

**Lesson 2: Calculation of Rocket/Asteroid Rendezvous**

If we know the steady speed of the asteroid and the rocket, as well as the distance between their original points and the destination point, we can calculate exactly when to launch the rocket in order to make contact with the asteroid.

Doing the Science

1. Start the Bot Miner Simulation by clicking on the “Sim” tab.
2. Select the Calculation option on the main screen.
3. Roll your mouse over each asteroid and record their speeds in column B of Table 1.
4. Next, record the constant bot miner rocket speed in Column E of Table 1.
5. Using the equations provided, calculate C and F for each asteroid and record your answers in the appropriate columns.

Table 1.

Asteroid	A. x-length (km)	B. Asteroid Speed (km/hr)	C=A/B	D. y-height (km)	E. Rocket Speed (km/hr)	F=D/E
Alpha (α)	600,000			40,000		
Beta (β)	600,000			30,000		
Gamma (γ)	600,000			20,000		
Delta (Δ)	600,000			10,000		

Do You Understand?

1. What unit measurement type are C and F in?
2. Subtract F from C for any row and enter it into the blank slot on the screen for Hours. Launch your rocket. Did your rocket land on an asteroid? Why or why not?
3. If launched at the same time, which would get to the destination first, the asteroid delta or the rocket? Why?