	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Your name	Date															
2	Partner's name																
3																	
4	**Phys 1101/1120 - Surrey campus**				**DISCLAIMER: These example data are purposefully**												
5	**Expt. 10: Projectile Motion**				**inaccurate. You may test your spreadsheet equations**												
6					**for correctness using these values, but your real**												
7	**DATA:**				**experimental values will be very different.**												
8																	
9	**Height of ends of level tube:**				**Diameter of steel ball:**				**Measured values of Range:**					**Measured time of flight:**			
10	**h1 (cm)**	**dh1 (cm)**	**dh1/h1**		**d (mm)**	**δd (mm)**	**δd/d**			**Rm (cm)**	**dRm (cm)**	**dRm/Rm**		**t (s)**	**dt (s)**	**dt/t**	
11	**150**	**0.5**	0.33%		**30**	**0.03**	0.10%		1	**95.5**	**0.2**	0.21%		**0.446**	0.00446	1.00%	
12									2	**95**	**0.2**	0.21%		**0.447**	0.00447	1.00%	
13	**h2 (cm)**	**dh2 (cm)**	**dh2/h2**		**Acceleration due to gravity:**				3	**94.5**	**0.2**	0.21%		**0.446**	0.00446	1.00%	
14	**100**	**0.5**	0.50%		**g (m/s^2)**	**dg (m/s^2)**	**dg/g**		4	**94**	**0.2**	0.21%		**0.445**	0.00445	1.00%	
15					**9.81**	**0.01**	0.10%		5	**94.5**	**0.2**	0.21%		**0.446**	0.00446	1.00%	
16	**Height of ends of tilted tube:**																
17	**h1f (cm)**	**dh1f (cm)**	**dh1f/h1f**														
18	**127**	**0.5**	0.39%														
19																	
20	**h2f (cm)**	**dh2f (cm)**	**dh2f/h2f**														
21	**110**	**0.5**	0.45%														
22																	
23	**Height of launch above timer pad:**																
24	**h3 (cm)**	**dh3 (cm)**	**dh3/h3**														
25	**99**	**0.5**	0.51%														
26																	
27	**CALCULATIONS:**																
28																	
29	**Height of ends of level tube:**				**Diameter of steel ball:**				**Measured values of Range:**								
30	**h1 (m)**	**dh1 (m)**	**dh1/h1**		**d (m)**	**δd (m)**	**δd/d**			**Rexp (m)**	**dRexp (m)**	**dR/R**					
31	1.5	0.005	0.33%		0.03	0.00003	0.10%		1	0.955	0.002	0.21%					
32									2	0.95	0.002	0.21%					
33	**h2 (m)**	**dh2 (m)**	**dh2/h2**		**Radius of steel ball:**				3	0.945	0.002	0.21%					
34	1	0.005	0.50%		**r (m)**	**dr (m)**	**dr/r**		4	0.94	0.002	0.21%					
35					0.015	0.000015	0.10%		5	0.945	0.002	0.21%					
36	**Height of ends of tilted tube:**																
37	**h1f (m)**	**dh1f (m)**	**dh1f/h1f**						**Experimental Range:**					**Average experimental time of flight:**			
38	1.27	0.005	0.39%							**Rexp (m)**	**dRexp (m)**	**(dR/R)_exp**		**t (s)**	**dt (s)**	**dt/t**	
39										0.955	0.002	0.21%		0.446	0.000632	0.14%	
40	**h2f (m)**	**dh2f (m)**	**dh2f/h2f**														
41	1.1	0.005	0.45%														
42																	
43	**Height of launch above timer pad:**																
44	**h3 (m)**	**dh3 (m)**	**dh3/h3**														
45	0.99	0.005	0.51%														
46																	
47	**Initial horizontal velocity of ball:**				**Time of flight of ball:**				**Theoretical Range:**								
48	**v (m/s)**	**dv (m/s)**	**dv/v**		**t (s)**	**dt (s)**	**dt/t**		**Rth (m)**	**dRth (m)**	**dRth/Rth**						
49	2.1505149	0.032602	1.52%		0.44584387	0.0011656	0.26%		0.958794	0.01475	1.54%						
50																	
51	**Sub-calculations for init. horiz. v:**				**Sub-calculations for t:**												
52	**d([h1-h2] - [h1f-h2f])**				**h3-r**	0.975											
53		0.01			**d(h3-r)**	0.005											
54	**([h1 - h2] - [h1f-h2f])**				**d(h3-r)/(h3-r)**	0.0051282											
55		0.33															
56	**d([h1-h2]-[h1f-h2f])/([h1-h2]-[h1f-h2f])**																
57		0.030303															