Teacher Preparation Lesson Plan

Subject Area: Environmental Science
Unit Title: Ecosystems and Food Webs
Grade Level: 9-12
Lesson Number: 1 of 7

Duration: 45 minutes
Date: March 10, 2023
Teacher: Ms. Jane Smith
Room: Science Lab

Curriculum Standards Alignment

Content Standards:

- HS-LS2-1: Analyze and interpret data for natural selection and speciation
- HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about all types of biological communities

Skills Standards:

- Scientific Inquiry
- Critical Thinking

Cross-Curricular Links:

- Mathematics: Data analysis and graphing
- English Language Arts: Technical writing and communication

Essential Questions & Big Ideas

Essential Questions:

- What are the components of an ecosystem?
- How do living and non-living factors interact in an ecosystem?

Enduring Understandings:

- Ecosystems are complex systems that include living and non-living components
- Human activities can impact ecosystem balance and biodiversity

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 groups of 4-5
- Set up whiteboard and markers

Technology Needs:

- Computers or laptops with internet access
- iNaturalist, PlantNet, and eBird software

Materials Preparation:

- Printed copies of ecosystem diagrams
- Whiteboard markers

Safety Considerations:

- Ensure students understand proper use of technology and software

Detailed Lesson Flow

Introduction (10 minutes)

- Introduce the concept of ecosystems and their importance
- Review learning objectives and outcomes

Direct Instruction (20 minutes)

- Define and describe biotic and abiotic factors
- Use diagrams and examples to illustrate ecosystem components

> **Engagement Strategies:**
>
> - Think-pair-share to encourage discussion
> - Visual aids to support learning

Guided Practice (20 minutes)

- Have students work in groups to create ecosystem diagrams
- Circulate to provide guidance and answer questions

> **Scaffolding Strategies:**
>
> - Provide sentence stems for writing
> - Offer one-on-one support as needed

Differentiation & Support Strategies

For Struggling Learners:

- Provide additional support and scaffolding
- Offer visual aids and graphic organizers

For Advanced Learners:

- Provide additional challenges and extensions
- Encourage independent research and projects

ELL Support Strategies:

- Provide visual aids and graphic organizers
- Offer one-on-one support and scaffolding

Social-Emotional Learning Integration:

- Encourage teamwork and collaboration
- Model and teach respect and empathy

Assessment & Feedback Plan

Formative Assessment Strategies:

- Observations of student participation and engagement
- Review of student work and diagrams

Success Criteria:

- Students can define and describe biotic and abiotic factors
- Students can create ecosystem diagrams

Feedback Methods:

- Verbal feedback during group work
- Written feedback on student work

Lesson Activities

Activity 1: Ecosystem Diagrams

- Have students work in groups to create ecosystem diagrams
- Encourage students to include biotic and abiotic factors

Activity 2: Food Web Creation

- Have students work in groups to create food webs
- Encourage students to include producers, consumers, and decomposers

Technology Integration

iNaturalist:

- Have students use iNaturalist to identify and record plant and animal species
- Encourage students to contribute to citizen science projects

PlantNet and eBird:

- Have students use PlantNet and eBird to identify and record plant and bird species
- Encourage students to contribute to citizen science projects

Assessment and Evaluation

Formative Assessment:

- Observations of student participation and engagement
- Review of student work and diagrams

Summative Assessment:

- Written test on ecosystem components and food webs
- Review of student-created ecosystem diagrams and food webs

Evaluation Criteria

Content Knowledge:

- Students can define and describe biotic and abiotic factors
- Students can create ecosystem diagrams and food webs

Critical Thinking and Problem-Solving:

- Students can analyze and interpret data on ecosystem components and food webs
- Students can evaluate the impact of human activities on ecosystems

Conclusion and Reflection

Conclusion:

- Review key concepts and takeaways from the lesson
- Emphasize the importance of ecosystem conservation and sustainability

Reflection:

- Have students reflect on their learning and what they would like to learn more about
- Encourage students to think about how they can apply what they have learned to real-world situations

Teacher Reflection

What worked well in this lesson?

- Students were engaged and participated in activities
- Students demonstrated understanding of ecosystem components and food webs

What could be improved in this lesson?

- More time could be allocated for student reflection and discussion
- Additional support could be provided for struggling students

Appendices

Appendix A: Ecosystem Diagrams

- Examples of ecosystem diagrams
- Blank templates for students to create their own diagrams

Appendix B: Food Web Creation

- Examples of food webs
- Blank templates for students to create their own food webs

References

References:

- National Geographic: Ecosystems
- Smithsonian: Food Webs