

Name: _____ Date: _____

Better By Design Activity – Plane Tactics Worksheet

1. List all of the changes you can think of to make your plane fly farther:

2. Pick the three changes you think will be most effective and write them in the table in the space provided on page 2 of this worksheet: Change 1, Change 2 and Change 3.
3. Conduct three trial runs of each version of your plane (including the original design), and record the total distance in the table on page 2 of this worksheet.
4. Now compute the total distance for each experiment by adding up the total distance for test 1, test 2 and test 3. Record your results in the Total column.

Example

Control Redesign	Distance Traveled					Effect (% Change)
	Test 1	Test 2	Test 3	Total	Average Distance	
No Change	6 feet	3 feet	3.5 feet	6+3+3.5 = 12.5 feet	12.5 / 3 = 4.2 feet	XXXXX
Change 1: Bent wing flaps down	5 feet	2 feet	2.5 feet	5+2+2.5 = 9.5 feet	9.5 / 3 = 3.2 feet	$\frac{(3.2 - 4.2) \times 100}{4.2} = -23.8\%$

5. Now find the average distance for each experiment by dividing the Total by 3.
6. We now want to see which changes made the plane fly farther. One way to look at this is to compute the percent change using the following steps:
 - A. Write down the average distance for **Change 1**: _____
 - B. Write down the average distance for **No Change**: _____
 - C. Subtract your answer in Step B from Step A: _____
 - D. Take your answer from Step C and divide by your answer from Step B: _____
 - E. Multiply your answer in Step D by 100: _____. This is your percent change!

The formula for this is:

$$[(\text{average from Change 1} - \text{average from No Change}) / \text{average from No Change}] * 100$$

To find the percent change for each trial, you only need to change the value for Step A.

Plane 1

Control Redesign	Distance Traveled					Effect (% Change)
	Test 1	Test 2	Test 3	Total	Average Distance	
No Change						
Change 1:						
Change 2:						
Change 3:						

7. What does a positive percent change mean?

8. What does a negative percent change mean?

9. Which one of your changes made the biggest difference? The least difference?
