Create An Algorithm Activity

Objective: Students will demonstrate their understanding of what an automation engineer does by writing and testing written instructions for a human robot.

Materials:

- **Bulk small candies or beads**
- **Small paper cups or plastic baggies**
- **Plastic spoons, tweezers, small measuring scoops, and ice cream sticks**
- **A timer**

Activity Instructions:

1. **Divide the class into teams of 3 to 4.**
2. **Assign one student in each group to be the Robot. The Robot must close their eyes and cannot do anything unless explicitly told to do so.**
3. **The other students are Automation Engineers. Their goal is to get the Robot to build a 3-cup pyramid.**
4. **The Engineers must write down a strict, step-by-step list of commands for the Robot to follow. Be as specific as possible!**
5. **The Engineers read their written instructions aloud to the Robot, one line at a time. They cannot change the wording or give hints if the Robot makes a mistake.**
6. **The Robot must execute the instructions literally.**
7. **If the program fails, the Engineers must pause, look at their "code" (the written steps), find the error, rewrite the line, and try running the program again.**

Post Activity Discussion Questions:

What did you like most about this activity?

What did you like the least about this activity?

When your 'Robot' misread a vague instruction and made a mistake, how did you have to adjust your thinking to fix the code?

Why is precision so critical when an Automation Engineer programs a massive robot on a real assembly line?

Extension Activities:

Students will analyze the historical development of automated technology by researching early mechanical innovations and evaluating how technology altered labor, manufacturing, and society

Utilizing the successful instructions written during this activity, students will create a process flowchart to visually communicate how a machine executes a task.