Dude Perfect Graphing Stories

Go to the following desmos activity, Copy of Graphing Stories. Go over slides 1, 2, and 3 with students one a time before having students try the rest of the problems.

Slide 3 can be extended with the questions below to investigate and discuss the time needed for the ball to go through the hoop and the effect of air resistance on the basketball.

micahstohlmann.com

Cotter Ranch (Chase) Tower Basketball shot

To figure out the time it will take the ball to reach the hoop we can use the following equation.

$y = -16t^2 + h$

Why did the basketball take longer to reach the hoop than we predicted?

If you dropped two objects that are the same size and shape but different weight which would hit the ground first?

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In discussing the answers to the above questions, the following videos can be used to build on or challenge students' ideas.

https://www.youtube.com/watch?v=_mCC-68LyZM (video about dropping objects with input on people's ideas with some misconceptions)

https://www.wired.com/2014/11/dropping-objects-worlds-largest-vacuum-chamber/
Website link has a video about dropping a feather and a bowling ball in a vacuum chamber as well as dropping objects on the moon.

https://www.youtube.com/watch?v=jme_vSj5wRo (1:30, 2:30
(video on dropping objects- cannonball and basketball- cannonball hits first because light ball reaches terminal velocity due to air resistance; stops increasing in velocity

https://www.youtube.com/watch?v=tF_zv3TCT1U
(mythbusters video about a bullet being fired and a bullet being dropped that hit the ground at the same time)

-Position related to time for a dropped object is parabolic motion
-The velocity of the ball related to time has a linear graph. In the Dude Perfect video the velocity of the basketball reaches terminal velocity and levels off as a horizontal line after starting as a negative constant slope.
-The acceleration due to gravity is constant.