Checkout Questions

Lab 3. Projectile Motion: How Do Changes to the Launch Angle, the Initial Velocity, and the Mass of a Projectile Affect Its Hang Time?

1. Given the models you created during your investigation of $t(\mathbf{v}_0)$ and $t(\theta)$, choose two instances for $\mathbf{v}_0$ and θ for which the hang time of the projectile is 2 seconds.

2. Let the acceleration due to gravity be expressed as $\mathbf{a} = -\mathbf{g}$ and the initial velocity of the projectile in the **y** direction as $\mathbf{v}_0 = \mathbf{v}\sin\theta$. Given the equation for the change in **y** below,

$$\Delta\mathbf{y} = \mathbf{v}_0 t + \frac{1}{2}\mathbf{a}t^2$$

   write an equation for hang time, t, as a function of $\mathbf{v}_0$, θ, and **g**.

3. Current scientific knowledge and the perspectives of individual scientists influence inferences but not observations.

   a. I agree with this statement.
   b. I disagree with this statement.

   Explain your answer, using an example from your investigation of projectile motion.

4. Scientists use experiments to prove ideas.

   a. I agree with this statement.
   b. I disagree with this statement.

   Explain your answer, using an example from your investigation of projectile motion.

5. Why is it useful to identify patterns during an investigation? In your answer, be sure to include examples from at least two different investigations.

6. Why is identifying cause-and-effect relationships so important in science? In your answer, be sure to include examples from at least two different investigations.