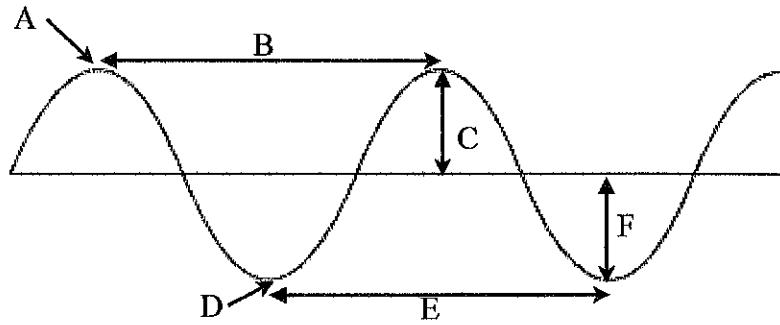


Name: \_\_\_\_\_

Date: \_\_\_\_\_

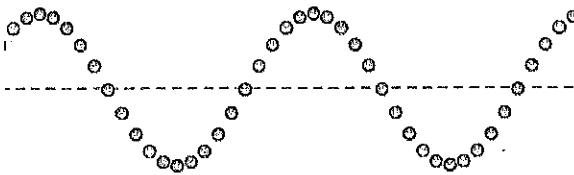
### Waves

- A: \_\_\_\_\_
- B: \_\_\_\_\_
- C: \_\_\_\_\_
- D: \_\_\_\_\_
- E: \_\_\_\_\_
- F: \_\_\_\_\_



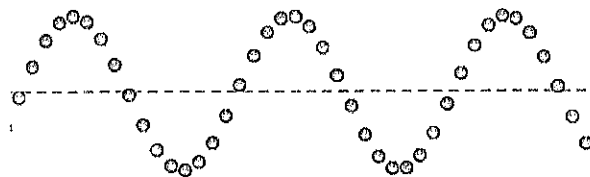
### Frequency

Wave 1:



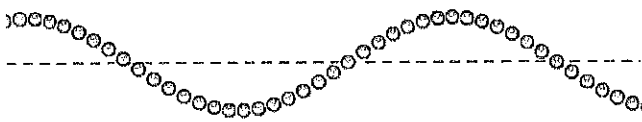
1. How many wavelengths long is Wave 1?
2. How many wavelengths long is Wave 2?
3. How many wavelengths long is Wave 3?

Wave 2:



4. Which wave has the highest frequency?
5. Which wave has the lowest frequency?

Wave 3:



6. What is the definition of frequency?
7. How can you tell by looking at it if a wave has high or low frequency?

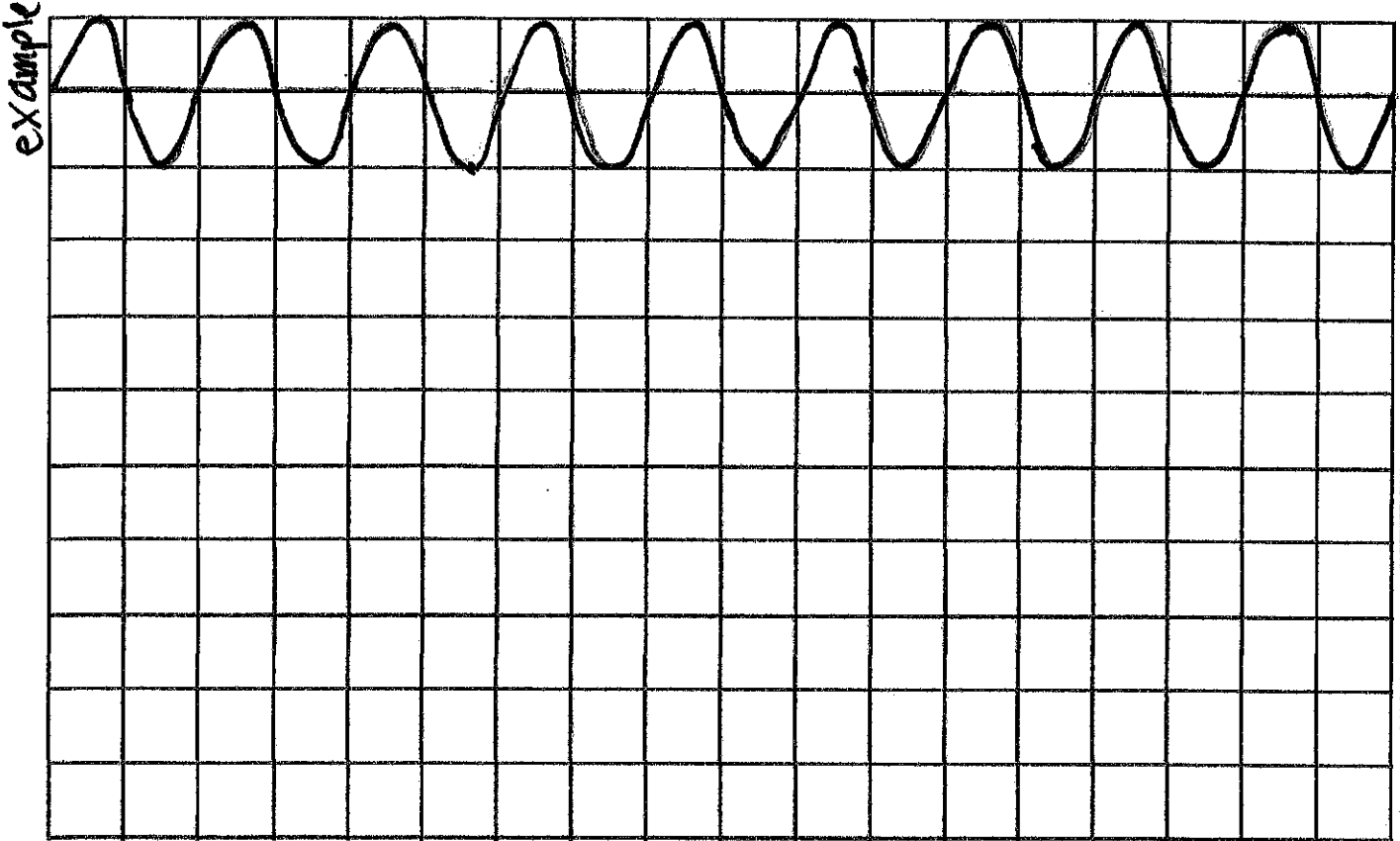
### Frequency Connection

There are three members of a family. The dad has a deep, low voice. The mom has a medium-high voice, and the baby has the highest voice.

8. Which wave belongs to the dad's voice? \_\_\_\_\_
9. Which wave belongs to the mom's voice? \_\_\_\_\_
10. Which wave belongs to the baby's voice? \_\_\_\_\_

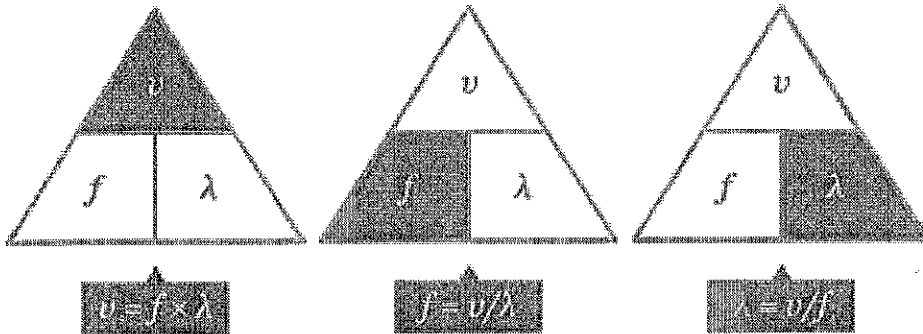
## Wave Properties

1. Figure out the amplitude and wavelength of the example wave.
2. Draw a wave that doubles the frequency of the example wave.
3. Draw a wave that doubles the amplitude of the example wave.



## Figuring out wave speed

Cut out and glue/tape the diagram and table below into your notebook. (Once completing the back)



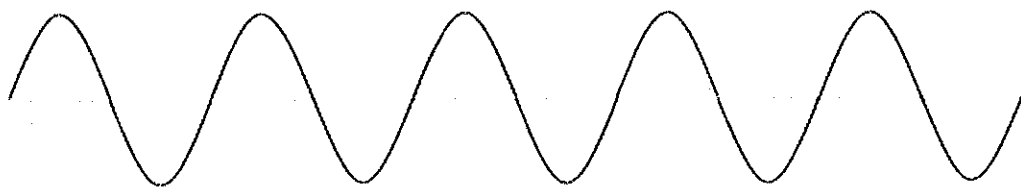
distance

Velocity =  $\frac{\text{-----}}{\text{time}}$

Property of Wave	symbol	unit
Velocity / Speed	v	(m/s) - meters/second
Frequency	f	(Hz) Hertz - waves per second
wavelength	$\lambda$	(m) - meters

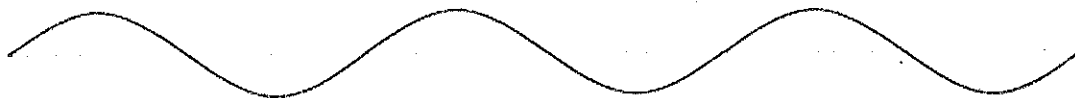
The time from the beginning to the end of the wave train in each situation is 1 second.

### Wave 1



- a) How many waves are there in this wave train? \_\_\_\_\_  
 b) Wavelength \_\_\_\_\_ cm    c) Amplitude \_\_\_\_\_ cm    d) frequency \_\_\_\_\_ Hz    e) speed \_\_\_\_\_ cm/s

### Wave 2



- a) How many waves are there in this wave train? \_\_\_\_\_  
 b) Wavelength \_\_\_\_\_ cm    c) Amplitude \_\_\_\_\_ cm    d) frequency \_\_\_\_\_ Hz    e.) speed \_\_\_\_\_ cm/s

### Problems:

1. What is the wavelength of a sound wave with a frequency of 50 Hz? The speed of sound is 342 m/s.
2. A sound wave in a steel rail has a frequency of 620 Hz and a wavelength of 10.5 m. What is the speed of sound in steel?

## Wave Speed Calculation

1. Use the formula  $frequency \times wavelength = wave\ speed$  to complete the table.

	Frequency (Hz or $\frac{1}{s}$ )	Wavelength (m)	Wave speed (m/s)
A	500		1500
B		0.5	1200
C	1,000	0.34	
D		0.03	300,000,000
E	150,000,000		300,000,000
F	20,000	0.15	

Cut out and  
tape/glue into  
your notebook

2. Water waves on a lake pass by a boat that is anchored.
  - A wave crest passes by the boat every 4.0 seconds. Calculate the frequency of the waves in hertz.
  - The distance from one wave crest to the next wave trough is 5.0m.
    - Calculate the wavelength of the waves.
    - Calculate the wave speed.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

3. What is the velocity of a wave with a frequency of 760 Hz and a wavelength of 0.45 m?
4. What is the frequency of a pendulum that is moving at 30 m/s with a wavelength of 0.35 m?
5. What is the wavelength of a sound wave moving at 340 m/s with a frequency of 256 Hz?
6. A wave with a frequency of 14 Hz has a wavelength of 3 meters. At what speed will this wave travel?
7. The speed of a wave is 65 m/s. If the wavelength is 0.8 meters, what is the frequency of the wave?
8. A wave has a frequency of 46 Hz and a wavelength of 1.7 meters. What is the speed of this wave?
9. A wave traveling at 230 m/s has a wavelength of 2.1 meters. What is the frequency of this wave?
10. A wave with a frequency of 500 Hz is traveling at a speed of 200 m/s. What is the wavelength?
11. A wave has a frequency of 540 Hz and is traveling at 340 m/s. What is its wavelength?
12. A wave has a wavelength of 125 meters is moving at a speed of 20 m/s. What is its frequency?
13. A wave has a frequency of 900 Hz and a wavelength of 200 m. At what speed is this wave traveling?
14. A wave has a wavelength of 0.5 meters and a frequency of 120 Hz. What is the wave's speed?