

## Lesson Plan: Major Landforms: Mountains and Climate

Teacher-contributed lesson plan idea by Smita Kalvey, Vidya Valley School, Pune, India.

As a **High School** or **Undergraduate Geography** or **Earth Sciences** teacher, you can use this set of computer-based tools to teach about **mountains** that comprise one of Earth's major landforms and the factors that affect their climate.

This lesson plan will teach your students about **geomorphic characteristics** of mountains, **orogeny**- formation of mountains through **tectonic processes** in the Earth's crust and enable them to describe different **types of mountains** (such as **fold** and **fault-block** mountains) and **major mountain systems** of the world. This lesson plan also includes a resource to explain how global climatic factors affect mountains and how mountains in turn, affect regional climate.

Thus, the use of this lesson plan allows you to integrate the teaching of a climate science topic with a core topic in **Geography** or **Earth Sciences**.

Use this lesson plan to help your students find answers to:

1. What is orogeny? Where are most orogenic belts located?
2. Compare and contrast between fold and fault-block mountains.
3. How do global climatic factors affect mountain climate and how do mountains in turn, affect regional climate?

### About the Lesson Plan

**Grade Level:** High School, Undergraduate

**Discipline:** Geography, Earth Sciences

**Topic(s) in Discipline:** Orogeny, Tectonic Processes, Fold Mountains, Fault-Block Mountains, Volcanism, Crustal Shortening, Heating and Thermal Expansion, Alpine-Type Mountain Belts, Andean-Type Mountain Belts, Intracontinental Mountain Belts, Climate Factors- Latitude, Elevation and Continentality

**Climate Topic:** Climate and the Lithosphere

**Location:** Global

**Access:** Online, Offline

**Language(s):** English

**Approximate Time Required:** 50-60 min

# 1 Contents

## 1. Reading (25 min)

A reading that introduces mountains and explains how they are formed or destroyed. It also describes different mountain types and various mountain systems of the world.

This can be accessed at:

<https://www.britannica.com/science/mountain-landform>

## 2. Video lecture (~23 min)

A video lecture that explains how global climatic factors affect mountain climate and how mountains in turn, influence the local climate.

This can be accessed at:

<https://www.coursera.org/lecture/mountains-101/3-1-global-climate-drivers-mRHYC>

## 3. Reading (10 min)

A reading to describe the effect of climate change on mountains.

This can be accessed at:

<http://www.fao.org/3/i2869e/i2869e00.pdf> (pages 68-70)

#### 4. Suggested questions/assignments for learning evaluation

- What is orogeny? Where are most orogenic belts located?
- Compare and contrast between fold and fault-block mountains.
- How do global climatic factors affect mountain climate and how do mountains in turn, affect regional climate?

## 2 Step-by-step User Guide

Here is a step-by-step guide to using this lesson plan in the classroom/laboratory. We have suggested these steps as a possible plan of action. You may customize the lesson plan according to your preferences and requirements.

### 1. Topic introduction and discussion

Use the reading, '[Mountain- Landform](#)' by Peter H. Molnar, Encyclopedia Britannica, to introduce the topic of mountains and their geomorphic characteristics. Use the text to explain the tectonic processes that are involved in the formation and degradation of mountain belts. Describe different types of mountains such as fold and fault-block mountains giving suitable examples and explain the processes involved in their formation.

This can be accessed at:

<https://www.britannica.com/science/mountain-landform>

### 2. Develop the topic of mountains further by describing their role in climate

Play the video lecture, '[Global Climate Drivers](#)' by Coursera to introduce your students to the role of mountains in global climatic conditions. Use the video lecture to first describe various global climate drivers such as the Hadley Cells and the Coriolis Force that can cause imbalances in

temperature, wind and precipitation on the Earth's surface. Extend this understanding by using the lecture and the quoted examples to explain how factors such as latitude, elevation and continentality of mountains influence the climate of different regions across the globe. Discuss how these factors affect mountain climate and in turn, how regional or local climates are affected by mountain belts.

This can be accessed at:

<https://www.coursera.org/lecture/mountains-101/3-1-global-climate-drivers-mRHYC>

### 3. Discuss further

Use the reading, '[Mountains and Climate Change- From Understanding to Action](#)', pages 68-70, by Thomas Kohler and Daniel Maselli, Centre for Development and Environment (CDE), Bern, to briefly discuss the global geo-physical, biological and socio- economic effects of climate change on mountains.

This can be accessed at:

<http://www.fao.org/3/i2869e/i2869e00.pdf>

### 4. Questions/Assignments

Use the tools and the concepts learned so far to discuss and determine answers to the following questions:

- What is orogeny? Where are most orogenic belts located?
- Compare and contrast between fold and fault-block mountains.
- How do global climatic factors affect mountain climate and how do mountains in turn, affect regional climate?

## 3 Learning Outcomes

The tools in this lesson plan will enable students to:

- explain orogeny and the orogenic processes
- describe different types of mountains and major mountain systems of the world
- understand the factors determining mountain climate
- discuss how mountains affect regional climate

## 4 Additional Resources

If you or your students would like to explore the topic further, these additional resources will be useful.

### 1. Reading and Associated Video

A reading that describes fold mountains and includes an embedded video that shows how fold mountains are formed due to tectonic forces.

This can be accessed at:

<https://www.nationalgeographic.org/encyclopedia/fold-mountain/>

### 2. Video

A song-based video that describes fold mountains and their characteristics.

This can be accessed at:

<https://www.youtube.com/watch?v=Jy3ORlgyXyk&feature=youtu.be>

### 3. Video

A short film that shows the life cycle of mountains.

This can be accessed at:

<https://www.nationalgeographic.com/video/shorts/367324227714/>

## 5 Credits/Copyrights

All the teaching tools in our collated list are owned by the corresponding creators/authors/organizations as listed on their websites. Please view the individual copyright and ownership details for each tool by following the individual links provided. We have selected and analyzed the tools that align with the overall objective of our project and have provided the corresponding links. We do not claim ownership of or responsibility/liability for any of the listed tools.

### 1. Reading; 'Mountain- Landform'

By Peter H. Molnar, [Encyclopedia Britannica](#).

### 2. Video lecture; 'Global Climate Drivers'

Part of the course '[Mountains 101](#)', offered by University of Alberta. Hosted by [Coursera](#).

### 3. Reading; 'Mountains and Climate Change'

Kohler T. and Maselli D. (eds) 2009. Mountains and Climate Change - From Understanding to Action. Published by Geographica Bernensia with the support of the Swiss Agency for Development and Cooperation (SDC), and an international team of contributors. Bern. This publication is available from the [Mountain Partnership Secretariat, FAO](#).

### 4. Additional Resources

[National Geographic](#)

<https://www.youtube.com/user/chizzlewizzle941/feed>