



Learning Material

Canada – Snow, Ice and Sea

Grade 7-9

Sample Solutions

Sample Solution

The exercises of the learning unit are embedded in a superordinated work order. Pupils should use the online tool to work on the exercises given in the additional material. Besides questions on the ISS, emphasis is on the exploration of the region as shown in the ISS-panorama. Moreover, pupils will create a map based on minimum distance classification.

Exercise Sheet 1: Earth Observation

Question 1: The ISS (International Space Station) is the largest artificial object in the orbit. How many cameras are installed on the ISS which record images of the earth 24 hours a day?

Answer: 4 cameras

Question 2: The ISS circles around the earth several times a day.

a) How many circles does it accomplish each day?

Answer: 16 circles per day

b) How long does it take for a full circle?

Answer: 90 minutes

Question 3: You can see the ISS from the earth but it is far away from here. Nevertheless, pictures can give a good impression of what is happening on our blue planet. Zooming in you can see the single pixels.

a) What is the flight altitude of the ISS?

Answer: 400km/~250miles

b) What is the size of one pixel within the ISS-panorama?

Answer: 500m x 500m

Exercise Sheet 2: Land Surfaces, Regions & Phenomenons

Question 1: Which (land-) surfaces can you distinguish in the ISS-panorama? Go from the coast to the hinterlands and list four surfaces on your way.

Possible Answers: Water, Snow, Clouds, Land

Question 2: What kind of lake is the Tobin Lake?

Answer: The Tobin Lake is a dammed up artificial reservoir.

Question 3: Fjord Saguenay

a) What is a Fjord?

Answer: A Fjord is an arm of the ocean reaching inland. A Fjord is built when valleys which were formerly covered by glaciers are filled with sea water. Therefore, they also represent the location of a prehistoric glacier. Due to their origin they are mostly surrounded by mountains.

b) Describe the characteristics of Fjord Saguenay.

Answer: Fjord Saguenay has a length of 100km, a depth of around 278m and a width of 3km. The Fjord flows into the Saint Lawrence River.

Question 4: Navigate to Lake Winnipeg

a) Which part of the lake is shown in the ISS-panorama?

Answer: The northeastern part

b) How did the lake emerge?

Answer: Lake Winnipeg developed by the end of the last ice age due to ablating of the glacier.

Exercise Sheet 3: The Classification

Question 1: Conduct a classification with the Canada-Tool. Choose the image section as shown in the figure below. Lake Winnipeg should be located at the bottom left. Create at least three surfaces: Lake Winnipeg, Clouds, Ice or Mountains/Land. You can display the mapping instructions below the tool to get the right order for creating your map.



Figure 1 : Image section to be chosen for classification with the Canada-Tool. Lake Winnipeg should be located at the bottom left.

- Create training samples for the selected surfaces.
- Name them and assign a color scheme.
- Save map.

Answer / Work Order a)-c): The conduction of the classification is described in the accompanying commentary as well as in the online tool itself. Below the tool map instructions can be displayed and hidden. All steps on how to make the classification with the ISS-panorama are described here as well. Moreover, symbols with different applications can be displayed and hidden.

Question 2. Test your classification with different training samples and compare the different classifications. Again, choose the same image

section as in exercise 1 of this exercise sheet (see Figure 1).

- How big is Lake Winnipeg in your classifications?

Answer: 13,000 to 14,000 km²

- What kind of problems can you identify when classifying the image? Compare the image and your created map.

Answer: It is sometimes difficult to distinguish water from ice. Parts of Lake Winnipeg are frozen which only gets obvious when browsing over the training samples with the mouse. Moreover, there can be mistakes when classifying clouds and ice surfaces. Due to testing of different classifications these differences become obvious.

Exercise Sheet 4: Living in Canada's cold

Question 1: The Canadian Culture

- Why is it so cold in Canada?

Answer: As Canada is located far north, some regions of the country are even assigned to the North Pole. But in Canada besides the polar climate also temperate climate zones are found. The ISS-Panorama shows the rather cold zones close to Alaska while in the West you can even experience a maritime climate.

- What is the National Sport in Canada?

Answer: The national sport of the Canadians is ice hockey.

Question 2: The Cree Tribe

- Describe who the Crees are and how the two groups of them are named within the region where the information point is located.

Answer: The Cree are one of the largest groups in North America belonging to the Indian Tribe. The

Majority in Canada lives north and west of Lake Superior, in Ontario, Manitoba, Saskatchewan, Alberta and the Northwest Territories. The Plains Cree are living in the great grasslands while the woodland cree are indigenous in the forested areas.

b) Which of both groups is indigenous in forested areas?

Answer: Woodland Cree

c) Among the different regions in which the two different tribes live, are there other differences?

Answer: The Plain Cree are rather nomadic depending on hunting of buffaloes. The Woodland Cree are more stationary including a rather small acting scope compared to the Plain Cree.

Question 3: Canada: Culture and Language

a) Why do we talk about the „Lake“ Winnipeg on the one hand and on the other hand about the „Lac“ Mistassini?

Answer: Canada is bilingual. French and English are the two community languages. The only province which is monolingual is Québec. Here, French is the exclusive community language. But even though all other provinces are officially bilingual there is a difference in teaching languages in schools or services between the provinces. Third community language is Inuktitut which is listed in Nunavut (a territory in the North of Canada).

b) Which problems occur due to the different languages used in Canada?

Answer: Especially the minority, french-speaking Canadians, feel neglected. There is a decrease in usage of French by time and less generations being native in this language. One example: Ontario. The province in the Southeast of the country is officially bilingual but there are only a few people who are fluent in French. Children can choose whether to attend classes in French or English. But the less

french-speaking children there are, it is questioned if there will be the possibility to get a whole class of french-speaking children. Even though there are offers for the francophone community, there is often a lack of understanding from the anglophone community which could lead to suspense.