Name _____ Date _____ Period _____

The Monkey and the Hunter

Don't worry. At GigaPhysics, we're a little squeamish about hurting virtual monkeys too. The "rifle" in this lab fires only a harmless foam dart.

Find the Lab

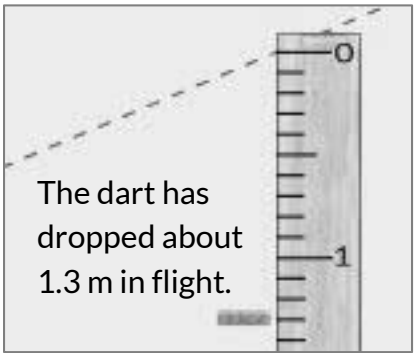
- In your web browser, go to **www.gigaphysics.com**, then click **Virtual Labs**, and finally **The Monkey and the Hunter**.

Part I: Learn How the Controls Work

- Experiment with the **Move rifle...** sliders to reposition the rifle.
- Click **Fire rifle**; this will both fire the rifle and release the monkey.
- Practice using the **Freeze** button to stop the animation in midair. The **Freeze** button will turn into the **Continue** button so you can resume the animation.
- Use the **Set muzzle velocity** slider to change the dart's speed.
- To move the ruler for measurements, drag it with your mouse.

Part II: Collect Your Data

- Position the rifle in the upper left corner and select a medium muzzle velocity.
- Fire the rifle, and click **Freeze** to stop the motion before the bullet hits the monkey.
- Drag the ruler into position to measure how far the bullet has dropped in flight. Measure from the tip of the dart straight up to the dotted line. Write your measurement in the first line of the table on the next page.



- Now measure how far the monkey has fallen, taking your measurement from the crosshairs on the monkey's left side to the dotted line above. Record your measurement.
- Click **Continue** and let the dart hit the monkey. Once again, measure and record the distances that the dart and the monkey dropped.
- Now move the rifle to the different positions indicated in the other lines of the table, changing the muzzle velocity where indicated, and repeat your measurements.

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Rifle position	Muzzle velocity	Distance dart dropped (midair)	Distance monkey dropped (midair)	Distance dart dropped (impact)	Distance monkey dropped (impact)
upper left	medium				
top center	slow				
lower left	fast				
lower center	slow				

Part III: Draw Conclusions

When you examine the distances that the dart and the monkey fell in each example, you should notice something important. What do you notice?

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Is there any combination of rifle position and muzzle velocity that could make the hunter miss the monkey (assuming that the hunter aimed directly at the monkey as in this demonstration)? Explain your answer.

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Suppose that two toy carts are pushed off the edge of a table at the same time, one of them at 1 m/s and the other at 2 m/s. Which of the carts, if either, will hit the ground first? Explain your answer.

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