

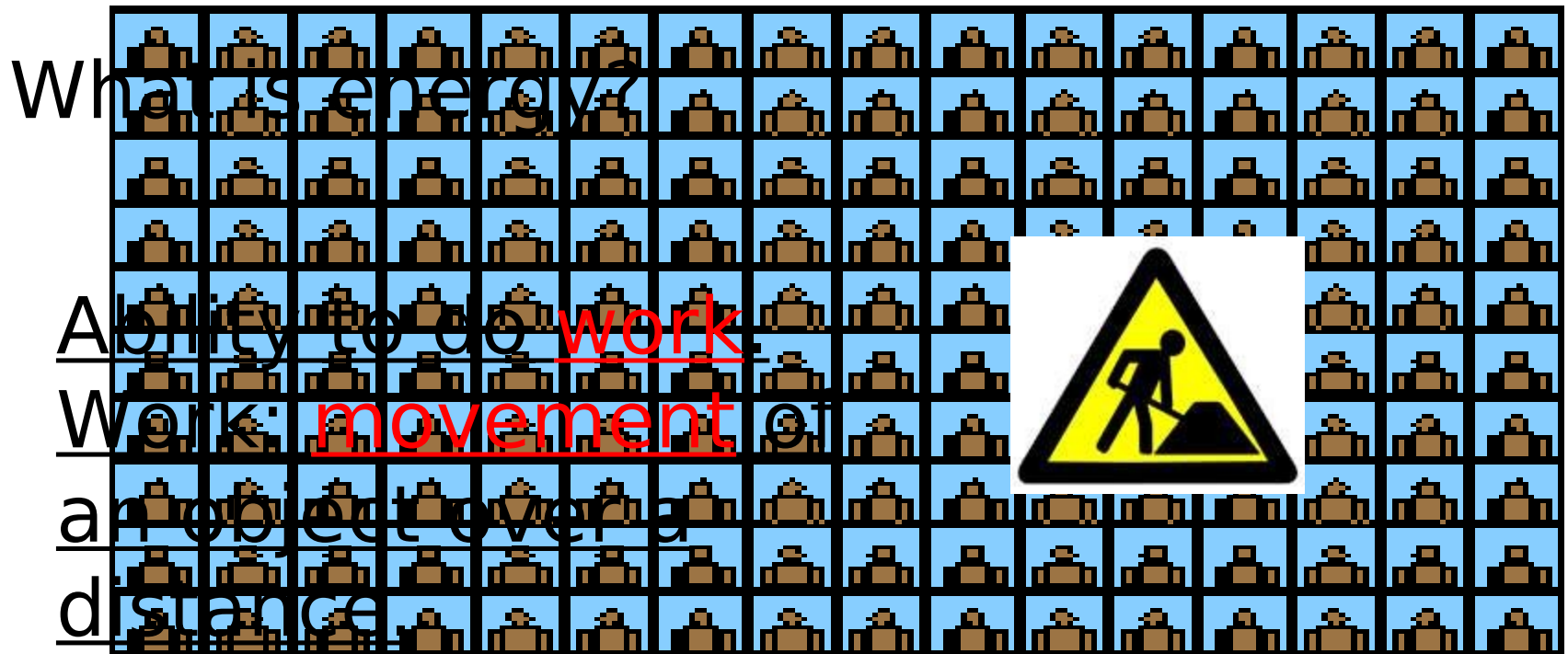
Target 11-11-13

- What is a wave?
- What does a wave transfer or carry?
- What is the main difference between Transverse and longitudinal waves?
- What is a medium?

Waves



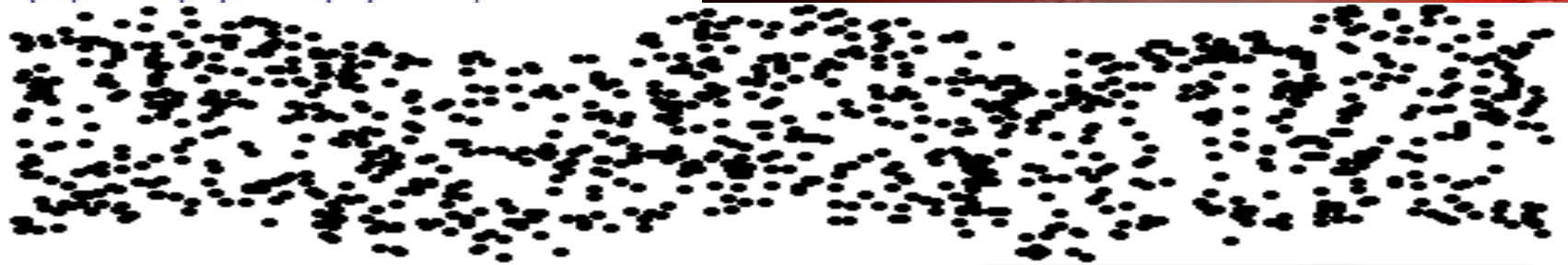
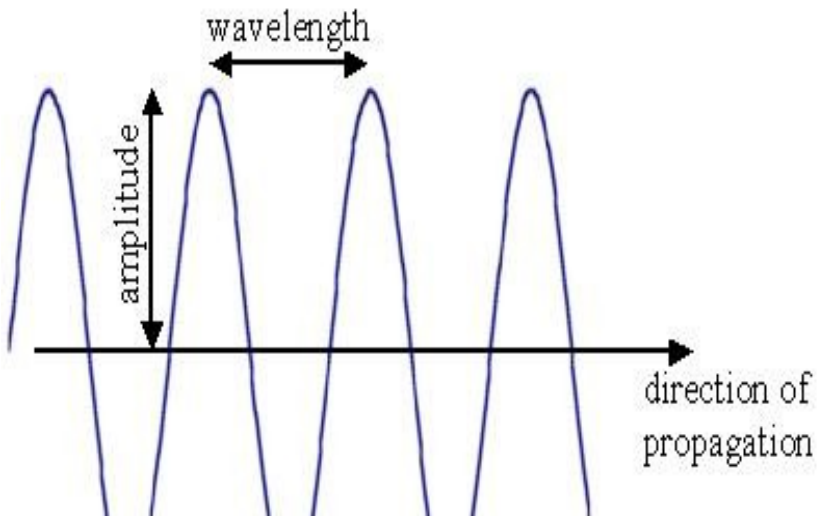
Rhythmic disturbances that carry energy without carrying matter are called **waves**.



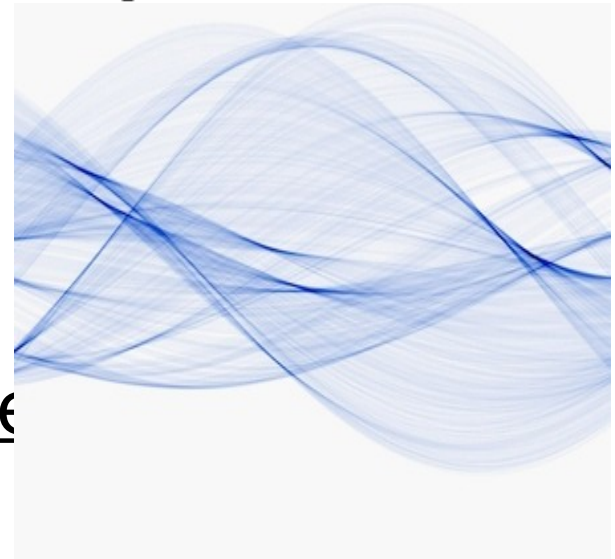
The energy (of the people standing up) is transferred around the stadium, but the people themselves do not move very far at all.

- Molecules
transport wave
energy without
themselves
moving, like a line
of people passing a
ball.





Transverse Wave -
wave energy causes
matter in the medium to
move up and down or
back and forth at a right angle
to the wave angles



Medium - the material that a wave causes to vibrate so the energy can travel through that material

Example of mediums:

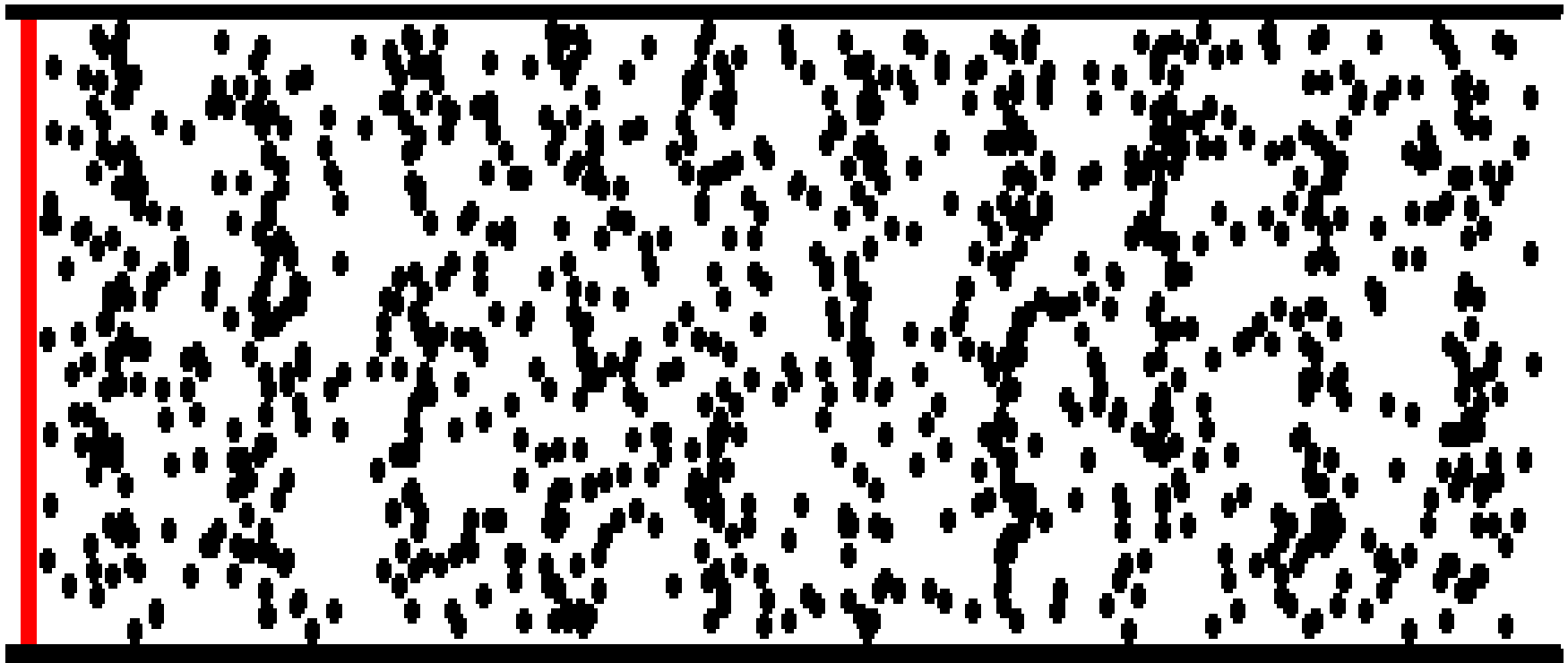
Gases - Air

Liquids - Water

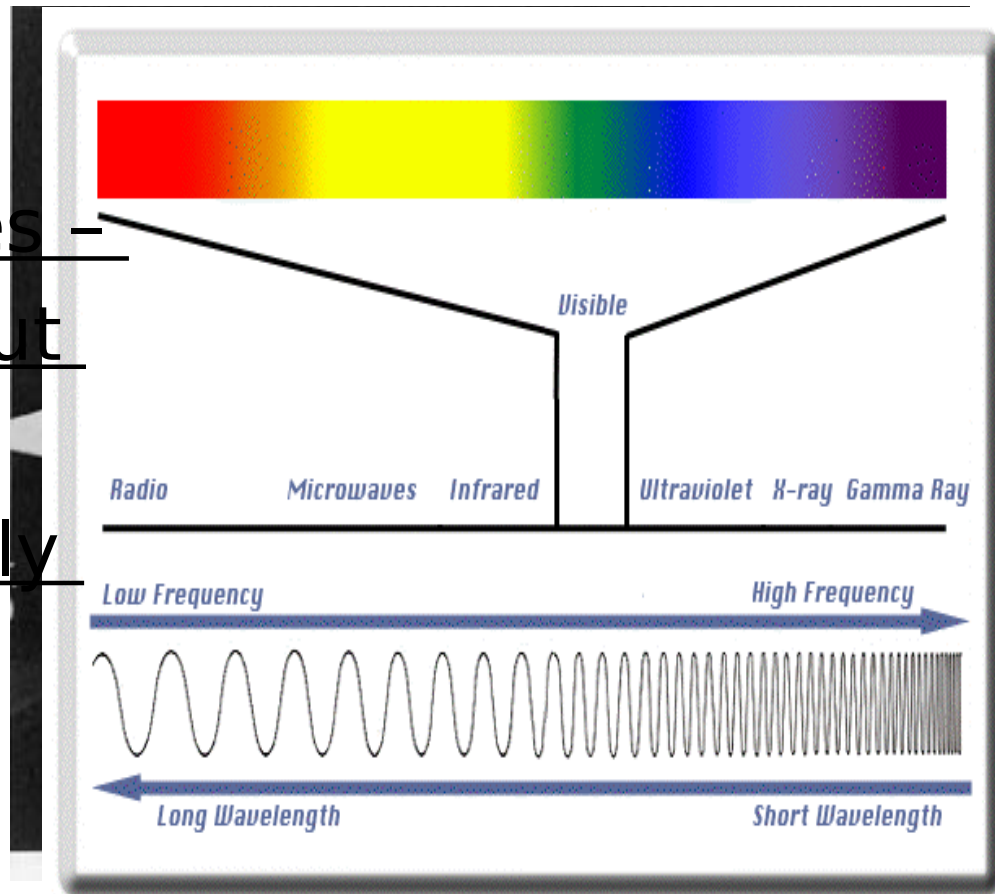
Solids - slinky



Compressional waves Matter in the medium
moves forward and backward in the
same direction as the wave
picture below?



- Sound Waves –
Compressional waves caused by colliding air molecules.
- Electromagnetic Waves –
Transfer energy without transferring matter;
produced by electrically charged particles.

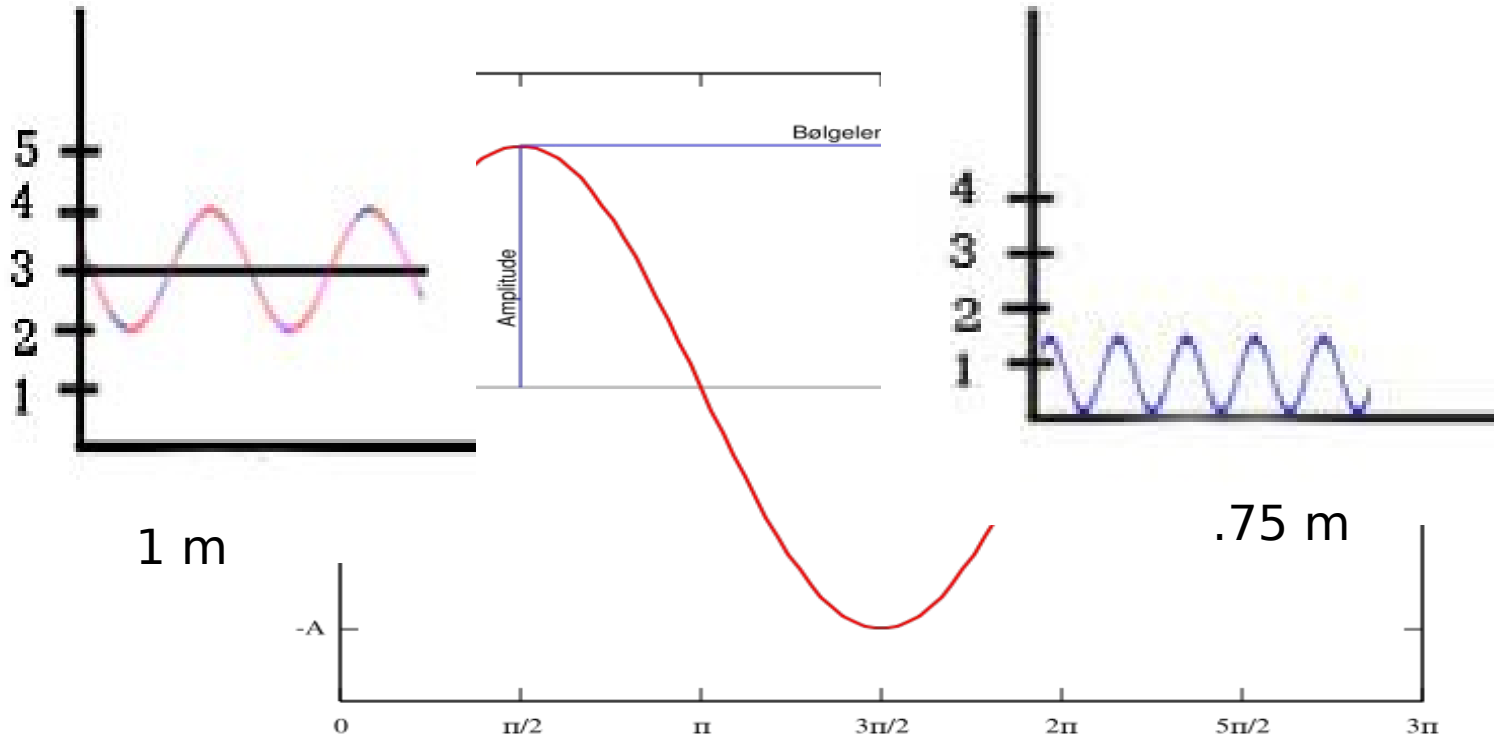


Mini Quiz

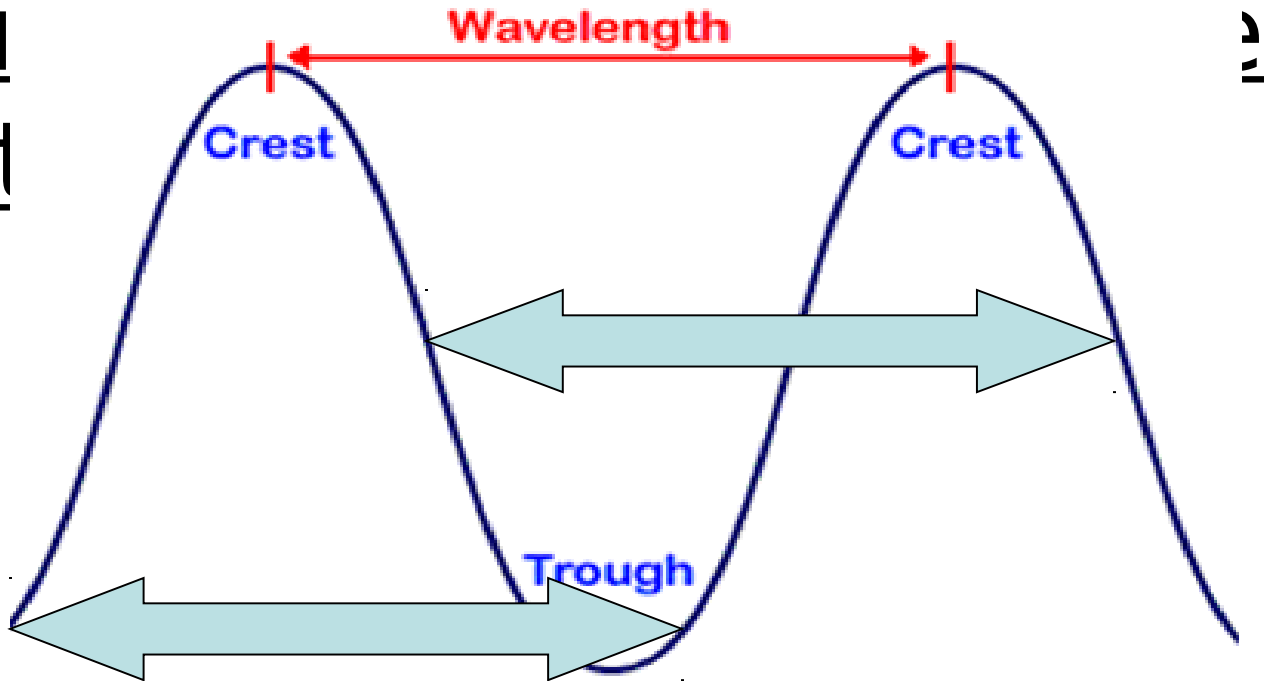
- 1) What are the different types of waves?
- 2) Draw a transverse wave
- 3) Draw a compressional wave
- 4) What is a medium. List 3 examples of mediums
- 5) Can a transverse wave be found in space?

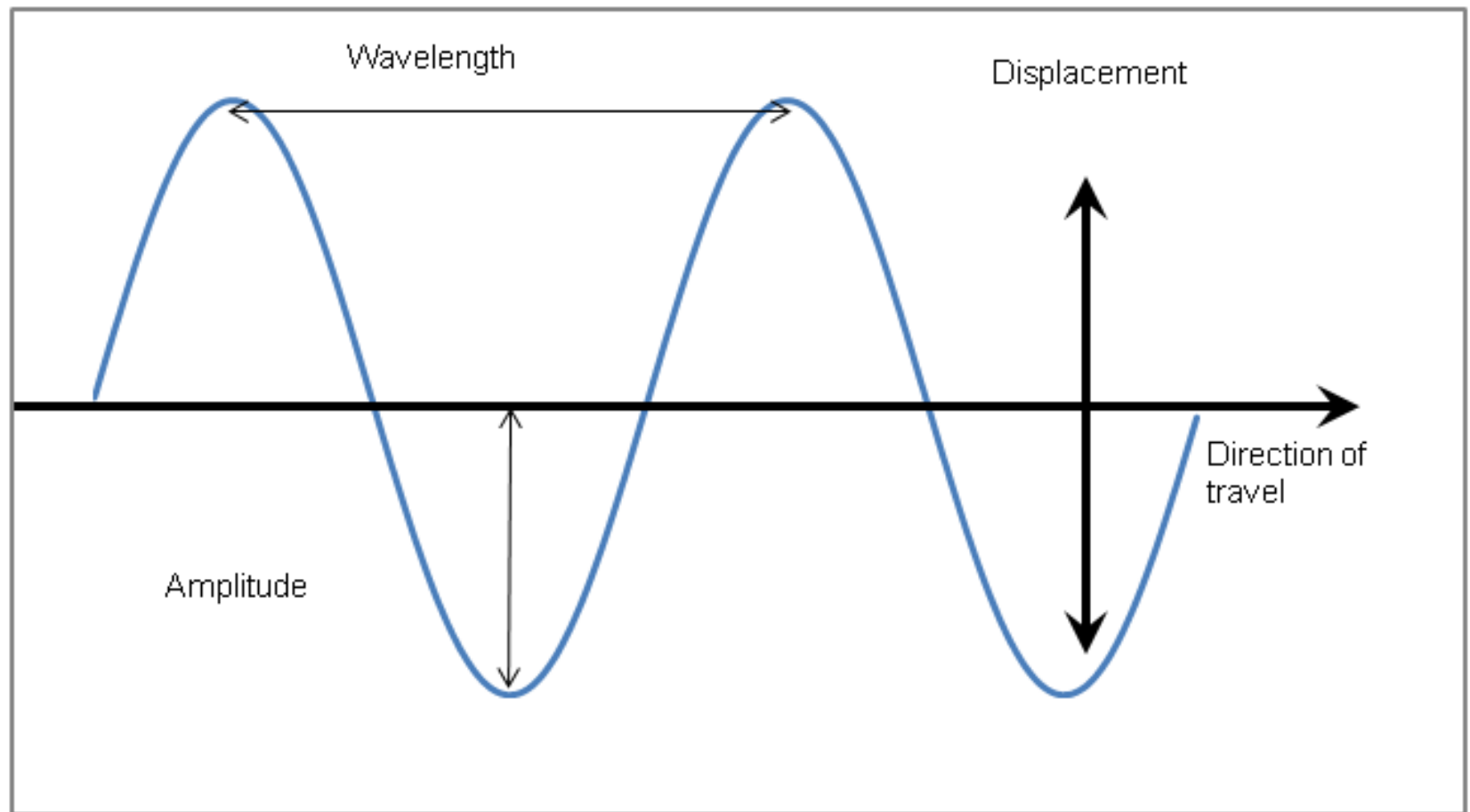
What are the amplitudes (in meters) of the waves below?

- Amplitude – A measure of how high crests are; the greater the amplitude, the more energy a wave carries.



- Wavelength - Distance from the top of one crest to the top of the next crest, or from the bottom of one trough to the bottom of the next

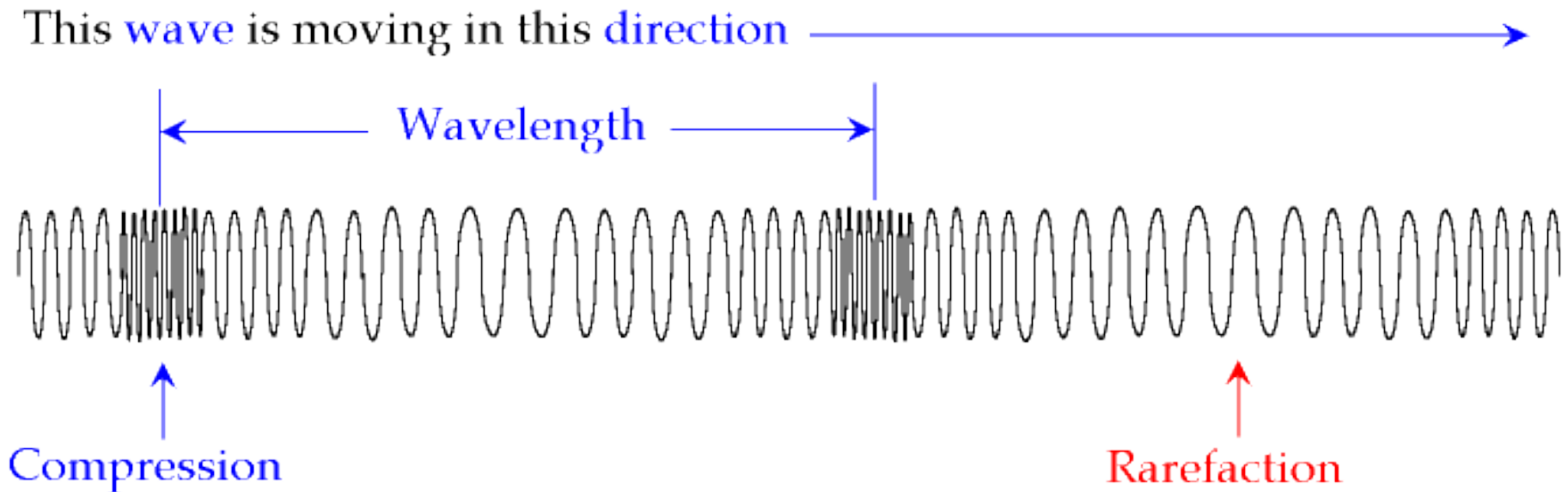




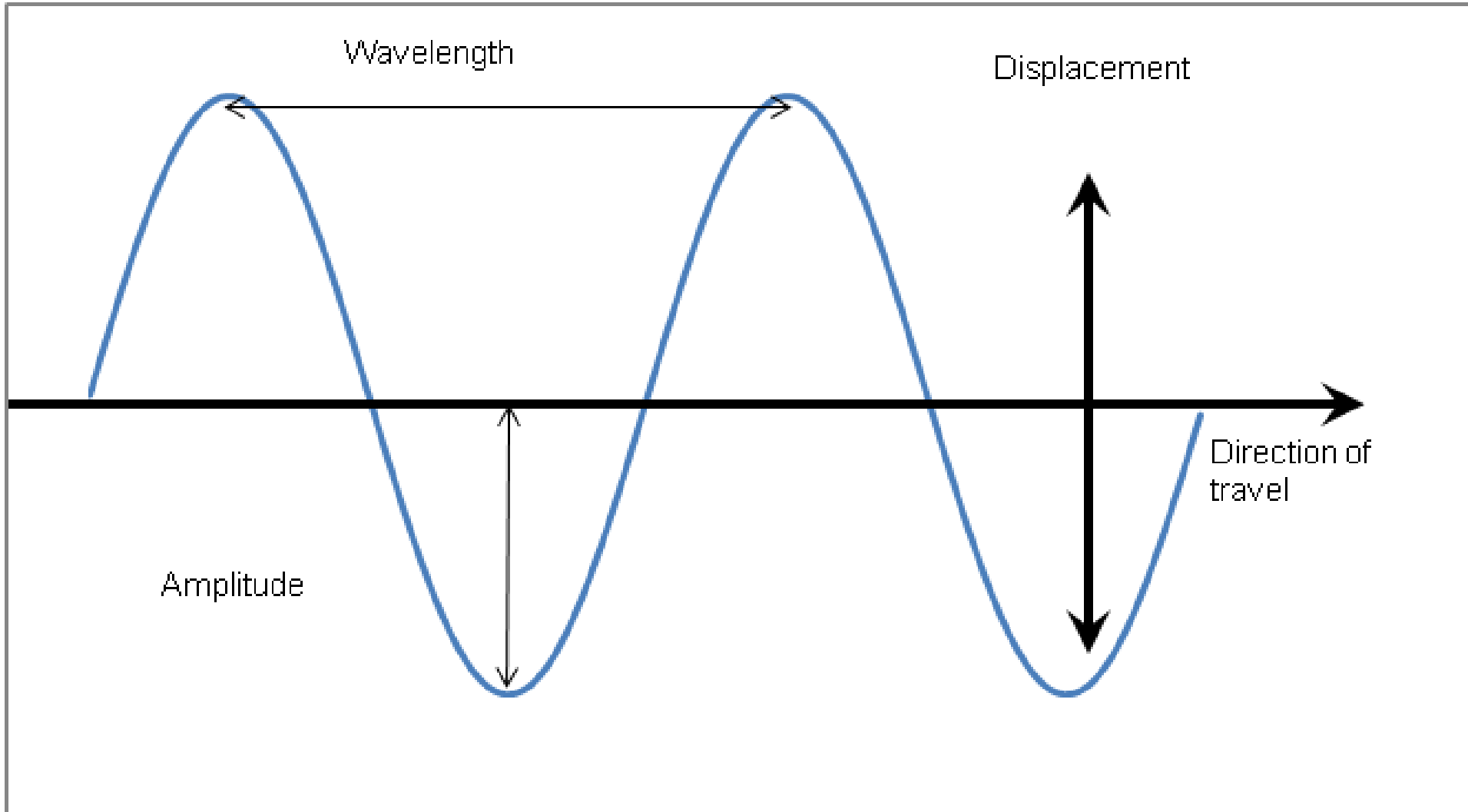
Target 11-12-13

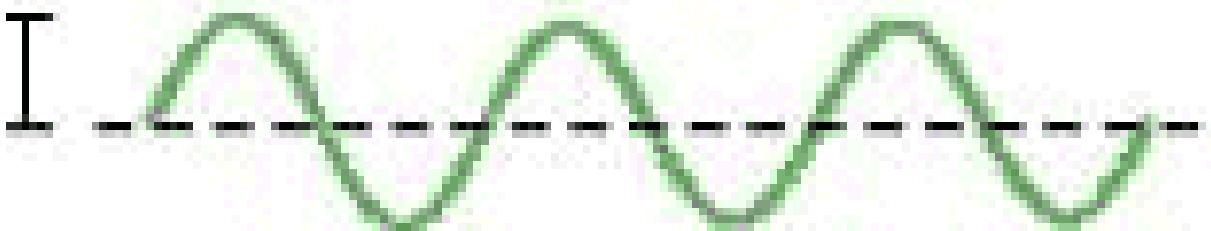
- 1. What types of wave need a medium?**
- 2. What types of wave do not need a medium?**
- 3. What kind of wave is a sound wave?**
- 4. What kind of waves are electromagnetic waves?**
- 5. What tells you how much energy is in a wave?**

In a Longitudinal wave, particles vibrate back and forth along the path that the wave travels.

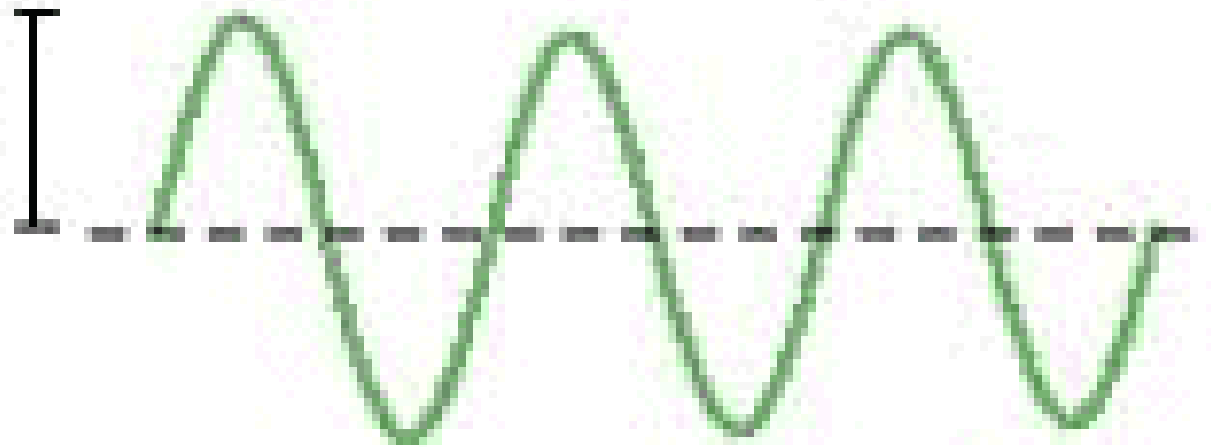


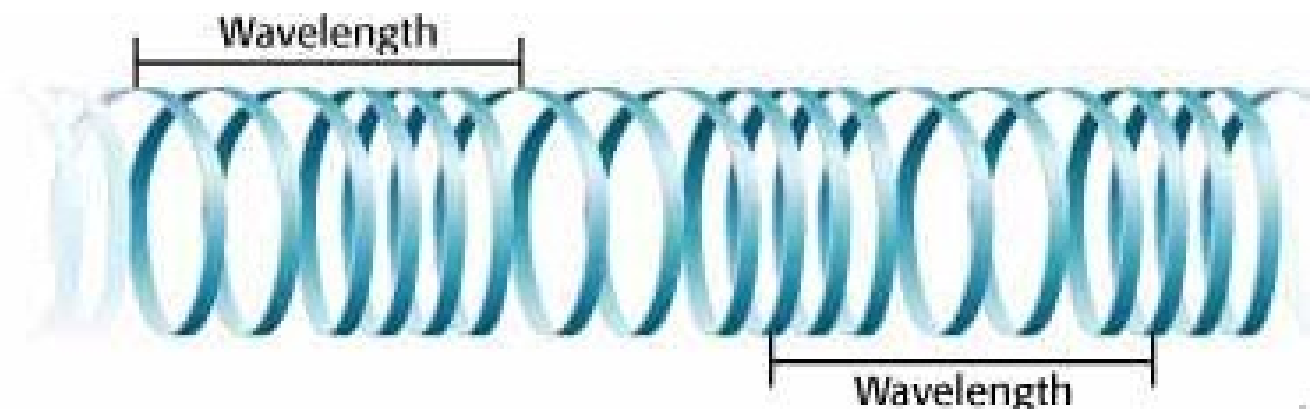
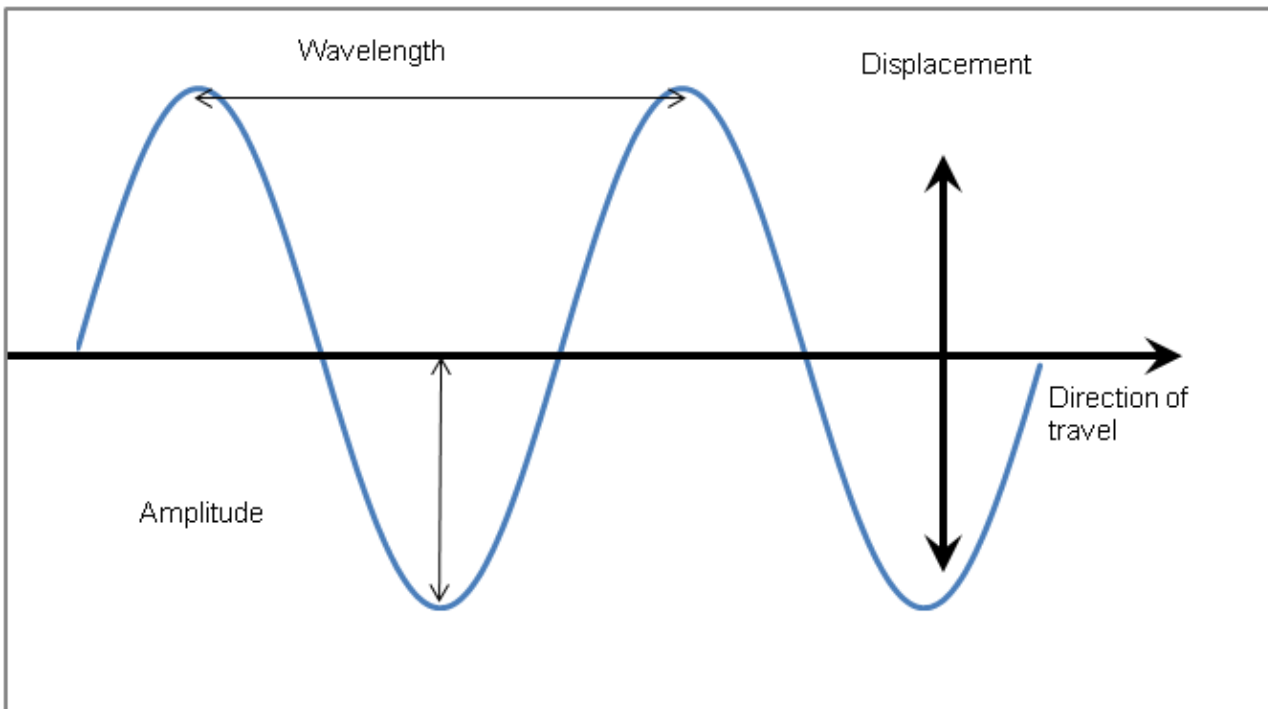
Amplitude is the maximum distance
the wave vibrates from its rest
position





amplitude





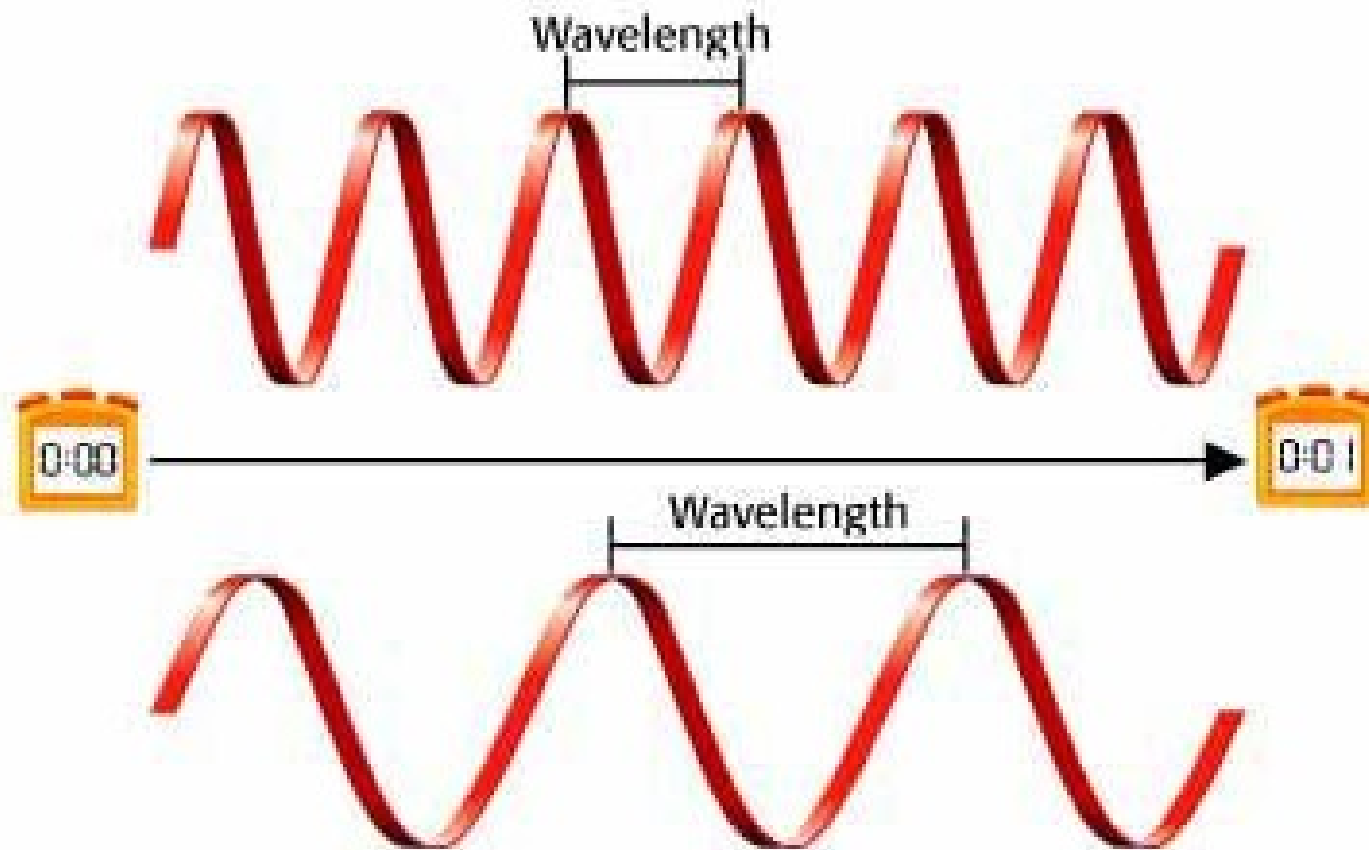
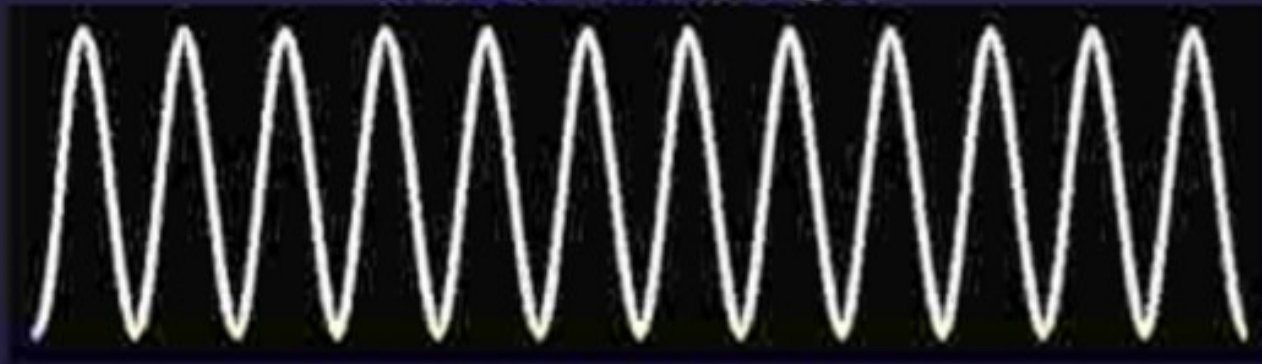
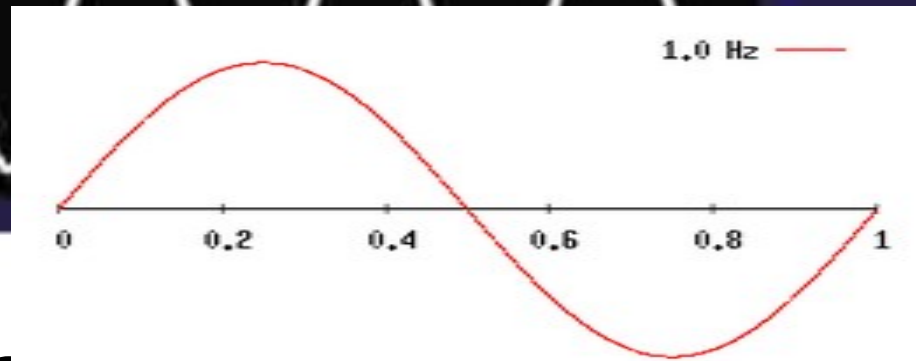
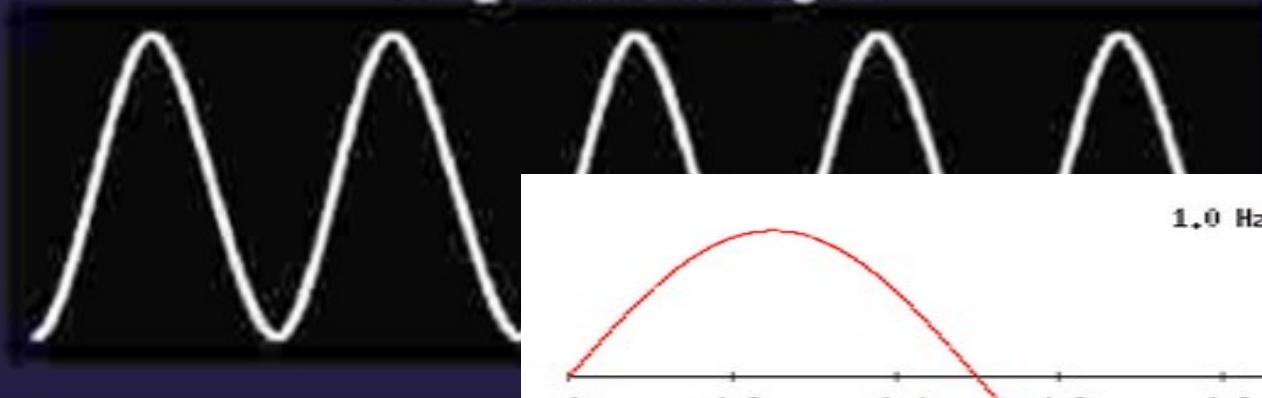


Figure 13 *At a given speed, the higher the frequency is, the shorter the wavelength.*

HIGHER FREQUENCY
shorter wavelength

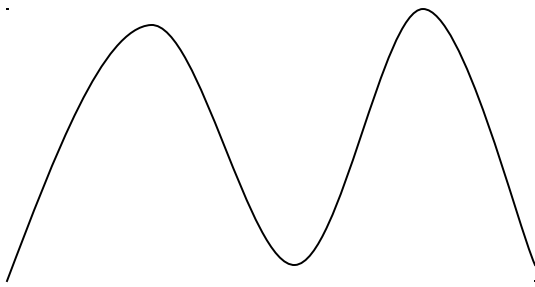


LOWER FREQUENCY
longer wavelength

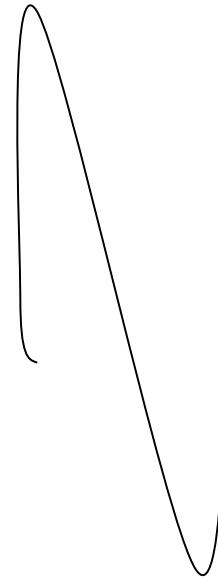


many wave $t[s]$

:h



This wave has a high/low frequency



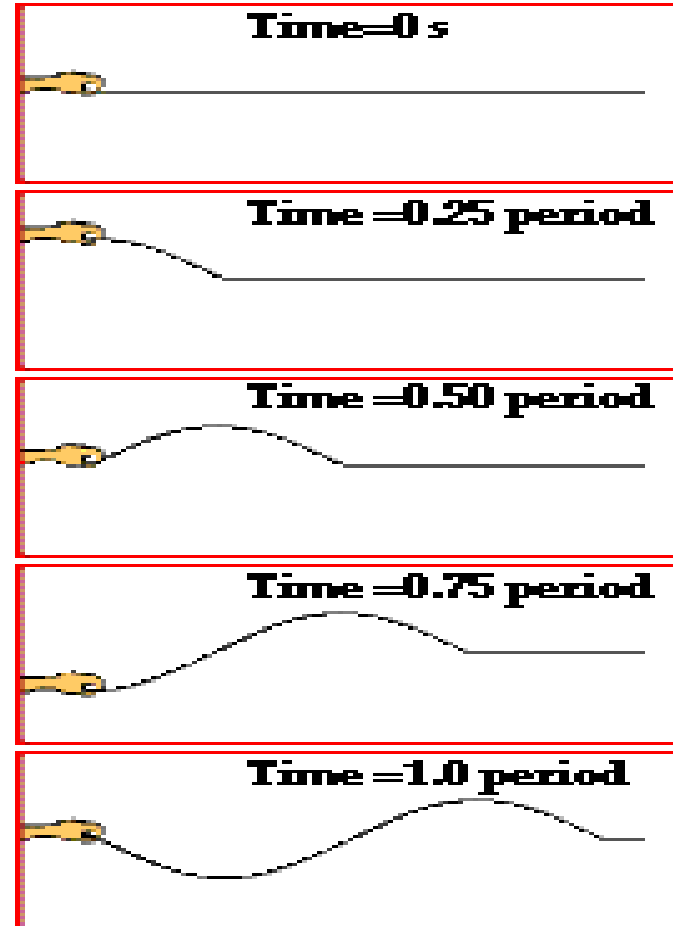
This wave has a high/low frequency

Wave Period

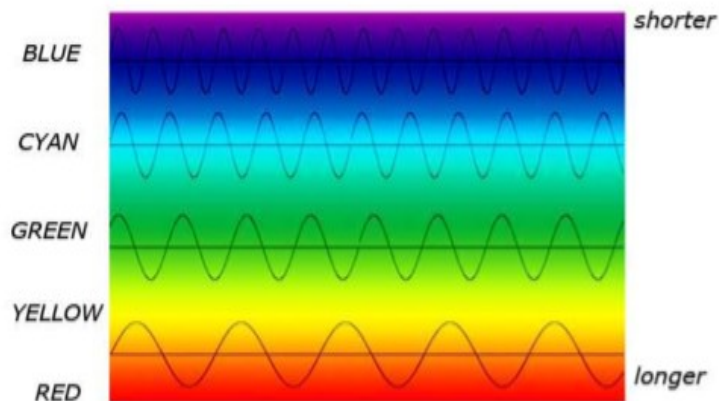
Wave period is just how much time it takes for one cycle to pass and the units are always in term of time. The faster a wave moves its period becomes smaller

$$\text{Period} = \frac{1}{\text{frequency}}$$

$$\text{frequency} = \frac{\text{one cycle}}{\text{Period}}$$



- Color and pitch result from the wavelengths and frequencies of light and sound.



Red
Orange
Yellow
Green
Blue
Indigo
Violet

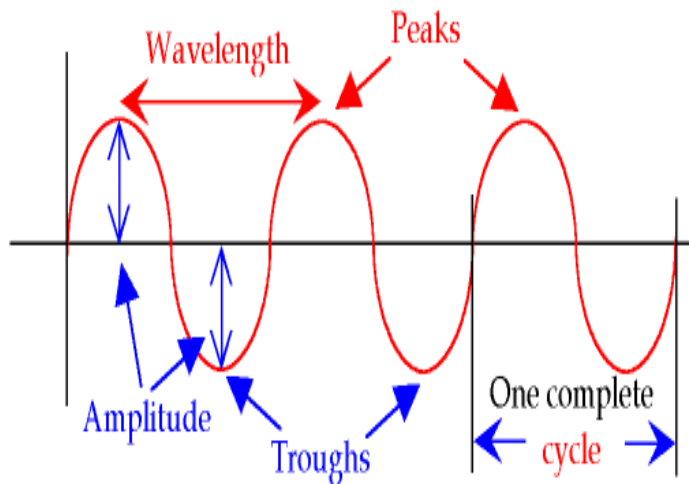


- Wave Speed – how fast a wave travels through a medium.
 - Mechanical waves travel faster in a medium in which atoms are packed closer

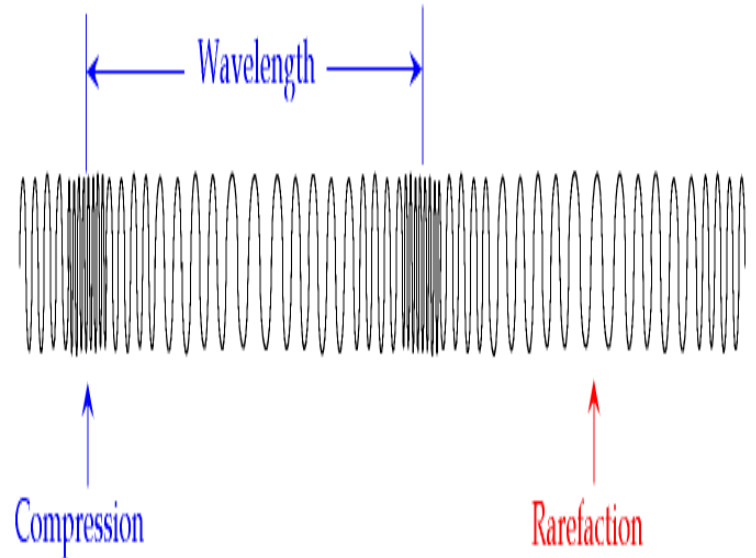


Labeled Waves

This wave is moving
in this direction



This wave is moving in this direction



Copy These Instructions

- **Fold your paper into fourths. You will have 8 boxes (4 front, 4 back). In each box, include the word, the definition of the word, and an ILLUSTRATION demonstrating the meaning of the word. Each box must be colored.**
- **-Wave**
- **-Longitudinal waves + one example**
- **-Medium**
- **-Amplitude**
- **-Transverse Waves + one example**
- **-Frequency**
- **-Wavelength**
- **-Your Name/Period**