Lesson Plan: Exploring Probability with Rock, Paper, Scissors, Lizard, Spock

Objective:

- Students will learn how to record, describe, and analyze the frequency of outcomes in simple probability experiments.
- They will understand randomness, fairness, equally likely outcomes, and unequally likely outcomes.
- Students will use appropriate language and grasp the 0-1 probability scale.

Grade Level:

- Suitable for KS3 11-14 year old pupils

Duration:

- Approximately **45 minutes** (adjustable based on class pace).

Materials Needed:

- Whiteboard or chart paper
- Markers
- Rock, Paper, Scissors, Lizard, Spock reference cards (optional)

Introduction (10 minutes):

1. **Engage**: Begin by asking students if they've played Rock-Paper-Scissors before. Briefly discuss the basic rules.
2. **Introduce the Twist**: Explain that today, they'll play an extended version called "Rock-Paper-Scissors-Lizard-Spock." Show them the additional choices (Lizard and Spock) and their interactions:
    - Rock crushes Scissors
    - Scissors cuts Paper
    - Paper covers Rock
    - Rock crushes Lizard
    - Lizard poisons Spock
    - Spock smashes Scissors
    - Scissors decapitates Lizard
    - Lizard eats Paper
    - Paper disproves Spock
    - Spock vaporizes Rock

Main Activity (25 minutes):

1. Play the Game:
    - Divide students into pairs.
    - Each pair plays several rounds of Rock-Paper-Scissors-Lizard-Spock.
    - Encourage them to keep track of their wins, losses, and ties.
2. Recording and Analyzing Outcomes:
    - After playing, gather the class.
    - On the whiteboard, create a table with columns for each choice (Rock, Paper, Scissors, Lizard, Spock).
    - Record the number of times each choice wins, loses, or ties.
    - Discuss randomness and how outcomes can vary.
3. Discuss Fairness and Equally Likely Outcomes:
    - Ask students:
        - Are all choices equally likely to win?
        - Is the game fair?
    - Discuss the concept of fairness and how it relates to probability.
4. Unequally Likely Outcomes:
    - Discuss why some outcomes are more likely than others (e.g., Rock vs. Lizard is less likely than Rock vs. Scissors).
    - Calculate the probabilities of specific outcomes (e.g., P(Rock wins) = ?).

Conclusion (10 minutes):

1. Reflect and Summarize:
    - Have students share their observations.
    - Summarize key points:
        - Probability involves analyzing outcomes.
        - Fairness matters.
        - Probabilities range from 0 to 1.
2. Homework (Optional):
    - Ask students to create their own probability experiments (e.g., rolling dice, flipping coins) and record outcomes.

Assessment:

- Informally assess student participation during discussions and their ability to calculate probabilities.

Extension (Challenge):

- Introduce conditional probabilities (e.g., given that Rock is chosen, what's the probability of winning?).

Remember to adapt the lesson plan to your students' needs and provide opportunities for hands-on exploration. Probability can be both fun and educational!