

## 4th Grade Lesson Plan: Exploring Algorithms and Patterns with AI

### Common Core State Standards (CCSS) Alignment:

- **CCSS.MATH.CONTENT.4.OA.C.5:** Generate and analyze patterns.

**Lesson Title:** Exploring Algorithms and Patterns with AI

### Objective:

By the end of this lesson, students will be able to:

1. Understand the concept of algorithms as step-by-step instructions.
2. Recognize how AI uses algorithms to identify and predict patterns.
3. Create simple algorithms to solve pattern-based problems.

**Materials Needed:**  Chart paper and markers

Printed handouts with pattern problems

Access to an AI voice assistant at Elementary School AI Agent

Computers or tablets with internet access

### Lesson Structure:

#### 1. Introduction (10 minutes)

##### **Teacher-Led Discussion:**

- Ask: "Have you ever followed a recipe or a set of instructions to build something?"
- Explain that an algorithm is like a recipe—a set of step-by-step instructions to solve a problem or complete a task.
- Discuss how computers and AI use algorithms to make decisions and recognize patterns.

#### 2. Activity (15 minutes)

##### **Exploring Patterns**

- Review different types of patterns (numeric, geometric, etc.).
- Provide students with handouts containing various patterns and ask them to identify and extend them.
- Discuss the rules that govern these patterns and how identifying these rules is similar to creating an algorithm.

##### **AI and Pattern Recognition**

- Introduce the concept of AI and how it uses algorithms to recognize patterns.

- Demonstrate using an AI voice assistant to answer a question or perform a task.
- Discuss how AI processes information and uses algorithms to provide responses.

### 3. Hands-On Practice (15 minutes)

#### Creating an Algorithm

- Divide students into small groups and assign each group a pattern-based problem.
- Ask each group to write a step-by-step algorithm explaining how to identify and extend the pattern.
- Have groups present their algorithms to the class and discuss the different approaches.

### 4. Discussion & Reflection (10 minutes)

#### Guided Class Discussion:

- Ask: "How do you think AI learns to recognize patterns?"
- Discuss real-life applications of AI in everyday technology (e.g., voice assistants, search engines, recommendation systems).

#### Closing Activity:

- Have students write a question they would like to ask an AI about patterns.
- Exit question: "Why do you think algorithms are important in AI?"

**Assessment:**  Observe group discussions and presentations for understanding of algorithms and pattern recognition.

Review students' written algorithms for clarity and accuracy.

#### **Extension Activities:** For Early Finishers:

- Encourage students to explore coding platforms like Scratch to create simple programs that follow their algorithms.

#### For Extra Challenge:

- Discuss more complex patterns (e.g., Fibonacci sequence) and have students explore how AI could use such patterns.

By engaging in hands-on activities and discussions, students will develop a deeper understanding of algorithms and how AI utilizes patterns to function! 