

Conor Hunt
High School Physics
Art Integration Paper

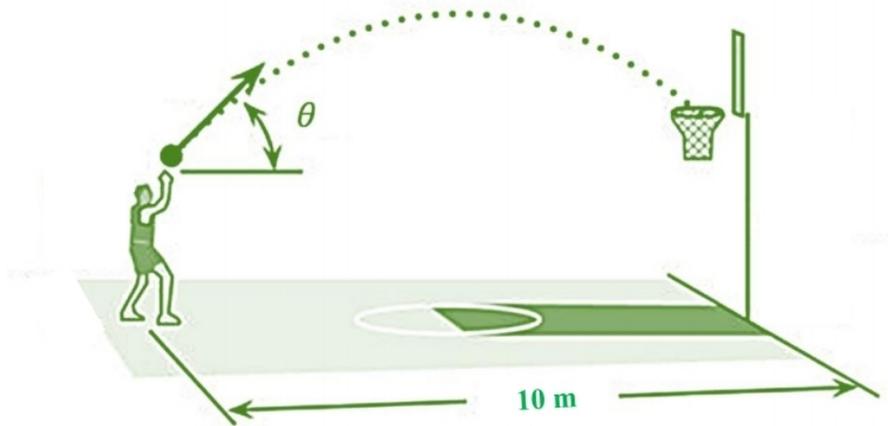
Art Form: The art forms that I'm using for this lesson plan are movement and play! I've spent a lot of time this year thinking about how my students don't consistently have PE in their schedule. New York City's DOE policy requires that, "Students must have PE for at least 180 minutes per week for 7 semesters, or 90 minutes per week for 8 semesters." My school does 70 minute blocks, so students end up having semesters without PE. There's a plethora of research that espouses the benefits of physical activity on one's learning, ability to learn, and ability to store memories. One of my longer term goals as a teacher is to figure out meaningful ways to incorporate more movement into my physics class.

Lesson Enhancement: This activity is designed for an introductory high school physics course, in a unit on 1D and 2D motion. Students in my course are mostly split between the 9th and 11th grade, many of my students are in 9th grade and many do not have gym or physical education in their schedules. There is a strong need for movement in their daily lives in school. Every year, I struggle to adequately address 2 dimensional and projectile motion in my physics class. I always feel like I'm rushing to fit it in, and the time needed to effectively explore the topics might take 3-5 weeks. As a result, I want to develop an activity that allows students to solve regents level projectile motion problems, while also moving in the process. It will also be a way to break away from the normal, sometimes banal structures, of the school day. In addition, I want students to see the direct connections between their favorite sports and how we can use physics to better understand or analyze motion and interactions in these sports. This will be a multi day opportunity for students to incorporate motion through basketball, volleyball, and soccer in their routines at school

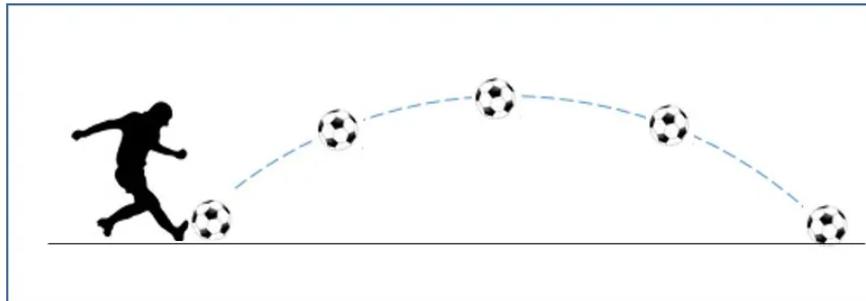
Students will use an app called Home Court to gather data on different launched projectiles (a basketball, a volleyball, a soccer ball). The app is intended for basketball players to track data on jump shots such as launch angle, release speed, and hang time, but can be used for any time of projectile.

Lesson Description

If Students decide to use a basketball for this activity, they will use the Home Court App to determine the angle they shoot the ball, and the hang time of the ball. These two pieces of data will allow them to figure out the velocity they must shoot the ball at in order for the ball to go through the hoop without hitting the backboard. Here is an image of the scenario:



For those who choose soccer, they will have to measure the launch angle and the initial velocity to predict the maximum horizontal distance. Here is an image of the scenario:



The volleyball will the same scenario as above: use the launch angle and launch speed to determine the maximum horizontal range

For those who want to launch a ball vertical upward, they will use the initial velocity and the hang time to determine the max height their projectile is launched

Interdisciplinary context: How can this art form (and/or art in general) be used to create interdisciplinary lessons, discussions or activities in your classroom? How can you connect to multiple content areas?

I decided to look at the New York State Physical Education Learning Standards are here are some of the High School Standards that seemed most relevant:

Standard 1 - Demonstrates competency in a variety of motor skills and movement patterns.

- 1.3.L1. Demonstrates competency in one or more fitness activities.
- 1.4.L1. Demonstrates competency in one or more lifetime activities.'

Standard 4 - Exhibits responsible personal and social behavior that respects self and others.

- 4.1.L1. Applies positive character traits in physical activity settings.

Standard 5 - Recognizes the value of physical activity for overall wellness, enjoyment, challenge, and/or self-expression.

- 5.3.L1. Selects and participates in physical activities that meet the need for self expression and enjoyment.

Students will have the opportunity to achieve Standard 1 by demonstrating a competency in a sport/activity of their choice (basketball, soccer, or volleyball). In addition, they will be working within their lab groups to gather and record their data together. Lastly, there will be plenty of opportunities for students to engage in unstructured play, outside of their data collection. I keep going back to the Bergen, D (2009) quote about the value of play: "The pedagogical value of play does not lie in its use as a way to teach children a specific set of skills through structured activities called 'play.' Rather, play is valuable for children primarily because it is a medium for development and learning. I'm really curious to see what students take away regarding 2-dimensional and projectile motion. I imagine there will be unexpected hiccups, but I think these will be outweighed by the benefits of the play.

