Project Title: Exploring Fractions on a Number Line

Grade Level: 3rd–4th Grade
Subject: STEM/Mathematics
Duration: 2 Days
Project Focus: Representing fractions on a number line
Project Description:
In this project, students will explore and represent fractions on a number line. They will create their own number lines, place fractions on them, and explain their reasoning. The project will help students visualize fractions as parts of a whole and understand how to locate fractions on a number line.

Materials Needed:

- Whiteboard and markers
- Rulers
- Large paper or chart paper
- Markers, colored pencils
- Fraction strips (optional)
- Fraction Number Line Worksheet
- Interactive Fraction Apps (optional)
- Scissors (optional, for cutting fraction strips)
- Glue or tape (optional, for attaching fraction strips)

Project Objectives:

- Students will learn how to represent fractions on a number line.
- Students will understand the relationship between whole numbers and fractions.
- Students will practice comparing and placing different fractions (e.g., **1/4**, **1/2**, **3/4**) on a number line.
- Students will collaborate and discuss their fraction placement with peers.

Project Steps:

Day 1: Introduction and Hands-On Practice

1. **Introduction**:
   Start by explaining what fractions are and how they represent parts of a whole. Use simple examples, such as **1/2**, **1/4**, and **3/4**, to introduce the concept of fractions on a number line.

2. **Create a Number Line**:
   On large paper or chart paper, have students draw a number line that starts from **0** and goes to **1**. Use a ruler to make sure the line is straight.
3. **Mark Fractions on the Number Line**:
   Using fraction strips or by dividing the space between **0** and **1** into equal parts, help students place fractions like **1/2**, **1/4**, and **3/4** on their number lines. Discuss where each fraction goes and why.
4. **Individual Practice**:
   Give students a **Fraction Number Line Worksheet** to complete individually. On this worksheet, students will draw their own number lines and place fractions on them. They will then write a short explanation for each fraction's placement.

Day 2: Exploration and Real-Life Application

1. **Review**:
   Begin the second day by reviewing what students learned about fractions and number lines on Day 1. Ask some students to share their number lines with the class and explain where they placed their fractions.
2. **Measuring with Fractions**:
   Explain how fractions on a number line can be used to measure distances. For example, if a yardstick has **1/2** and **1/4** markings, students can use a number line to measure portions of the yardstick.
3. **Group Activity**:
   Have students work in pairs or small groups. Give each group a ruler or yardstick. Ask them to measure a specific fraction on the ruler (e.g., **3/4**) and discuss how the number line helps them see the fraction's placement.
4. **Presentations**:
   Each group will present their findings, explaining how they used a number line to find the correct fraction and why the fraction is placed at that point.

Assessment:

- Review the **Fraction Number Line Worksheets** to assess each student's understanding of fractions and their ability to correctly place fractions on a number line.
- Observe group discussions and presentations to ensure students can explain their reasoning for placing fractions at specific locations on the number line.

Extensions and Challenges:

- For students who finish early, challenge them to represent fractions greater than **1** (e.g., **5/4**, **3/2**) on a number line.

- Ask students to compare two fractions (e.g., **3/4** and **2/3**) and determine which one is greater by placing them on the number line.

Safety Note:

Ensure students are using rulers and other materials safely. Be cautious when handling scissors if students are cutting fraction strips, and make sure students use materials responsibly to prevent accidents.

Accommodations for ELL and ESE Students:

For English Language Learners (ELL), use visual aids like fraction strips and interactive apps that can help them better understand the placement of fractions. Pair ELL students with classmates who can help explain the lesson in simpler language. For students with exceptionalities (ESE), allow extra time to complete tasks and use hands-on materials like fraction strips to provide a more concrete understanding of fractions. Additionally, offer verbal explanations and allow students to work at their own pace.