Scenario 3: Mixture Problem

Objective: Solve a problem involving mixing two solutions to achieve a desired concentration.

Details:

- You have a 20% saline solution and a 50% saline solution. How much of each solution should be mixed to obtain 100 liters of a 30% saline solution?
- **Rational Equation:** Let x be the amount of 20% solution, and $100 - x$ be the amount of 50% solution. The equation is given by:

$$0.2x + 0.5(100 - x) = 0.3 \times 100$$

Activity:

1. **Set Up the Problem:**
   - Understand the concentrations and volumes and set up the rational equation.
2. **Solve the Rational Equation:**
   - Simplify and solve for x:

$$0.2x + 50 - 0.5x = 30 \implies -0.3x + 50 = 30 \implies -0.3x = -20 \implies x = \frac{-}{-}$$

   - Calculate the amount of the 50% solution: $100 - 66.67 \approx 33.33$ liters.
3. **Interpret Results:**
   - Discuss how much of each solution should be mixed and the role of rational equations in solving mixture problems.