Name_____ **Date**_____ **Pd**____

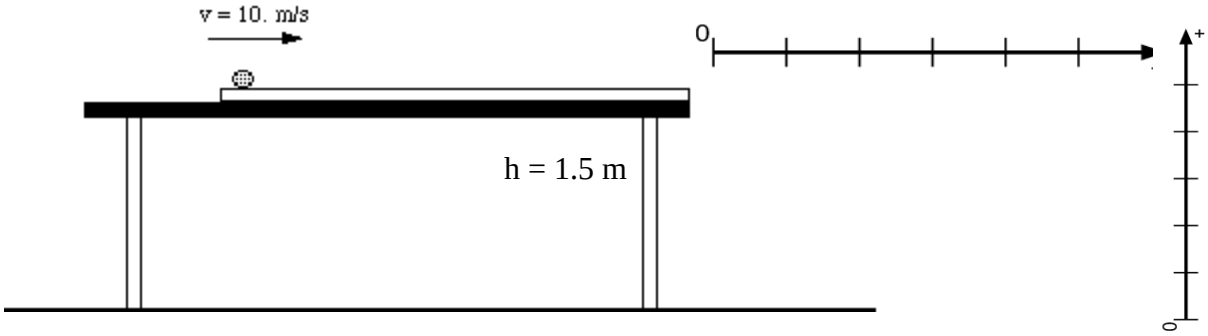
CH 6: HORIZONTALLY LAUNCHED PROJECTILES

Use **-10 m/s²** for the acceleration due to gravity.

$v = \Delta x/\Delta t$ $a = \Delta v/\Delta t$ $v_f = at + v_i$ $\Delta x = \frac{1}{2}a(\Delta t)^2 + v_i\Delta t$ $v_f^2 = v_i^2 + 2a\Delta x$

1. Given the following situation of a marble in motion on a rail with negligible $F_{friction}$:

   a. Sketch two motion maps showing the motion of the marble after it leaves the rail. Draw one horizontal and one vertical velocity motion map.



   b. Once the ball leaves the table, calculate how long it will take the ball to hit the floor.

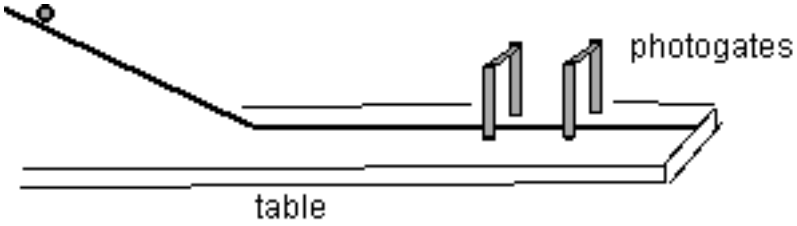
Givens	Unknown	Equation	Substitute into equation	Answer with Units

   c. In the time you have calculated in part b, how far will the ball travel horizontally before hitting the floor?

Givens	Unknown	Equation	Substitute into equation	Answer with Units

   d. What other factors affect the range of the sphere?

2. A student finds that it takes 0.20s for a ball to pass through photogates placed 30 cm apart on a level ramp. The end of the ramp is 92 cm above the floor. Where could a coin be placed so that the ball directly strikes the coin on impact with the ground?



Givens	Unknown	Equation	Answer

floor

	Givens	Unknown	Equation	Substitute into equation	Answer with Units
Y Vertical					

	Givens	Unknown	Equation	Substitute into equation	Answer with Units
X Horizontal					

3. Suppose now that the **same ball**, released from the same ramp (92 cm high) struck a coin on the floor placed 25 cm from the end of the ramp.

a. What was the ball's horizontal velocity?

Givens	Unknown	Equation	Substitute into equation	Answer with Units

b. How long did it take the ball to pass through the same photogates?

Givens	Unknown	Equation	Substitute into equation	Answer with Units