

Dynamic Design: The Cleanroom

Working Together

STUDENT ACTIVITY

BACKGROUND

In this activity you will work together as a team to construct an array frame using a similar procedure as the Genesis scientists did in the cleanroom.

PROCEDURE

Part 1: Observations and Ideas

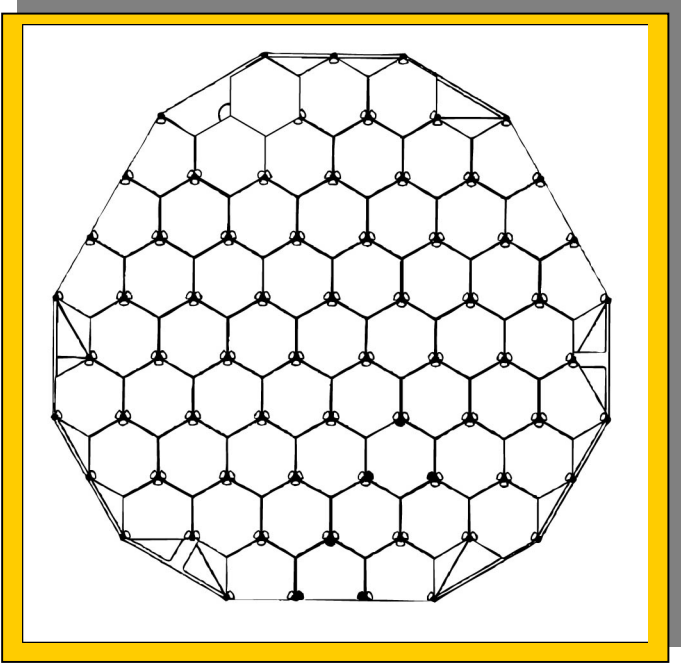
1. As you watch the demonstration, make observations of the procedure that the teacher and volunteers use to assemble the wafers onto the array frame. List notes here of ideas that may be helpful to you as your team completes the assembly.

Part 2: Preparing for Assembly

2. Gather the materials you will need for this procedure.
3. Divide the following tasks among the people in your group. This must be done before the assembly.
 - Cut out nine hexagon wafers
 - Using a pencil, draw the outline of the array onto a large sheet of paper using the overhead projector and the transparency of the array frame. Use a marker to make the lines thick.
4. In your notebook record a step-by-step, detailed procedure for assembling the array. Use the demonstration and video to guide this planning. This step is required before your group can complete any of the assembly.

Part 3: Assembling the Wafers on the Array

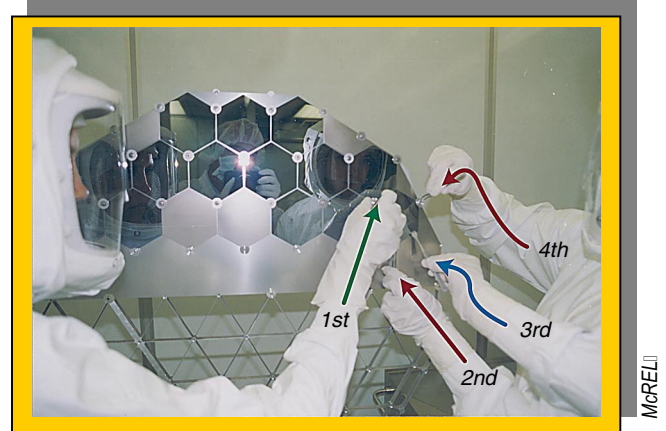
5. The top of the array frame should hold three wafers. Determine who will be completing each job: holding the wafer, holding the retainers, screwing in the screws. Start by placing the first three wafers at the top of the frame and determine where the holes would be. Draw little circles at these locations. The bottom retainer should be at the bottom of the wafers at each row. Refer to the diagram at right.



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6. Begin the assembly by having the person holding the retainers (stickers)(red/medium gray/2nd and 4th arrows in the graphic), use forceps to place stickers over the first two bottom holes for that row and hold them there. Next the person who will pick up the wafer (blue/light gray/3rd arrow in graphic) using forceps and place the wafer on the left side of the top row. Finally the third person in the group will place the large sticker (retainer) over the top left corner of the wafer and stick the wafer to the array (green/dark/1st arrow in graphic). Then this same person will place a small sticker (screw) in the middle of the retainer to symbolize screwing in the screw. Continue with this process, the person holding the retainers should continue to do so while the person getting the wafer will get the next wafer and hold it next to the first without letting it touch the first. The person who is in charge of the top retainers and screws will then place the large sticker (retainer) on the upper right side of the first wafer AND the upper left side of the next wafer followed by the small sticker (screw). Continue practicing this process. Once the first row is done, switch jobs as you complete the second row. Make sure your teacher has a chance to see you assemble at least one wafer. You will be completing this in the assessment section of this module.



7. Record any questions or problems for the teacher in your notebook or on this sheet as you go. Make sure these are addressed before the assessment.
8. Once the second row is done make sure your names are on the large sheet. Follow the directions of your teacher for storing the array frame until it is needed for the assessment.
9. Complete the following questions as a group.
 - a) What was the most difficult part of this procedure? Why?
 - b) How was working as a team critical for completing this task? What would you do differently to be more effective when you do this for the assessment?
 - c) After viewing the video clip of the scientist completing this procedure in the cleanroom, what are some similarities and differences with this simulation?

