

	Winding up/ Student walk	Galileo's Inclined Plane	Galileo's Free Fall	Video Analysis
Student Experience	Students discuss and evaluate ways to determine the velocity of winding toys. Students experience data set that discusses constant velocity	Students analyze a ball rolling down an inclined plane to gather time and displacement data to produce the acceleration due to gravity.	Students take part in Galileo's famous falling objects lab to determine the acceleration due to gravity. (modeling of equation)	Students use cell phone cameras to collect and analyze data.
T4T Material	N/A	balls, vertical blinds, 4 in rings	Any materials that can be dropped.	N/A
Big Idea	$Velocity = \Delta X / \Delta t$	Acceleration Non constant velocity	$x = 1/2 at^2$	To minimize human error in data points.
Connection to Culminating Activity CA Standards	Meaning of velocity and procedure for experimentally determining the average velocity from motion. Plotting data. Forces & motion 1.a	Students experiment with accelerating objects and changing velocities. *Video Analysis* Forces & motion 1.a	Students learn that objects fall at the same rate due to the acceleration due to gravity. Forces & motion 1.a	Scaffold in inclined plane and free fall activity.
Next Generation Science Standards	HS-PS2-1 Crosscutting concepts: Patterns Science & Engineering practice: Analyzing & interpreting data Mathematical/computational thinking Common Core: MP.2 , .4 HSN.Q.A.1, .2 HSA.CED.A.2	HS-PS2-1 Crosscutting concepts: Patterns Science & Engineering practice: Analyzing & interpreting data Mathematical/computational thinking Common Core: MP.2 , .4 HSN.Q.A.1, .2 HSA.CED.A.2	HS-PS2-1 Crosscutting concepts: Patterns Science & Engineering practice: Analyzing & interpreting data Mathematical/computational thinking Common Core: MP.2 , .4 HSN.Q.A.1, .2 HSA.CED.A.2	

Time	(2) 55 minute class	(1) 55 minute class	(1) 55 minute class	-
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Culminating Activity – Mouse Trap Car				
	Mouse trap Car Build	Experimenting and Collection Data	Mouse Trap Write Up	
Student Experience	Students are introduced to the Culminating Activity (if not done at the beginning of unit) Students design and carry out the construction of a mouse trap powered vehicle.	Students design and carry out a test to determine the velocity of their vehicle.	Students articulate their findings in a well structured lab write up	
T4T Material	One mouse trap (pairs) The cart	N/A	N/A	
Big Idea	Build a functioning car that travels in a line.	Designing a controlled experiment. Thinking about how they will collect data to determine the velocity of their mouse trap car.	Articulate scientific findings. Reporting and interpreting data and graphical representations. Drawing conclusions from scientific method.	
CA Standards	-----	-----	-----	
Next Generation Science Standards	HS-PS2-1 Crosscutting concepts: Patterns Science & Engineering practice	HS-PS2-1 Crosscutting concepts: Patterns Science & Engineering practice: Analyzing & interpreting data Mathematical/computational thinking Common Core: MP.2 , .4 HSN.Q.A.1, .2 HSA.CED.A.2	ELA Common core: WHST.11-12.7 WHST.11-12.9 Use of text books and student research to back up experimental data.	
Time	Three 55 min period	One 55 min period	Two 55 min periods	

Total Time:

(11) 55 minute class periods

*Teacher can adjust pacing for winding up and lab write up based on student needs