Dude Perfect Model Rocket

-Show one and or both of the following Dude perfect model rocket videos
https://www.youtube.com/watch?v=WpqUOW19aJQ&t=295s
https://www.youtube.com/watch?v=uPCi5Rs7EuA&t=5s

-Direct students to the following website for a model rocket launch simulator and give students time to explore what leads to the greatest height
http://www.ohio4h.org/statewide-programs/4-h-science/science-alive-4-h-school-enrichment/rockets-away-launch-simulator
Discuss what lead to the greatest height

The optimal conditions for simulator can vary slightly but around 640 feet is the highest the rocket can fly. This is accomplished with the following conditions: cone style (4^{th} option), nose weight (8 oz), body weight (0.8 oz), tail weight (0.8 oz), water (30 oz), and pressure (140 psi). The cone that is closest to a triangle is the most aerodynamic. For the cone weight, too much can decrease height but too little would cause the rocket to spin over the top. Less is better for the body and tail weights.

- Go over the Force powerpoint with students (see attached)

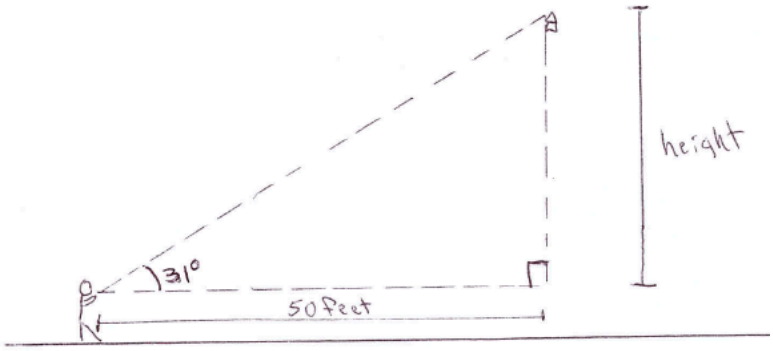
-Time to design rockets (Need empty 2 liter bottles. Materials can include cardboard, playdough, tape, cardstock, paper, scissors, and extra 2 liter bottles).

-Before launching the rockets talk about how trigonometry and a clinometer can be used to determine the height of the rockets.

Use the following geogebra page to talk about SOHCAHTOA

https://www.geogebra.org/m/f6B77EqA

Go over a few examples like the following for how tangent can be used to find the height.



Use the following GeoGebra page to show how a clinometer works

https://www.geogebra.org/m/HN5hK2uU

-For the students that are recording the angles, measure a set distance away from the launch that they will stand. Record the angles and then calculate the height of the rockets.

-There are different water bottle launchers that can be purchased through Amazon.
I used the StratoLauncher IV Deluxe.