Science Lab: Exploring Technologies that Influence Inheritance of Traits

Grade Level: 8th Grade

Duration: 30 minutes

Objective:
Students will explore and understand the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

Materials Needed:

- Printed handouts on selective breeding, genetic engineering, and CRISPR technology
- Chart paper and markers
- Access to a computer or tablet (optional for further research)

Safety Precautions:

- Follow school safety policies at all times.

Introduction (5 minutes):

- Begin with a brief discussion on how humans have historically influenced the traits of plants and animals.
- Introduce the technologies: selective breeding, genetic engineering, and CRISPR.

Activity Steps:

1. **Group Discussion and Research (10 minutes):**
    - Divide students into small groups.
    - Assign each group one of the technologies: selective breeding, genetic engineering, or CRISPR.
    - Provide handouts and allow access to computers/tablets for additional research.
    - Ask each group to discuss and note how their assigned technology works and its impact on inheritance.
2. **Create a Concept Map (10 minutes):**
    - Using chart paper, have each group create a concept map illustrating how their technology influences the inheritance of traits.
    - Encourage creativity and clarity in their maps.
3. **Presentation and Reflection (5 minutes):**

- Each group presents their concept map to the class.
- After presentations, lead a reflection discussion with the following questions:
    - What are the benefits and drawbacks of each technology?
    - How do these technologies compare to natural selection?

Assessment:

- Observe group discussions and concept map presentations to assess understanding.
- Collect completed concept maps for evaluation.

Reflection Questions:

1. How have technologies like CRISPR changed our approach to influencing inheritance compared to traditional methods like selective breeding?
2. What ethical considerations should be taken into account when using genetic engineering?

Standards Addressed:

- **MS-LS4-5:** Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
- **MS-LS4-4:** Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.