Name_____ Period _____ Date _____

Bot Miner

Lesson 1: Controlling the Rocket/Asteroid Rendezvous
Without knowing the speed of the asteroid and without a steady speed from the rocket, we must experiment to find the perfect balance of thrust and timing to land on an asteroid.

Doing the Science
1. Start the Bot Miner Simulation.
2. Select the "Controller" option on the main screen.
3. Experiment by clicking the "Thrust" button multiple times to try to land on an asteroid.
4. Each time that you land on an asteroid, record the Bot Miner Rocket Speed and the number of hours into the appropriate table cells in Table 1 below.

Table 1. Rocket Speed

Asteroid	Bot Miner Rocket Speed (km/hr)	Hours
Alpha (α)		
Beta (β)		
Gamma (γ)		
Delta (Δ)		

5. Once you land on an asteroid, select "OK" and then immediately on the next screen, select "New Asteroid" and then return to "Controller."
6. Repeat steps 3-5 until Table 1 is completed.
7. Calculate the speed of each asteroid. Record these values in Table 2 below.

Table 2. Asteroid Speed

Asteroid	Asteroid Speed (km/hr)
Alpha (α)	
Beta (β)	
Gamma (γ)	
Delta (Δ)	

What Do You Understand?

1.   Describe how you calculated the speed of an asteroid.

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2.   What units of measurement should be used for the speed of the asteroids?

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3.   Describe what the "Thrust" button provided to the rocket.

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4.   A person suggests adding wings, flaps, or a rudder to control the direction of the rocket. Create an argument for or against the merits of this idea.

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5. Construct an explanation of what modifications would have to be made to the rocket to have the rocket change its direction of motion.

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