

# Iceland

## Student Fieldwork Activity Book



# Iceland

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Task 1



# Iceland

## Geysir Center



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## Geysir Center



### Task 1:

Complete the following questions and tasks.

1. What is responsible for the amazing colour variations in geothermal hot springs and pools?

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2. For three geysirs of your choice, give the following information:

Geysir name: \_\_\_\_\_

Translation: \_\_\_\_\_

Reason for this name: \_\_\_\_\_

Geysir name: \_\_\_\_\_

Translation: \_\_\_\_\_

Reason for this name: \_\_\_\_\_

Geysir name: \_\_\_\_\_

Translation: \_\_\_\_\_

Reason for this name: \_\_\_\_\_

# Iceland

## Geysir Center



### Task 2:

1. How high do the eruptions of Strokkur reach?

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2. Draw and label 4 diagrams to explain the process of a geyser eruption:

A large, empty rectangular box with a thin black border, intended for drawing a diagram to explain the process of a geyser eruption.A large, empty rectangular box with a thin black border, intended for drawing a diagram to explain the process of a geyser eruption.A large, empty rectangular box with a thin black border, intended for drawing a diagram to explain the process of a geyser eruption.A large, empty rectangular box with a thin black border, intended for drawing a diagram to explain the process of a geyser eruption.







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## Gullfoss



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## Gullfoss



### The Golden Waterfall

Gullfoss is known as the Golden Waterfall. The falls are created from the power of the Hvítá river. The waters are a combination of the glacial meltwater from the Langjökull and Hofsjökull icecaps and rainwaters from the interior. Hvítá means 'White River' and the milky colour of the water is derived from glacial rock flour dissolved in the flow.

The waterfall is a result of isostatic uplift. The rise in the land after the ice age caused the river to readjust to a new base level. With increased erosional action, Hvítá cut down into its old profile and began to flow across a fault. Exposure of this weakness allowed the river to erode further and resulted in Gullfoss.

The waterfall is 32m high and tumbles down a double cascade before entering the gorge which is 70 metres deep and 2.5 kilometres long. The rock structure at Gullfoss is outlined in the adjacent diagram.

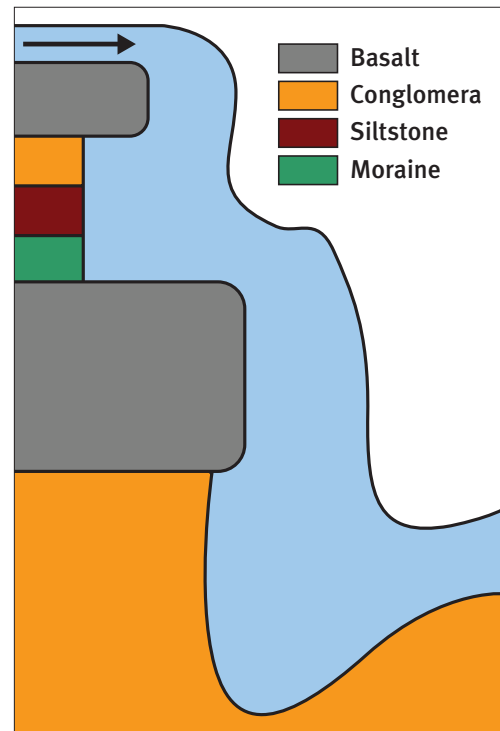
The old floodplains of the Hvítá can be seen when looking down towards the gorge. The fault line is evident from the gorge axis.



The glacial event known as a jökulhlaup, a glacial outburst, is the main cause of increased discharge from Hvítá.

Volcanic activity beneath the icecaps melts the overlying ice. Eventually sub-glacial channels are formed to release this meltwater into the fluvial system. Average discharge is 100-180m<sup>3</sup>/second.

The falls were saved from commercial exploitation by the actions of Sigríður Tómasdóttir and her father Tómas Tómasson. With HEP development in private hands Sigríður threatened to throw herself off the falls. The government then bought the falls.



Notes

# Iceland

## Gullfoss



### Student Activities

#### Task 1 asks students to look at the formation of the waterfall.

This activity can start conversations regarding theory and reality of annotating and recognising geological features.

**Iceland**  
**Gullfoss**

**Task 1:**

**Formation:**  
Gullfoss provides an example of a waterfall created as a result of resistant cap rock overlying softer more easily eroded rock. High discharge and velocities in the river have eroded the softer rock leaving a ledge of resistant rock. However, it is far more complex than this. The river abruptly changes direction as it follows a fault line. It also drops down in two distinct stages. The raised terraces represent the former floodplain. Land has risen since the last glacial period and the river has eroded vertically to establish a lower base level.

1. What is the name of the river that created Gullfoss? How does this translate into English?  
\_\_\_\_\_
2. Identify the resistant cap rock and the softer underlying geology.  
\_\_\_\_\_
3. What is the average rate of flow of water passing over Gullfoss?  
\_\_\_\_\_
4. What is the length and depth of the canyon that has been eroded below Gullfoss?  
\_\_\_\_\_
5. Explain why rates of flow are higher in summer than in winter.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

nst the experience shows 19

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## Gullfoss



### Student Activities

**Task 2 asks students to match labels to the correct positions on the waterfall image.**

This activity can start conversations regarding theory and reality of annotating and recognising geological features.

**Iceland**  
**Gullfoss**

Task 2:

1. Match the labels to the correct locations:

- A. Resistant cap rock
- B. Less resistant rock
- C. Upper drop: 22 metres
- D. Lower drop: 22 metres
- E. Former floodplain level
- F. Fault line
- G. Change in direction of river flow

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