8th Grade Science Lab: Investigating Natural Selection

Objective:
Students will explore the concept of natural selection by simulating how environmental changes can affect a population of species over time.

Materials Needed:

- Colored paper clips (red, green, blue, yellow)
- Large container or tray
- Tweezers
- Timer or stopwatch
- Data recording sheets
- Graph paper

Safety Precautions:

- Students stay at their lab stations to prevent accidents.
- Use tweezers carefully to avoid injury.

Lab Duration: 40 minutes

Lab Procedure:

Introduction (5 minutes):

1. Briefly explain the concept of natural selection.
2. Discuss how certain traits can help organisms survive better in specific environments.

Experiment Setup (5 minutes):

1. Mix all colored paper clips in the container. Each color represents a different trait in a species.
2. Spread the paper clips randomly over a large surface (e.g., table or tray).

Simulation Activity (20 minutes):

1. Divide students into groups. Each group will simulate a different environment.
2. Assign roles: one student will be the "predator" using tweezers, while others will record data.

3. Set the timer for 1 minute. The predator will use tweezers to pick up as many paper clips as possible.
4. After 1 minute, count how many of each color remain. Record the data.
5. Repeat the simulation for three rounds, altering the "environment" by changing the background color (e.g., use colored paper) to see how it affects the visibility of paper clip colors.
6. After three rounds, have students graph their results to observe patterns.

Reflection and Discussion (10 minutes):

1. **Reflection Questions:**
   - Which color paper clip was most often picked up? Why?
   - How did changing the background affect which paper clips were picked up?
   - How does this simulation represent natural selection?
2. **Assessment:**
   - Have students write a brief paragraph explaining how natural selection can lead to changes in species over generations.
   - Discuss how this lab relates to real-world examples of natural selection.

MS-LS4-1 Standards Addressed:

1. Analyze and interpret data to provide evidence for the effects of natural selection on the traits of populations.
2. Use simulations to understand how changes in environmental conditions can lead to natural selection.

Conclusion:

Review the main concepts learned from the lab and emphasize the importance of understanding how environmental factors can influence the survival of species.