

Preparation for – A level Physics



Key Terms: SUVAT - displacement; velocity; acceleration; time; force; resultant; resolve

Topic: Equations of motion

Key Question: How is 'motion' modelled in computer games?

 What to watch	 What to read	 What to do
<p>Choose you favourite 2....</p> <p>https://www.youtube.com/watch?v=ZzDYfGFODGY</p> <p>https://www.youtube.com/watch?v=NJRGRNCqkQ</p> <p>https://www.youtube.com/watch?v=ynuNUu5u!</p> <p>(Optional) How I got an A* in physics</p> <p>https://www.youtube.com/watch?v=oZbwtcw0DY&t=385s</p>	<p>Cherry pick best explanation...</p> <p>https://www.stem.org.uk/resources/elibrary/resource/27021/monkey-and-hunter</p> <p>https://en.wikipedia.org/wiki/Monkey_and_hunter</p> <p>https://spark.iop.org/monkey-and-hunter-experiment#gref</p> <p>Some history:</p> <p>https://ibmathsresources.com/2013/11/10/war-maths-projectile-motion/</p> <p>https://www.iwm.org.uk/collections/item/object/11456</p> <p>https://niglelf.tripod.com/fc_ballistics.htm</p> <p>When they couldn't get enough mathematicians...</p> <p>Search these docs for 'projectiles'</p> <p>https://videogamehistorian.wordpress.com/tag/bletchley-park/</p> <p>https://cgi.csc.liv.ac.uk/~ped/teachadmin/histsci/htmlform/lect5.html</p>	<p>Try some of the simulations below .</p> <p>https://phet.colorado.edu/en/simulation/projectile-motion</p> <p>https://phet.colorado.edu/en/simulation/collision-lab</p> <p>https://ophysics.com/k8.html</p> <p>https://ophysics.com/k10.html</p> <p>Decide what SUVAT equations have been used to 'animate' them.</p> <p>Have any of the 'laws of nature' been 'tweaked' to make them more playable ?</p> <p>Eg: what is the value of 'g' in your game?</p>

SUVAT Equations

$$v = u + at$$

$$v^2 = u^2 + 2as$$

$$s = ut + \frac{1}{2}at^2$$

$$s = vt - \frac{1}{2}at^2$$

$$s = \frac{1}{2}(u + v)t$$

s – displacement
u – initial velocity
v – final velocity
a – acceleration
t - time



What to submit

Screen shot or an annotated diagram – showing force arrows / resultant vectors – linking observations of the simulation to chosen SUVAT equations – see if you can make estimates / measure and calculate 'g'

Show working out to find 'g' in your favourite 'game' <https://www.youtube.com/watch?v=RIz3kIPET3o>

Optional – write an award winning app/game that earns 50K a week so you can take up 'non-working' ventures 😊

<http://www.crayonphysics.com/>

<https://www.linerider.com/>

