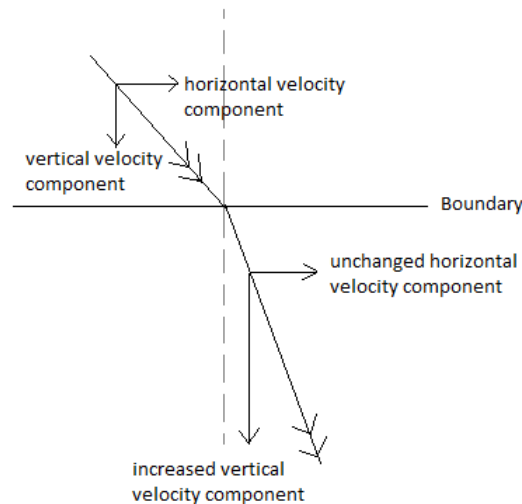


## TURNING POINTS

### 2-1 Early theories of light

1. Newton's theory stated that light consisted of corpuscles (discrete particles) and that they travelled faster in transparent substances like water or glass.  
Huygen's theory on the other hand was that light was a wave and that the waves travelled more slowly in transparent substances like water or glass.
2. The component of the corpuscle's velocity parallel to the boundary remains unchanged.  
The component of the corpuscle's velocity perpendicular to the boundary increased.



3. (a) Young's double slit fringe pattern consisted of many equally spaced light and dark bands. This could not be explained using the corpuscular theory as that could only account for a pair of bright fringes.  
(b) The fringes seen are the result of the superposition of the two diffracted beams from the double slit. Where the incident beams meet and their paths are a whole number of wavelengths different there is constructive interference because the waves arrive in phase and a bright fringe is seen. Where the incident beams meet and their paths differ by an odd number of half-wavelengths there is destructive interference because the waves arrive in antiphase and a dark fringe is seen.
4. (a) Newton's theory was accepted in preference to Huygen's because
  - Newton's reputation was greater
  - No method to measure the wave speed in air or a transparent medium was available so there was no evidence to back either theory
  - Wave theory could not explain polarisation (it was thought the waves were longitudinal)(ANY ONE)  
(b) The wave theory of light was still not accepted after Young's experiment because
  - wave speeds in transparent media and air had still not been measured
  - it was still not realised that light was transverse rather than longitudinal(ANY ONE)