Constant acceleration

The animation shows the position and the velocity at different times of a free-falling object. Air resistance is neglected.
The data presented can be used in a variety of ways to support the understanding of uniform accelerated motion. For example:

Students can draw a position-time and velocity-time graph using a graphing software. The lines of best-fit can be drawn (quadratic for the position and linear for the velocity) and then compared to equation of motion. The acceleration is the gradient/slope of the velocity time graph. The data is made so that using units of time as seconds and distance as meters, the acceleration is 9.8m s^{-2} (acceleration due to gravity on Earth).

The student can also check that the acceleration is constant by finding the change in velocity per unit time for each time interval using a table similar to the one below:

Time (s)	Velocity (m s^{-1})	Change in velocity (m s^{-1}) Δv	Change in velocity per unit time (m s^{-2}) $\frac{\Delta v}{\Delta t}$
0	0		
0.25	0.25	$2.5 - 0 = 2.5$	$\frac{2.5}{0.25} = 10$
0.50	0.49	$4.9 - 2.5 = 2.4$	$\frac{2.4}{0.25} = 9.6$

etc.
The values obtained for the acceleration are not always exactly the same, this could be used to discuss precision in measurements and uncertainties.

Also this could serve as an introduction to using video analysis to measure g. Tracker (http://physlets.org/tracker/) is a free software that can be used for video analysis.