

A. Firing the Cannons on *Constitution*, using projectile motion to explore maximums and zeros

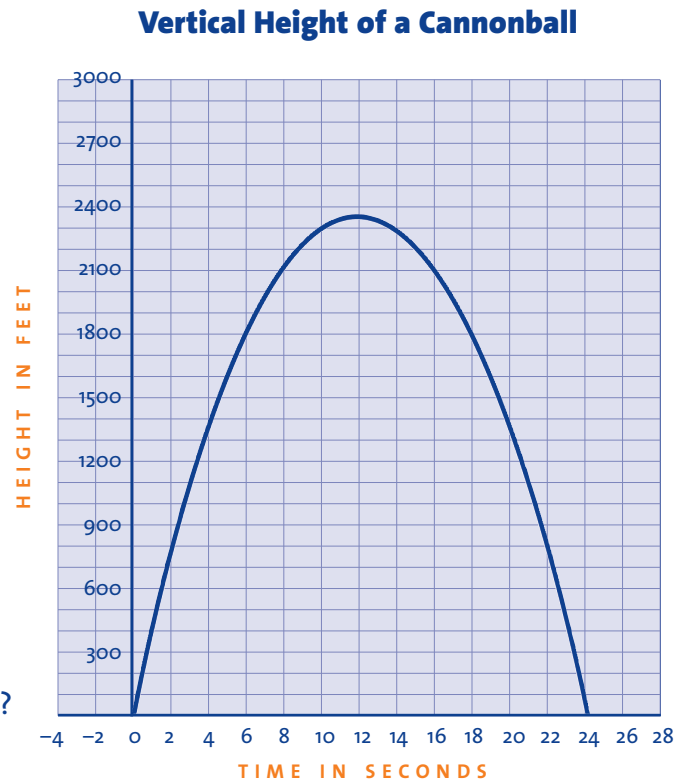
The graph below shows the vertical height of a cannonball fired from the *Constitution* with an initial vertical velocity of 388 ft/s and initial height of 24 ft.

Also, $h(t) = \frac{-1}{2}gt^2 + v_0t + h_0$, where $h(t)$ represent the vertical distance determined by time, g represents the acceleration due to gravity, v_0 represents the initial upward velocity and h_0 represents the initial height. The acceleration due to gravity is roughly either 32 ft/s^2 or 9.8 m/s^2 .

1. Identify the values, substitute them into the equation, and write an equation for the height.

2. Which value of g did you use? Why?

3. What is the maximum height of the cannonball?



4. How long does it take to reach the maximum height?

NAME



5. How much time passes before the cannonball lands in the water?

6. How high off of the ground is the cannonball after 10 seconds?

7. When is the cannonball 1,500 ft off the ground?

