Back Up

Topic: Transverse and longitudinal waves
(middle school physics)

by Lodge

Back Up

Make the disturbance it takes
With sound and ocean waves
To move this energy from here - to a brand new place
It's a mechanical day
When a medium is necessary
While the energy through a vacuum explains
Electromagnetic rays

Transverse me all with perpendicular motion
A rope so up and down just like the surface of the ocean
When a sound goes off it creates some longitudinal waves
Bounce off and back up back up back up
Bounce off and back up

Now at the top of the crest
We look around so impressed
But down deep in the trough
We get a little distressed
Where amplitude is ok
It's just a shallow wave
A short distance or length to the next sunny day
Well hey this frequency is insane
23 million passed today!

Can you dig the wave that reflects after striking a barrier?
Like water hitting a bridge, or when sound hits a wall
Maybe diffract a little, spread out a little,
When you hit the edge of the obstacle
Its like a carnival, of intervals.

When light goes into my glass
It tends to bend and refract
Travels at different speeds
Depending where it's at
Though waves will join & combine
Your crest is similar to mine
Constructive interference - positive right?
Amplitude is so gonna rise

Student Lyric Guide

Name:_____ Transverse and Longitudinal Waves

Back Up

Make the disturbance it takes, with sound and ocean waves

Define a wave and give two examples. _____

_____

_____

To move this energy from here – to a brand new place
When a medium is necessary, While the energy through a vacuum explains, Electromagnetic rays

Give two examples of how sound would travel through two different types of mediums.

1. _____

2. _____

Which one would travel faster? _____

How is light an example of an electromagnetic wave? _____

_____

What are some other examples of electromagnetic waves?_____

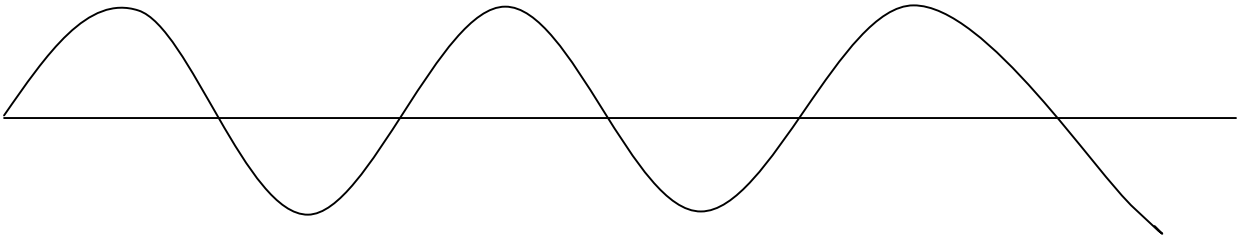
_____

Transverse me all with perpendicular motion
A rope so up and down just like the surface of the ocean
When a sound goes off it creates some longitudinal waves
Bounce off and back up

Draw a diagram of how a transverse and a longitudinal wave travel.

Now at the top of the crest ,We look around so impressed
But down deep in the trough, We get a little distressed
Where amplitude is ok, It's just a shallow wave
A short distance or length to the next sunny day, Well hey this frequency is insane,23 million passed today!

Label the diagram of a wave with crest, trough, amplitude, wavelength.



Describe amplitude and frequency _____

_____

Can you dig the wave that reflects after striking a barrier?, Like water hitting a bridge, or when sound hits a wall

What is reflection? _____

Draw what water would look like hitting a wall.

Maybe diffract a little, spread out a little, When you hit the edge of the obstacle

What is diffraction? _____

Draw what water would look like hitting a bridge.

How is this like a carnival of intervals? _____

_____

When light goes into my glass, It tends to bend and refract
Travels at different speeds, Depending where it's at

What is refraction?_____

Draw a picture of refraction.

Why does it look like this? _____

Though waves will join & combine, Your crest is similar to mine
Constructive interference - positive right? ,Amplitude is so gonna rise

The adding of two waves is called?_____

What is the result of two waves combining? _____

What is the opposite of constructive interference?_____

Teacher Key

Name:_____KEY_____

Back Up

Make the disturbance it takes, with sound and ocean waves

Define a wave and give two examples. *A disturbance that transfers energy from one place to another. Ex. 1 Sound Wave Ex. 2 Ocean wave*

To move this energy from here – to a brand new place
When a medium is necessary, While the energy through a vacuum explains, Electromagnetic rays

Give two examples of how sound would travel through two different types of mediums.
Sound waves traveling through metal. Sound waves traveling through water.

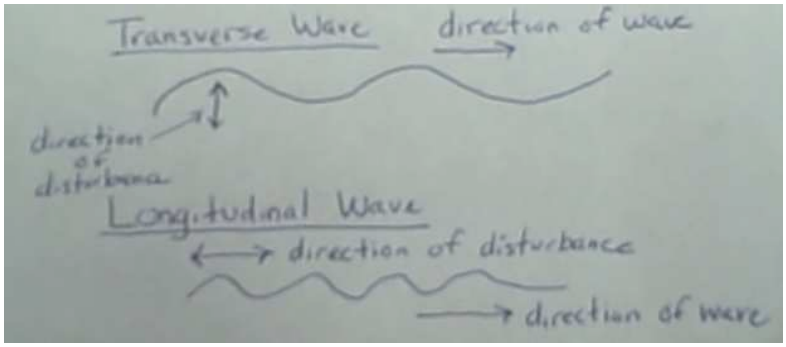
Which one would travel faster? __*sound through metal*_____

How is light an example of an electromagnetic wave? _____*light is invisible but still transfers energy*_____

What are some other examples of electromagnetic waves?_____*heat waves, radio waves, cell phone waves*

Transverse me all with perpendicular motion
A rope so up and down just like the surface of the ocean
When a sound goes off it creates some longitudinal waves
Bounce off and back up

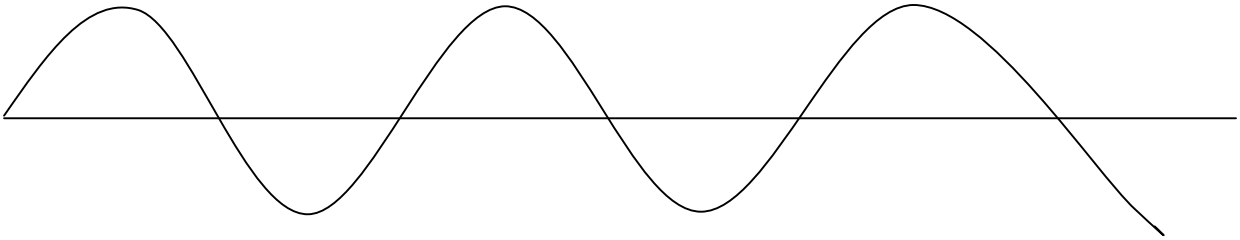
Draw a diagram of how a transverse and a longitudinal wave travel.

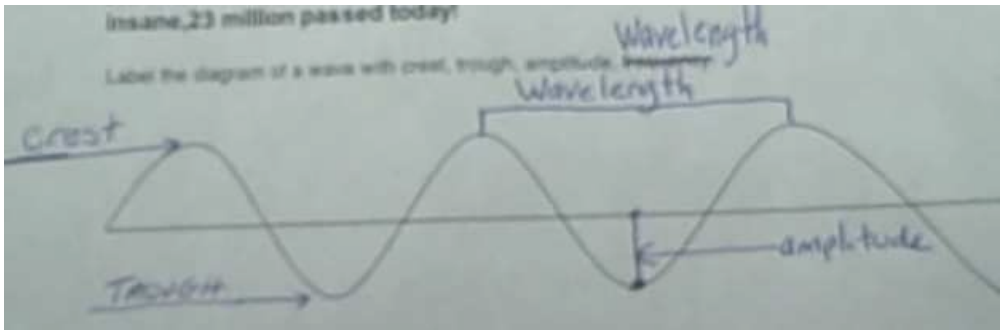


Now at the top of the crest ,We look around so impressed
But down deep in the trough, We get a little distressed

Where amplitude is ok, It's just a shallow wave
A short distance or length to the next sunny day, Well hey this frequency is insane,23 million passed today!

Label the diagram of a wave with crest, trough, amplitude, frequency.



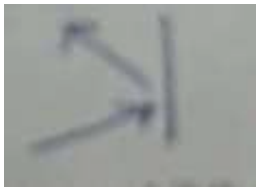


Describe amplitude and frequency *Amplitude – the distance from a line in the middle of the wave to the crest or trough. Frequency – the number of wavelengths that pass a fixed point.*

Can you dig the wave that reflects after striking a barrier?, Like water hitting a bridge, or when sound hits a wall

What is reflection? *The bouncing back of a wave after is strikes a barrier.*

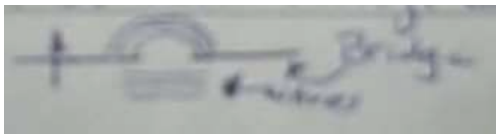
Draw what water would look like hitting a wall.



Maybe diffract a little, spread out a little, When you hit the edge of the obstacle

What is diffraction? *The spreading out of waves through an opening*

Draw what water would look like hitting a bridge.



How is this like a carnival of intervals? _____*answers will vary*

When light goes into my glass, It tends to bend and refract
Travels at different speeds, Depending where it's at

What is refraction?_____*the bending of a wave as it enters a new medium*____

Draw a picture of refraction.

Why does it look like this? ___*Because waves travel at different speeds in different mediums*_

Though waves will join & combine, Your crest is similar to mine
Constructive interference - positive right? ,Amplitude is so gonna rise

The adding of two waves is called?_____*Constructive interference*

What is the result of two waves combining? _____*a bigger wave*

What is the opposite of constructive interference?_____*Destructive interference*

Music Video Extension Activity

1. Hand out or project the lyrics and read them out loud and discuss their meaning
2. Play the song for the students, multiple times, encouraging them to sing along
3. Use the student lyric guide in place of, or to supplement class notes
4. Allow students class time, in small groups, to “act” out a portion of the song
5. Film the student groups singing/acting out the song