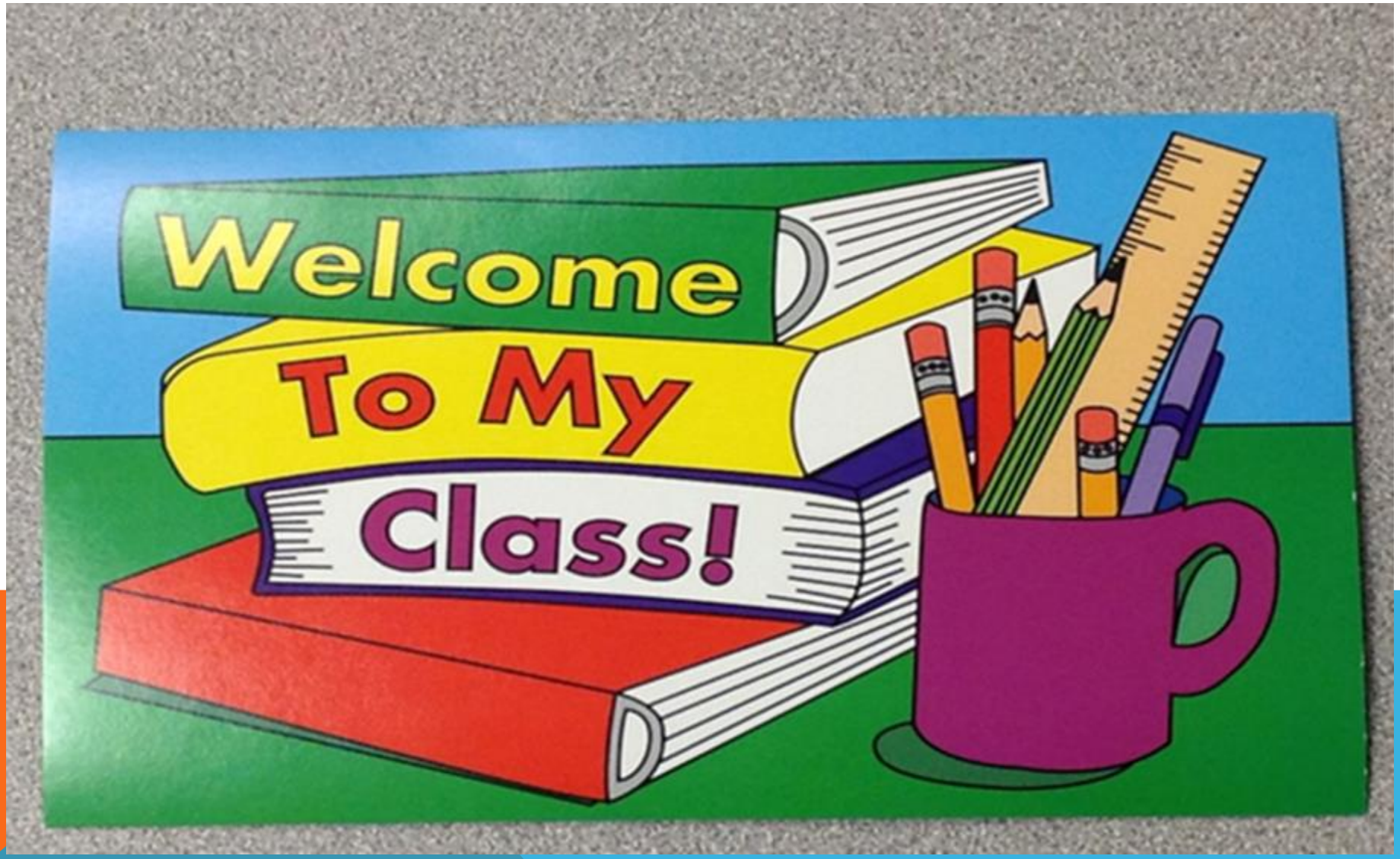
Pakistan School
Kingdom of Bahrain

CLASS : 10

SUBJECT : PHYSICS



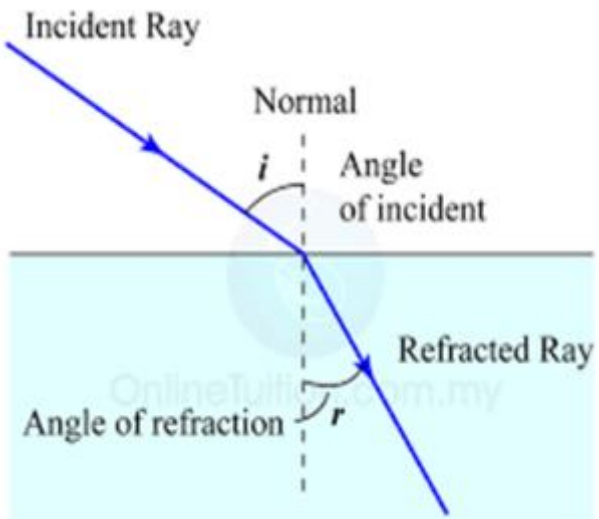
ENGAGING STARTER

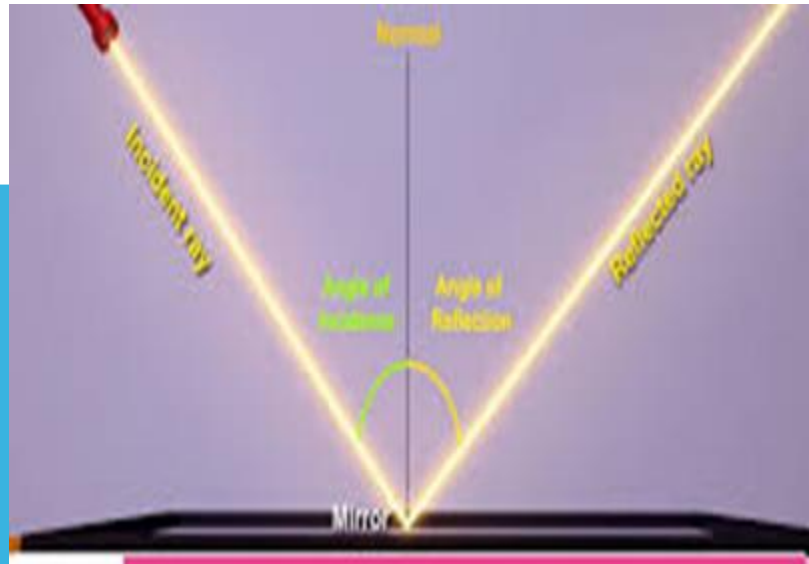
What is happening in the given pictures?

Which properties of waves are shown here?

Can you guess the name?

What do you think is there any device used to study waves properties? Yes /No





TOPIC

Ripple tank

OBJECTIVE

At the end of this lesson students will be able to :

Describe the working of ripple tank .

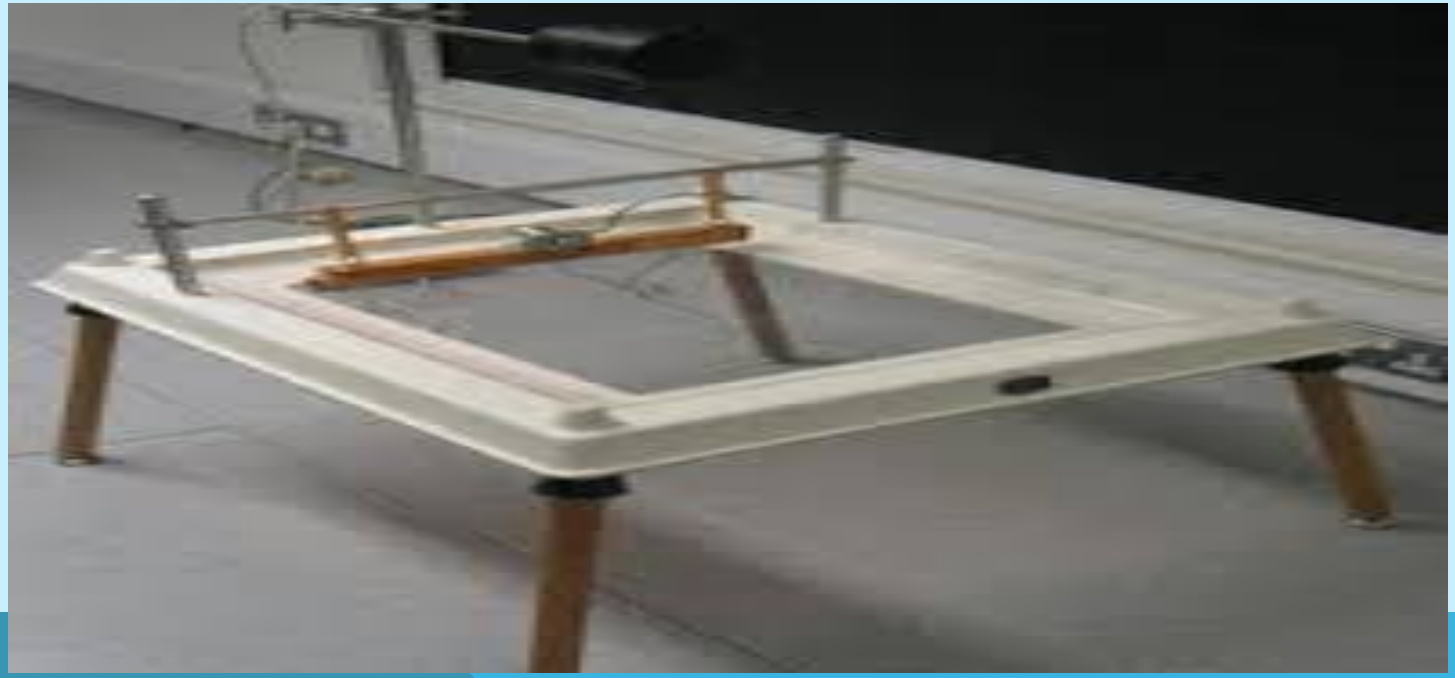
Analyze the properties of waves.

RIPPLE TANK

Ripple tank is a device used to produce water waves and to study their characteristics.

STRUCTURE

Ripple tank consists of a rectangular tray having glass bottom and is placed nearly half meter above the surface of a table. Waves can be produced on the surface of water present in the tray by means of vibrator (paddle).This vibrator is on oscillating electric motor fixed on a wooden plate over the tray such that its lower surface just touches the surface of water.

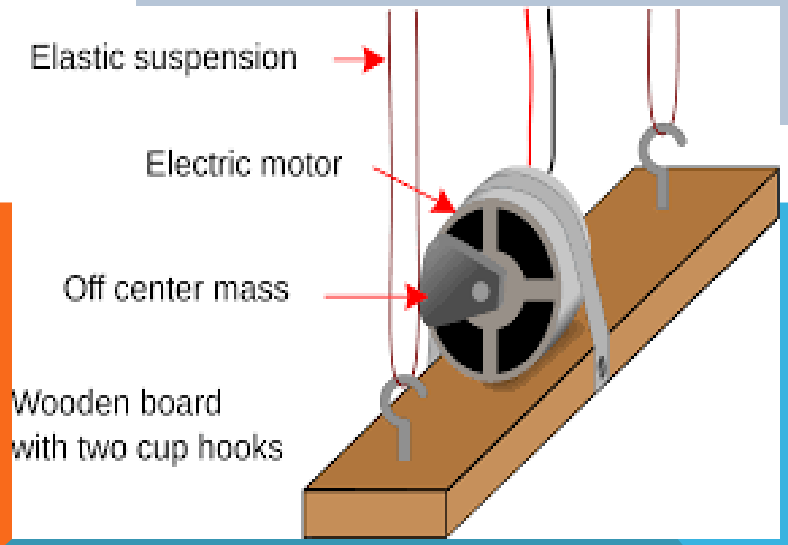


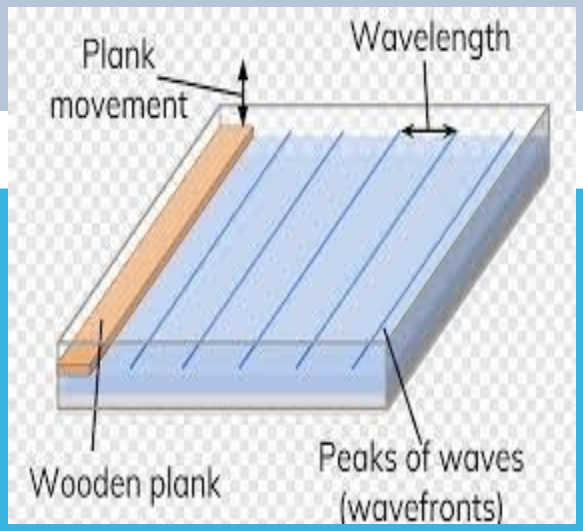
WORKING

- On setting the vibrator ON, this wooden plate starts vibrating to generate plane water weaves.

An electric bulb is hung above the tray to observe the image of water waves on the paper or screen.

The crests and troughs of the waves appear as bright and dark lines, on the screen.

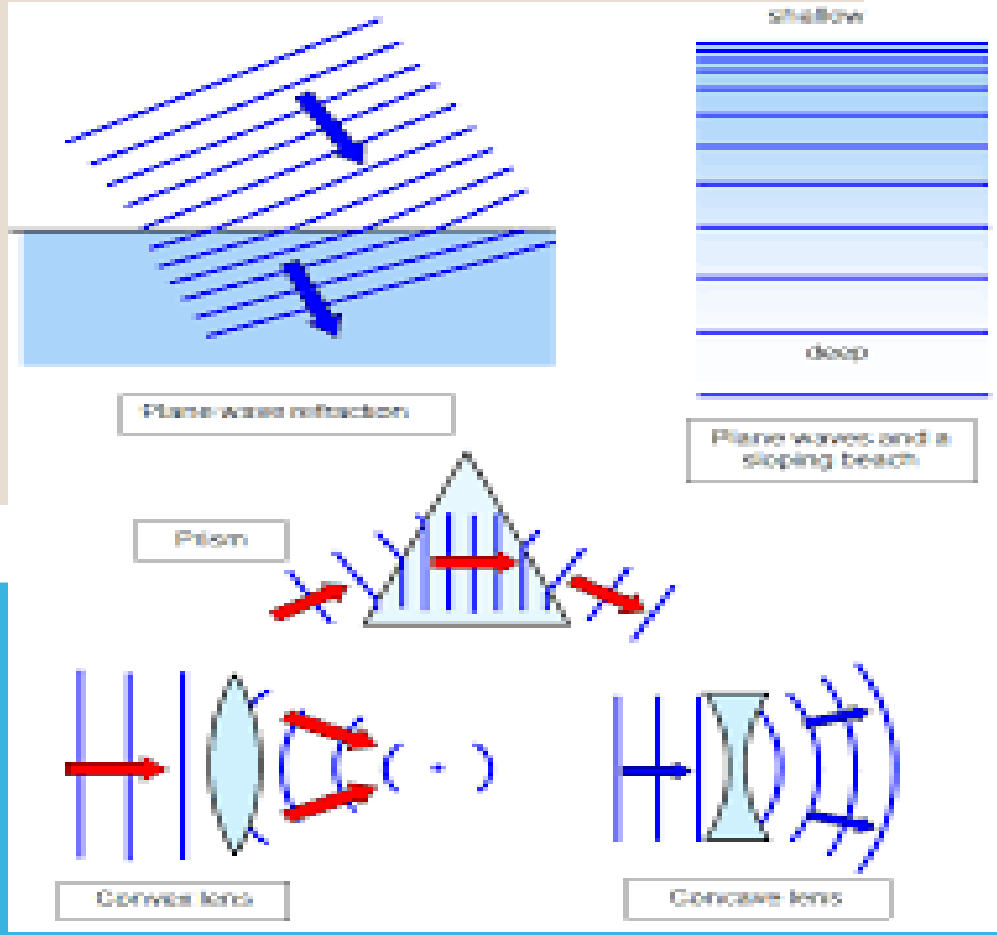




PROPERTIES OF WAVES WITH REFERENCE TO RIPPLE TANK EXPERIMENT

There are three properties of waves which can be studied by using ripple tank.

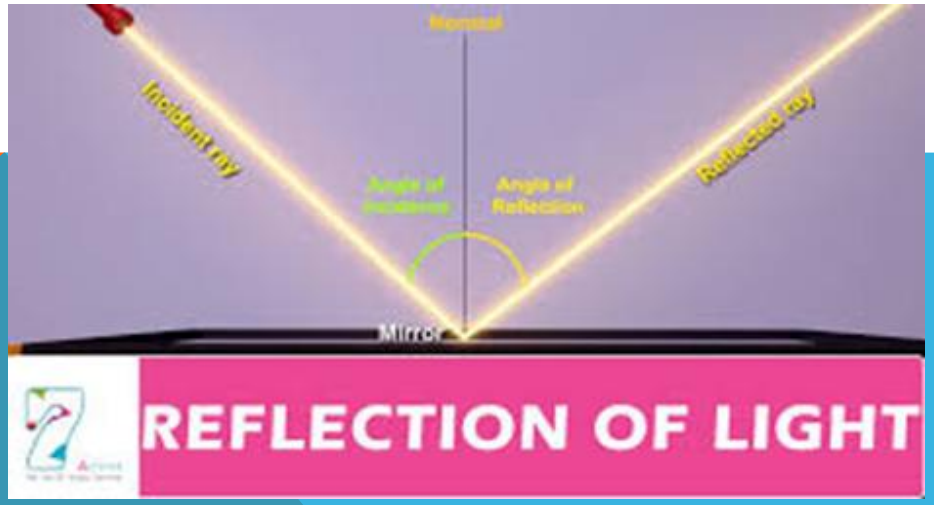
1. Reflection
2. Refraction
3. Diffraction



REFLECTION

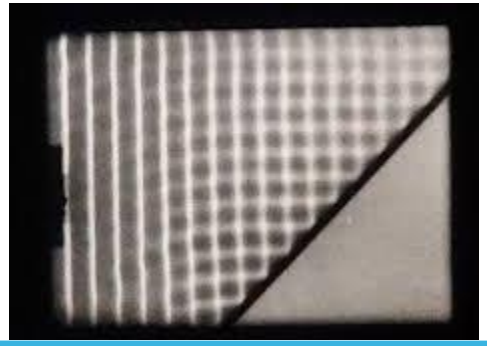
Thus we define reflection as:

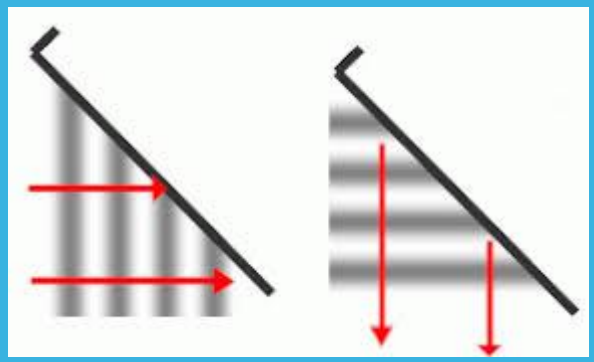
"When waves moving in one medium fall on the surface of another medium they bounce back into the first medium such that the angle of incidence is equal to the angle of reflection, The phenomenon is called reflection of waves."



A) REFLECTION:

To study the reflection of water waves, place a barrier in the ripple tank. The water waves will reflect From the barrier. If the barrier is placed at an angle to the wave front the reflected waves can be seen to obey the law of reflection i.e. the angle of the incident wave along the normal will be equal to the angle of the reflected wave as shown in figure.





NUMERICAL PROBLEM

A wave move on a slinky spring with frequency of 4 Hz and wavelength of 0.4m . What is the speed of wave?

Given:

Frequency = f = ...?

Wavelength = λ = ...?

To find

Speed = v = ?

Solution

By using ..... equation

V= ..... λ

V = ...x .....

v =.....m/s

THE WAVE LENGTH OF WAVE IS 0.1M AND HAS FREQUENCY OF 2HZ. THEN HOW LONG WILL TAKE THE WAVE TO REACH THE OPPOSITE SIDE OF THE TANK 2M AWAY?

Given

Wavelength = λ = ...

Frequency = f = ...

Distance = d = 2m

To find

Time taken = t = ?

Solution

Using wave equation

V = ... λ

V= .....x .....

V= .....m/s

Now using formula

V= d/t

So t= d/v t= ..../.....

t= .....s

PLENARY

- Tell the name of device used to study water waves .
- Ripple tank is used to study ..... Number of properties of waves .
- Describe the name of properties used to study by using ripple tank .
- In reflection ray of angle of incidence should be equal to angle of ..... (reflection / refraction)
- Speed of water will .....while passing from shallow to deep part . (increase / decrease)


STAY HOME!
STAY SAFE!

Allah Hafiz