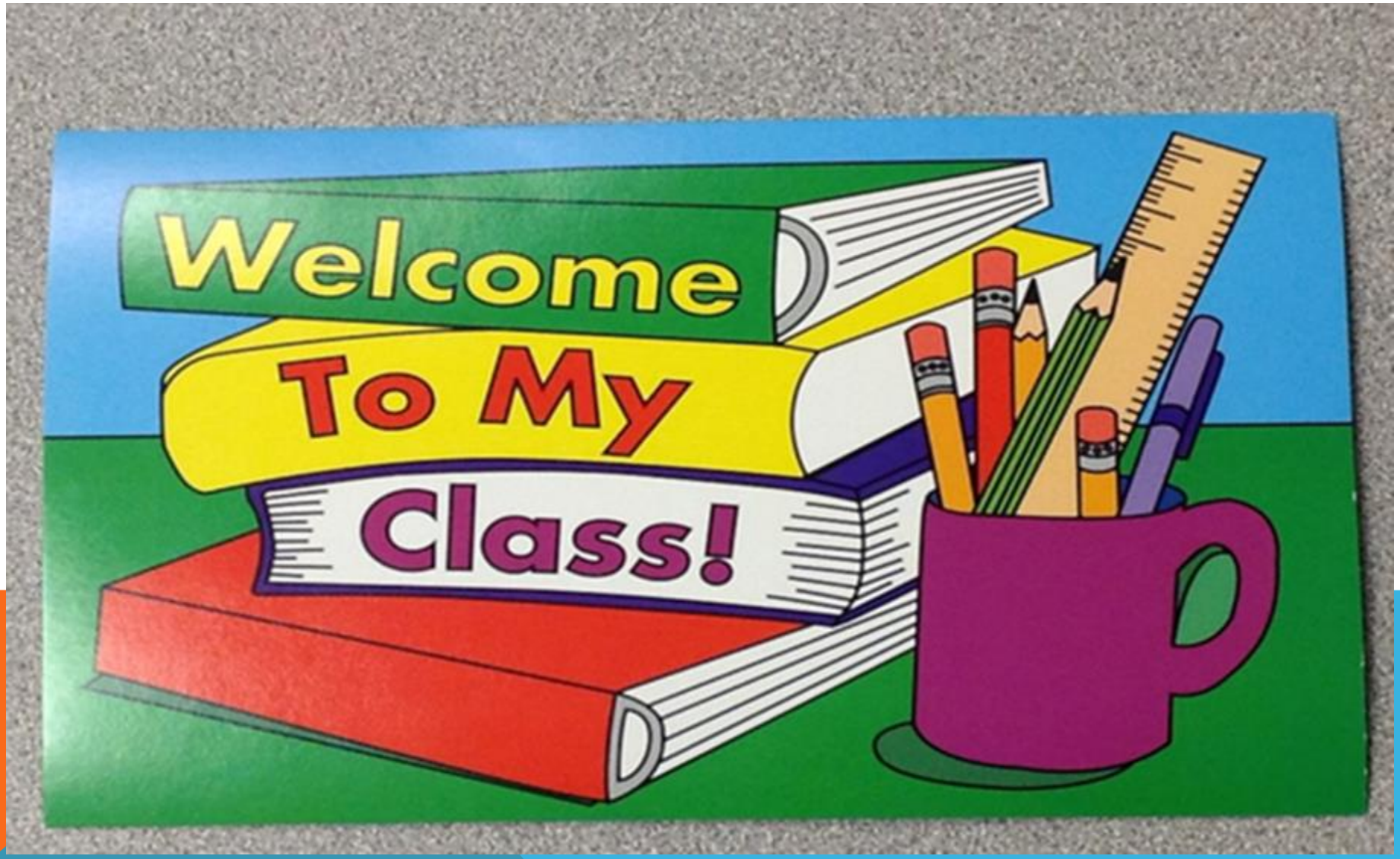
Pakistan School
Kingdom of Bahrain

CLASS : 10

SUBJECT : PHYSICS

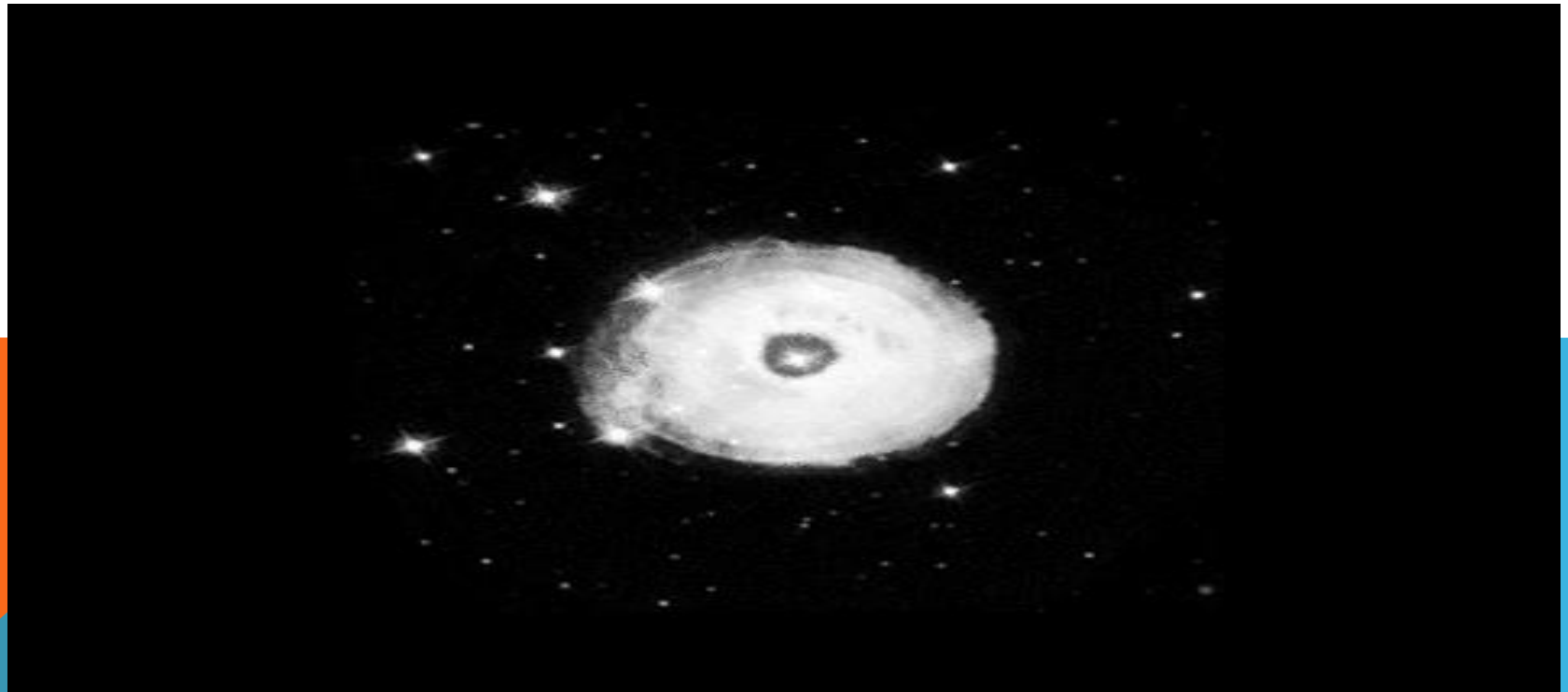


ENGAGING STARTER

Identify the place shown in picture.

Can we hear that blast in space ?

Justify your answer.



TOPIC

- Speed of sound
- Noise

- Uses of Ultra sound

OBJECTIVE

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

Describe the uses of ultra sound in daily life.

SPEED OF SOUND

Speed of sound in air is = 330m/s

Speed of sound in liquid (water) is = 1480m/s

Speed of sound in solid is = 6000m/s

Greatest speed of sound is in .....

Least speed of sound is in .....

Why ?

FORMULA TO FIND SPEED OF SOUND

We can find the speed of sound by using wave equation

$V = f\lambda$

Where v= ....

And f=.....

λ = ...

DIFFERENCE BETWEEN NOISE AND MUSICAL SOUND

MUSICAL SOUND

Sounds which are pleasant to our ears are called musical sounds.

For example:

Sound produced by flute .

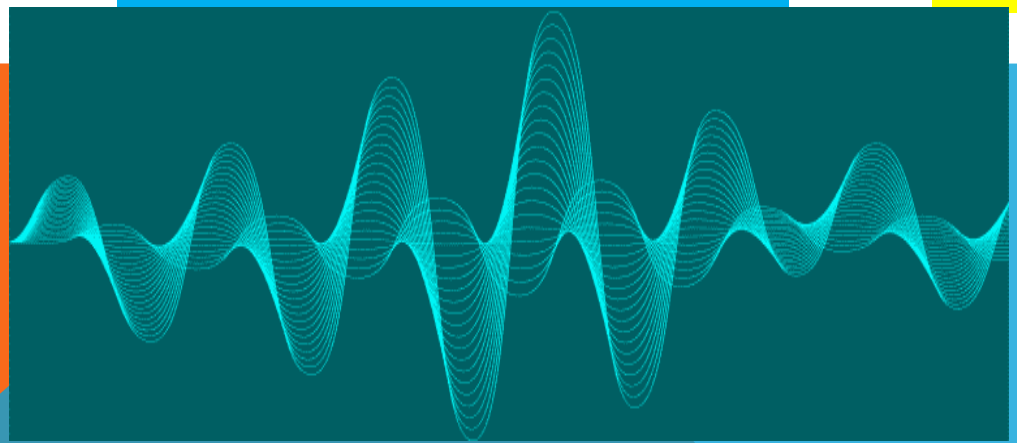
Voice of bird

NOISE

Sound which has jarring and unpleasant effect on our ear is called noise.

For example:

Sound of machinery , traffic , slamming of door



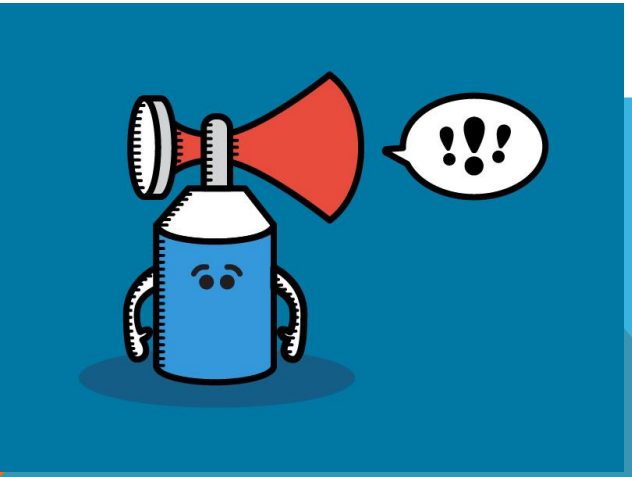
NOISE POLLUTION

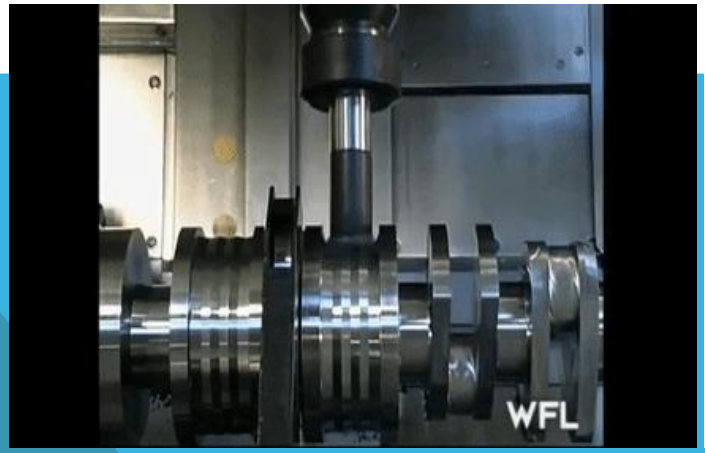
Noise is an undesirable sound that is harmful for health of human and other species.

Sources: Machinery in industrial area , loud vehicle horns ,hooters and alarms.

Effects :It can cause hearing loss, sleep disturbance, hypertension , high stress level etc.

Solution :Replace noisy machinery with environment friendly machinery ,using hearing protection devices.





FREQUENCY RANGE

AUDIBLE FREQUENCY RANGE

The range of the frequencies which a human ear can hear is called audible frequency range.

Value : Frequency of 20Hz to 20000Hz .

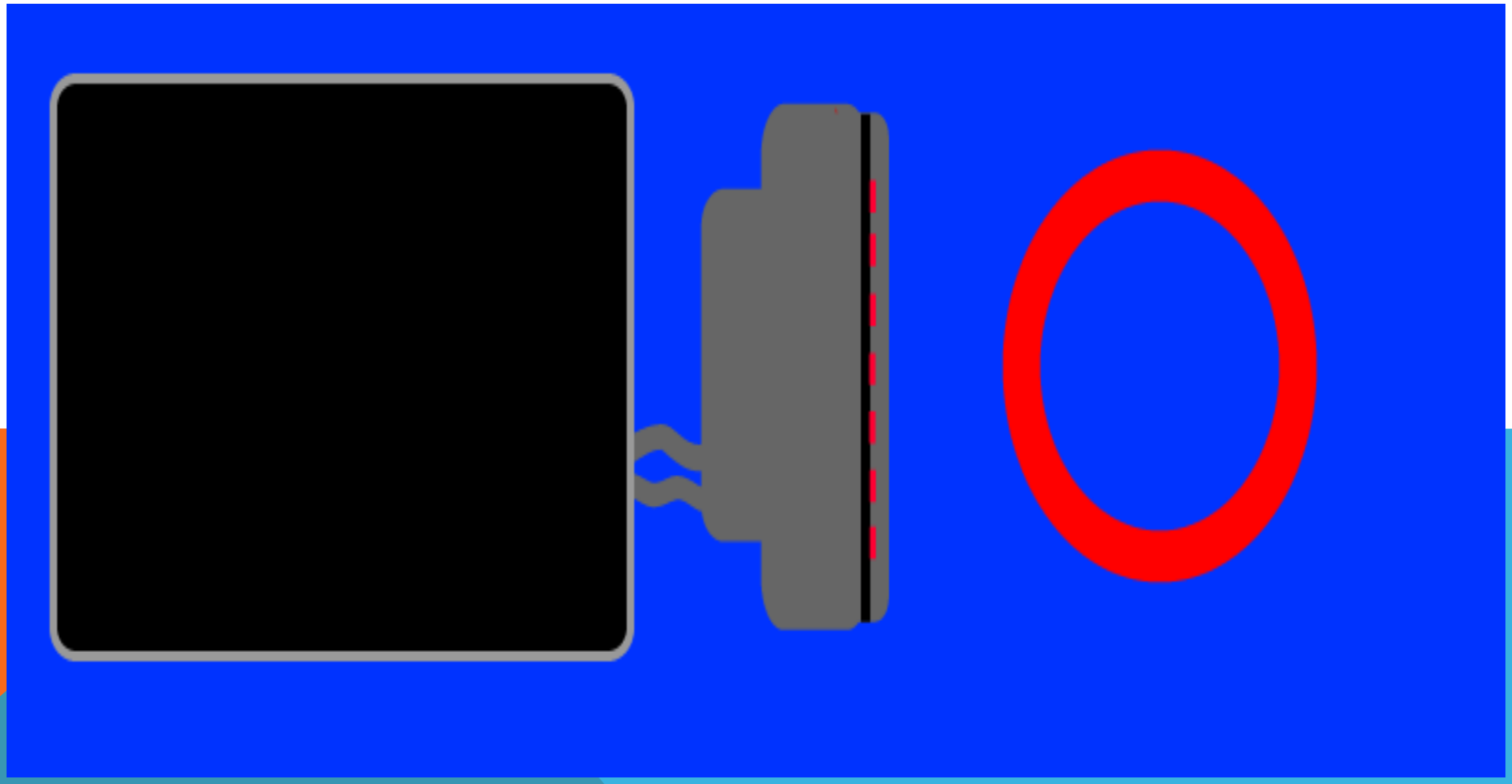
INAUDIBLE FREQUENCY RANGE

The range of the frequencies which a human ear can not hear is called inaudible frequency range.

Value : Frequency higher than 20000Hz .

ULTRA SOUND

Sound of frequency higher than 20000Hz which are inaudible to normal human ear called ultrasound.



USES

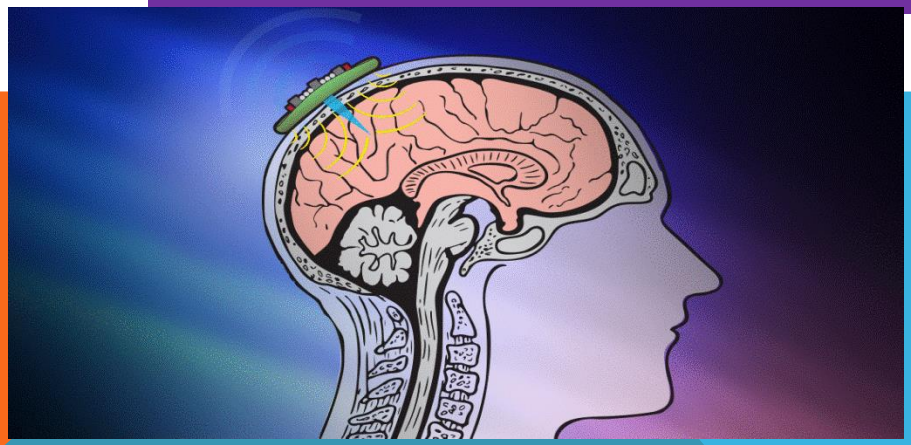
Some uses of ultrasound is given below:

In medical field:

To diagnose different diseases like tumors.

To remove blood clots formed in arteries.

To get the picture of thyroid gland for diagnosis purposes.



USES

To locate under ground water depth.

To locate objects lying deep on the ocean floor etc .

Germs and bacteria in liquid can be destroyed by using high intensity ultrasonic waves.

SONAR

SONAR= sound navigation and ranging

Method:

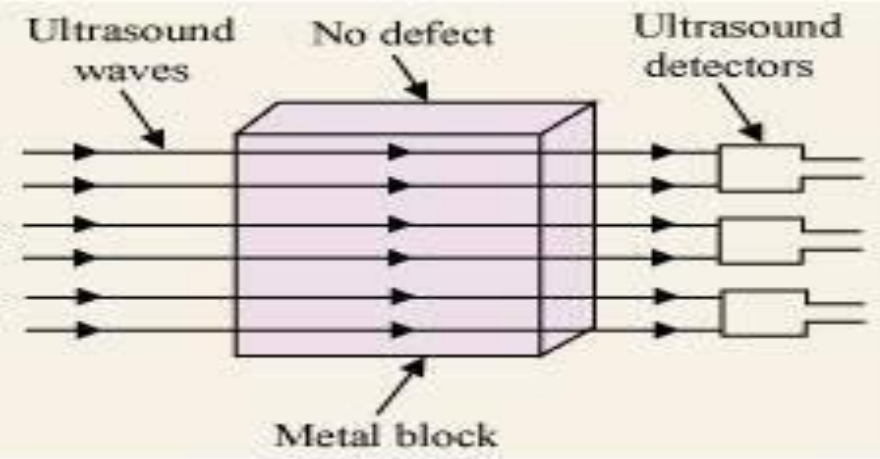
Sound waves are sent from a transmitter and a receiver collects the reflected sound .The time lapse is calculated , knowing the speed of sound in water , the distance of object from the ocean surface can be estimated.

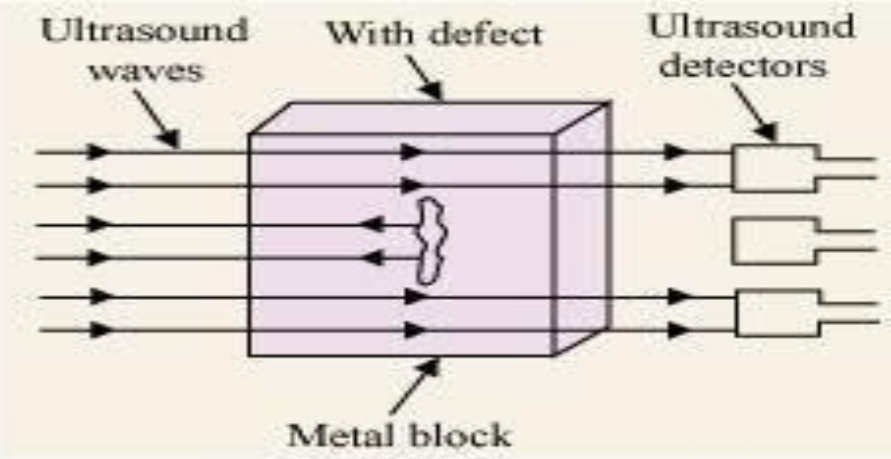
Use: It is also used to see the shape and size of object .

USES OF ULTRA SOUND

Cracks in engine ship aero planes turbine can be detected by ultrasonic waves.

Method : A powerful beam of ultra sound is made to pass through defective parts .these waves are reflected by the surface of cracks and flaws .By comparison of reflected waves from cracks and surface give clue of the existence of the cracks.





PLENARY

- Speed of sound can be found by using.....
- Give one example of pleasant sound .
- The sound which has jarring effect on ear is known as ..... (musical sound / noise)
- Describe some effects of noise on human body.
- The audible frequency range for human ear is up to .....
  (20000Hz /30000Hz)
- SONAR is used to find .....?
- Ultra sound is used to diagnose .....
  (tumor /blood circulation)

HOME WORK

Solve by using wave equation Q.1.3 from exercise page number 35 on your note book.


STAY HOME!
STAY SAFE!

Allah Hafiz