

date  
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Scan II  
Unit-2

## Progressive waves

Progressive waves  $\rightarrow$  The disturbance travels forward i.e. it is handed over from one particle to the next after some time. Each particle has the same constant amplitude. The phase varies along the wave. That is a particle reaches any stage of its displacement at a time different from that of the last and the next particles. (i) No particle is permanently at rest. Every particle is momentarily at rest at the ~~order~~ extreme positions of its displacement. Different particles reach this position at different times. (ii) All the particles have the same maximum velocity which

They have on passing through their mean positions one after the other.

(8) Every region passed successively through condition of compression, maximal density and refraction and these conditions travel forward.

(9) The displacement, velocity and strain equations are represented by

$$y = a \sin \frac{2\pi}{\lambda} (vt - x)$$

$$\frac{dy}{dt} = \frac{2\pi av}{\lambda} \cos \frac{2\pi}{\lambda} (vt - x)$$

$$\frac{dy}{dx} = -\frac{2\pi a}{\lambda} \cos \frac{2\pi}{\lambda} (vt - x)$$

A particle has its maximum velocity and maximum strain (change of pressure) at the same time and has its maximum displacement a quarter



period later. The velocity and the pressure curves, therefore, agree, and ~~is~~  $T/4$  ahead of the displacement curve. (b) There are a transmission of energy across every plane.

