

Geosite Project:

5-Lessons Geology Structure for Middle School Students

Overview

This educational project is designed to introduce middle school students (ages 11-13) to fundamental geological concepts through a structured 5-lesson approach. The program combines classroom instruction with hands-on field experience, culminating in a visit to a UNESCO Geopark geosite. The lessons integrate traditional frontal teaching with ~~cooperative learning and~~ dialogical teaching activities, ensuring students work in small groups of 3-5 members to enhance understanding and peer collaboration.

The project follows a progressive structure that builds from basic geological concepts to practical field application. Students begin with foundational knowledge about Earth's structure, processes, and history, then advance to understanding geodiversity and UNESCO Geoparks. The educational journey reaches its peak with a field excursion to a local Geosite, where students apply their theoretical knowledge in a real-world setting. The program concludes with reflection and assessment activities that consolidate learning outcomes.

Each lesson incorporates multimedia resources, including videos from the Geosite project, YouTube free content, slides with images, and interactive materials such as Rock Boxes containing minerals and rocks from the Park. The teaching methodology emphasizes active learning through ~~Dialogical Teaching and cooperative group work~~, hands-on exploration, and digital tools developed by the Erasmus Plus GEOSite project.

Lesson Structure

Lesson 1: General Geology Concepts - Part 1 (120 minutes, classroom)

This introductory lesson establishes the foundation for geological understanding. Students explore Earth's vast timeline through the 15-minute "A Geo Time Walk" video from the Geosite project, which contextualizes the 4.6 billion-year history of our planet. Following video discussion, the lesson covers Earth's internal structure, including the core, mantle, and crust, with particular attention to varying crustal thickness. Continental drift theory is presented through engaging film content, followed by discussions of faults, earthquakes, and their impact on landscapes. The lesson concludes with exploration of geological landscape features such as valleys, mountains, beaches, and cliffs through visual presentations, and an introduction to volcanic phenomena using YouTube video resources.

Lesson 2: General Geology Concepts - Part 2 (120 minutes, classroom)

Building upon the first lesson's foundation, this session delves deeper into Earth's materials and processes. Students learn to distinguish between rocks and minerals, understanding their fundamental differences and relationships. The three main rock types - sedimentary, magmatic, and metamorphic - are introduced with emphasis on their formation processes and characteristics. The highlight of this lesson is the hands-on **Rock Box** activity, where students work in cooperative learning groups to examine actual minerals and rocks from the Geopark using binocular microscopes and geological maps. This tactile experience reinforces theoretical concepts while developing observational and analytical skills essential for geological study.

Experiments with acid and lime stone will be made (10 minutes).

Lesson 3: Geodiversity and UNESCO Geoparks - Preparation (120 minutes, classroom)

This third preparatory lesson bridges theoretical knowledge with practical application. Students explore the relationship between geology and landscape formation, leading to an understanding of geodiversity as a concept. The lesson provides comprehensive coverage of UNESCO Geoparks, including their definition, historical development, and conservation objectives. Specific information about the UNESCO Geopark to be visited - in the fourth lesson - is presented, along with detailed preparation for the upcoming field excursion. Students receive information about the specific Geosite they will explore and are introduced to the digital tools developed by the Erasmus Plus GEOsite project that will enhance their field experience.

Lesson 4: Field Excursion to Geosite (240 minutes, field trip)

The culminating field experience allows students to apply their classroom learning in a real geological setting. The carefully structured 4-hour excursion includes 30 minutes travel time to the Geosite, followed by intensive field exploration using Flip Cards as educational tools. The 150 minutes of field activities are divided into two focused sessions with appropriate breaks for rest and refreshment. Students work in small groups to explore the Geosite systematically, using the FLIP CARD digital tool and other resources introduced in previous lessons. This hands-on experience reinforces theoretical concepts while developing practical geological observation and analysis skills. The return journey provides time for initial reflection on discoveries made during the field visit.

Lesson 5: Conclusions and Assessment (120 minutes, classroom)

The final lesson serves as both consolidation and evaluation of the entire learning experience. Students participate in structured discussions about their discoveries, questions raised, and knowledge gained throughout the program. The lesson employs ~~cooperative learning methodology~~ and dialogical Teaching , with students working in small groups to summarize their understanding of four key areas: general geological concepts, UNESCO Geoparks, the specific Geosite visited, and the digital tools utilized. This active approach allows students to share insights, clarify understanding, and demonstrate their learning outcomes. The lesson concludes with assessment activities that measure both individual and group learning achievements.

Lesson Summary Table

Lesson	Duration	Location	Main Topics	Teaching Methods	Resources
1	120 min	Classroom	Earth's history (4.6 billion years), Earth's structure (core, mantle, crust), Continental drift, Faults & earthquakes, Geological landscapes, Volcanic phenomena	Frontal teaching + Cooperative learning groups (3-5 students)	"A Geo Time Walk" video (15 min), Continental drift film, Slides with images, YouTube volcanic videos
2	120 min	Classroom	Rocks vs minerals distinction, Three rock types (sedimentary, magmatic, metamorphic), Hands-on rock identification	Frontal teaching + Cooperative learning with Rock Boxes	Rock Boxes with park minerals/rocks, Binoculars, Geological maps

Lesson	Duration	Location	Main Topics	Teaching Methods	Resources
3	120 min	Classroom	Geology & landscape relationships, Geodiversity concepts, UNESCO Geoparks (history, objectives), Local Geopark information, Geosite preparation, Digital tools introduction	Frontal teaching + Cooperative learning groups	Slides, Information materials about local UNESCO Geopark, Digital tools from Erasmus Plus GEOSite project
4	240 min	Field Trip	Geosite exploration and practical application of geological concepts	Field-based Dialogical Teaching with Flip Cards	Flip Cards, Digital tools, van or bus for Transportation, Field equipment
5	120 min	Classroom	Reflection on discoveries, Knowledge consolidation, Assessment of learning outcomes	Cooperative learning groups focusing on: General geology, UNESCO Geoparks, Visited Geosite, Digital tools used	Group work materials, Assessment tools

Key Educational Principles:

- **Dialogical Teaching:** all activities will be inspired by dialogue as a pedagogical principle and a powerful learning tool
- **Cooperative Learning:** some lesson incorporate small group Cooperative work (3-5 students)
- **Progressive Structure:** Building from basic concepts to practical application
- **Multimedia Integration:** Videos, slides, digital tools, and hands-on materials
- **Real-world Discovery:** Field experience at UNESCO Geopark Geosite
- **Reflective Practice:** Structured conclusion and assessment activities