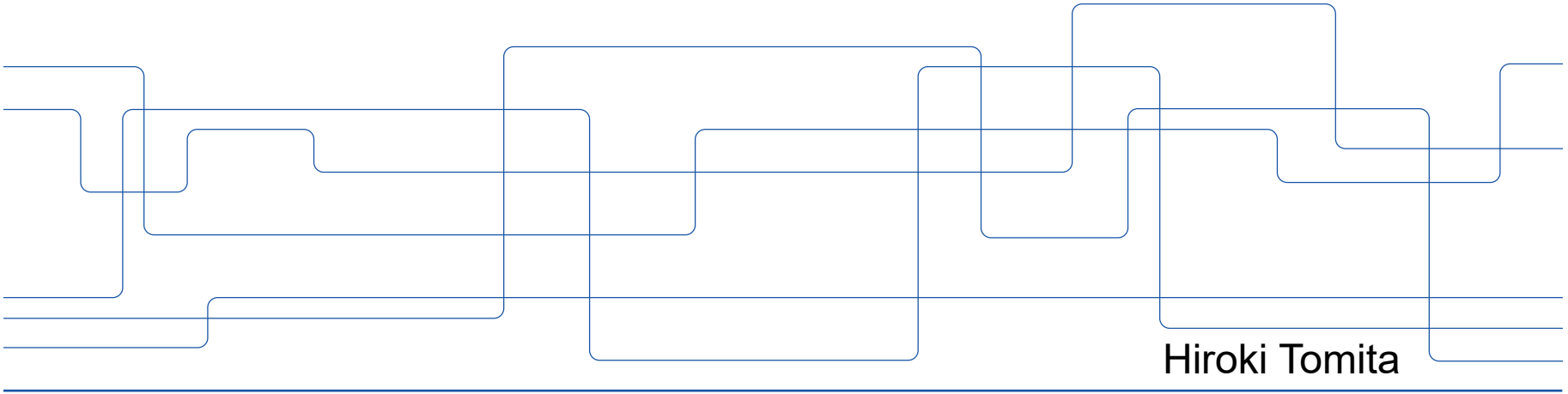
KTH ROYAL INSTITUTE
OF TECHNOLOGY

Wave Characteristics

Oscillations, Travelling waves, Wave behaviour



Hiroki Tomita

Transverse or Longitudinal wave

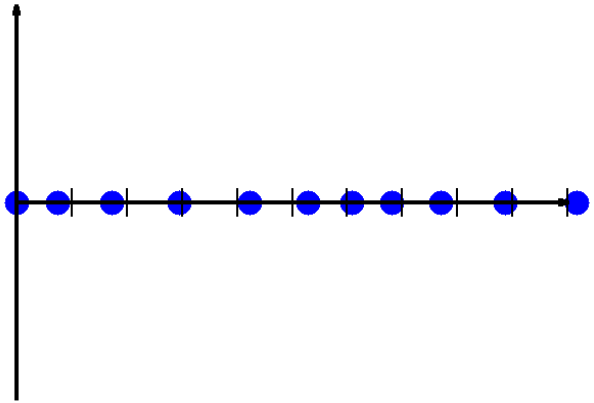
- Transverse wave

  The displacement of the medium is perpendicular to the direction of propagation of the wave

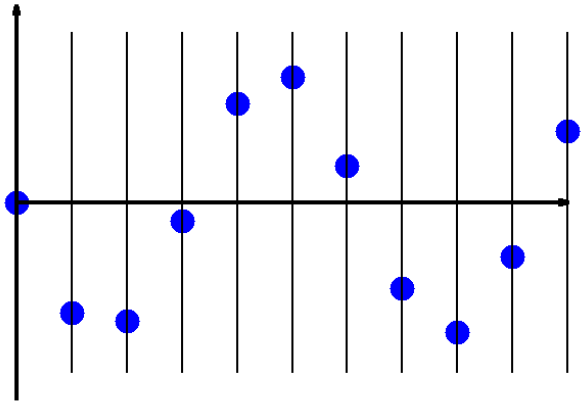
- Longitudinal wave

  The displacement of the medium is parallel to the direction of propagation of the wave

Transverse or Longitudinal wave?

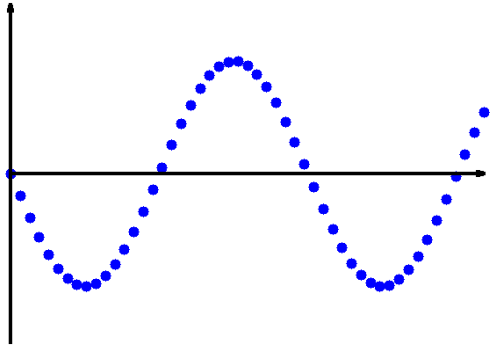


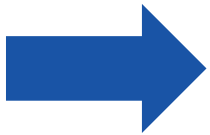
Longitudinal wave
(ex. sound wave)

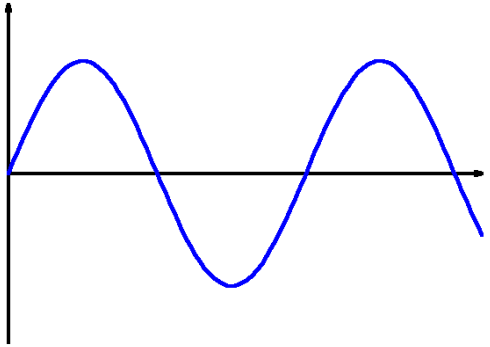


Transverse wave
(ex. water wave)

Transverse wave





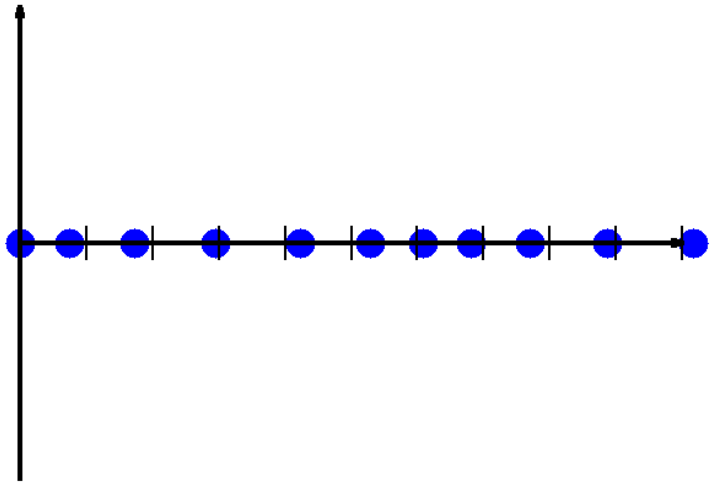


Increase the number of particles

Managed to see the shape of transverse wave!!

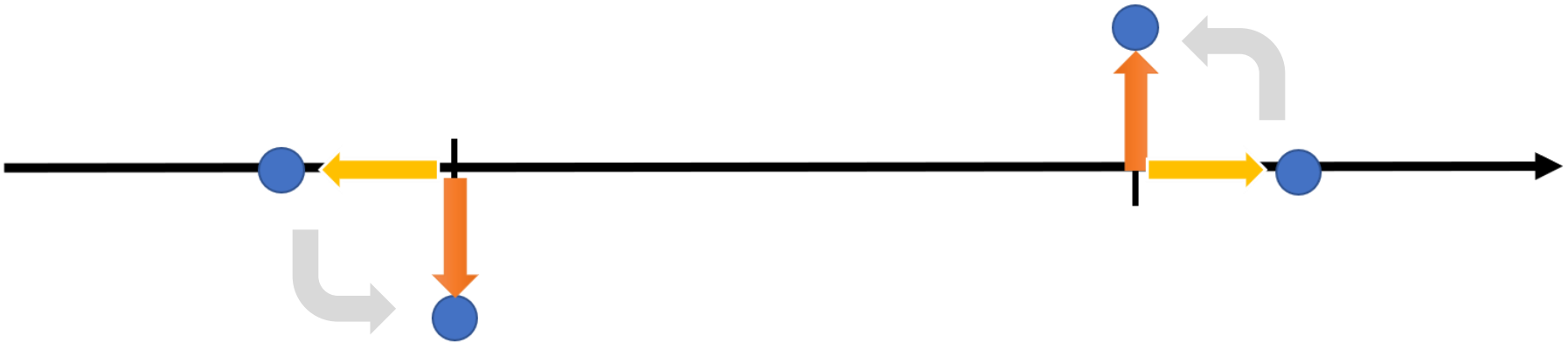
Longitudinal wave

How can we draw the graph of longitudinal wave?



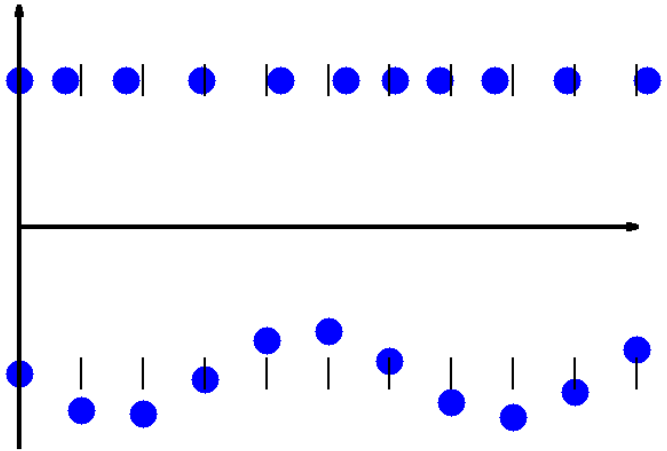
Longitudinal wave

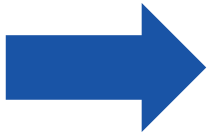
If a particle moves in the direction of the wave, it is considered as moving upward

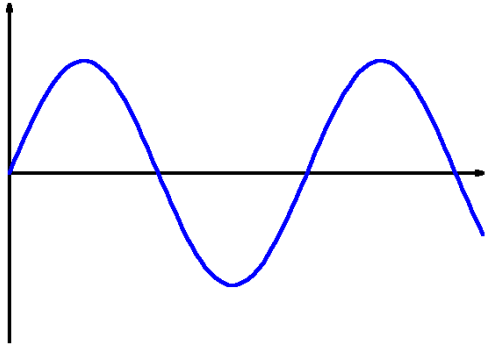


If a particle moves in the opposite direction of the wave's motion, it is considered as moving downward

Longitudinal wave



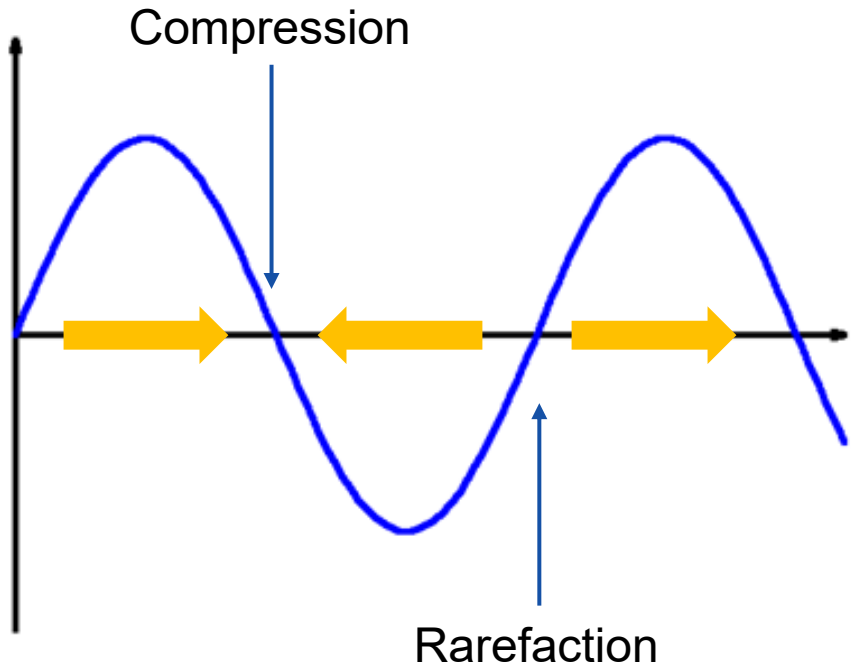




We can regard longitudinal wave as transverse wave

Managed to see the shape of longitudinal wave!!

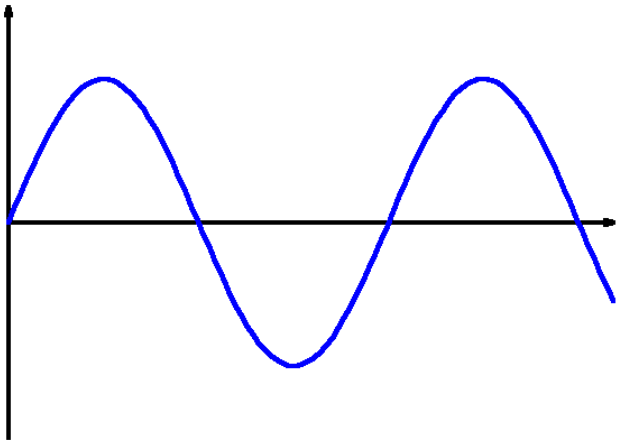
Longitudinal wave



How to draw the graph of wave

How can we draw the graph then?

Real wave is moving continually



In order to draw the graph, we have to …

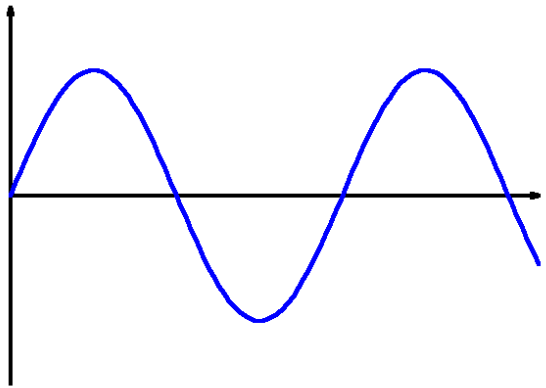
1. Stop

   The Time

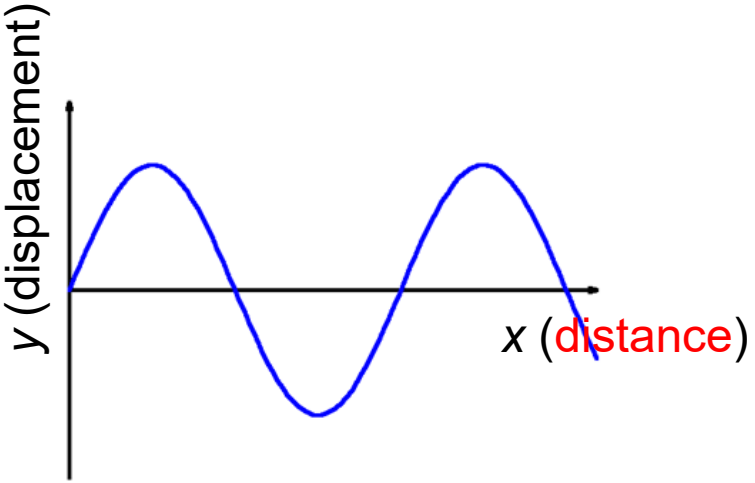
2. Fix

   The Observing Point

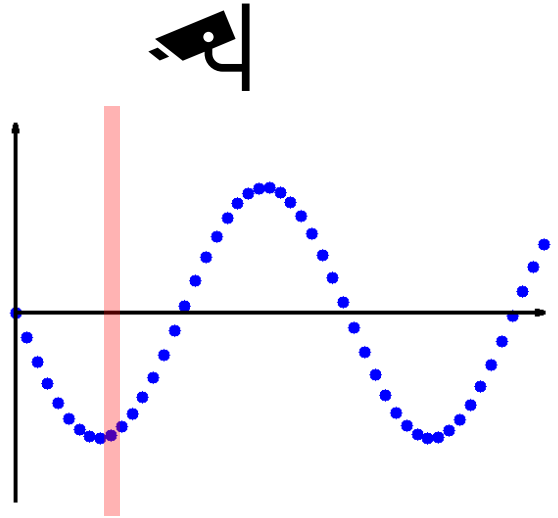
The graphs of wave (Time fixed)



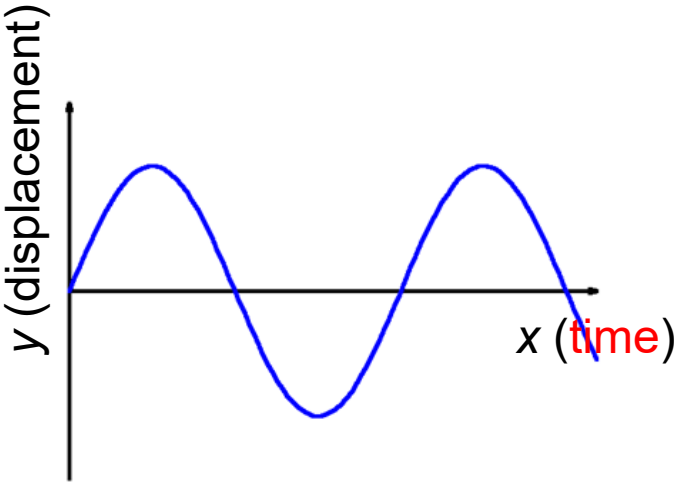
Take a photo
(stop the time)



The graphs of wave (Observation point fixed)



Record the specific point (fix the point)



Variables for wave

- Wavelength λ

  The distance of one wave cycle

- Period T

  The duration of time of one wave cycle

- Amplitude A

  The intensity of the wave

- Frequency f

  The number of the wave per unit of time (1 sec)