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Lab Title: Cognitive Development

Section 1: Performance Expectations

What will the student be asked to do?

- Select one or more performance standards:
  - Plan and carry out a scientific investigation relating to cognitive development
  - Analyze data from their experiments with two subjects
  - Communicate their findings and identify which cognitive stage applies

Main Idea/Concept Demonstrated or Taught by Lab:

This lab will require students to collect and present data on Jean Piaget's Cognitive Developmental Stages.

At the end of this lab, students should be able to:

- Demonstrate an understanding of the Jean Piaget's Cognitive Developmental Stages
- Identify which subject would coincide with which cognitive developmental stage
- Identify the developmental phenomena (or milestones) which apply to their subjects

Key Terms and Psychologists Associated with Main Idea/Concept:

cognitive development, Jean Piaget, schemas, assimilation, accommodation, sensorimotor, preoperational, concrete operational, formal operational, stranger anxiety, object permanence, egocentrism, conservation, mathematical transformations, abstract thinking

Materials:

Students will need to find two subjects ranging from 8 months – 13 years old. Students will create experiments that would identify which cognitive developmental stage the subjects are in. Students will need to get parental consent to use the children in their experiments.

Instructions:

1. Students should plan in advance which children they would like to observe and get parental permission.
2. Students should hypothesize which age the child is in according to Piaget's stages.
3. Students should create experiments to test the child's cognitive stage.
   a. **Sensorimotor** - For example, if a student chooses an 8-month-old, assess object permanence. The student could hide an object under a blanket and see if the infant still thinks it exists or not. A student could observe whether or not the infant exemplifies stranger anxiety.
   b. **Preoperational** - For example, if a student chooses a 4-year old, the student could ask the child specific questions about the world around them. Why is the grass green? Do you have a brother? The students would look for egocentrism.
   c. **Concrete Operational** - Another experiment could be for conservation; a student could ask a 4-year-old how many pennies are on the table in front of the child. The child

responds. Then, spread out another row of equal amount of pennies on the table (above the previous row) and as which row has more. The student could also do an experiment with liquid. Have two glasses holding equal amounts of liquid. Then, pour the liquid into a taller glass. Ask the child about the amount of liquid. Is the amount the same or not? This would identify a lack of conservation. Then, do the same experiment with an 8-year-old. The student would then compare and contrast the results.

4. Students have the flexibility to choose which ages they would like to work with to take advantage of the relationships they may already have (may be easier to find subjects). Ideally, students should video the children doing the experiments. The students could discuss their follow-up questions and findings in the video and submit the video as an assignment. The videos should include the following: the experiments with both subjects, the follow up discussion regarding both subjects relating to Jean Piaget's Cognitive Developmental Stages.

Follow-up and Discussion:

- Ask students to apply Piaget's stages to the children they observed. Students should identify the correct Piaget stage the children are currently in.
- Ask students to identify any developmental phenomena or milestones they witnesses or did not observe. For example, lack of conservation or egocentrism.
- Ask students to reflect how they would have conducted the experiment differently.

Section 2: Crosscutting Concepts

Select at Least One

- Select one or more of the following cross-cutting concepts central to the phenomena that students will investigate:
  - Does cognitive development remain *stable* over time or *change* over time with experience?
- Describe how the cross-cutting concept(s) will factor into the lab.
  - Students will be able to observe how a stage theory is stable or changes over time.
  - Students will be able to observe patterns if they choose two similar ages for the experiments.

Section 3: Lab Report (written, verbal, or recorded)

Suggested Content to be Included in Student Report:

- Students will create experiments to identify which cognitive development stage the subjects are in.
- Students will identify the developmental phenomena in each stage, whether present or not. For example, lack of conservation or egocentrism.
- Students could video the experiments and their follow up discussion relating to Piaget's stages and submit to the teacher for an assignment.
- Students should reflect how they would have modified the experiment.

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