

## Teachers' Guidelines

**Title of the package:** Siberia

Information about the package:

**Brief Description:** The package is about the Siberia and covers such fields of knowledge connected with that region as: climate, hydrosphere, geology, landscape, plants, animals, economy and culture.

**How does the package relate to STEAM education:** The package mainly focuses on science and art.

Earth sciences (climatology, geography, geology, hydrosphere), biology and economy represent the science category. There are many activities and interesting facts in the toolkit connected with these disciplines.

To the field of art might be added culture section from the package. It covers such areas like music or daily lifestyle of indigenous people of Siberia.

**Keywords:** Siberia, Siberian languages, Siberian people, Siberian rivers, indigenous people, vegetation zones, ice road, pingo, palsa, permafrost thawing, taiga, tundra, steppe, Trans-Siberian Railway, Baikal-Amur Mainline, shamanism, throat singing, chum, yaranga, Buryat cuisine, Tuvan cuisine.

**Age Range:** 16-18

**Didactical Hours:** 6

Learning objectives:

The student will:

- learn about geography of Siberia;
- learn about global warming in Siberia and see its results;
- understand an importance of Siberia for Russian Federation in political and economical meaning;
- see the variety of languages, cultures and habits, which make the world diverse.

Content of the package:

Link to the package: <https://graasp.eu/s/ghexvm>

### 1. Introduction

- information about Siberia geography + film "The languages of Siberia" (<https://youtu.be/alla2Fqopag>);
- exercise 1 - choose correct names for the geographical areas on a map;
- information about Siberia population in Polarpedia (<https://polarpedia.eu/en/siberia/>);
- film about Siberian people (<https://youtu.be/uMgYKTcwmzU>);
- graphic Siberian ethnic groups;
- exercise 2 - mark on a map where do Nenets, Buryats, Evenks and Chukchi live (<https://view.genial.ly/607d4d2bd2a0500dab9647e2/interactive-content-where-do-live-siberian-people>).

Project office: Księcia Janusza 64, 01-452, Warsaw, Poland [edu-arctic2.eu](http://edu-arctic2.eu) [edukacja@igf.edu.pl](mailto:edukacja@igf.edu.pl)

EDU-ARCTIC 2: from polar research to scientific passion – innovative nature education in Poland and Norway receives a grant of ca. 240 000 EUR received from Iceland, Liechtenstein and Norway under EEA funds. The purpose of the EDU-ARCTIC 2 project is to: enhance the knowledge about nature, geography, natural resources, political specificities concerning polar regions and increase awareness of environmental issues and climate change, increase of interest in pursuing STEM education and careers due to enhancement of knowledge about scientific research, and their place in the modern world, familiarizing young people with scientific career opportunities; introduce innovative tools by way of an e-learning portal and effective methods of teaching science in schools.

## 2. Climate and hydrosphere

- graphic about temperature in Novosibirsk;
- video about Siberian climate 0:58-1:54 (<https://youtu.be/JGIPbsKVGuE>);
- exercise 3 - Read short descriptions of four Siberian cities climatic conditions and analyze the temperature and precipitation data;
- exercise 4 - link the words into correct pairs (<https://view.genial.ly/607d75df7a4e9d0dc35ecf08/interactive-content-climate-of-siberia>);
- exercise 5 – show on a map main Siberian rivers;
- exercise 6 – which Siberian river is the longest?;
- interesting fact – what is “ice road” in Siberia?.

## 3. Geology and landscape

- interactive map with some mountain ranges in Siberia (<https://view.genial.ly/607e987e81ec650d3bbff4ec/interactive-content-geology-of-siberia>);
- information about permafrost thawing in Siberia + 2 graphics;
- definition of permafrost (<https://polarpedia.eu/en/permafrost-7/>);
- film about thawing permafrost ([https://youtu.be/6\\_qwX2u6igw](https://youtu.be/6_qwX2u6igw));
- worksheet 1 – effects of permafrost thawing in Siberia and the main threats that process may cause;
- link to the Polarpedia that might be helpful in doing the worksheet: <https://polarpedia.eu/en/category/all-articles/land-geology/>.

## 4. Plants

- exercise 7 – look at the climate maps of Siberia and explain, why an agriculture is only possible in that region without artificial irrigation between 50 and 60 degrees North;
- exercise 8 – do the exercise about vegetation zones in Siberia (<https://view.genial.ly/607eb3b683f09d0d343f8387/interactive-content-chronological-order>);
- information about vegetation zones in Siberia: Arctic desert, tundra, forest-tundra, taiga (boreal forest), forest steppe.

## 5. Animals

- graphic with some Siberian animals;
- map of vegetation zones in Siberia;
- exercise 9 – which animals live in tundra / taiga?;
- film “Amazing discovery! 40.000 year old horse found in Siberian permafrost” (<https://youtu.be/Mq8iaXbN5tc>);
- article “What lurks in glaciers and permafrost” (<https://edu-arctic.pl/en/articles/what-lurks-in-glaciers-and-permafrost>);
- exercise 10 - specify the problem based on the film and text given, and think about possible threats for humans.

## 6. Economy

- information about history of Siberia economy;
- map of Trans-Siberian Railway;
- exercise 11: worksheet 2 – how long is Trans-Siberian Railway?;
- map of Baikal-Amur Mainline (BAM);
- exercise 12 – what mineral deposits are exploited in Siberia?.

## 7. Culture

- graphic and film about Siberian languages (<https://youtu.be/alla2Fqopag>);
- information about shamanism;
- throat singing as an example of folk music + film (<https://youtu.be/CIGHD9bt5GY>);
- examples of local traditional houses: chum and yaranga;
- traditional reindeer herding of Nenets people (<https://youtu.be/f90qex-w78g>);
- examples of local cuisine: buuzy (Buryat cuisine) and dalgan (Tuvan cuisine);
- exercise 13 - look for other Siberian dishes recipes. Think which of them you can prepare at home;
- additional materials – 2 films about indigenous people of Siberia (<https://youtu.be/OrjPUIBRHuM>),

### Guidelines for teachers:

#### 1. Introduction – SLIDES 2-5

Learn about geography of Siberia – watch films: “Languages of Siberia” and “Siberian people”, read about Siberia in Polarpedia and do the exercise 1 and 2. The graphic “Siberian ethnic groups” might be an inspiration to discuss about the future for Siberian indigenous people and their culture.

#### 2. Climate and hydrosphere – SLIDES 6-10

Learn about climate and temperatures in Siberia. Watch a film and do the exercises 3-6. Read about “ice road” (*zimnik*) and think about other places in the worlds where such a phenomenon is observed. Think of what type of information you may learn from the four Siberian cities climate tables given in that section.

#### 3. Geology and landscape – SLIDES 11-13 + siberia-worksheet1

There is an interactive map of Siberia with some mountain ranges marked. Think about other examples – where these mountains are located? Learn about a permafrost in Siberia and the main threats connected with its thawing. Do the worksheet 1.

#### 4. Plants – SLIDES 14-17

There are 2 exercises to do: 7 and 8 to complete your knowledge about vegetation zones in Siberia. Look at the climate maps in exercise 7. Revise the main goal of photosynthesis process. Explain how the temperature affects plant growing.

#### 5. Animals – SLIDES 18-20

See the variety of Siberian animal species. Do the exercise 9, watch a film and read an article about permafrost thawing. You will find there more information on threats connected with that process. Link these materials with “Geology and landscape” section and complete your worksheet 1 if you haven’t mentioned these threats in that task.

#### 6. Economy – SLIDES 21-23 + worksheet2

In that part you will understand the economic importance of Siberia for Russian Federation. Learn the short story of history of industry in Siberia, important economic areas and mineral deposits. Read about two main railways in Siberia – you can compare them taking into account their length and meaning for local societies. Do the exercises 11 and 12.

#### 7. Culture – SLIDES 24-30

There are presented some aspects of traditional Siberian cultures (languages, religion, music, lifestyle, cuisine). Let’s do all these activities in comparison to your culture – see the different approach and try to understand why it is so different. Do the exercise 13 – that might be a

project for all students in your class (e.g. creating Siberian cuisine book) or practical task (preparing a dish at home / during classes).

Additional resources and links, references:

**1. Additional resources:**

- Article: *What lurks in glaciers and permafrost*, <https://edu-arctic.pl/en/articles/what-lurks-in-glaciers-and-permafrost>

**2. Definitions from Polarpedia – an online encyclopedia of the Arctic – used in the package:**

- *Siberia*: <https://polarpedia.eu/en/siberia/>
- *Permafrost*: <https://polarpedia.eu/en/permafrost-7/>
- *Pingo, palsa*: <https://polarpedia.eu/en/category/all-articles/land-geology/>

**3. Films used in the package:**

- *The languages of Siberia*: <https://youtu.be/alla2Fqopag>
- *Siberian people*: <https://youtu.be/uMgYKTcwmzU>
- *History of Siberia from stone age to Russian conquest*: <https://youtu.be/JGIPbsKVGuE>
- *Scientists say vast areas of Siberia are thawing with "devastating consequences" - BBC News*: [https://youtu.be/6\\_qwX2u6igw](https://youtu.be/6_qwX2u6igw)
- *Amazing discovery! 40.000 year old horse found in Siberian permafrost*: <https://youtu.be/Mq8iaXbN5tc>
- *The Languages of Siberia*: <https://youtu.be/alla2Fqopag>
- *Incredible Throat Singer in Remote Siberia*: <https://youtu.be/CIGHD9bt5GY>
- *Beyond the Arctic Circle: Nenets Reindeer Herders*: <https://youtu.be/f90qex-w78g>
- *The Teleuts - ethnic minority from Siberia, shamanism, coal mines*: <https://youtu.be/OrjPUIBRHuM>
- *The Tuvans - Buddhism, shamanism, throat singing, wrestlers, khuresh*: <https://youtu.be/scZ8X608EeI>

**4. Interactive materials:**

- *Where do Siberian people live*: <https://view.genial.ly/607d4d2bd2a0500dab9647e2/interactive-content-where-do-live-siberian-people>
- *Climate of Siberia*: <https://view.genial.ly/607d75df7a4e9d0dc35ecf08/interactive-content-climate-of-siberia>
- *Geology of Siberia*: <https://view.genial.ly/607e987e81ec650d3bbff4ec/interactive-content-geology-of-siberia>
- *Vegetation zones of Siberia*: <https://view.genial.ly/607eb3b683f09d0d343f8387/interactive-content-vegetation-zones-of-siberia>