

Teachers' Guidelines

Title of the package: Iceland

Information about the package:

Brief Description: Toolkit covers the following topics related to Iceland: climate, hydrosphere, geology, landscape, fauna and flora, economy and culture.

How does the package relate to STEAM education: Toolkit mainly refers to scientific issues, and partly to art.

Earth sciences (climatology, geography, geology, hydrosphere), biology and economics are the sciences related to the scientific part of the package, which includes numerous exercises and interesting facts about these disciplines.

The art part includes topics such as Icelandic music, literature and architecture.

Keywords: Iceland, saga, Vikings, tundra, Thule, Icelandic language, Althing, Geysir, glaciers, volcanoes, Atlantic rift, jökulhlaup, Vatnajökull, sandur, hydroelectric power plant, geothermal power stations, Icelandic horses, Björk Guðmundsdóttir.

Age Range: 15-18

Didactical Hours: 2-3 (45 min each)

Learning objectives:

Student will:

- indicate the location of Iceland on the world map and list the most characteristic elements of the island's landscape;
- understand the influence of volcanoes and glaciers on the topography;
- understand how the climate and location affect the biodiversity of Iceland's flora and fauna;
- list the most important sectors of the Icelandic economy.

Content of the package:

Link to the package: <https://graasp.eu/s/129db5>

1. Introduction

- basic facts about Iceland + Polarpedia info: <https://polarpedia.eu/en/iceland/>;
- short history of Iceland;
- „Cod Wars” with Great Britain: <https://youtu.be/hfD3gevx48Y>;
- exercise 1: Which national minority in Iceland is the largest? Check this out and put the answer. Write when (year) the data were collected.

2. Geology and landscape

- a brief outline of Iceland's geological history with graphics;

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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.

- volcanoes + exercise 2: Enter the names of the volcanoes the descriptions refer to, and indicate their location on the map;
 - glaciers + exercise 3: Calculate how many km² of Iceland's surface is covered by glaciers.
- 3. Climate and hydrosphere**
- a brief description of the Icelandic climate + climatograph for the town of Grenivik;
 - some Icelandic rivers + exercise 4: Mark on the map the longest river of Iceland, and exercise 5: What is called the waterfall in the attached photo?
 - electricity generation and types of power plants + worksheet ex. 1: Analyze the table below and describe the energy sector of Iceland in a few sentences. Explain why is energy production structure in Iceland like this.
- 4. Animals**
- film about Icelandic fauna: <https://youtu.be/3sF8cvVxleA>;
 - basic information about animal species inhabit the island + exercise 6: Complete the table with one interesting fact that was mentioned in the video.
- 5. Plants**
- basic information about Icelandic plant species with photos;
 - characteristics of tundra in Iceland;
 - short history of Icelandic forests;
 - information about protected areas + exercise 7: Answer the questions: 1. What is the name of the largest national park in Iceland?, 2. In which year was it founded?.
- 6. Economy**
- breeding and meat production;
 - Icelandic horses;
 - agriculture + worksheet ex. 2: Compare one of the selected agricultural products produced in Iceland from the table with the data for your country (note that the data should refer to the same year). Then convert this value per capita;
 - export of marine products;
 - a summary of the most important sectors of the Icelandic economy producing for export + interactive map: <https://oec.world/en/profile/country/isl?tradeScaleSelector1=tradeScale0>;
 - worksheet ex. 3: Find out how many tourists have visited Iceland in recent years.
- 7. Culture**
- language, literature, music, pop culture and architecture of Iceland;
 - exercise 8: Create a project with other students on contemporary Icelandic culture. Consider a clear and graphically interesting form (poster, infographic, etc.).
- 8. Wrap-up**
- crossword about Iceland: <https://learningapps.org/watch?v=prq8ef0qj21>;
 - worksheet ex. 4.

1. Introduction – SLIDES 2-4

This section contains basic data about Iceland - currency, population, religion and history. The history of modern Iceland is complemented by the film about the conflict with Great Britain, the so-called “Cod Wars”. The proposed task is e.g. to check the data on the number of the national minorities in Iceland. It is worth analyze these data over the last dozen or so years and considering what are the reasons of that phenomenon.

2. Geology and landscape – SLIDES 5-14

This part is devoted to the geology of Iceland - how the geological past as well as the activities of glaciers and volcanoes affect the island's landscape. The photos show individual elements of the landscape. Some maps make it easier to locate the described places and complete tasks 2 and 3.

3. Climate and hydrosphere – SLIDES 15-21 + worksheet ex. 1

This section provides information on the climate and river system in Iceland, with the most characteristic places. How do Iceland's natural resources affect its energetics? What are the most common energy sources on the island? Do the exercise 1 from attached worksheet.

4. Animals – SLIDES 22-23

Here you will find basic information about the animal species in Iceland. Based on the movie and the attached graphic, do the exercise 6.

5. Plants – SLIDES 24-27

This part is devoted to the characteristics of Icelandic flora. It contains information on selected plant species and their number. There is also a description of the tundra that is characteristic for Iceland. It is worth considering where else in the world this type of vegetation occurs, and also revise such definitions as: biome and permafrost. Information about protected areas and the history of forests in Iceland can be encouraging for discussion about human impact on the environment and how we can reduce it. Task 7 requires to check (preferably on the map) the national parks in Iceland.

6. Economy – SLIDES 28-32 + worksheet ex. 2 and 3

In this section, you can learn about the main sectors of the Icelandic economy. It is worth considering them in terms of geography. The aim of exercises in the attached worksheet is to compare the data. In task 2, you should compare the selected agricultural product produced in Iceland with a similar one produced in your own country, and in task 3, you should analyze the data on the tourism sector and compile it in the form of a graph. It is worth comparing the data on the value of Iceland's exports with the data for different countries. That website might be useful: <https://oec.world/en>.

7. Culture – SLIDES 33-37

A few selected issues related to Icelandic culture are presented here. The exercise 8 may be an interesting proposition for the students. They can be treated as an

additional task. Its aim is to make a project (individually or in a group) on contemporary Icelandic culture in a graphically interesting form.

8. Wrap-up – SLIDE 38 + worksheet ex. 4

Additional resources and links, references:

1. Definitions from Polarpedia – an online encyclopedia of the Arctic:

- *Iceland*: <https://polarpedia.eu/en/iceland/>
- *Sandur*: <https://polarpedia.eu/en/sandur/>
- *Glacial abrasion*: <https://polarpedia.eu/en/glacial-abrasion/>
- *Jökulhlaup*: <https://polarpedia.eu/en/jokulhlaup/>

2. Films:

- *When Iceland Defeated Britain: The Cod Wars (Short Animated Documentary)*: <https://youtu.be/hfD3gevx48Y>
- *Animals + wildlife in Iceland | Where and When to find them*: <https://youtu.be/3sF8cvVxleA>
- *Björk : human behaviour*: <https://youtu.be/p0mRIhK9seg>

3. Interactive materials:

- *Information about Iceland*: <https://view.genial.ly/60d04aadd36a420dcb2d288a/interactive-content-iceland-basic-information>
- *Information about Icelandic economy*: <https://oec.world/en/profile/country/isl?tradeScaleSelector1=tradeScale0>
- *Crossword about Iceland*: <https://learningapps.org/watch?v=prq8ef0qj21>

4. Additional materials:

Adler M. 2017. *Geology and Scenery of Iceland*

Andrew R.E.B. 2008. *Volcanotectonic Evolution and Characteristic Volcanism of the Neovolcanic Zone of Iceland*

Arnalds O., Gísladóttir F.O., Sigurjónsson H. 2002. *Sandy desert of Iceland: an overview*. *Journal of Arid Environments* 47:359-371

Björnsson H. 1979. *Glaciers in Iceland*. *JÖKULL* 29:74-80

Björnsson H. 1992. *Jökulhlaups in Iceland: prediction, characteristics and simulation*. *Annals of Glaciology*.16

Denk T., Grímsson F., Zetter R., Símonarson L.A. 2011. *Late Cainozoic floras of Iceland. 15 million years of vegetation and climate history in the northern North Atlantic*

Chapter 1 *Introduction to the Nature and Geology of Iceland*. Springer Verlag

Fraedrich W., Heidari N. 2019. *Iceland from the West to the South*. Springer

Geological outline of Iceland. 1995. IGS International Symposium on glacial erosion and sedimentation, 26-28 Aug. 1995.

Iceland in figures. 2018. Volume 23. Published by Statistics Iceland Borgartún 21a IS-105 Reykjavík Iceland