

Stage 1 – Desired Results	
Established Goals: Students will understand and apply differentiation rules in solving problems.	
Understanding(s)/goals <i>Students will understand:</i> a) Definitions of position, displacement, velocity and acceleration b) Concept of derivative as rate of change of a moving object c) Relation between position, velocity and acceleration	Essential Question(s): a) What is the average velocity of a moving object? b) What is the speed of a moving object at a given time? c) How acceleration and velocity are related and how fast is velocity changing?
Student objectives (outcomes): <i>Students will be able to:</i> a) Estimate average velocity and velocity at a given time b) Relate the concept of derivative as a rate of change c) Calculate velocity and acceleration using derivative	
Stage 2 – Assessment Evidence	
Performance Tasks: a) Design a plan to collect data for estimating speed of a moving object b) Use the definition of derivative to find velocity	
Stage 3 – Learning Plan	
Learning Activities: a) Use applets to model a moving object, i.e., http://www.physicssource.org/items/detail.cfm?ID=6875 (W, H, E) b) Collect data (E, E2, T, O) c) Use MATLAB to plot the data and find equation of best fit curve for both position and velocity as a function of time (H, E, E2, O) d) Calculate velocity and acceleration using the model (E, R) e) Calculate velocity and acceleration using formulas (R, E2) f) Compare the results (H, E, R, E2, T, O)	<i>W-where, what</i> <i>H-hook, hold</i> <i>E-equip, experience, explore</i> <i>R-rethink, revise</i> <i>E-evaluate</i> <i>T-be tailored (personalized)</i> <i>O-be organized</i>