1. Each team of ten (10) students needs to build 50 airplanes according to the instructions provided in class. Note that the templates provided are indicative of the folds required and cannot be followed blindly, because there are positional variations caused during printing and copying of the templates. **You should attempt to fold each of planes identically**—this is one of the processes you are able to control. You can build as craftsmen or in a production fashion.

2. Write your student IDs in the 1-10 spaces available on the data collection sheet.

3. Each team should also take one of the 100-foot measuring tapes to determine the flight length of each plane.

4. In teams of ten students, locate an available flight path for testing your planes. Place the toe-position tape on the floor at the head of the flight path in which your team is flight testing.

5. **PLEASE RESPECT OTHER STUDENTS AND CLASSES IN PROGRESS!!**

6. Each team of ten should designate:
   
   A. One person to position the measuring tape reel at the point from which the planes are tossed (toe position).
   
   B. Seven (7) people to toss your fifty planes (7x7 + 1) in an identical manner to minimize a second kind of process variability.
   
   C. The ninth member of your team will stand at the receiving position of the flight path and pull the end of the tape to the farthest distance traveled by the plane.
   
   D. Your scribe, the tenth member of your team, will stand next to the person holding the measuring tape so that they can read the distance and mark it on the data sheet. Since we are using a production line to assemble our planes we will assume that each student made five of the planes apiece.

7. The flight distance is measured from the point at which the planes are thrown (the toe-position) to the **first contact** with the wall or floor. Record the straight line distance (do not measure diagonals) to the nearest inch. Each person’s five distances should be written on a single row of the data collection chart.

8. Return to class, complete the calculations on the data collection sheets and plot your **X-bar** and **R** values on the charts. Note that you must establish appropriate scales on the y-axis for both the **X-bar** and **R** charts. **X-bar** is the average of each row of the data collection matrix. **R** is the difference between the smallest flight distance and the longest distance on each row of five planes. The **SUMS** at the bottom of the matrix are the totals for the **X-bar** and **R** columns.

9. Turn in your worksheets with completed calculations. Be sure that you have included all of your team’s student IDs on the worksheet. Only one worksheet per team.