Teacher Preparation Lesson Plan

Subject Area: Math
Unit Title: Building and Extending Patterns with Basic Math Operations
Grade Level: 3-4
Lesson Number: 1 of 10

Duration: 60 minutes
Date: March 10, 2024
Teacher: Ms. Johnson
Room: 101

Curriculum Standards Alignment

Content Standards:

- Recognize and extend patterns using shape and color
- Identify and create patterns using numbers
- Create and extend patterns using basic math operations

Skills Standards:

- Use critical thinking to solve problems
- Communicate mathematical ideas effectively
- Use technology to enhance learning

Cross-Curricular Links:

- Science: Patterns in nature
- Art: Patterns in design
- Music: Patterns in rhythm

Essential Questions & Big Ideas

Essential Questions:

- What is a pattern?
- How can we create and extend patterns using basic math operations?
- Why are patterns important in real-life situations?

Enduring Understandings:

- Patterns are all around us and can be found in nature, art, and music
- Basic math operations can be used to create and extend patterns
- Patterns can be used to solve problems and make predictions

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 pairs
- Prepare materials for pattern blocks activity
- Set up technology for presentation

Technology Needs:

- Computer with internet access
- Projector and screen
- Tablets for students

Materials Preparation:

- Pattern blocks
- Worksheets for pattern recognition
- Math operation charts

Safety Considerations:

- Ensure students handle materials safely
- Supervise students during activities
- Have a first aid kit available

Detailed Lesson Flow

Pre-Class Setup (15 mins before)

- Set up room and materials
- Prepare technology
- Review lesson plan

Bell Work / Entry Task (5-7 mins)

- Pattern recognition game
- Introduction to patterns
- Review of math operations

Opening/Hook (10 mins)

- Introduction to lesson topic
- Engagement strategies
- Review of learning objectives

> **Engagement Strategies:**
>
> - Think-pair-share
> - Group discussion
> - Hands-on activity

Direct Instruction (20-25 mins)

- Direct instruction on pattern recognition

- Use of visual aids and examples
- Guided practice

> **Checking for Understanding:**
>
> - Formative assessment
> - Quizzes
> - Class discussion

Guided Practice (25-30 mins)

- Pattern blocks activity
- Worksheets for pattern recognition
- Math operation charts

> **Scaffolding Strategies:**
>
> - Provide support for struggling students
> - Offer challenges for advanced students
> - Encourage peer-to-peer support

Independent Practice (20-25 mins)

- Pattern creation activity
- Math operation practice
- Reflection and self-assessment

Closure (10 mins)

- Review of learning objectives
- Assessment and feedback
- Conclusion and reflection

Differentiation & Support Strategies

For Struggling Learners:

- Provide extra support and scaffolding
- Offer one-on-one instruction
- Use visual aids and examples

For Advanced Learners:

- Offer challenges and extensions
- Provide opportunities for leadership
- Encourage independent practice

ELL Support Strategies:

- Use visual aids and examples
- Provide bilingual resources
- Offer one-on-one instruction

Social-Emotional Learning Integration:

- Encourage self-awareness and self-regulation
- Teach empathy and communication skills
- Foster a positive classroom environment

Assessment & Feedback Plan

Formative Assessment Strategies:

- Quizzes and class discussions
- Observations and feedback
- Self-assessment and reflection

Success Criteria:

- Students can recognize and extend patterns
- Students can create and extend patterns using basic math operations
- Students can communicate mathematical ideas effectively

Feedback Methods:

- Verbal feedback
- Written feedback
- Peer-to-peer feedback

Homework & Extension Activities

Homework Assignment:

Create a pattern using basic math operations and explain how you created it.

Extension Activities:

- Create a pattern using real-world examples

- Research and present on a famous mathematician
- Design a math-themed game or puzzle

Parent/Guardian Connection:

Encourage parents/guardians to ask their child about their pattern creation and provide feedback and 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?

What is a Pattern?

A pattern is a repeating sequence of objects, colors, or shapes. Patterns can be found in nature, art, and music.

Examples of Patterns:

- Alternating colors
- Repeating shapes
- Mathematical sequences

Why are Patterns Important?

Patterns are important because they help us understand and describe the world around us. They can be used to solve problems, make predictions, and create art and music.

Real-World Applications of Patterns:

- Science: Patterns in nature
- Art: Patterns in design
- Music: Patterns in rhythm

Using Basic Math Operations to Build and Extend Patterns

Basic math operations such as addition, subtraction, multiplication, and division can be used to build and extend patterns.

Examples of Building and Extending Patterns:

- Adding 2 to a number to create a pattern
- Subtracting 1 from a number to extend a pattern
- Multiplying a number by 2 to create a pattern

Guided Practice: Building and Extending Patterns

Activity 1: Pattern Blocks

Use pattern blocks to create and extend patterns.

Activity 2: Number Patterns

Use worksheets to identify and create number patterns.

Pattern Creation Activity

Create a pattern using basic math operations and explain how you created it.

Success Criteria:

- Pattern is created using basic math operations
- Pattern is extended correctly
- Explanation is clear and concise

Math Operation Practice

Practice using basic math operations to build and extend patterns.

Examples of Math Operation Practice:

- Adding 2 to a number to create a pattern
- Subtracting 1 from a number to extend a pattern
- Multiplying a number by 2 to create a pattern

Formative Assessment

Use quizzes, class discussions, and observations to assess student understanding.

Success Criteria:

- Students can recognize and extend patterns
- Students can create and extend patterns using basic math operations
- Students can communicate mathematical ideas effectively

Conclusion

In conclusion, building and extending patterns with basic math operations is a fundamental concept that students should master. By the end of this lesson, students will be able to identify, create, and extend patterns using addition, subtraction, multiplication, and division.

Next Steps:

- Review and practice building and extending patterns
- Apply patterns to real-world situations
- Continue to develop math skills and knowledge