Teacher Preparation Lesson Plan

Subject Area: Science
Unit Title: Rock Weathering
Grade Level: 9
Lesson Number: 1 of 10

Duration: 60 minutes
Date: 2024-02-20
Teacher: John Doe
Room: 101

Curriculum Standards Alignment

Content Standards:

- Understand the concept of rock weathering
- Identify and describe the different types of weathering
- Explain the importance of rock weathering in shaping the Earth's surface

Skills Standards:

- Analyze the factors that influence the rate and type of rock weathering
- Evaluate the impact of human activities on rock weathering

Cross-Curricular Links:

- Geology
- Environmental Science

Essential Questions & Big Ideas

Essential Questions:

- What is rock weathering and why is it important?
- How do different types of weathering affect the Earth's surface?

Enduring Understandings:

- Rock weathering is a fundamental process that shapes our planet's landscape
- Human activities can impact the rate and type of rock weathering

Student Context Analysis

Class Profile:

- Total Students: 25
- ELL Students: 5
- IEP/504 Plans: 3
- Gifted: 2

Learning Styles Distribution:

- Visual: 40%
- Auditory: 30%
- Kinesthetic: 30%

Teacher Preparation Lesson Plan

Pre-Lesson Preparation

Room Setup:

- Arrange desks in a U-shape to facilitate group work
- Set up a projector and screen for presentations

Technology Needs:

- Computer with internet access
- Projector and screen

Materials Preparation:

- Rock samples
- Handouts with guiding questions

Safety Considerations:

- Ensure students handle rock samples carefully

Detailed Lesson Flow

Pre-Class Setup (15 mins before)

- Set up the room and technology
- Prepare materials and handouts

Bell Work / Entry Task (5-7 mins)

- Ask students to write down what they know about rock weathering

Opening/Hook (10 mins)

- Show images or videos of examples of rock weathering

> **Engagement Strategies:**
>
> - Ask students to share their prior knowledge
> - Use visual aids to illustrate the concept

Direct Instruction (20-25 mins)

- Provide a detailed explanation of the different types of weathering

> **Checking for Understanding:**
>
> - Ask students to identify and describe the different types of weathering

Guided Practice (25-30 mins)

- Distribute rock samples and have students work in pairs to identify the type of weathering

Scaffolding Strategies:

- Provide guiding questions to focus their investigation

Independent Practice (20-25 mins)

- Ask students to design and conduct an experiment to demonstrate the process of mechanical weathering

Closure (10 mins)

- Review the key concepts learned during the lesson

Differentiation & Support Strategies

For Struggling Learners:

- Provide additional support and guidance during the guided practice

For Advanced Learners:

- Provide additional challenges and extensions during the independent practice

ELL Support Strategies:

- Provide visual aids and graphic organizers to support language development

Social-Emotional Learning Integration:

- Encourage students to work collaboratively and respect each other's ideas

Assessment & Feedback Plan

Formative Assessment Strategies:

- Observe student participation during the guided and independent practice

Success Criteria:

- Students can identify and describe the different types of weathering

Feedback Methods:

- Provide feedback during the guided and independent practice

Homework & Extension Activities

Homework Assignment:

Ask students to research and write a short report on a real-world example of rock weathering

Extension Activities:

- Ask students to design and conduct an experiment to demonstrate the process of chemical weathering

Parent/Guardian Connection:

Ask parents/guardians to encourage students to explore and learn about rock weathering in their everyday lives

Teacher Reflection Space

Pre-Lesson Reflection:

- What challenges do I anticipate?
- Which students might need extra support?
- What backup plans should I have ready?

Post-Lesson Reflection:

- What went well?
- What would I change?
- Next steps for instruction?

Introduction to Rock Weathering

What is Rock Weathering?

Rock weathering is the process of breaking down rocks into smaller fragments or minerals. It is a fundamental process that shapes our planet's landscape and plays a crucial role in the formation of soil, sediment, and landforms.

Types of Rock Weathering

Mechanical Weathering:

- Breakdown of rocks into smaller fragments through physical forces such as wind, water, and ice

Chemical Weathering:

- Breakdown of rocks through chemical reactions with water, air, and other substances

Factors Influencing Rock Weathering

Climate and Temperature

Climate and temperature play a significant role in rock weathering. High temperatures and high levels of rainfall can accelerate the weathering process, while low temperatures and low levels of rainfall can slow it down.

Human Activities

Human activities such as mining, construction, and agriculture can also impact rock weathering. These activities can alter the natural environment and increase the rate of weathering.

The Grand Canyon

The Grand Canyon is a classic example of rock weathering. The Colorado River has carved out a massive canyon over millions of years, exposing layers of rock and creating a unique landscape.

The Rocky Mountains

The Rocky Mountains are another example of rock weathering. The mountains have been shaped by a combination of mechanical and chemical weathering, resulting in a rugged and diverse landscape.

Summary

In conclusion, rock weathering is a fundamental process that shapes our planet's landscape. It is influenced by a combination of factors, including climate, temperature, and human activities. By understanding rock weathering, we can better appreciate the dynamic nature of our environment and the importance of preserving it for future generations.

Assessment

Students will be assessed on their understanding of rock weathering through a combination of formative and summative assessments, including quizzes, class discussions, and a final project.

Rock Weathering Diagrams

Insert diagrams of rock weathering processes

Guided Practice Handout

Insert guided practice handout

Independent Practice Materials

Insert independent practice materials

Quiz and Rubric

Insert quiz and rubric

Textbooks and Articles

Insert references to textbooks and articles

Online Resources

Insert references to online resources

Key Terms

Insert definitions of key terms