

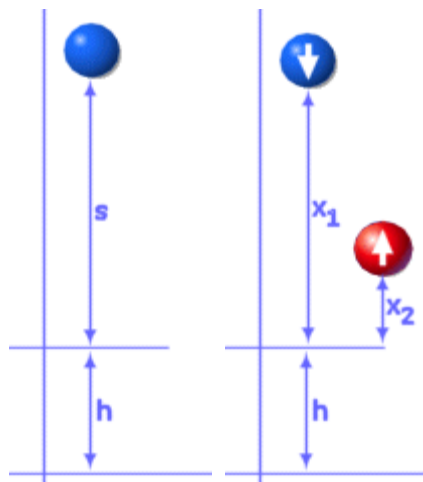
## Vertical motion

Always think about gravity and the fact that the particle is at rest at maximum height.

1.



Water from a fountain rises to a height of 19 metres. By modelling the drops of water as particles find (a) the speed of the water as it leaves the nozzle, (b) the time a particle spends rising before it falls.



2.

Jim the Juggler throws a blue ball in the air with initial speed  $5\text{ms}^{-1}$  from a height of  $h=1.2$  metres. (a) Find the maximum height  $s$  it reaches and the time taken. At the instant the ball reaches this maximum height, Jim throws up a red ball with the same speed and from the same height. (b) Find where and when the balls pass each other.