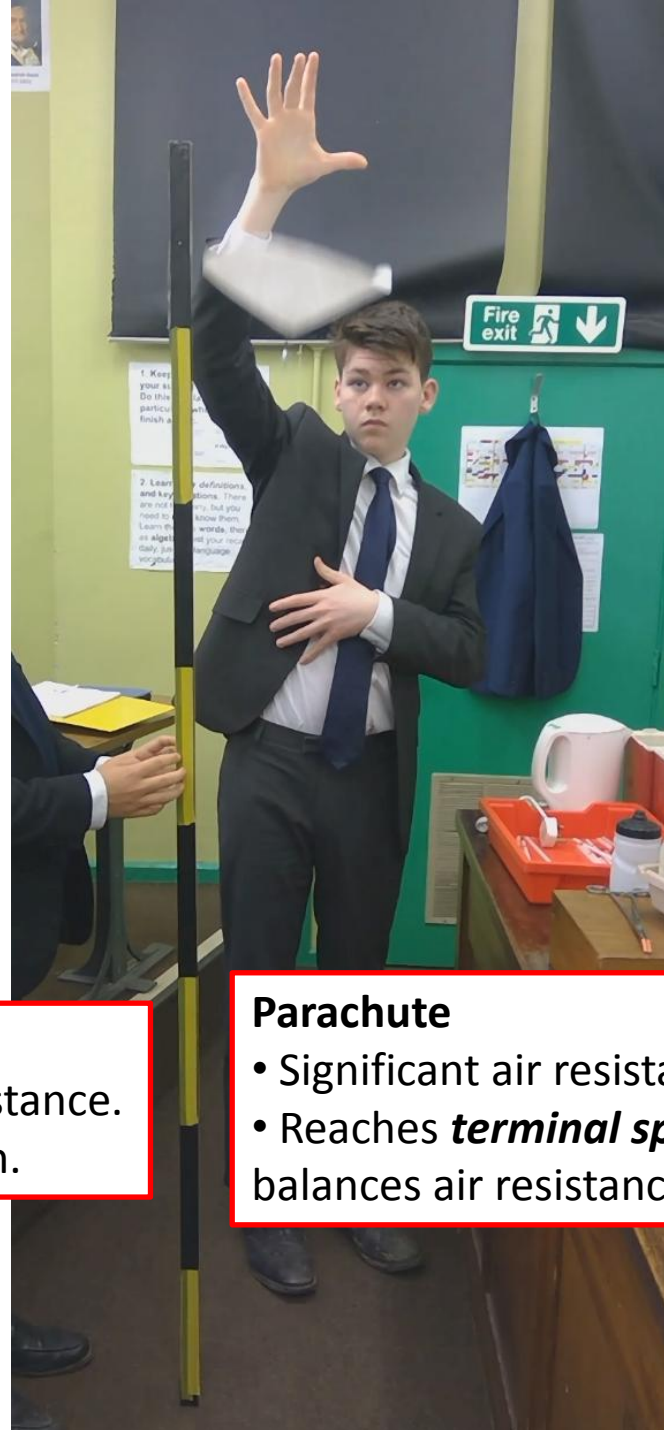




2.00m
ruler

Ball

- Insignificant effect of air resistance.
- Constant acceleration motion.



Parachute

- Significant air resistance.
- Reaches ***terminal speed*** when weight balances air resistance.

29.75 frames per
second video
motion capture

29.75 frames per
second video
motion capture

BALL VS PARACHUTE

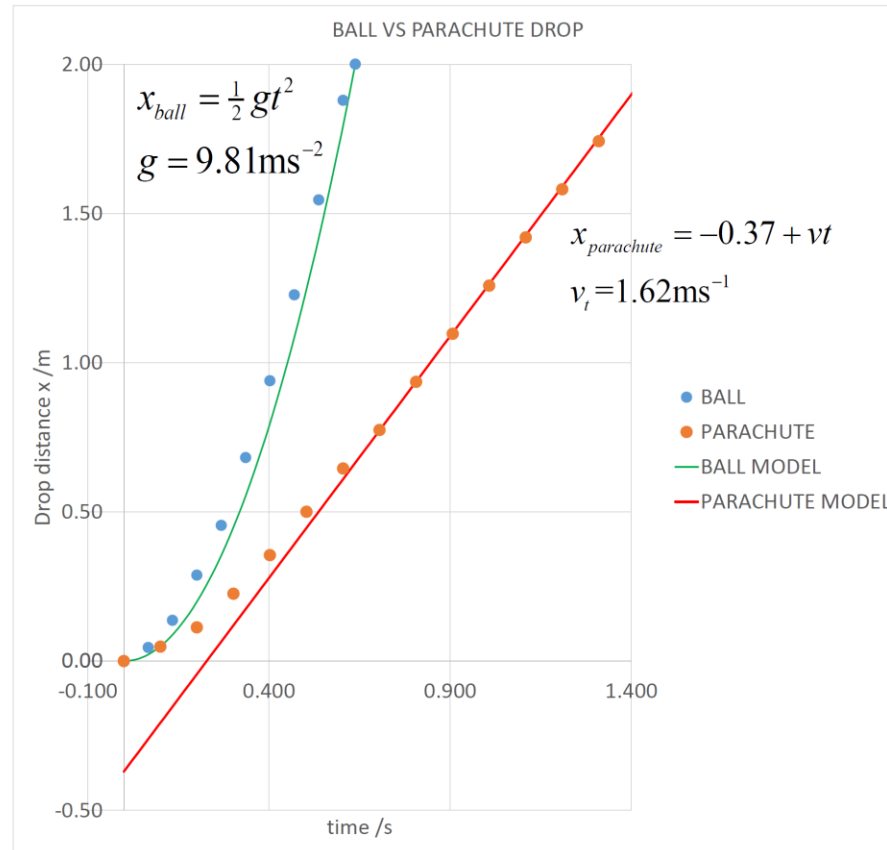
11/03/2020

BALL

Screen ball drop /mm	x /m	frame #	time /s
0	0.00	0	0.000
3	0.05	2	0.067
9	0.14	4	0.134
19	0.29	6	0.202
30	0.45	8	0.269
45	0.68	10	0.336
62	0.94	12	0.403
81	1.23	14	0.471
102	1.55	16	0.538
124	1.88	18	0.605
132	2.00	19	0.639

PARACHUTE

Screen ball drop /mm	x /m	frame #	time /s
0	0.00	0	0.000
3	0.05	3	0.101
7	0.11	6	0.202
14	0.23	9	0.303
22	0.35	12	0.403
31	0.50	15	0.504
40	0.65	18	0.605
48	0.77	21	0.706
58	0.94	24	0.807
68	1.10	27	0.908
78	1.26	30	1.008
88	1.42	33	1.109
98	1.58	36	1.210
108	1.74	39	1.311



BALL MODEL

t/s	x/m
0	0
0.01	0
0.02	0
0.03	0
0.04	0.01
0.05	0.01
0.06	0.02
0.07	0.02
0.08	0.03
0.09	0.04
0.1	0.05
0.11	0.06
0.12	0.07
0.13	0.08
0.14	0.1
0.15	0.11
0.16	0.13
0.17	0.14
0.18	0.16
0.19	0.18
0.2	0.2
0.21	0.22
0.22	0.24
0.23	0.26
0.24	0.28
0.25	0.31
0.26	0.33

PARACHUTE MODEL

t/s	x/m
0	-0.4
0.01	-0.4
0.02	-0.3
0.03	-0.3
0.04	-0.3
0.05	-0.3
0.06	-0.3
0.07	-0.3
0.08	-0.2
0.09	-0.2
0.1	-0.2
0.11	-0.2
0.12	-0.2
0.13	-0.2
0.14	-0.1
0.15	-0.1
0.16	-0.1
0.17	-0.1
0.18	-0.1
0.19	-0.1
0.2	-0
0.21	-0
0.22	-0
0.23	0
0.24	0.02
0.25	0.04
0.26	0.05

- Constant acceleration motion for ball
- Parachute reaches terminal speed (i.e. attains a constant speed) after about 0.5s.