

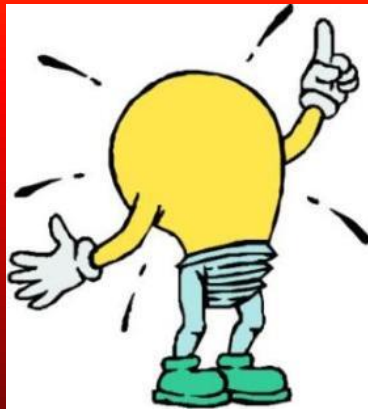
Edexcel P1 Pre-exam Presentation

You are given all the equations you need
on page 2.

$$v = f \times \lambda$$

λ = wavelength

MAKE SURE YOU CHECK!
(when asked to calculate)



$$P = I \times V$$

I = current (amps)

Refraction

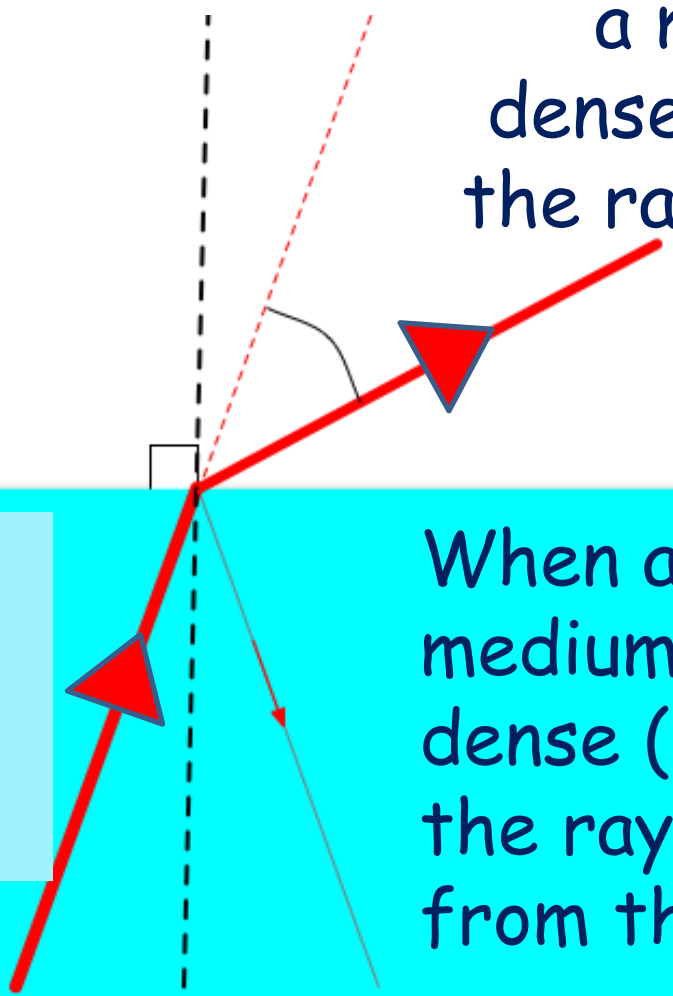
Air (fast medium)

normal

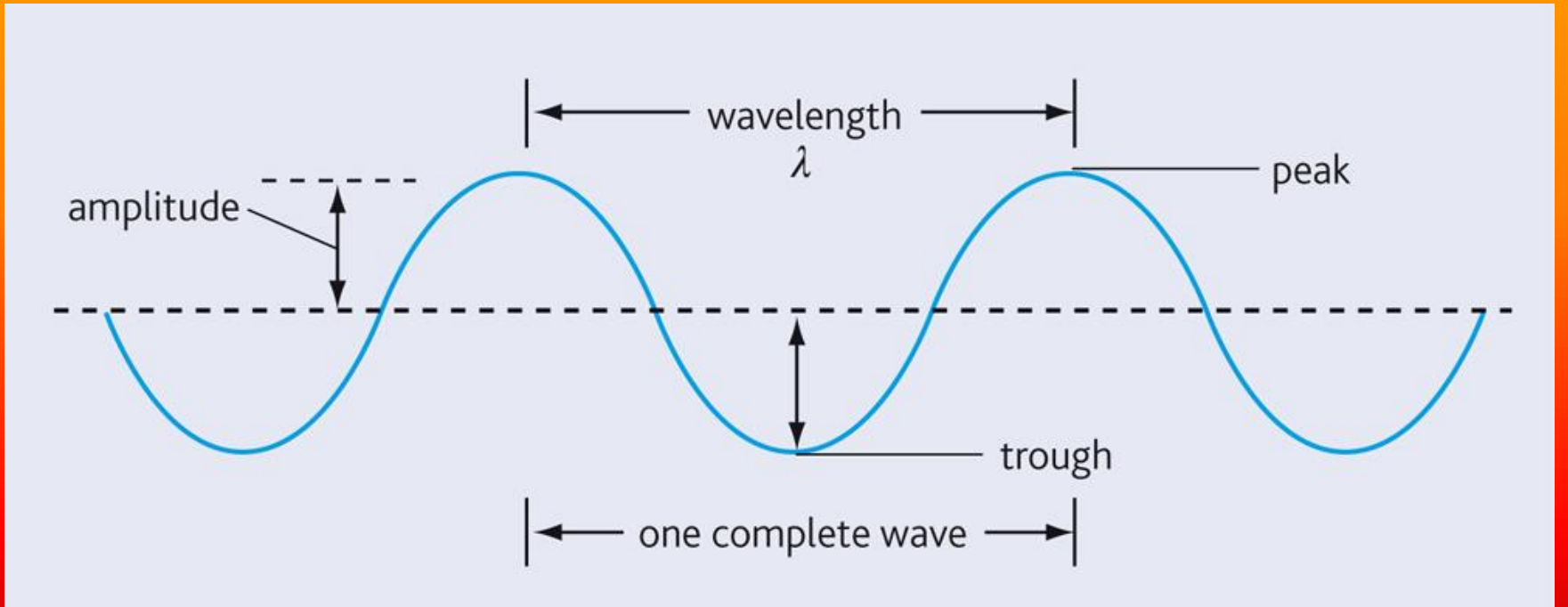
When a light ray enters a medium that is less dense (like water to air) the ray bends away from the normal.

Water (slow medium)

When a light ray enters a medium that is more dense (like air to glass) the ray bends towards from the normal.



Parts of a wave



Wave calculations 1

Wave speed (meter/second, m/s) = $\frac{\text{distance (meter, m)}}{\text{Time (second, s)}}$

$$v = \frac{x}{t}$$

For example, if a wave carries a surfer 52 meters in 8 seconds, the wave speed is:

$$v = \frac{52}{8} = 6.5 \text{ m/s}$$

Wave calculations 2

Wave speed (meter/second, m/s)

= frequency (Hertz, Hz) x wavelength (meter, m)

$$v = f \times \lambda$$

For example, if some waves of 13-meter wavelength have a frequency of 0.5 Hz then the wave speed is:

$$v = 0.5 \times 13 = 6.5 \text{ m/s}$$

A plane uses its fuel by transforming CHEMICAL ENERGY into KINETIC ENERGY and picks up speed.



As it gains height this KINETIC ENERGY is transformed into GRAVITATIONAL POTENTIAL ENERGY.

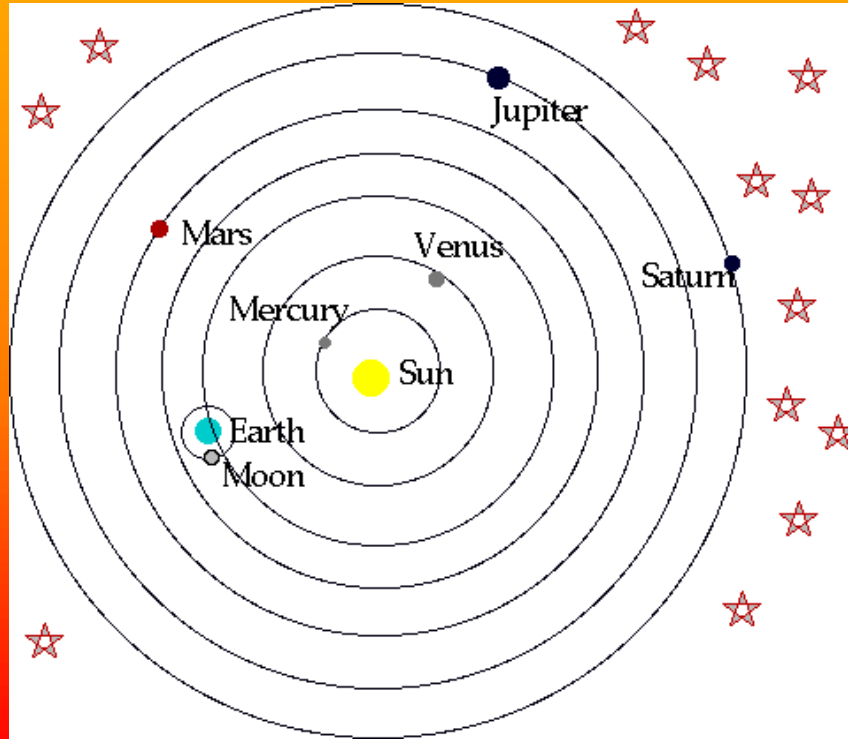
The waste energy is THERMAL or HEAT ENERGY which goes into the surroundings.



UV, X-rays and Gamma rays can damage skin and lead to cancer and eye problems.

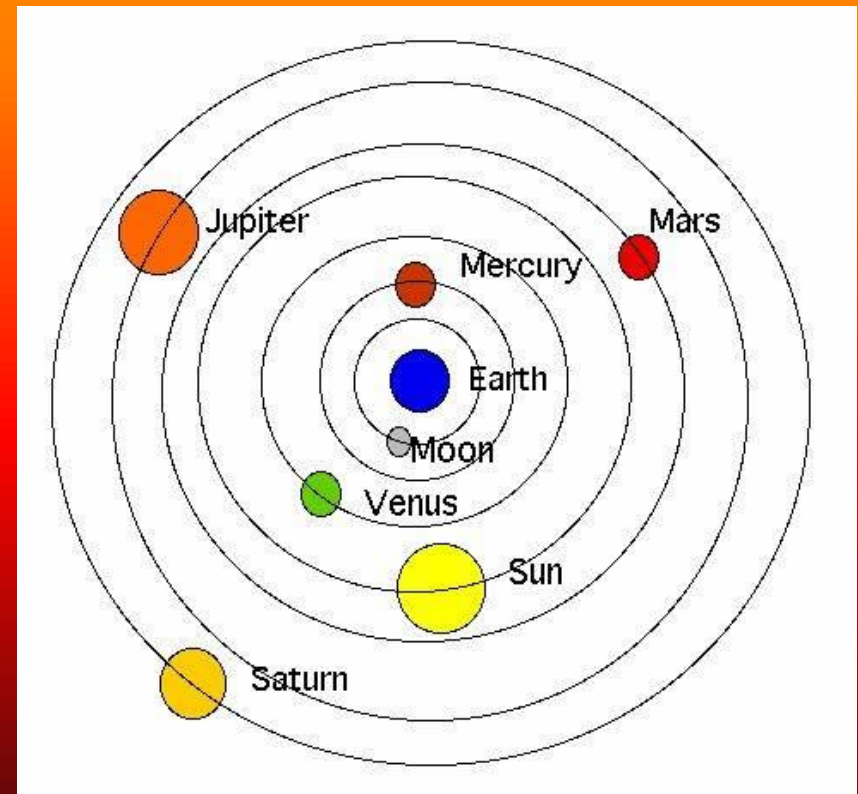
Gamma rays are especially dangerous.

Model of our Solar system



Heliocentric means
the centred around
the sun.

Geocentric means the
centred around the
Earth.



Alien life?

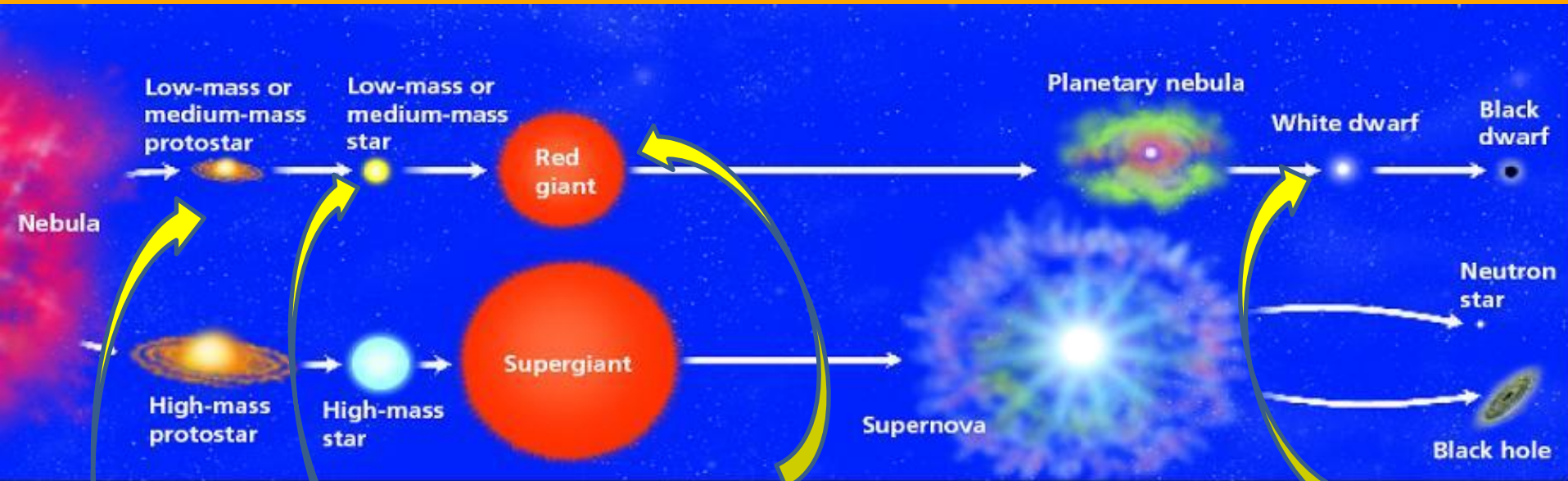
If you have a 1 in a 100 chance of throwing the piece of paper in the bin, if you throw it a 100 times you should get it in about once.



If there is a 1 in a billion chance of alien life existing and a 100 billion solar systems in the Universe then there should be 100 planets with alien life on.

Unfortunately they are so far away we'll never meet them.

Life cycle of a star



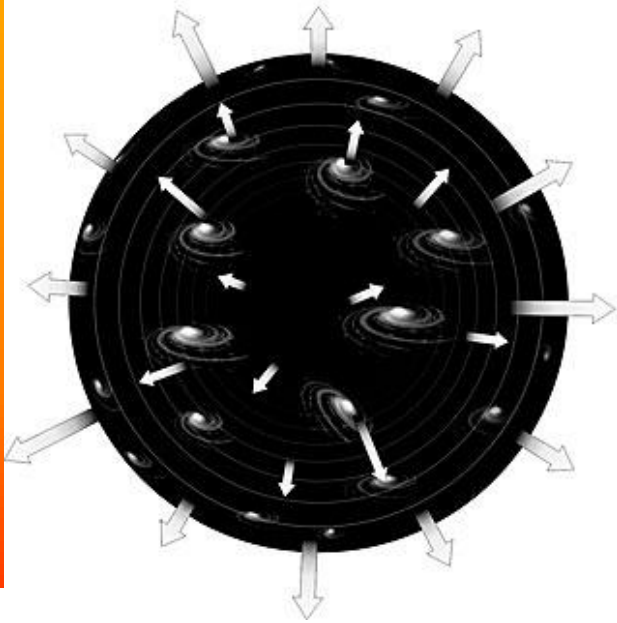
Getting dense and hot due to gravity (starts to emit light).

Stable star. Gravity is counter acted by Thermo Nuclear Fusion.

Once the fuel runs out gravity crushes the star causing it to expand.

The star explodes into a shell of gas and leaves a hot white dwarf.

Theories about the Universe



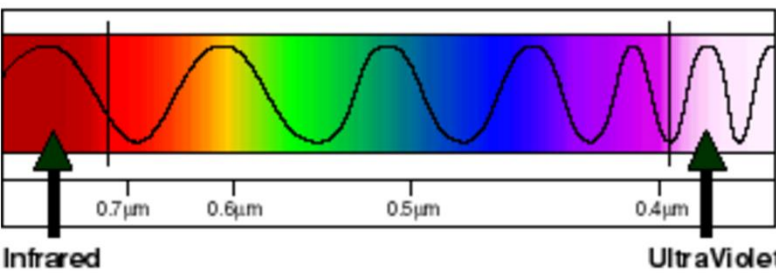
The Universe is expanding. If you rewind time then it should have started from a single point that exploded, The Big Bang.

There are two pieces of evidence:

- Cosmic microwave background radiation
- Red shift shows that galaxies are moving away from us.

Red Shift/Blue Shift

The Doppler Effect with Light



When a moving object emits sound or light the waves get compressed if the object is moving towards you and so shift towards the blue end of the spectrum. 'Blue shift'

Red shift

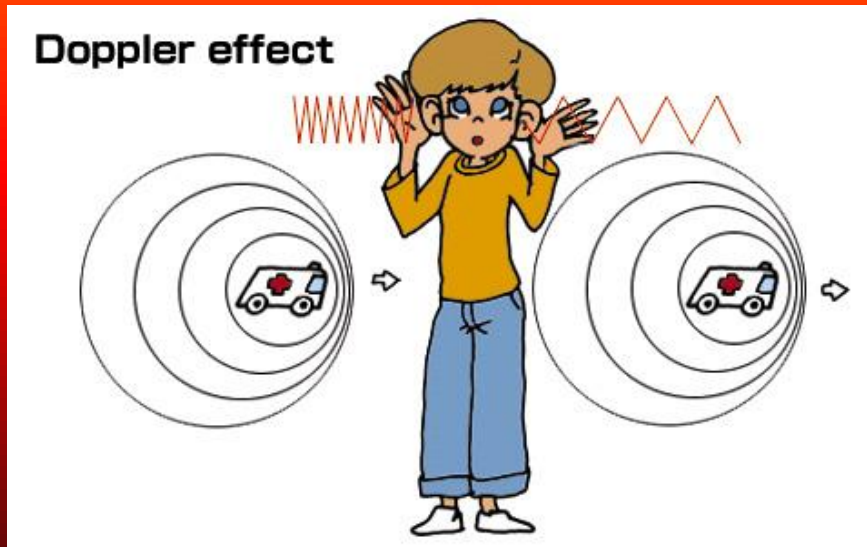
The light from distant stars has a stretched out wavelength (the wavelength is longer). This means the wavelengths have shifted towards the red end of the spectrum, 'Red shift'.

All galaxies show red shift and so we can tell that all galaxies are spreading out.

Doppler shift

This red or blue shift is known as the 'Doppler effect' and applies to a siren or speeding engine too.

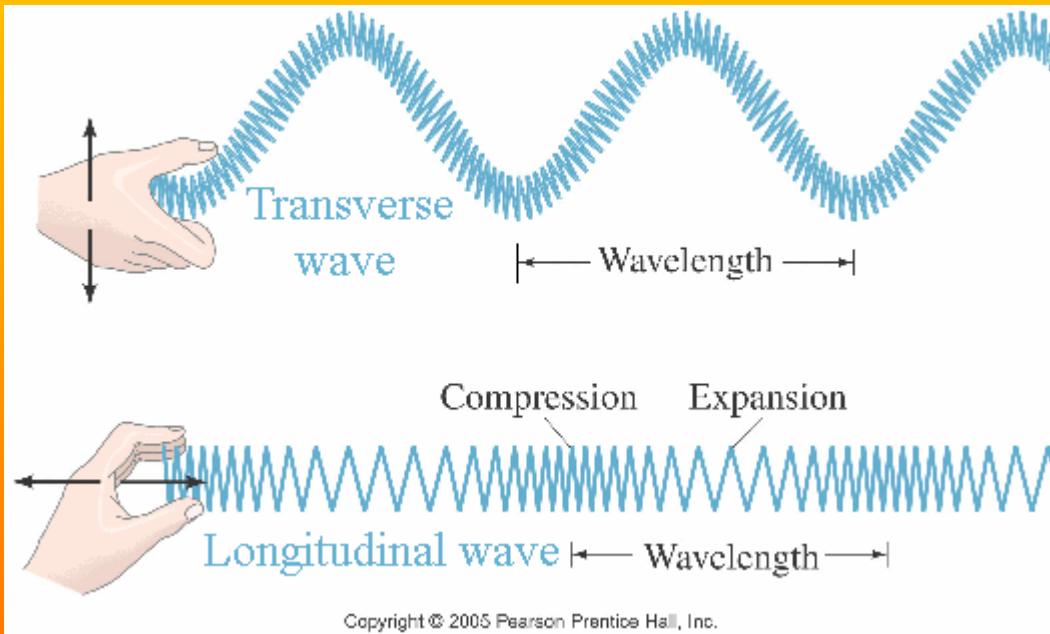
If travelling towards you the sound is compressed so the wavelength is short (higher pitch). If travelling away from you it is longer (so lower pitch).



WAVES

'T'ransverse waves oscillate side to side.

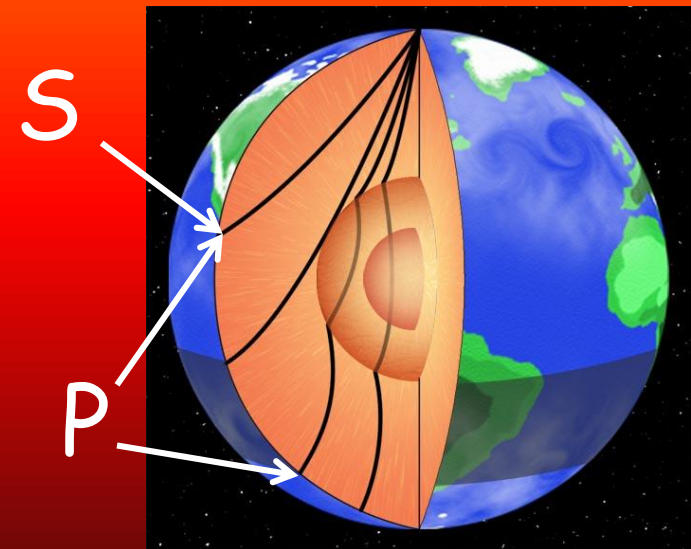
'L'ongitudinal' waves oscillate along the wave.



We detect earthquakes by seismic waves.

P waves travel faster than S waves.

We use more than one seismometer stations to triangulate where an earthquake happened.

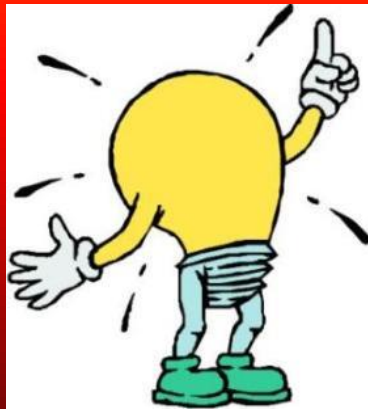


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