***Nerf Guns and More!***

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All materials are posted at my website under the Information Extras page….OR email me and I can share the folder through Google Drive.

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Description:

*A ball is thrown into the air, a football player attempts to kick a football over the goal post, a toy rocket is launched straight upward*… how many of these starting lines to “real-life” problems do you recognize ? Consider actually modeling projectile motion in the classroom so that students can answer the question : *when am I ever going to use this?* Get ready to do some problem solving in this workshop! Leave with materials ready to use! Bring graphing calculator or laptop.

STEM

Grades 9-12

Notes:

Aug 2015

What the Math?

Day 1-2

1. Free Fall Jump / 2- [Free Fall Tower Gizmo](https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=650)/ 3- [The Physics Classroom](http://www.physicsclassroom.com/class/vectors/Lesson-2/Horizontal-and-Vertical-Displacement)/ 3- [Golf Gizmo](https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=26)

Depending on student ability and background, this can take longer/shorter. You may opt to do all activities, or cut this back.

Day 3- Determine firing velocity of a Launcher pre-requisite work.

Do this as a class- review what the big idea is from the Golf Range Gizmo. Engage again with the [Myth Busters video](https://youtu.be/tF_zv3TCT1U) demonstrating the concept of dropping bullet and firing a bullet at 0 degrees and answering the question: Will they hit at the same time?”

Day 4-Determine the velocity of a “flick”

Opportunity for students to simulate what they will need to do for the Nerf/Halo toy. Gives opportunity for the teacher to debug.

Day 5 – option to work in ExploreLearning – Golf Gizmo/Free Fall Tower

Day 6 -10– Start testing/Problem Solving/write up results

READY?

**Product Testing: Nerf Gun verses Halo**

*Your problem is to do some product testing on a popular child’s toy, the Nerf Gun and Halo gun. First, if the product makes a claim as to how far it will shoot, you need to devise a way to test it. Second, we will compare the two products and determine which toy shoots the farthest. Third, if your toy did not state a claim, can you recommend a claim based on your tests? Which toy would you recommend and why?*

**Teacher/Student**

* What are some obstacles to consider ?
* What are some of your expectations?
* How will you make use of technology in verifying your work?
* Do the results make sense?
* And, how to they compare on paper to reality?
* Can you identify sources of error?

Technology:

**Explore Learning** – Merges science and math- virtual lab experience-

[www.Explorelearning.com](http://www.explorelearning.com)

Gizmos- Free Fall Tower , Golf Range, etc…

You can sign up for a 1-month free trial which gives you plenty of access to all features.

Subscriptions are available $800?

**The Physics Classroom**- <http://www.physicsclassroom.com/>

FREE !!! Interactive, but not like the Gizmos. Excellent for the math teacher looking to improve their physics background.