

Goals:

## *Differentiate between uniform and non-uniform motion.*

- Analyze and interpret an object's motion
- Measure  $\Delta X$  and  $\Delta T$
- Graph/Calculate slope  
     $X$  vs  $T$  and  $V$  vs  $T$  for both uniform/nonuniform situation
- Slope  
    Slope  $x$  vs  $t \rightarrow$  velocity  
    Slope  $V$  vs  $T \rightarrow$  acceleration
- Describe motion in words and numbers

Pretest:

Diagnoser questions

Uniform motion

1. Here are meter sticks and a marble. Make the marble move down the meter sticks the same way all the way down.
  - a. make 3 sections
  - b. make motion same in each section
  - c. data table—every trial!!!!
2. Graph data (tell them position on  $Y$ , time on  $X$ )—GRAPH TOTAL MOTION, NOT EACH SECTION
  - a. slope of line—rise over run—what does this slope tell us?
  - b. Turn slope into equation
3. As a team, in words, what does the graph tell you?
4. Group report out (white boards?)
5. Define: Uniform motion definition and equation—extend line on graph
6. Make a  $V$  vs  $T$  graph (straight line, no slope)

Nonuniform motion

1. If it's not uniform motion, what is it?
2. same set up—make it move not the same (aka not like you did yesterday)
  - a. 3 sections
  - b. Make motion NOT uniform
  - c. data table for every trial
3. Graph data
  - a. can you find a slope? (NO)
  - b. is it the same as the graph for uniform motion (no)

4. Find velocity for each section
5. graph velocity vs. time
  - a. does this look like other  $v$  vs  $t$  graph?
  - b. What is slope?
6. Slope = acceleration (equation) for NONUNIFORM MOTION
7. What was slope on uniform  $v$  vs  $t$  graph? Slope = 0
8. Conclusion: uniform motion has 0 acceleration

#### Assessment

Given them a situation (data or setup)

They graph  $X$  vs  $T$  and  $V$  vs  $T$  for each set of data

State as uniform or nonuniform. How do you know this? Explain your reasoning.