

Rocket Worksheet #5 – Factors changing performance

Use the prediction spreadsheets found on the [Rocket Worksheets webpage](#) for this worksheet. These spreadsheets are ones I created for predicting the performance of the Arcas Aerotech rocket that some of you will build this spring. The engine used is the G35-7 and each variable is changed several times. You will be analyzing the performance of 4 factors: Cd, mass, air density and diameter.

1) What is the formula for computing drag on a rocket? What does each variable stand for? (2)

Cd performance

1) How can you determine the Cd for your rocket? (1)

2) Use the spreadsheets to fill in the table? (5)

Cd	Apogee(feet)	Time(s)	Amt Change(feet)
		Avg Change=	

3) What observations can you make about how the Cd changes: (3)

Rocket mass performance

1) Use the spreadsheets to fill in the table? (5)

Mass(kg)	Apogee(feet)	Time(s)	Amt Change(feet)
		Avg Change=	

2) What observations can you make about how the rocket mass changes: (3)

Air density performance

1) How can you calculate the air density on the day of the launch without using a fancy formula? (1)

2) Use the spreadsheets to fill in the table? (5)

Air Density	Apogee(feet)	Time(s)	Amt Change(feet)
		Avg Change=	

3) What observations can you make about how the air density changes: (3)

Rocket diameter performance

1) Use the spreadsheets to fill in the table? (5)

Diameter(m)	Apogee(feet)	Time(s)	Amt Change(feet)
		Avg Change=	

2) What observations can you make about how the rocket diameter changes: (3)

Conclusions

1) Which of the 4 variables changes the performance of the rocket the most? Explain. (3)

2) Which of these factors can you control? Explain. (3)

3) Would there be any other factors that you would be interested in testing? Explain. (3)