

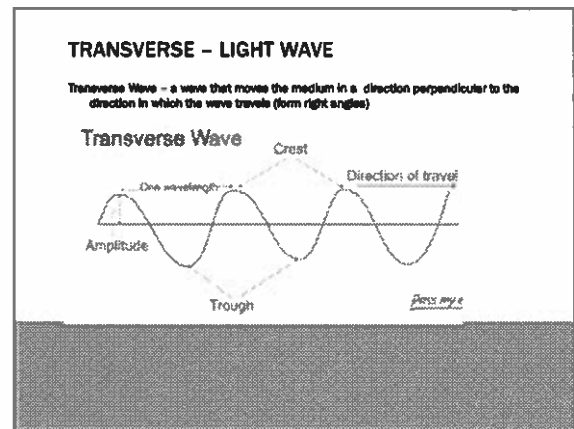
WAVE

Wave: a disturbance that transfers energy from one point to another
 Mechanical energy (kinetic)
 Created by a vibration through a medium (air)

3 TYPES OF WAVE

1. Transverse - light
2. Longitudinal (compression) - sound
3. Surface

** Our focus is on 1 and 2

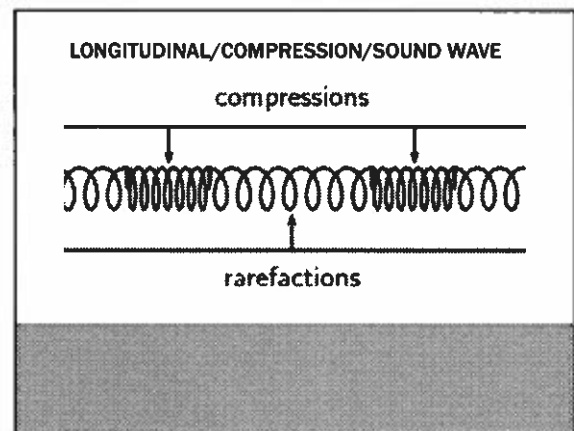


**LONGITUDINAL/COMPRESSION WAVES
SOUND**

Longitudinal waves: move particles of the medium in the same direction as the wave (parallel)

Compression - is the area on a longitudinal wave where the particles/medium are more close together (compressed)

Rarefaction - is the area on a longitudinal wave where the particles/medium are more spread out



Sound Waves

- **Compression (Longitudinal) Waves**
 - vibrations travel in the same direction as the wave
- **Most travel through a medium**
 - Gas - slow
 - Liquid - faster
 - Solid - fastest
- **Slower than light (you see fireworks before you hear them)**

Which number represents a compression?

Answer

1

RELATIONSHIP BETWEEN FREQUENCY AND WAVELENGTH

When one increases the other decreases

↑ ↓

Inverse Relationship

Relationship of Frequency to Wavelength

Frequency	Wavelength
Higher Frequency	Shorter Wavelength

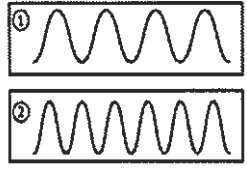
Relationship of Frequency to Wavelength

Frequency	Wavelength
Lower Frequency	Longer Wavelength

2 THINGS THAT AFFECT THE SPEED OF SOUND WAVES

Type of Medium <ul style="list-style-type: none">• Sound travels faster in solid	The temperature <ul style="list-style-type: none">• Lower temp decreases speed• Higher temperature increases speed
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?



The frequency of a wave is observed twice overtime. The frequency of this wave is –

Answer

Increasing

THE END

Waves Vocabulary

Day 1 and 2: Monday 5/4/20 and Tuesday 5/5/20

Directions: Use the following links to help you define and draw an illustration for the following terms. Feel free to find and use other resources.

Video	Links
1	https://www.youtube.com/watch?v=kC8d5BHcemk
2	https://youtu.be/KWzyQKcJBYg
PPT	https://drive.google.com/file/d/1UqVxuDVj9tYG5qdGn5xif_McoqfgWySQ/view?usp=sharing

Definition	Illustration
1. <u>Wave</u>	
2. <u>Longitudinal /Compression Wave</u>	
3. <u>Transverse Wave</u>	
4. <u>Crest</u>	
5. <u>Trough</u>	

6. <u>Compression</u>	
7. <u>Rarefaction</u>	
8. <u>Wavelength</u>	
9. <u>Amplitude</u>	
10. <u>Frequency</u>	
11. <u>Pitch</u>	

**10. In the second video, which direction is the actual wave moving?
(Up and Down or Right to Left)**

11. What happens to the wavelength when the frequency increases?

12. How do you describe the relationship between frequency and wavelength?

Day 3 and 4: Wednesday 5/6/20 and Thursday 5/7/20

Directions: I am attaching links to resources to help you define and draw an illustration for the following terms. Feel free to find and use other resources.

Video	Links
1	https://www.youtube.com/watch?v=I8eUgxc3x04
2	https://www.youtube.com/watch?v=irqfGYD2UKw
PPT 1	https://drive.google.com/file/d/1UqVxuDVj9tYG5qdGn5xif_McoqfgWySQ/view?usp=sharing

13. Define Medium- _____

4.

Medium	Speed
Gas	
Liquid	
Solid	

15.

*** SOUND can not travel through a _____.

Why? _____

16. Identify two things that affect the speed of a wave

17. The speed of light is _____ km/h

18. The speed of sound is _____ km/h

19. Which do you normally observe first, lightning or thunder? Explain your answer.

20. Explain how pitch is related to sound. _____

21. Explain how amplitude is related to sound. _____

TABLE 17.1
Speeds of Sound in Various Media

Medium	v (m/s)
Gases	
Hydrogen (0°C)	1 286
Helium (0°C)	972
Air (20°C)	343
Air (0°C)	331
Oxygen (0°C)	317
Liquids at 25°C	
Glycerol	1 904
Sea water	1 533
Water	1 493
Mercury	1 450
Kerosene	1 324
Methyl alcohol	1 143
Carbon tetrachloride	926
Solids	
Diamond	12 000
Pyrex glass	5 640
Iron	5 130
Aluminum	5 100
Brass	4 700
Copper	3 560
Gold	3 240
Lucite	2 680
Lead	1 322
Rubber	1 600

Speed of Sound in Different Media

1. In which medium does sound travel the fastest in?

2. In which medium does sound travel the slowest in?

3. Rank the states of matter from the state that sound travels the fastest in to the state that sound travels the slowest in.

4. Does air affect the speed of sound?

5. Why do you think sound travels faster in diamond than in Pyrex glass?

Speed of Sound in Air Graph

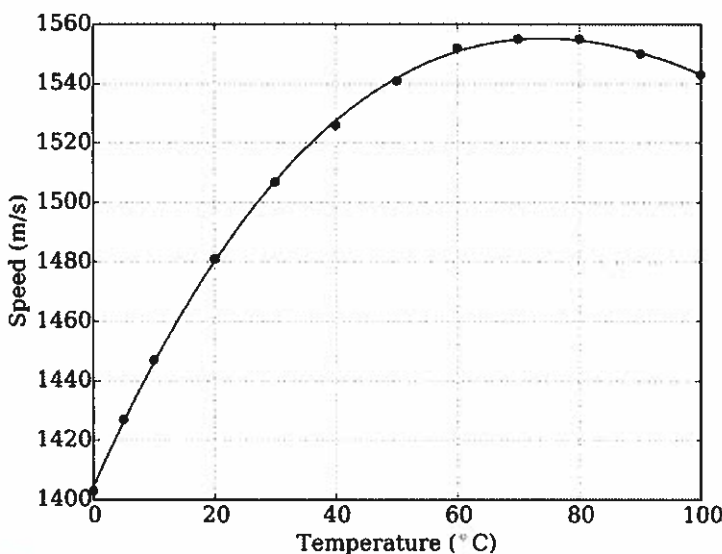
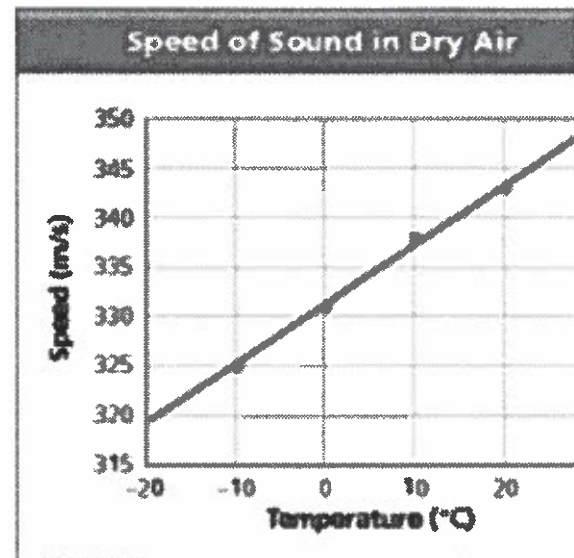
- Which temperature does sound travel the fastest in?

- Which temperature does sound travel the slowest in?

- What type of relationship is there between temperature and speed of sound?

- What is the approximate speed of sound at -10°C?

- What is the temperature when the speed of sound is approximately 337.5 m/sec?



Speed

of Sound vs. Temperature in Water

1. Describe the relationship between temperature and the speed of sound in water for the first 70°.

2. What is the approximate speed of sound at 20°C in water?

3. What is the temperature when the speed of sound in water is approximately 1550 m/s?

Why do you think the line on the graph begins to curve downward starting at 80°C?

Day 5 + Day 6 Friday 5/8/20 and Monday 5/11/20

Electromagnetic Spectrum Songs/Videos

Day 7 Tuesday 5/12/20

Answer the following questions as you watch the video.

Video link:

<https://youtu.be/kOkv8ynpppk>

<https://youtu.be/CK1Uowu9mQk>

What makes up the EM Spectrum?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

8. Which waves are most the most dangerous?

9. Which type of wave is given off through heat by animals?

10 What are the harmful waves that come from the sun?

11. Which waves are the longest?

12. Which waves have the most energy?

13. Which waves have the least amount of energy?

14. What is ROYGBV?

Researching Sound Technology

Day 8 Wednesday 5/13/20

Directions: Today you will identify and describe 5 technologies that use longitudinal/Compression (sound waves).

Name of Sound Technology	Description
1	
2	
3	
4	
5	

Researching Light Technology

Day 9 Thursday 5/14/20

Directions: Today you will identify and describe 5 technologies that use transverse (light) waves.

Name of Sound Technology	Description
1	
2	
3	
4	
5	

Day 10 Friday 5/15/20
Write True or False in each box

Wave Comparison Chart

Characteristics	Transverse Waves	Compressional Waves
1. Needs a medium		
2. Carries Energy		
3. Particles move parallel to the wave		
4. Particles move at right angles (perpendicular) to the wave.		
5. Can travel through empty space		
6. Have a wavelength, frequency, amplitude, and velocity (speed)		
7. Light and electromagnetic waves		
8. Sound waves		