

Lesson Outline

Teacher Name: **Todd Ollendyke**

School: **Upper St. Clair High School**

Course Title: **21st Century Science – A Physical Science Approach**

Topic/Unit: **Motion, specifically projectile motion**

Model Topic: **Projectile motion**

Modeling Tool: **NetLogo / Excelet**

Please provide a brief description for each section.

1. Describe the preparation you will do with the students prior to the model.
 - Prior to the introduction of the model, we will cover topics in motion.
2. Describe the learning objectives related to the model and how you will achieve them.
 - Students will indicate how velocity and angle affect projectile motion.
 - Students will identify the horizontal and vertical components involved in projectile motion.
 - Students will identify angles and velocities required to create a specific “flight path”.
 - Students will predict an angle and velocity required to create a specific “flight path” in a game format.
 - Students will determine altitudes using a clinometer and trig table for objects around the school.
 - Students will track the flight of a stomp rocket using a clinometer and trig table.
3. Describe the discussion questions you will use after the model.
 - Which pass has the lower angle – when a quarterback throws a long bomb or a “bullet”?
 - What angle should you throw to produce the greatest distance for any given velocity?
 - How can you tell how tall something is without directly measuring the object?
4. Describe the type of student assessment you will use.
 - Lab Activity: launch their paper rockets and determine the altitude.
 - Calculation: find the height of objects given the distance and angle
 - Data prediction: identify which data creates the longest flight path.