Projectile Motion II

- Both vertical and horizontal position values are relevant to this video clip's study.

- After the video has been marked and the data incorporated into a spreadsheet, use the vertically and horizontally placed meter sticks for scaling purposes.

- The origin should be moved to either the initial starting position or the final position in the last frame.

- A plot of y vs x position values will result in the trajectory of the ball.

- Study of this motion will yield results indicating that the horizontal (x) velocity of the ball remains constant, even as it rises and falls. The x position-time graph should be linear and sloped upward, indicating a constant velocity. The x velocity-time graph will be constant (horizontal).

- Students will discover that the vertical (y) velocity decreases throughout the entire trip, both while the ball is rising and falling. The y position-time graph should be parabolic with a square term coefficient of ±4.9, the y velocity-time graph linear with a slope of ±9.8, and the y acceleration-time graph a constant value of ±9.8.

- Students can apply the Pythagorean Theorem to the horizontal and vertical velocity values to calculate the ball's speed at any time and/or position of its flight.