Huh?

**TOPIC/SUBJECT AREAS**
Communicating Through Models: Engineering and Math

**DURATION**
60 minutes

**MATERIALS**
- 2x2 bricks in 6 different colors
- Baseplates - 1 per student
- Privacy screen building plans and build - 1 per pair
- Scorecard
- Game board - 1 per player
- Dry erase markers

**SCHEDULE**
- Play Logic Puzzles - Instructor vs. Students
- Students build Privacy Cardholder (if instructor hasn’t already done so)
- Students Pair Up and Play Logic Puzzles
- Group Discussion

*If you have extra time, use extensions if appropriate for the environment and students.
OBJECTIVES
One student will create a secret combination of 2x2 bricks while another student tries to guess the combination in 8 guesses or less.

ALIGNED STANDARDS CCSS OR NGST
Engineering: ITEA #10 Problem Solving Approaches. Using different approaches to solve problems.

KEY TERMS
Secret Combination: A pattern or series of numbers, letters, colors, or other items that are unknown to a person or group of people.
Valid Reasoning: Using previous guesses or known information to help determine future decisions.

OVERVIEW OF ACTIVITY
Students will pair up - one will create a secret combination of bricks while the other tries to guess the combination within 8 tries.

Developing 21st century skills with the use of manipulatives will increase the ability to use valid reasoning to solve hidden combinations. Students build confidence as they work in groups to problem solve.

BACKGROUND INFORMATION FOR INSTRUCTOR
This is a logic puzzle, similar to the game Mastermind, where students guess a secret combination of bricks. This logic puzzle helps students develop valid reasoning by requiring players to guess secret combinations of brick colors. After each guess, the creator of the secret combination must reveal which bricks are in the correct position as well as the correct color. With little information, the guesser must improve upon their previous guess to crack the secret combination. Students have 8 chances to correctly guess the secret combination.
Huh?

MATERIALS

• 2x2 bricks in 6 different colors
• Baseplate
• Privacy screen building plans and build - 1 per pair
• Scorecard
• Game board - 1 per player
• Dry erase markers

STEP-BY-STEP DIRECTIONS FOR STUDENTS

1. Choose a partner.

2. Decide who creates the secret combination (the creator) and who is guessing (the guesser). Each person gets a turn to be both the creator and the guesser.

3. Using the example, build your privacy screen holder out of bricks.

4. Using the scorecard as a privacy screen, place it between you and your partner using the privacy screen holder.

5. Both players need to set up their game board by placing their base plate in the designated area on the game board.

6. The creator comes up with a secret combination of 4 - 2x2 bricks across the top of the base plate. The creator can only choose between 6 colors, however they can use the same color more than one time. Once the creator is finished creating their secret combination the game can begin.
STEP-BY-STEP DIRECTIONS FOR STUDENTS (CONT’D)

7. The guesser chooses a combination of 2x2 bricks and places them on their base plate. They ask the creator if each color in each spot is correct one by one and the creator responds after each guess. For example: Guesser, “1, pink?” - Creator, “no” - Guesser, “2, green?” - Creator, “yes”.

8. Correct guesses are only correct for the same color in the same location. For each correct guess, the creator checks the squares on the game board that correspond to the correct guess location.

9. The game continues with the guesser choosing combinations of bricks until either they run out of guesses (8) or they guess the secret combination.

10. Keep track of your score on the scorecard. If you guess the combination on the first try you get 8 points, the second try 7 points, the third try 6 points, and so on. The points are listed on the game board.

11. Switch roles and continue playing.

12. Participate in group discussion.