Rocket Worksheet #7 – Prediction

Goal: Explore multiple data sources to help you predict the altitude of your rocket.

1. Open the spreadsheet for your rocket in Google Docs. If you do not see it, click on All Items. Save a copy and rename it your rocket name ("Duck Dynasty Prediction"). Invite Mr. Duhrkopf to edit.

2. There are several tabs for the different engines available. Click on the tab for the engine that you plan on using. If you have not decided on the engine, use all the tabs and then pick.
  Engine Chosen _____

Part 1 - Aerotech Data

3. Using the rocket description in the Aerotech catalog for your rocket:

- What is the listed mass of the rocket in kg? _____.
- What altitude do they predict for your rocket, in feet, and engine choice?
  Engine_____ Predicted Altitude_____

4. Double check that the spreadsheet has the listed mass of the rocket, in kg, entered in cell B5.

5. Using the tab for your engine choice, vary the Cd on the spreadsheet until you get the predicted altitude from the Aerotech prediction.
  Cd = _____.

Part 2 - RockSim Data

6. Consult the RockSim data that Mr. Duhrkopf shared with you.
- What altitude does RockSim predict for your rocket, in ft, and engine choice? _____
- What is the center of pressure for your rocket? CP = _____
- RockSim Cd's: Arcas = .59 , Sumo = .36 , G-Force = .38 , Astrobee = .73

Part 3 - Previous Flights Data

7. Find rocket launches comparable to your rocket using the flight summaries for the past 3 rocket rally's and demo flights.

Rocket	Mass	Engine	Cd	Prediction	Altitude	Notes

8. What information did you find helpful in making a prediction for your Cd and altitude of your rocket after looking at all three data sources?

9. Pick a Cd and enter it cell B12. Explain your reasoning in detail.

Cd = _____

10. Find the mass of your rocket, in kg, and enter it in cell B5.   Mass = _____

11. What is your predicted altitude using the spreadsheet? _____

12. How does that altitude compare to what the 3 data sources predict? Why the difference?

13. Do you think you should change your Cd? If so, what did you change it to and why?

14. What is your predicted altitude? _____

15. Please delete the engine sheets that you are not using.

16. Make sure and save your predicted spreadsheet when you have completed your prediction.