2nd/3rd Mystery Build: A Collaborative STEM Challenge

Grade Level: 2nd-3rd Grade

Time Required: 45-60 minutes

Materials Needed:

- LEGO sets or similar building blocks
- Timer
- Paper and crayons/markers for reflection

Texas Essential Knowledge and Skills (TEKS) Addressed:

- Science:
    - 2.2 Scientific investigation and reasoning. The student develops abilities to ask questions and seek answers in classroom and outdoor investigations. The student is expected to:
        - (A) ask questions about organisms, objects, and events during observations and investigations.
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- Mathematics:
    - 2.1 Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
        - (A) apply mathematics to problems arising in everyday life, society, and the workplace;
        - (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;

Objectives:

- Students will practice descriptive language skills by verbally describing LEGO structures.
- Students will engage in teamwork and collaboration.
- Students will experience the challenges of interpreting and conveying information accurately.
- Students will reflect on their learning experiences and identify strategies for improvement.

Procedure:

Introduction (10 minutes):

- Begin by discussing the importance of teamwork and communication in solving problems.
- Explain the activity: students will work in pairs with different roles – the Observer and the Builder.
- Describe the task: the Observer will view a LEGO structure hidden from the Builder's view. The Observer must then describe the structure to the Builder, who will try to replicate it using their own set of LEGO pieces.
- Emphasize the need for clear and detailed descriptions without using gestures.

Activity (20-30 minutes):

- Divide students into pairs and assign roles (Observer and Builder).
- Set a timer for 3-5 minutes for each round.
- Allow the Observers to view the LEGO structure while the Builders wait with their sets blocked from view.
- Lookers describe the structure to their Builders without using gestures.
- Builders attempt to replicate the structure based on the descriptions given.
- After the first round, have students switch roles and repeat the process.

Reflection (10-15 minutes):

- Lead a class discussion on the activity.
- Prompt students to reflect on their experiences: What was challenging about being a Observer? What was challenging about being a Builder? How did the roles differ in difficulty?
- Encourage students to share any strategies they used to improve communication or replication.

- Ask students how their understanding of the task changed when they switched roles. Did previous experience help in the new role?
- Guide students to draw conclusions about the importance of clear communication and teamwork in problem-solving.

Conclusion:

- Summarize key points from the reflection discussion.
- Reinforce the value of working together and communicating effectively in STEM activities.
- Encourage students to use their communication skills and teamwork strategies in future projects.

Assessment:

- Informal assessment can be conducted through observation during the activity and participation in the reflection discussion.
- Look for evidence of effective communication, collaboration, and problem-solving skills.

Extension:

- For advanced learners, increase the complexity of the LEGO structures or reduce the time limit for observation and building.
- Introduce elements of competition by scoring each pair based on accuracy and time.
- Explore how technology tools could enhance communication in similar collaborative activities.

Safety Considerations:

- Ensure students handle LEGO pieces safely to prevent any accidents.
- Maintain a clear workspace to avoid tripping hazards.