Teacher Preparation Lesson Plan

Subject Area: Earth Sciences
Unit Title: Understanding Igneous Rocks
Grade Level: 9
Lesson Number: 1 of 10

Duration: 60 minutes
Date: March 10, 2023
Teacher: Ms. Johnson
Room: 205

Curriculum Standards Alignment

Content Standards:

- Earth Sciences: Understand the characteristics and properties of igneous rocks
- Geology: Identify and describe the different types of igneous rocks

Skills Standards:

- Critical Thinking: Analyze the economic and environmental significance of igneous rocks
- Communication: Present information on the characteristics and properties of igneous rocks

Cross-Curricular Links:

- Mathematics: Calculate the percentage of minerals in an igneous rock
- Language Arts: Write a report on the importance of igneous rocks in construction

Essential Questions & Big Ideas

Essential Questions:

- What are the characteristics and properties of igneous rocks?
- How are igneous rocks formed?
- What is the economic and environmental significance of igneous rocks?

Enduring Understandings:

- Igneous rocks have unique characteristics and properties that distinguish them from other types of rocks
- The formation of igneous rocks is a complex process that involves the cooling and solidification of magma or lava
- Igneous rocks have significant economic and environmental implications

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%

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:

- Igneous rock samples
- Handouts with guided notes

Safety Considerations:

- Ensure students handle rock samples carefully
- Provide gloves for students to wear when handling rocks

Detailed Lesson Flow

Introduction (10 minutes)

- Introduce the topic of igneous rocks
- Show a video on igneous rocks

Direct Instruction (20 minutes)

- Explain the formation of igneous rocks
- Discuss the characteristics and properties of igneous rocks

> **Engagement Strategies:**
>
> - Think-pair-share
> - Group discussion

Guided Practice (20 minutes)

- Have students work in groups to match igneous rock samples with their characteristics
- Circulate around the room to provide guidance and answer questions

> **Scaffolding Strategies:**
>
> - Provide sentence stems for students to use when describing igneous rocks
> - Offer one-on-one support to students who need it

Independent Practice (20 minutes)

- Have students complete a worksheet on the characteristics and properties of igneous rocks
- Allow students to use their notes and textbooks for reference

Closure (10 minutes)

- Review the key points of the lesson
- Ask students to reflect on what they learned

Differentiation & Support Strategies

For Struggling Learners:

- Provide additional support materials, such as visual aids and simplified texts
- Offer one-on-one assistance and accommodations

For Advanced Learners:

- Provide extension activities, such as researching and presenting on advanced topics
- Encourage students to take on leadership roles in group activities

ELL Support Strategies:

- Provide bilingual resources and multimedia materials
- Offer extra time to complete assignments and assessments

Social-Emotional Learning Integration:

- Encourage students to work collaboratively and respect each other's opinions
- Teach students to self-regulate their emotions and behaviors

Assessment & Feedback Plan

Formative Assessment Strategies:

- Quizzes and class discussions
- Observations of student participation and engagement

Success Criteria:

- Students can identify and describe the characteristics and properties of igneous rocks
- Students can explain the formation of igneous rocks

Feedback Methods:

- Verbal feedback during class discussions
- Written feedback on assignments and assessments

Homework & Extension Activities

Homework Assignment:

Have students research and write a short report on a type of igneous rock

Extension Activities:

- Have students create a model of an igneous rock formation
- Have students research and present on the economic and environmental significance of igneous rocks

Parent/Guardian Connection:

Send a letter to parents/guardians explaining the lesson and asking for their support

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?

Igneous Rock Formation

Intrusive Igneous Rocks:

- Formed from the cooling and solidification of magma beneath the Earth's surface
- Typically coarse-grained

Extrusive Igneous Rocks:

- Formed from the cooling and solidification of lava on the Earth's surface
- Typically fine-grained

Characteristics and Properties of Igneous Rocks

Texture:

- Phaneritic: coarse-grained
- Aphanitic: fine-grained
- Porphyritic: mixture of coarse-grained and fine-grained

Color:

- Black
- Brown
- Gray
- White

Composition:

- Quartz
- Feldspar
- Mica

Economic and Environmental Significance of Igneous Rocks

Economic Significance:

- Source of minerals and metals
- Used in construction

Environmental Significance:

- Formation of landscapes
- Creation of natural hazards such as volcanic eruptions

Conclusion

Summary:

- Igneous rocks have unique characteristics and properties
- Igneous rocks are formed from the cooling and solidification of magma or lava
- Igneous rocks have significant economic and environmental implications

Assessment:

- Formative assessments: quizzes and class discussions
- Summative assessments: written test and group presentation