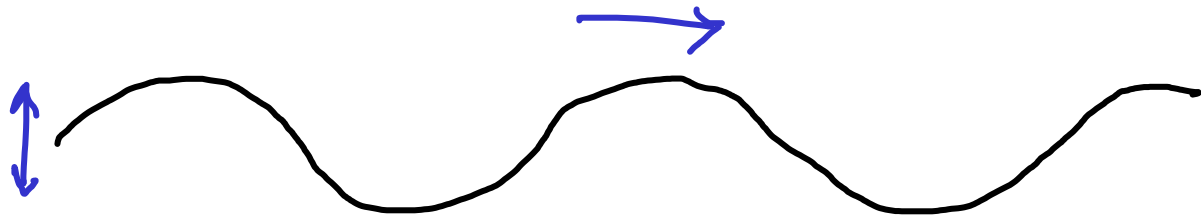


describe what is meant by wave motion as illustrated by vibrations in ropes and springs and by waves in a ripple tank

Wave Motion

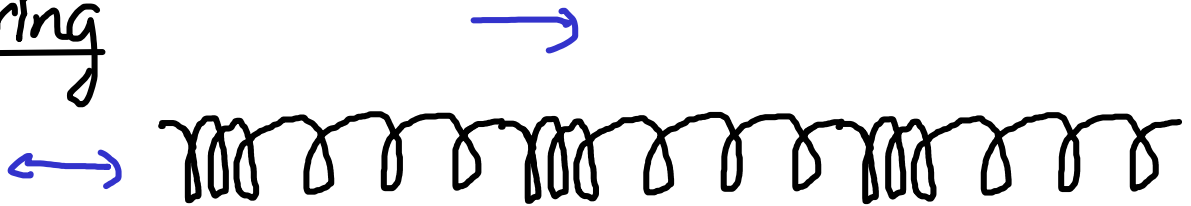
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Rope



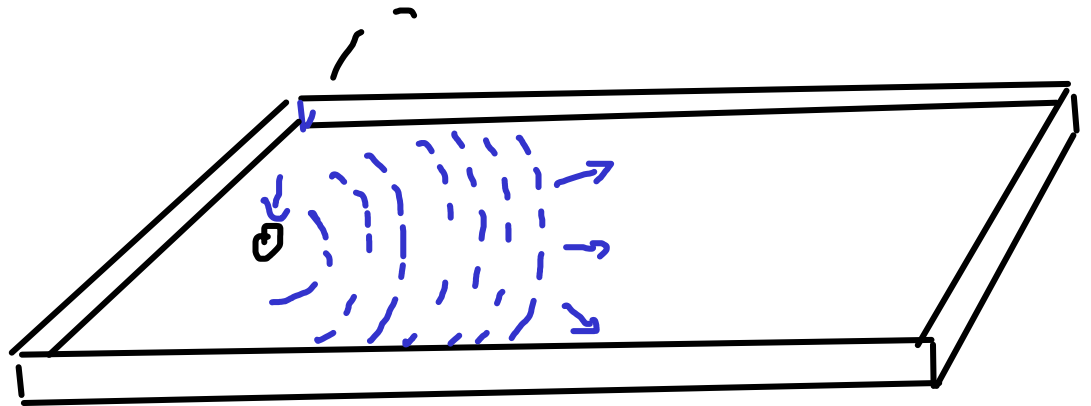
Shake on end up and down

Spring



push and pull at one end

Ripple

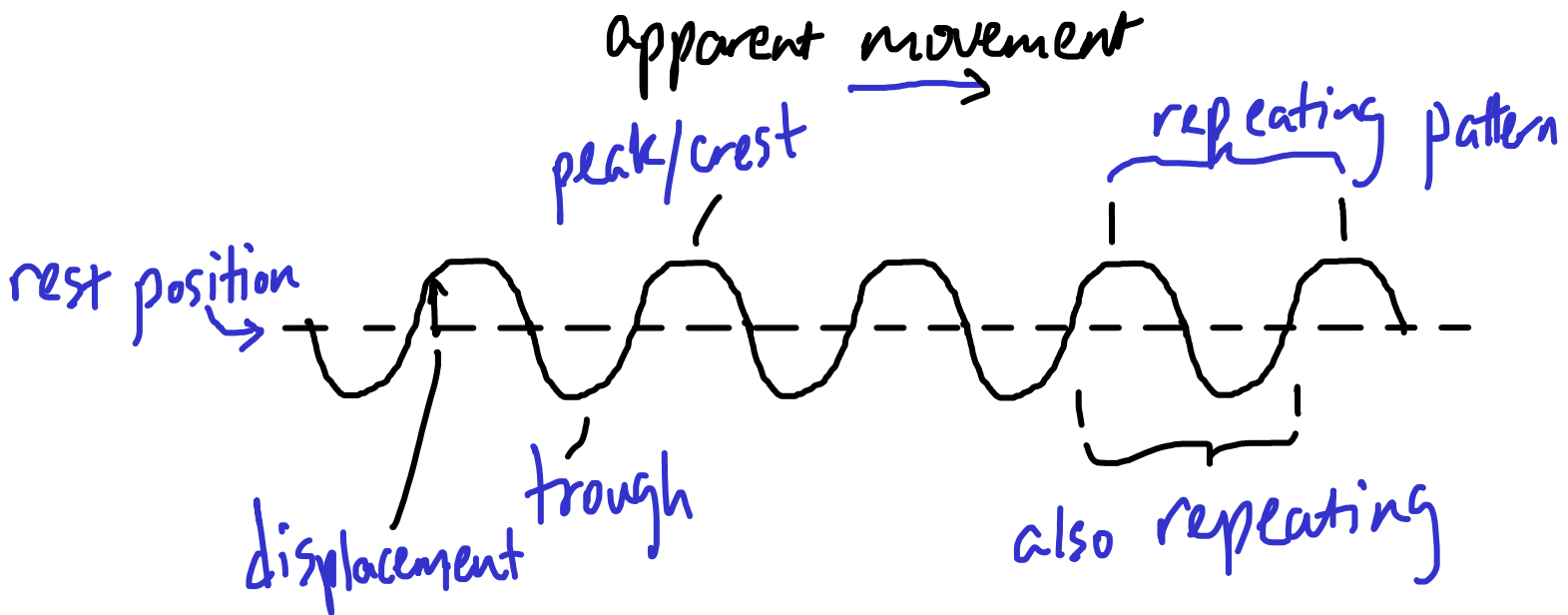


Throw stone into water

Wave - a repeating pattern that appears to travel.

Describing a Wave

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Speed = distance repeating pattern (e.g. peak) travels per unit time

wavelength = length of repeating unit (e.g. distance between peaks)

amplitude = maximum displacement of a point from rest position

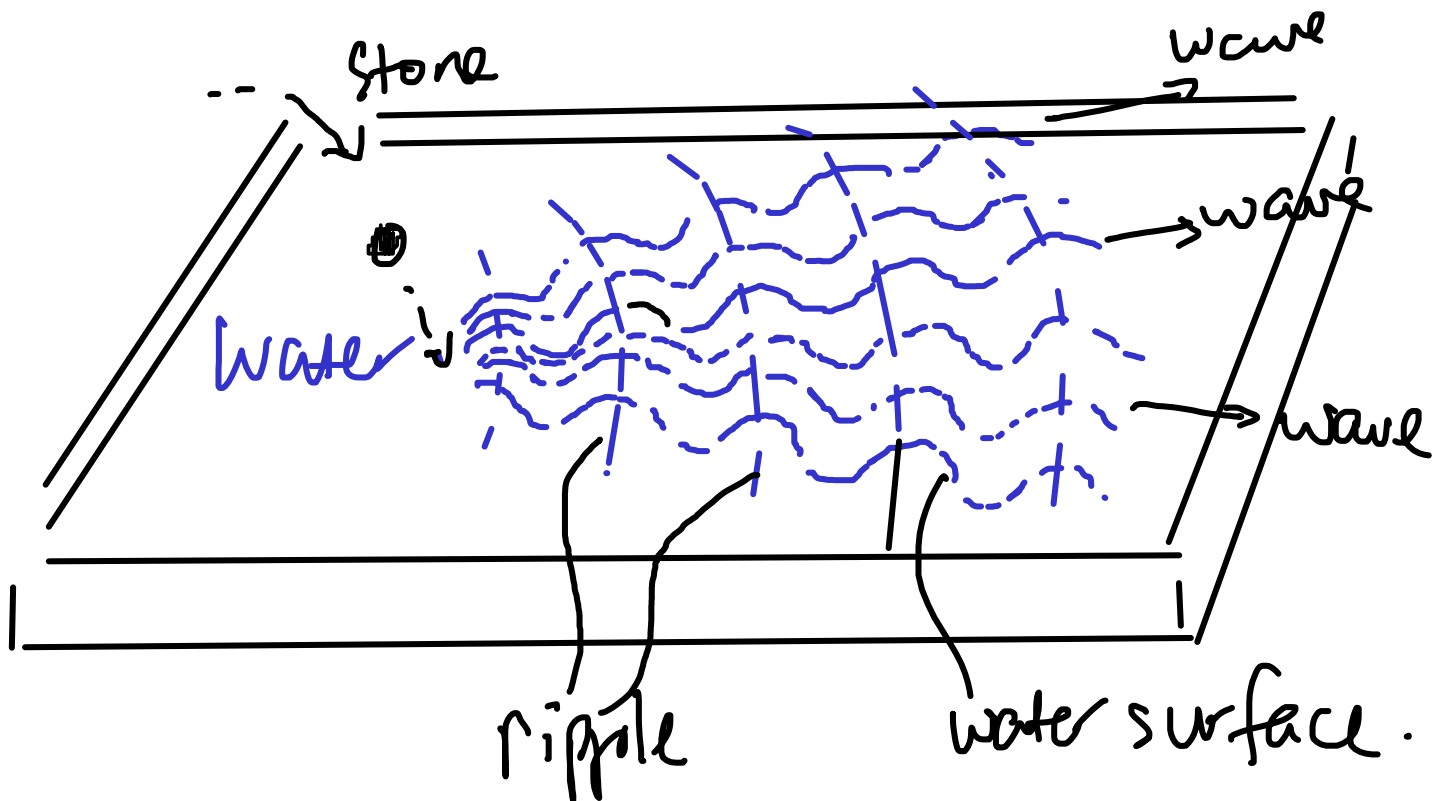
period = time taken for a point to do 1 cycle of motion (e.g. up, down once)

frequency : number of cycles per unit time of a point (e.g. how many up-down per second)

Wavefront

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e.g. ripple tank



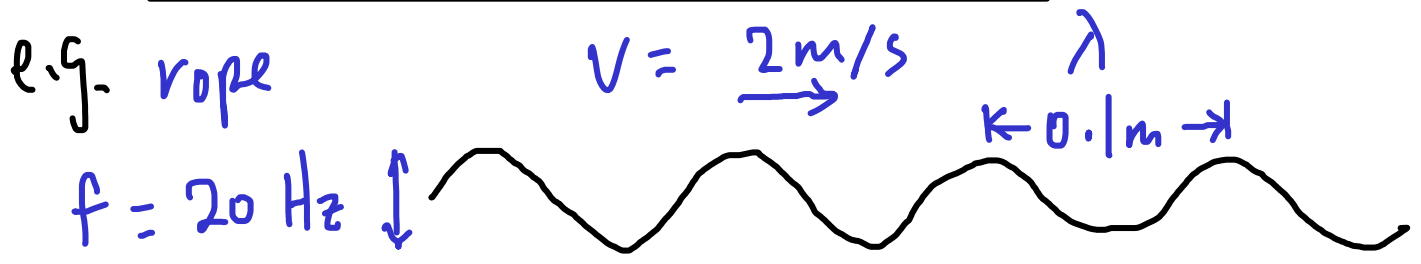
So a ripple is a line joining the peaks of waves on water surface

Such line is called Wavefront

Wavefront - line joining points on waves at the same stage of cycle.
e.g. peak, trough, middle

Velocity, frequency and wavelength

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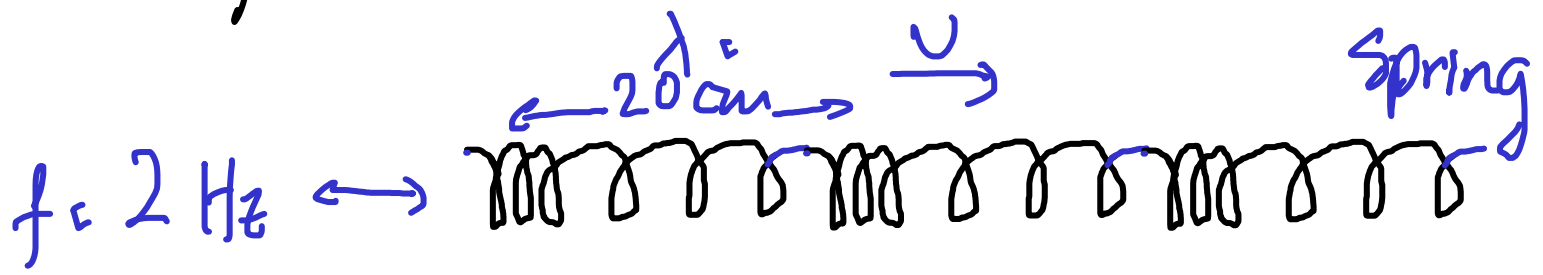
Shake faster, ∴ more waves
- shorter wavelength

velocity = frequency × wavelength.

$$v = f \lambda$$

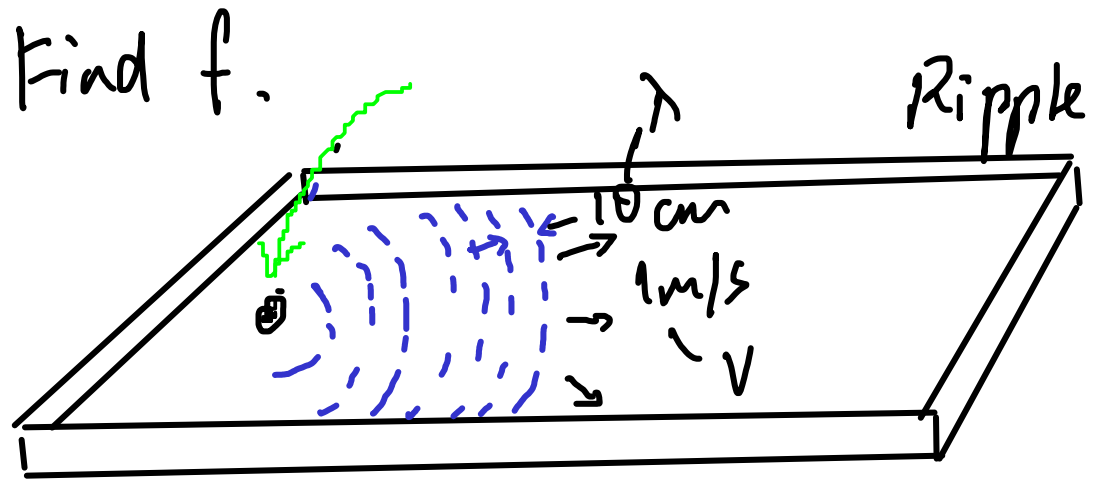
Can use for all waves.

e.g. find v . $v = f \lambda = 2 \times 0.2 = 0.4 \text{ m/s}$



e.g. Find f .

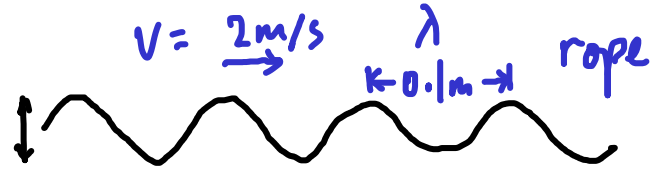
$$f = \frac{v}{\lambda}$$
$$= \frac{1}{0.1}$$
$$= 10 \text{ Hz}$$



Transverse, Longitudinal Waves

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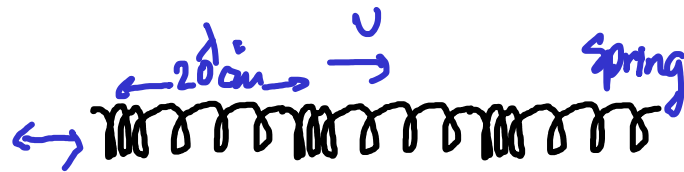
e.g. rope wave - travels to right,
but each point moves
up, down.



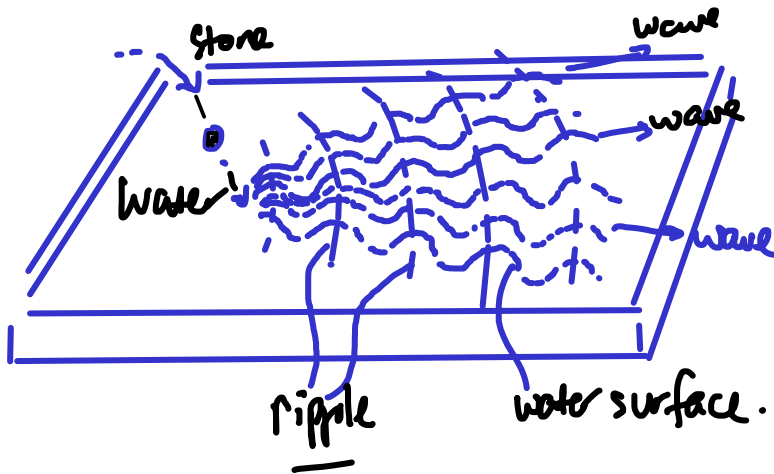
→ oscillation \perp wave dirn → Transverse wave

e.g. Spring wave.

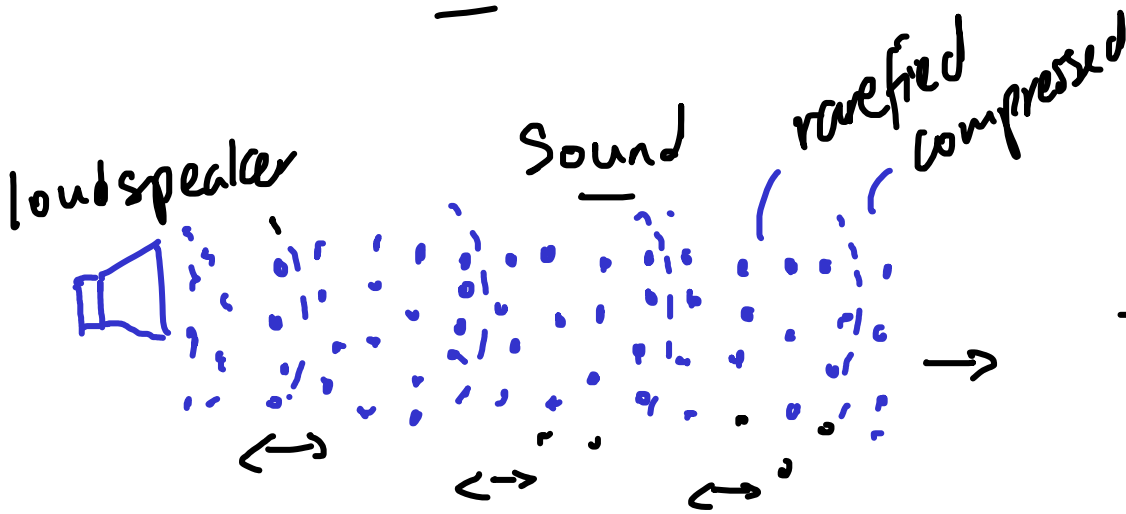
→ oscillation \parallel wave dirn



→ Longitudinal Wave



Transverse



Longitudinal