academic language in the boxes into colloquial language (see worksheet 3).
5. Explain in colloquial language how avalanches form. The given words and phrases might help you to include cause and effect structures (see worksheet 4).
6. Use your explanation from task 5 and rewrite it using nominalizations (see worksheet 4)!

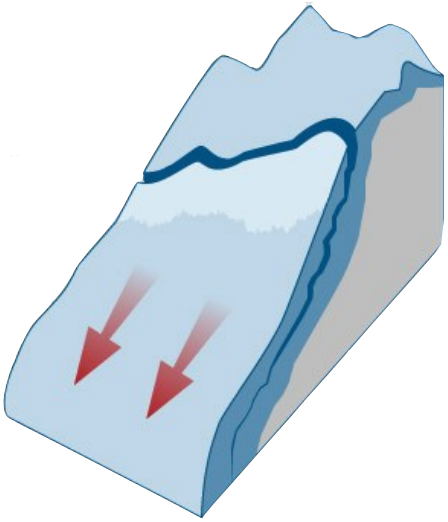
A
The layer of snow closest to the ground maintains its temperature, causing a temperature difference between the upper and lower layers of snow.

B
This causes an avalanche.

C
The upper layers of snow lose grip and begin to slide.

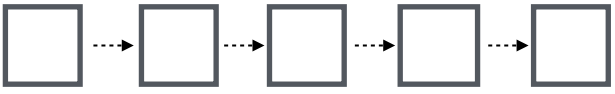
D
Temperature in the top layer of snow decreases.

E
Then evaporation begins to occur in the lower layers, disrupting the stability of the snow above.



M1: Formation of Avalanche *(Source: essentialtravel.co.uk, edited)*

Here you can solve task 1. You can write the letters in the boxes.



Word Bank:
cause = Ursache
effect = Wirkung
layer = Schicht
to maintain = beibehalten
evaporation = Verdunstung
disrupt = unterbrechen
to decrease = sinken

Worksheet 2: Avalanches

Here you can solve task 3.

causes	effects

Worksheet 3: Avalanches

Here you can solve task 4. You may use the synonyms used in the word bank.

D Temperature in the top layer of snow decreases.	**D** _____ _____ _____ _____
A The layer of snow closest to the ground maintains its temperature, causing a temperature difference between the upper and lower layers of snow.	**A** _____ _____ _____ _____
E Then evaporation begins to occur in the lower layers, disrupting the stability of the snow above.	**E** _____ _____ _____ _____
C The upper layers of snow lose grip and begin to slide.	**C** _____ _____ _____ _____
B This causes an avalanche.	**B** _____ _____ _____ _____

M2: Formation of Avalanche *(Source: essentialtravel.co.uk, edited)*

Word Bank:
layer = Schicht
to maintain = beibehalten
evaporation = Verdunstung
disrupt = unterbrechen
to decrease = sinken

Worksheet 4: Avalanches

Here you can solve task 5.

If_____

and _____

then_____

_____

This leads to_____

_____

which results in_____

_____

If this happens_____

_____

This leads to_____

_____

Here you can solve task 6. You may use nominalizations from task 4!

If_____

and _____

then_____

_____

This leads to_____

_____

which results in_____

_____

If this happens_____

_____

This leads to_____

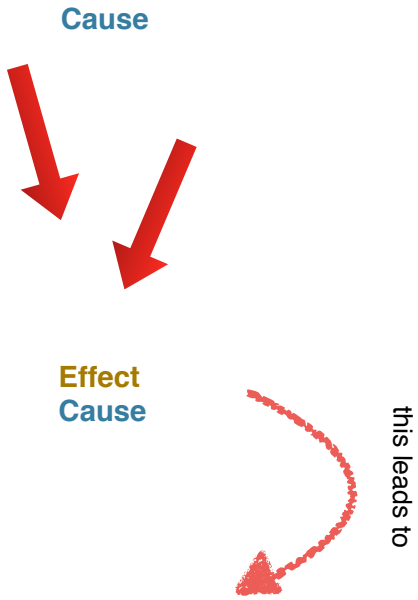
_____

Worksheet 5: Avalanches

7. Visualize the process of how an avalanche forms. You may use the causes and effects you have just found. Use arrows to link the different causes and effects. The given structure and the phrases may help you. Try to use nominalizations to explain processes!
   Also name the arrows!

HOW DO AVALANCHES FORM?

In a cause and effect scheme with different elements, processes can sometimes be seen as an effect and a cause at the same time.



Phrase Bank:
- firstly/ secondly…
- when/if…
- then…
- due to/ because of (this)
- A leads to B/ A triggers B
- consequently/ inevitably
- the effect is
- as a result

You might also:
- add arrows
- use adjectives &
- be as precise as possible!
  E.g. *intense snow* instead of *snow*

How can you visualize an explanation?
The key expressions are written in

boxes (rectangles)

or elongated circles

- these symbols are connected with arrows to visualize links/ processes
- use colors to emphasis connections

M3: Visualization Bank *(Source: Hoffmann 2009: 23)*

Worksheet 6: Avalanches

8. Look for cause and effect schemes in the text. Underline causes with a blue pen and effects with a brown pen.
9. Name the two types of avalanches and visualize how they form (see worksheet 7).
10. Explain in colloquial language how avalanches form. Add additional information from the video (see worksheet 7).
11. Visualize your explanation and use academic language (see worksheet 8)!

Extremes: How Avalanches Form

Avalanches occur regularly on mountains around the world and are harmless, unless someone happens to be in the way. Avalanches are born from a weakness in the snow. Each time it snows, a new layer of snowpack is added and is characterized by snow crystal size and shape, how wet the snow is, and depth of the snow layer. Sometimes these layers bond really well to each other, sometimes they do not. Snow is a shape-changer, depending on current temperature and weather conditions. Snow begins its life as a fluffy six-armed crystal flake, but while it is laying on the ground as part of a snowpack, changes occur. During cold weather, water vapors can slip to the bottom of the snowpack, forming angular crystals. These crystals tend to weaken the snow and then destabilise it from below.

M5: Avalanche *(Source: durchblick-fime.de)*

Sun and light rain can also produce thin surface crusts, which make it difficult for new snow to bond securely. Rain weakens the bonds in the snow and increases its mass. But when rain freezes, it can strengthen and bind the snow. Hoar frosts, which are flat frozen crystals, can also form on the surface of the snow in extremely cold weather, creating a slippery layer when covered by new snow. Instabilities in the snowpack can be triggered by the wind, a heavy storm, a change in temperature, or the weight of a person. They are most common on slopes between 30 to 45 degrees.

Generally, there are two types of avalanches: sluffs and slabs. Sluffs, or point release avalanches, are most common. They occur when loose, light snow tumbles down a mountain, and usually begin at a single point, growing wider and wider as they gather snow during the descent. Slab avalanches tend to be more deadly. They occur when a large slab of snow is released and slips down a mountain slope. The slab is a strong layer of snow laying on top of a weaker layer of snow. When the weak layer breaks, the slab begins to avalanche and can travel down the mountain at speeds of up to 80 miles per hour. A big avalanche, one that runs for 1,000 feet or more, will often develop a cloud of snow crystals that ride above the tumbling snow. Over 90% of victims triggered the avalanche that killed them. Over the past 20 years about 500 people have died in avalanches in the US.

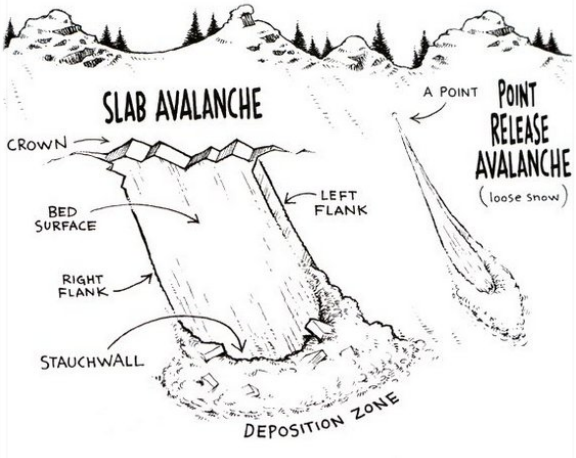
M4: How Avalanches Form *(Source pbs.org, edited; justgetout.net, edited)*

This video provides additional information on the formation of avalanches. http://www.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.avalanche/how-do-avalanches-form/

Facts about avalanches:
Here you can find additional information about avalanche accidents in the U.S.: http://avalanche.state.co.us/accidents/us/

Word Bank

current = aktuell	hoar frost = Raureif
fluffy = flockig	slope = Hang
snowpack = Schneedecke	descent = Niedergang
water vapors = Wasserdampf	slab = Platte
(to) increase = vergrößern	



M6: Types of Avalanches *(Source: justgetout.net)*

Worksheet 7: Avalanches

Here you can solve task 9.
Use the given cause and effect scheme! Use arrows to connect the different causes and effects.

Cause/ Causes **Effect**

⇨ Sluff avalanche

⇨ Slab avalanche

Here you can solve task 10.
Remember to use cause and effect schemes!

Phrase Bank:
- firstly/ secondly…
- when/if…
- then…
- due to/ because of (this)
- A leads to B/ A triggers B
- consequently/ inevitably
- the effect is
- as a result

Worksheet 8: Avalanches

Here you can solve task 11. Add arrows and colors to link the different causes and effects. Label the arrows and use the phrase bank! The causes and effects you have underlined in task 8 might help you.

Remember…how do you write academic language?
- use cause and effect schemes
- nominalize
- use terminology
- use modifiers and be precise!

Multiple Causes

Effect

Cause 1

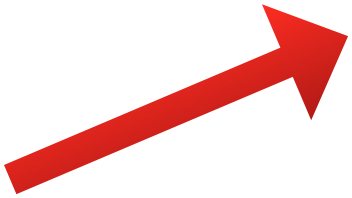
or/ and

Cause 2

Avalanche

or/ and

Cause 3



Phrase Bank:
- cause A triggers B
- cause A reinforces B
- multiple causes lead to
- the effect only occurs if
- the result is/ this may lead to
- as a result/ consequence
- this, in turn, causes
- the reason for this is

Worksheet 9: Avalanches

12. Read through the material and record the avalanche protection measures and their effects. Create a mind map to structure and visualize your findings. The given structure might help you (see worksheet 10).
13. Visualize how the typical cause and effect structure of how an avalanche forms and then destroys buildings and infrastructure can be interrupted (see worksheet 11).
14. Explain in colloquial language how this effect prevention measure works (see worksheet 11).

Avalanche protection measures

Avalanche protection is one of the main responsibilities of the protective measures team. Our work encompasses permanent avalanche protection activities, including barriers and planning measures, and temporary avalanche protection, for example by triggering avalanches artificially. Avalanche protection measures seek as far as possible to shield people, settlements and infrastructure against avalanches.

Most mountain areas have got an avalanche bulletin, which provides useful information (see links below)!

M8: Controlled Explosion *(Source: mearsandwilbur.com)*

Technical measures

- Explosions trigger avalanches artificially.
- Controlled avalanche starting zones are protected by supporting structures that prevent triggering of avalanches. Dams are built to reduce the endangered area within the avalanche track. Affected objects may also be protected by avalanche shelters and the reinforcement of house walls at the avalanche side.

Building measures

- Avalanche galleries or tunnels are the classic structures for protecting transportation routes. Avalanches either overflow the gallery or deposit their snow on the roof without impairing the traffic.

Forestry measures

- Mountain forests provide efficient and inexpensive protection from avalanches.

Organizational measures

- Closure of roads and the evacuation of houses. Short-term measures of this kind are becoming increasingly important in connection with tourism.

The topography and the interaction of the terrain and weather can give rise to big variations in the characteristics of the snowpack. Forecasting the exact location and timing of an avalanche therefore remains impossible. The probability of an avalanche being released, however, can be estimated.

M7: Prevention Measures *(Source: measures slf.ch, edited;* planat.ch*, edited)*

Here you can watch a video of a controlled avalanche in Norway: https://www.youtube.com/watch?v=IS-KXIPd5xU&spfreload=10 Watch 0:25-1:40min!

Avalanche Bulletin Colorado: http://avalanche.state.co.us

Accidents in the U.S.: http://avalanche.state.co.us/accidents/us/

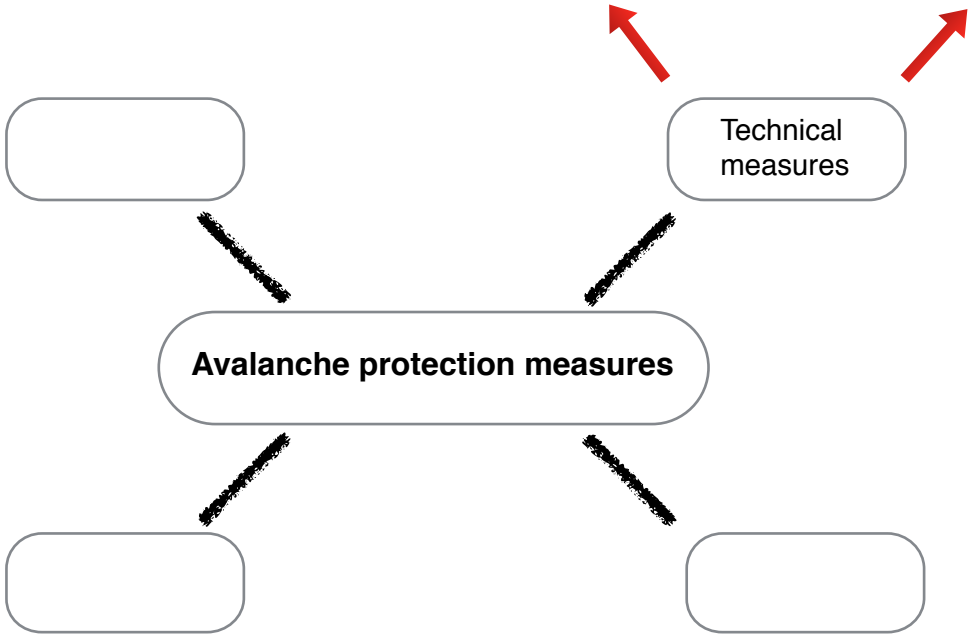
Avalanche Bulletin Canada: http://www.avalanche.ca

Word Bank

measure = Maßnahme
encompass = umfassen
shield = Schutz
(to) trigger = auslösen
artificially = künstlich
affected = betroffene
reinforcement = Verstärkung
bulletin = amtliche Bekanntmachung
prevent = verhindern
forestry = forstwirtschaftlich
(to) deposit = ablagern

Worksheet 10: Avalanches

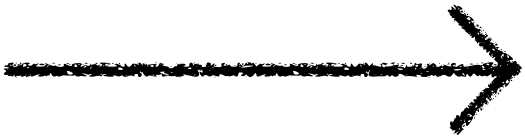
Here you can solve task 12.
Use arrows and colors to link the different measures and their effects.



Phrase Bank:
- when/if…
- A leads to B
- the effect is
- cause A triggers/ reinforces B
- consequently/ inevitably
- the result is/ this may lead to
- as a result/ consequence
- this, in turn, causes
- due to/ because of (this)

Worksheet 11: Avalanches

Here you can solve task 13.
Use arrows and labels to show where and how the measures prevent the typical cause and effect scheme.

Cause  **Effect**

Here you can solve task 14.

The cause and effect scheme is interrupted because…

Phrase Bank:
- when/if
- cause A triggers/ reinforces B
- B only happens if
- consequently/ inevitably
- the result is/ this may lead to
- as a result/ consequence
- this, in turn, causes

Worksheet 12: Avalanches

15. Use all the given material and create a webpage for the Mountain Rescue Service Colorado. Therefore, explain in academic language how avalanches form.

Hi guys, my name is Jack and I work for the Mountain Rescue Service in Colorado, U.S.. Avalanches are a big problem for us! People get killed each year. We are currently working on a webpage for tourists to make them aware of avalanches. There, we explain how avalanches form.

M9: Jack
(Source: www.popularmechanics.com)

Here you can solve task 15.

Phrase Bank
- when/ if
- only if
- then
- due to/ because of (this)
- 1 initiates/ triggers 2
- this leads to…
- as a result (of)/ therefore…
- consequently/ inevitably…
- this, in turn, causes…
- the effect is…
- therefore…

Worksheet 13: Avalanches

Unit Review:
Mountain rescue service in Colorado wants to publish a radio report to inform tourists about the formation of avalanches and security measures against avalanches.
Create a dialogue between a tourist and Jack from the mountain rescue team. Record an audio file that entails a brief explanation of how avalanches form and an explanation of which protection measures are applied. Use academic language.
Therefore…
a) Firstly, write a dialogue.
b) Secondly, record the dialogue with your mobile phone. You can ask your partner if he or she would be so kind to play one role.
c) Finally, present your recording to your partner and compare your recordings. Decide which one is best and why. What could be improved? (see worksheet 14)

Here you can solve part **a** of the unit review.

Tourist:

Jack:

Worksheet 14: Avalanches

Here you can solve part **c** of the unit review.

What makes a good explanation?

- use cause and effect schemes
- nominalize
- use terminology
- use modifiers and be precise!

What makes explanation A a good one?	What makes explanation B a good one?

What could be improved?	What could be improved?

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