

## Data Sheet for Rolling Objects

Name: \_\_\_\_\_ Partners: \_\_\_\_\_

You must use at least one solid ball, one hollow ball, one solid cylinder, and one hollow cylinder.

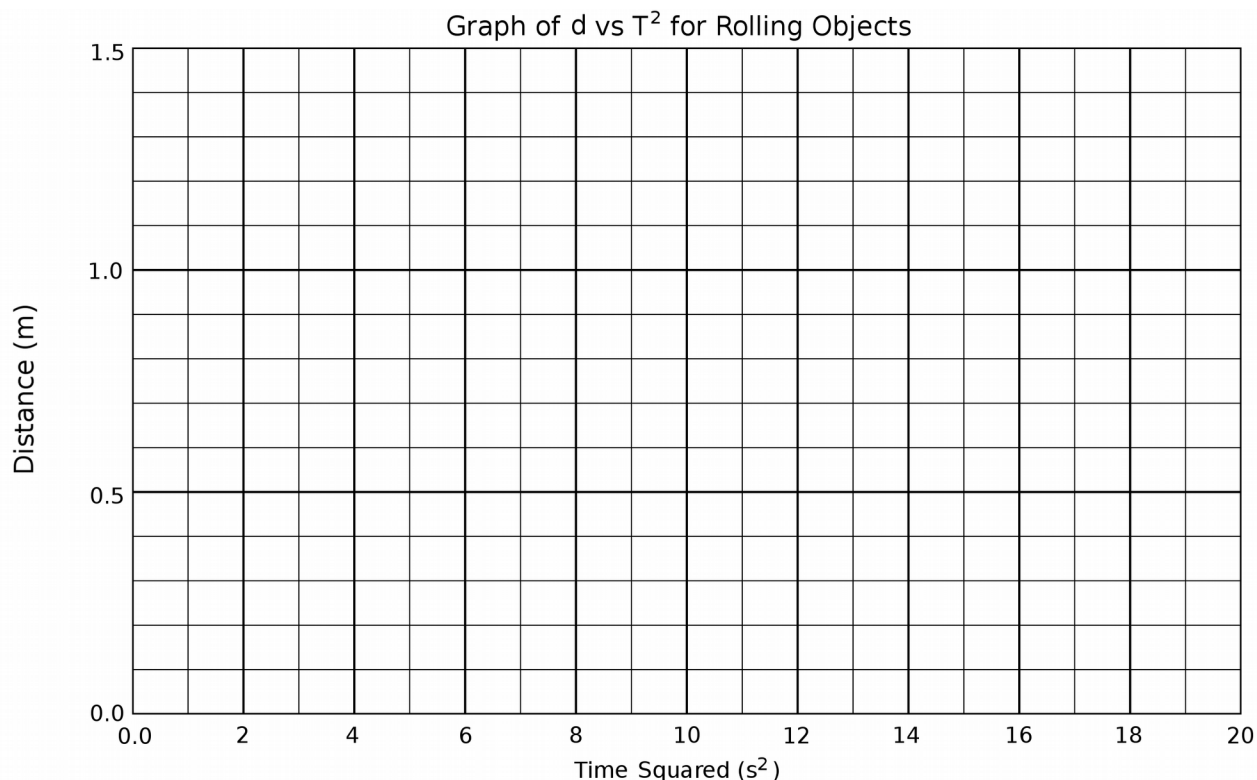
Tilted table measurements  $L =$  \_\_\_\_\_ m       $h =$  \_\_\_\_\_ m      Measure the times in seconds (s)

Object	t for d=0.5 m	t <sup>2</sup> for d=0.5 m	t for d=1.5 m	t <sup>2</sup> for d=1.5 m	Slope (m/s <sup>2</sup> )	g (m/s <sup>2</sup> )
Solid Ball						
Hollow Ball						
Solid Cylinder						
Hollow Cylinder						

You then need to graph these data as  $d$  vs.  $t^2$  using the supplied graph paper and determine the slopes to the best lines that go through your data using the program at <http://yosemitefoothills.com/Calculator> using the choice . Calculate and graph the slope and y-intercept for (x,y) pairs that go exactly through (0,0) . That program forces the resulting line to go through the origin at (0,0) since necessarily zero distance will correspond to zero time. It also produces a graph of the result that you can check against your graph.

The slope of your graph can be connected to the value of  $g$ . For example, for a solid ball  $d = \frac{1}{2} g t^2 \left( \frac{5}{7} \frac{h}{L} \right)$  and

therefore the graph slope will be  $slope = \frac{1}{2} g \left( \frac{5}{7} \frac{h}{L} \right)$  and therefore  $g = \frac{14L}{5h} \cdot slope$  .



Use the coordinate system below to graph your data, but add a point at (0,0) and draw a best line through your points.