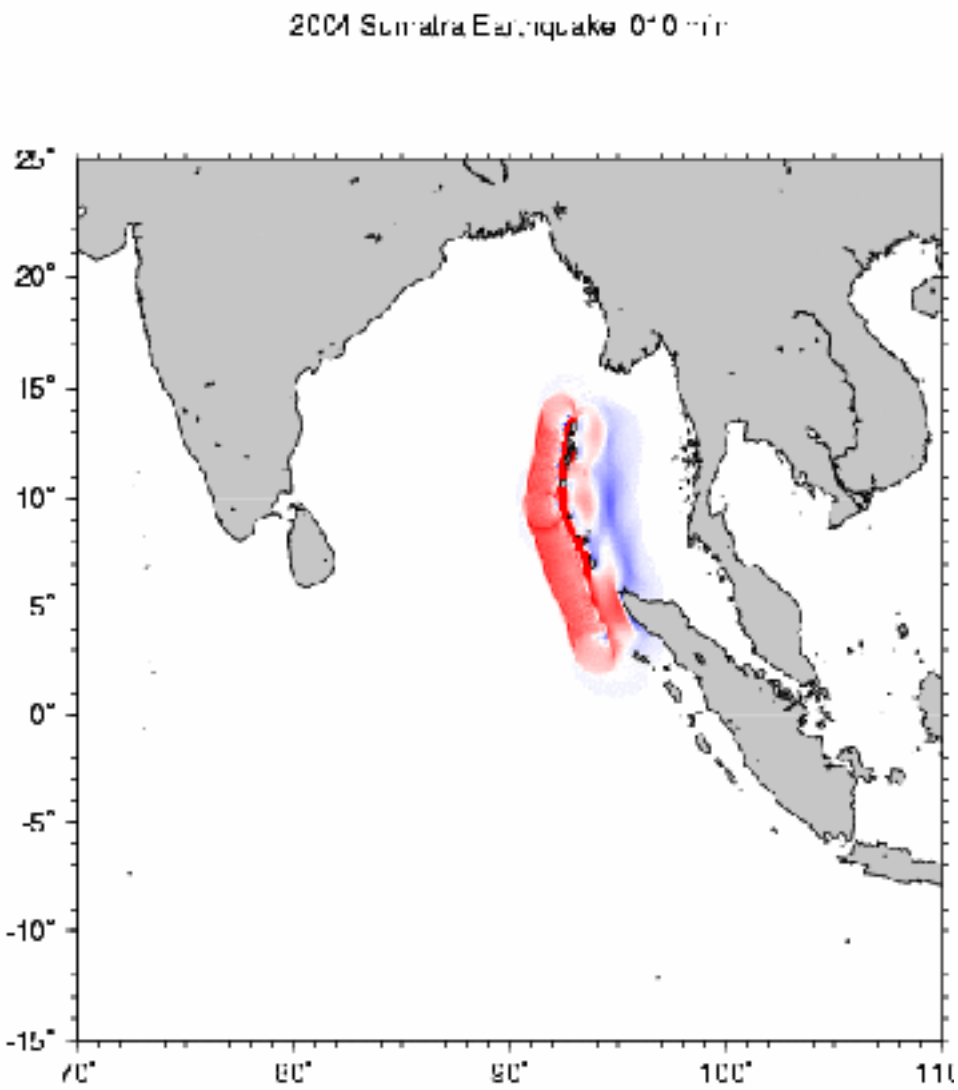
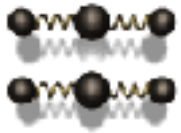
Waves



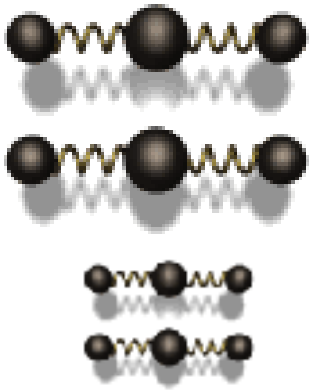
Tsunami caused by Sumatra earthquake

Waves: Definitions

- **Vibration** (**V**) – Back and forth motion.



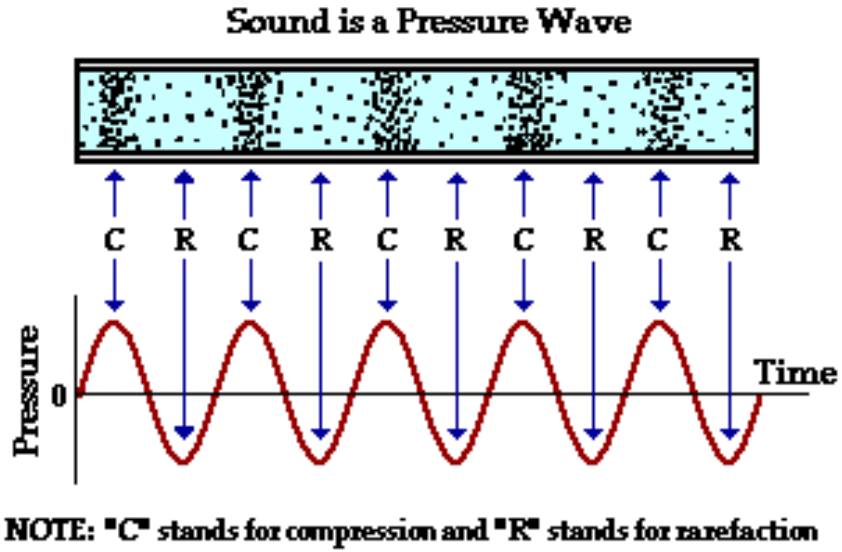
- **Frequency** (**F**) – The number of vibrations something makes in one second.

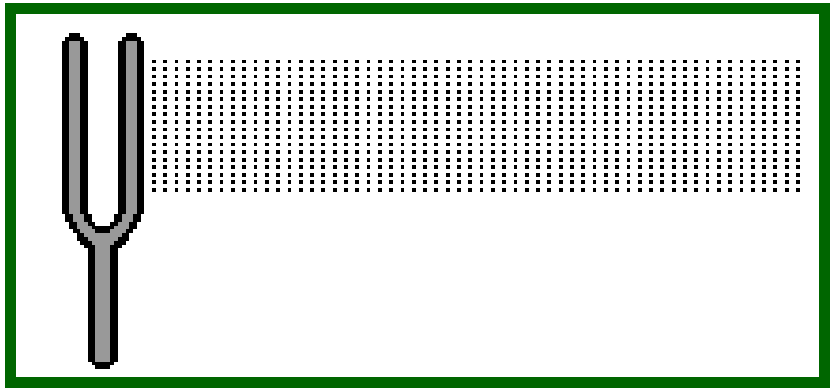


- **Amplitude** (**A**)– The size of the vibration.

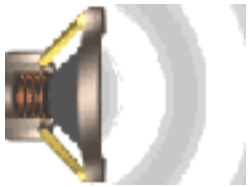
- **Resonance** – Large vibrations when something is pushed at its natural frequency

Waves: Sound

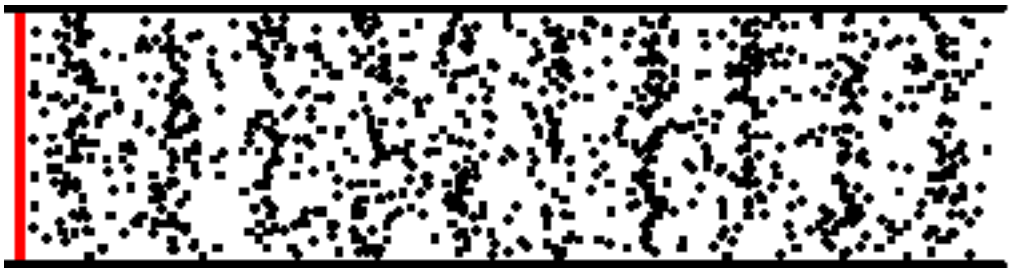




Tuning Fork Cause air to be compress and rarified

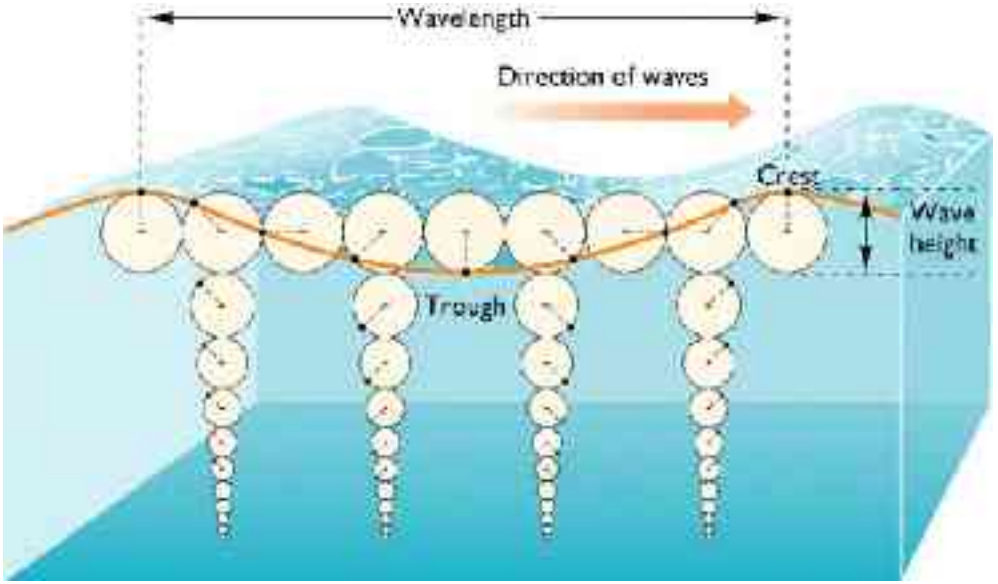


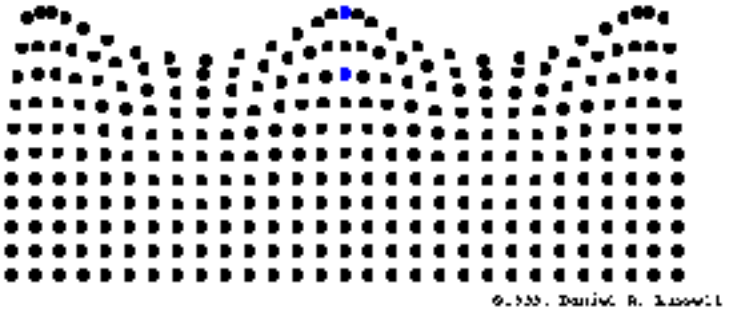
Loudspeaker



Longitudinal Wave

Waves: Water





Waves: Light

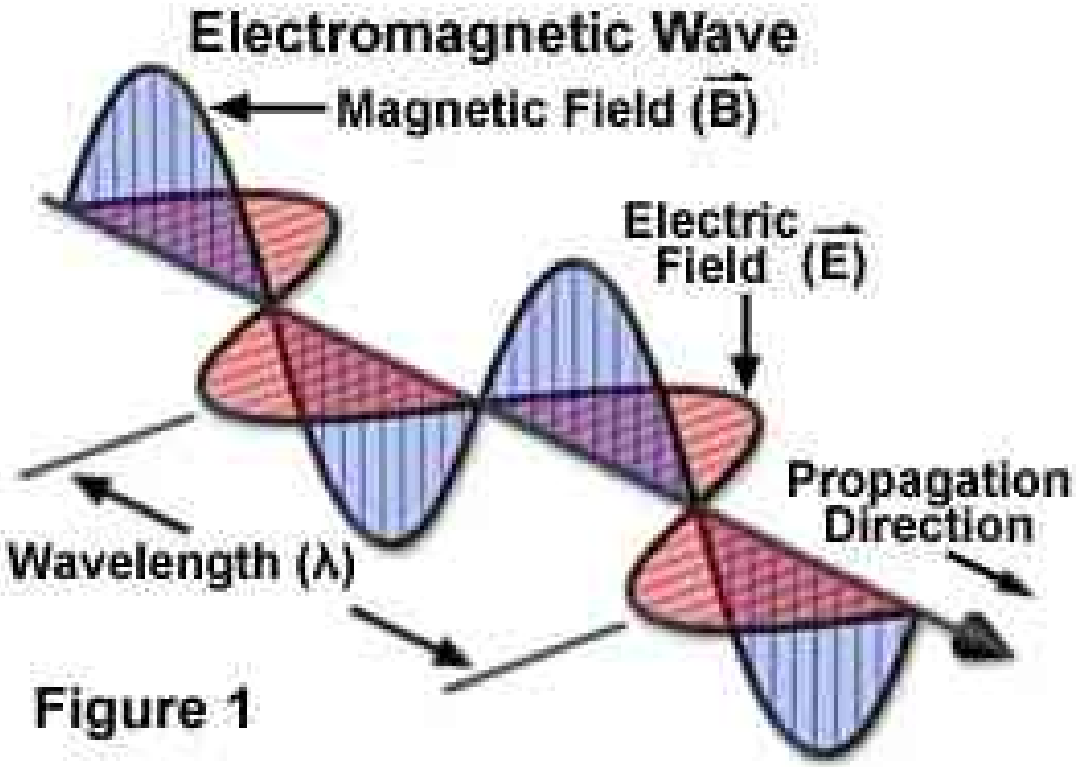
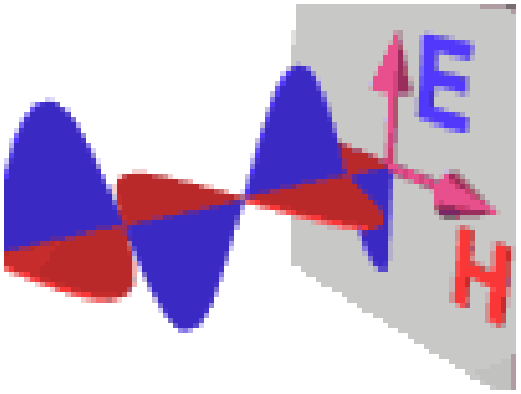
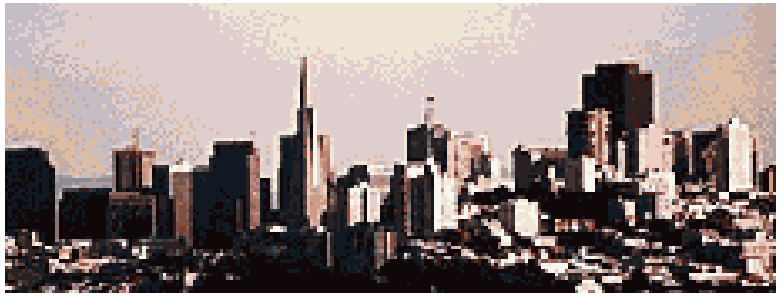
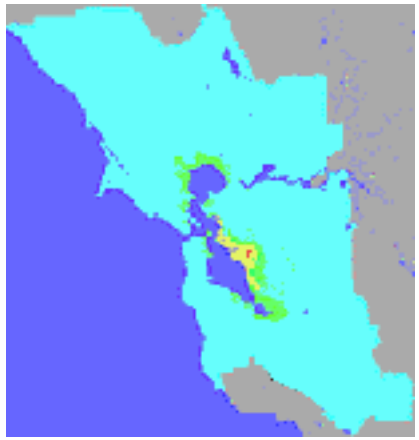


Figure 1



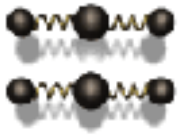
Waves: Earthquake



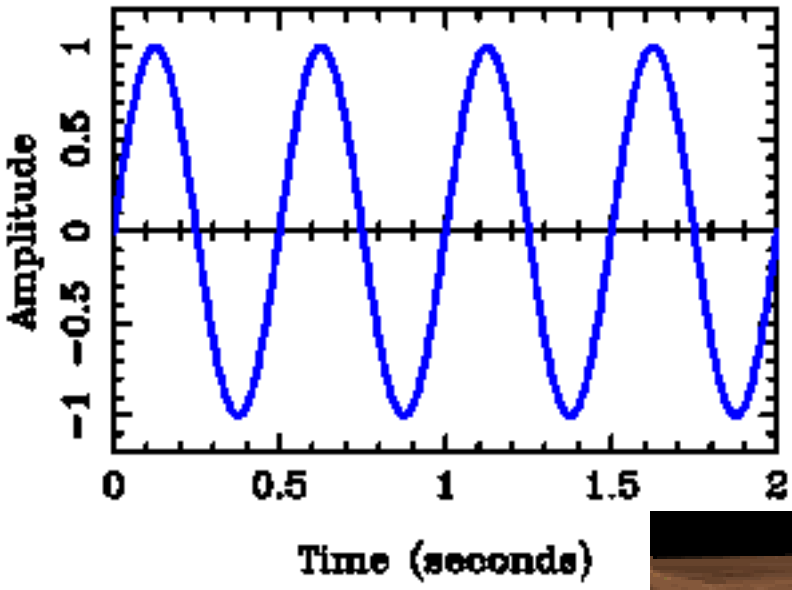


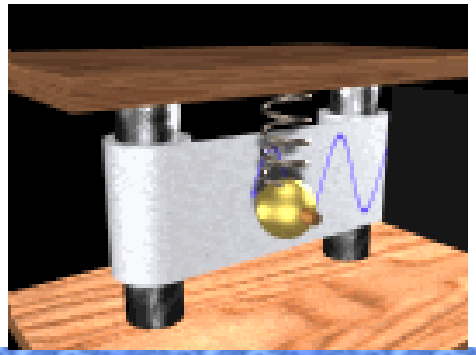
Waves: Frequency

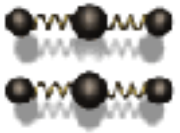
- **Frequency** (**F**) – The number of vibrations something makes in one second



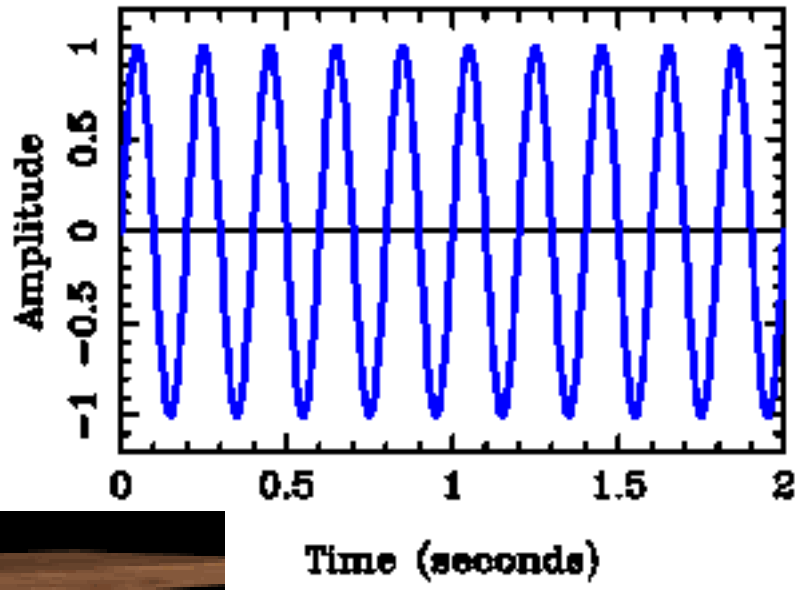
Low Frequency





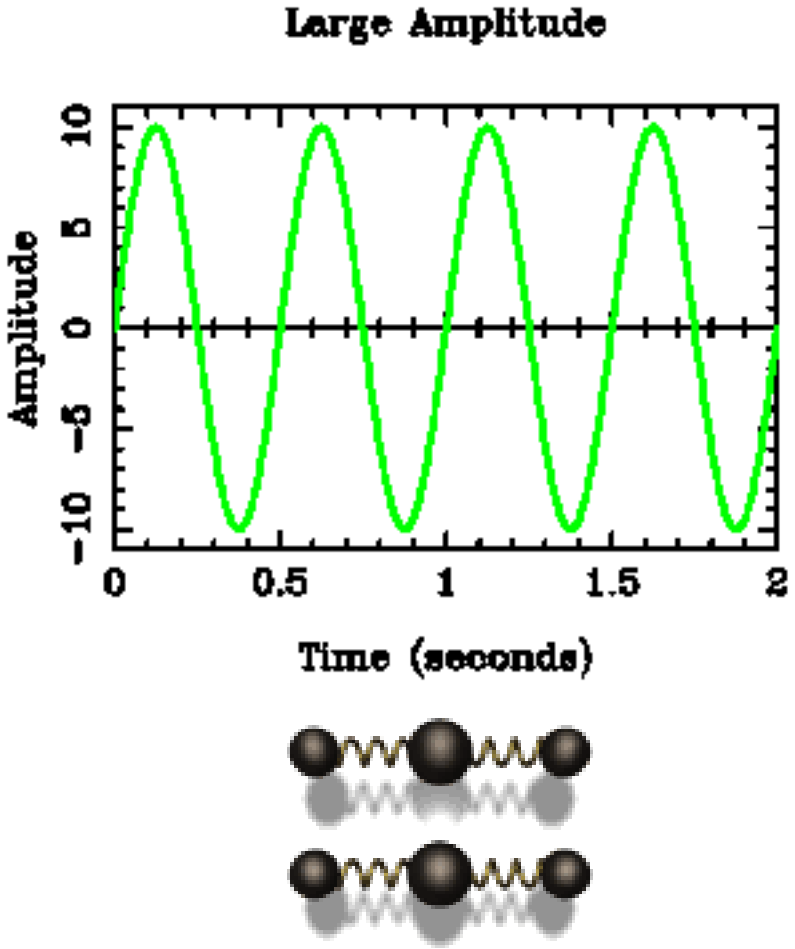


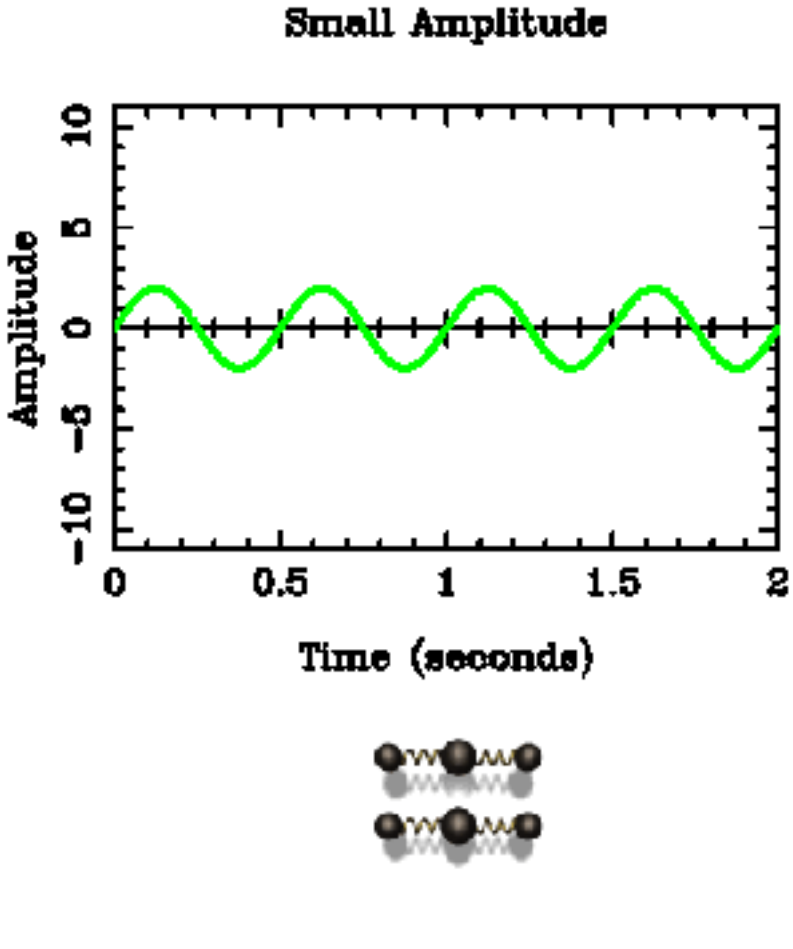
High Frequency



Waves: Amplitude

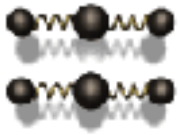
- **Amplitude** (**A**)– The size of the vibration.



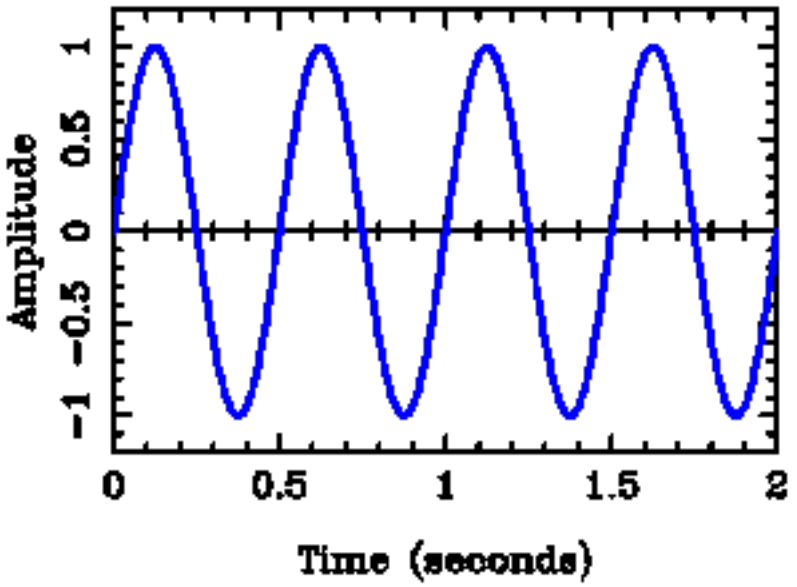


Waves: Frequency

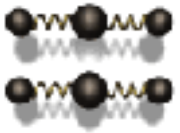
- **Frequency** (**F**) – The number of vibrations something makes in one second

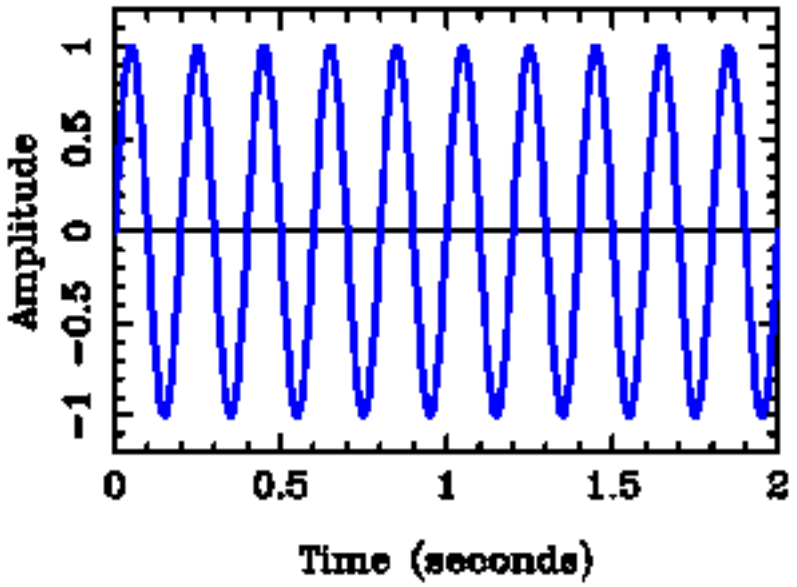


Low Frequency



High Frequency



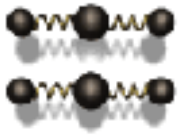


What's the Frequency?

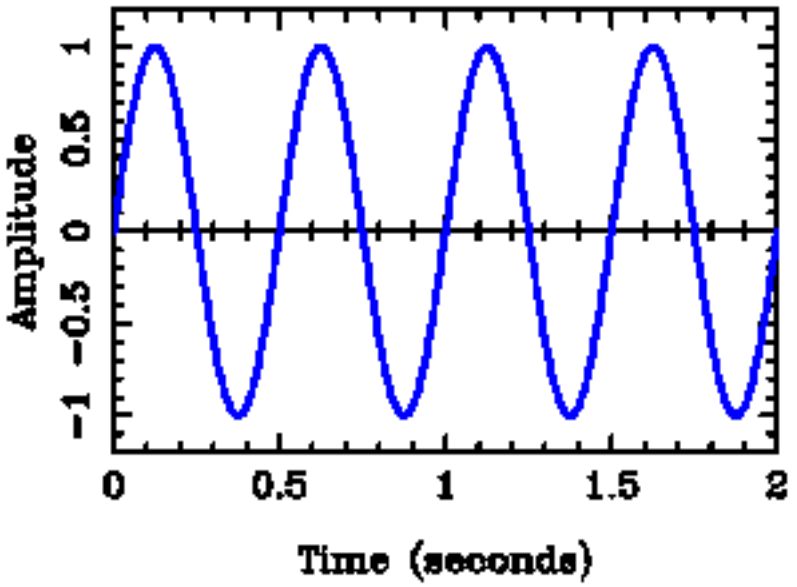
F = ?

Waves: Frequency

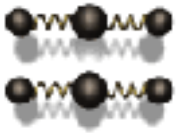
- **Frequency** (**F**) – The number of vibrations something makes in one second

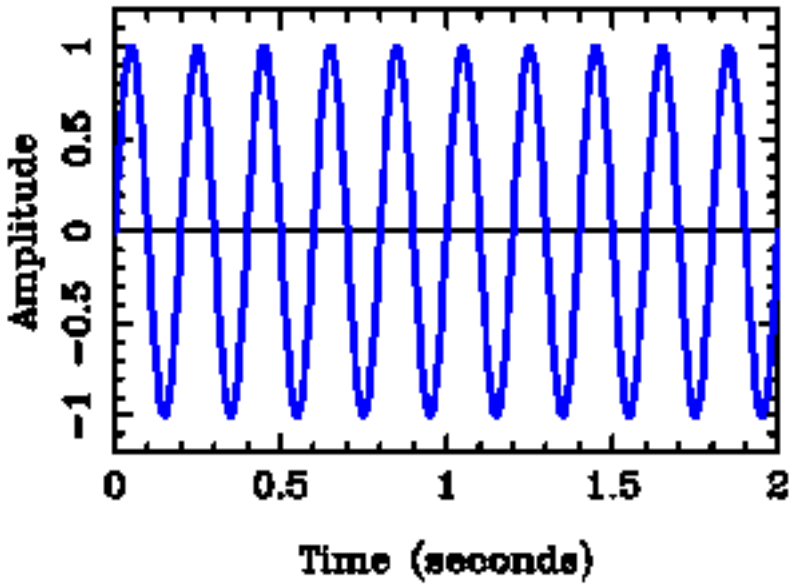


Low Frequency



High Frequency



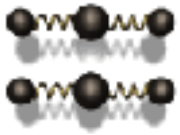


What's the Frequency?

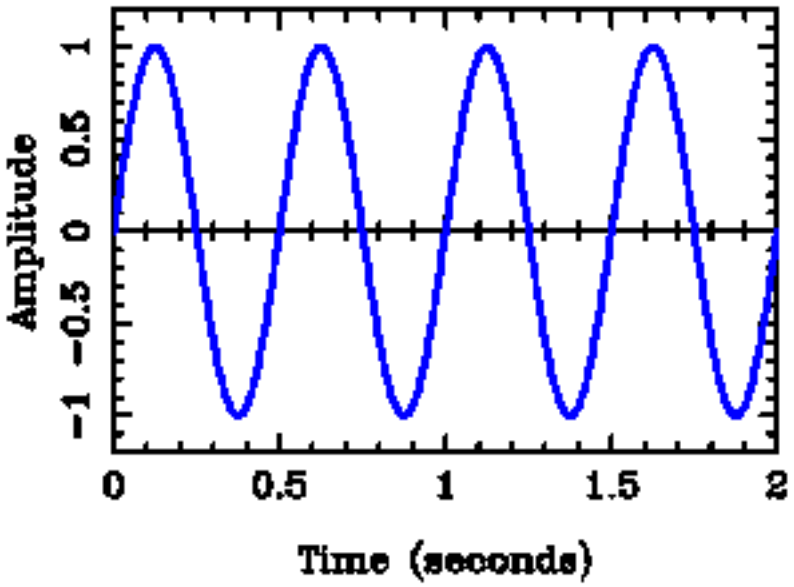
F = **V** / **T** = 4 / 2 = 2

Waves: Frequency

- **Frequency** (**F**) – The number of vibrations something makes in one second

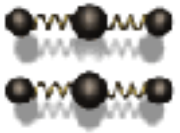


Low Frequency

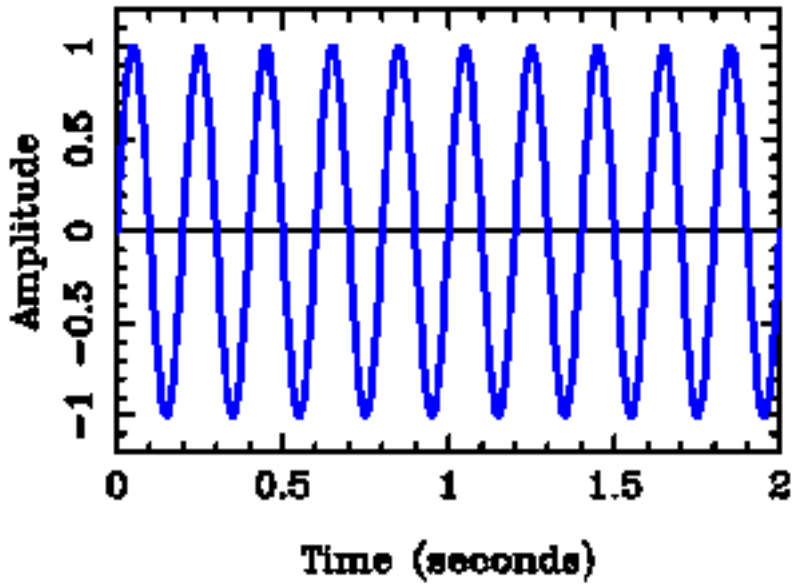


What's the Frequency?

F = **V** / **T** = 4 / 2 = 2



High Frequency

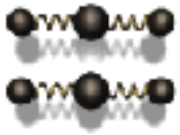


What's the Frequency?

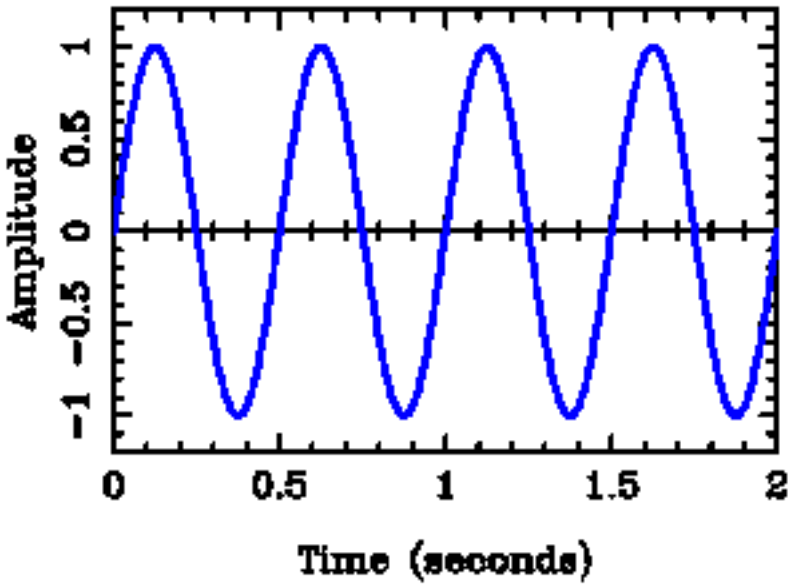
F = ?

Waves: Frequency

- **Frequency** (**F**) – The number of vibrations something makes in one second

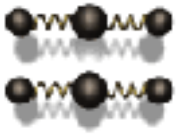


Low Frequency

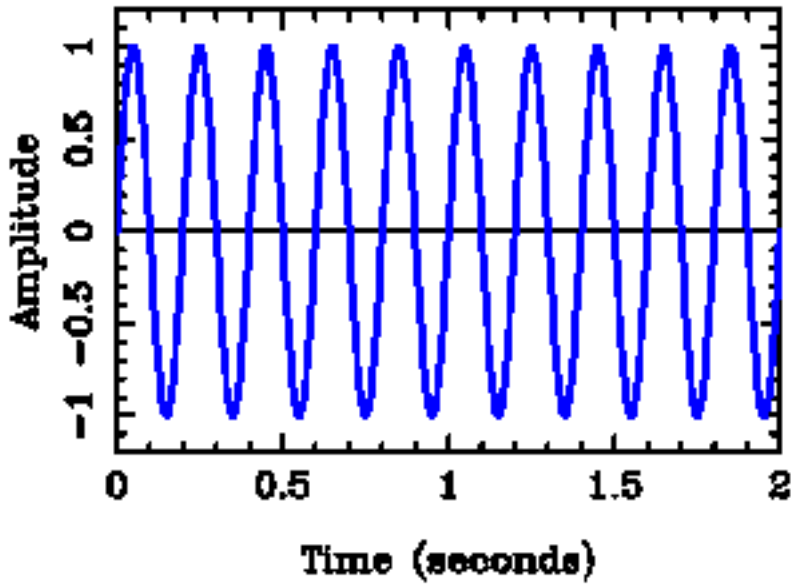


What's the Frequency?

F = **V** / **T** = 4 / 2 = 2



High Frequency

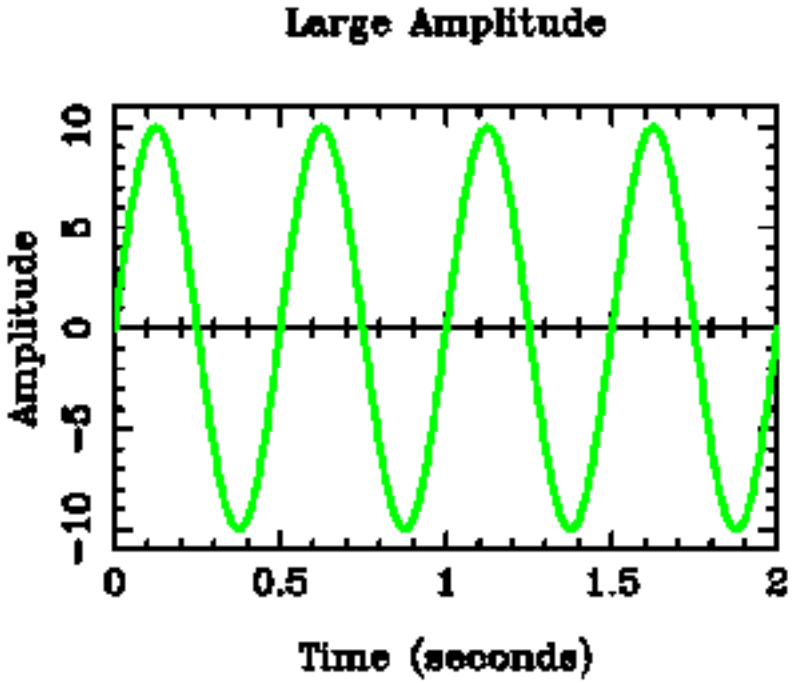


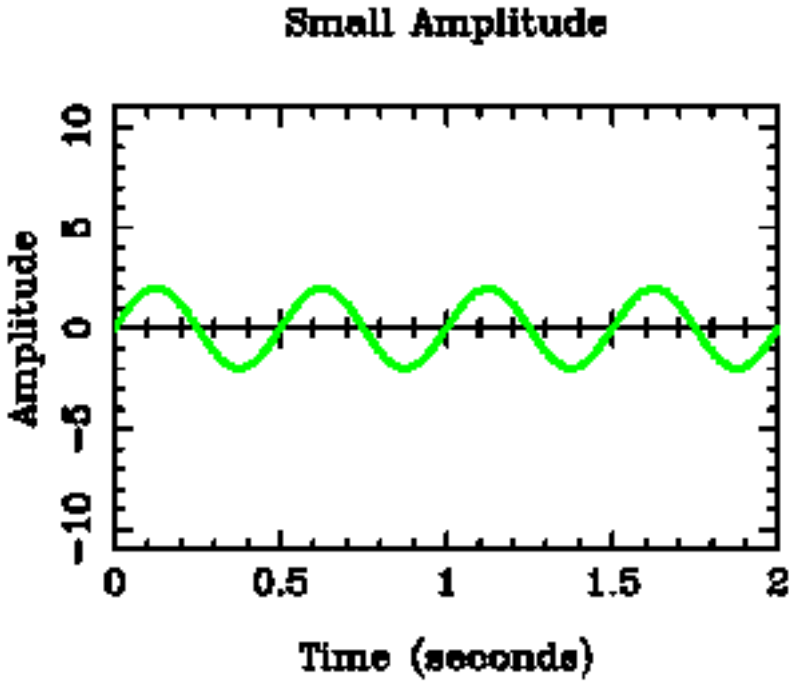
What's the Frequency?

F = **V** / **T** = 10 / 2 = 5

Waves: Amplitude

- **Amplitude** (**A**)– The size of the vibration.



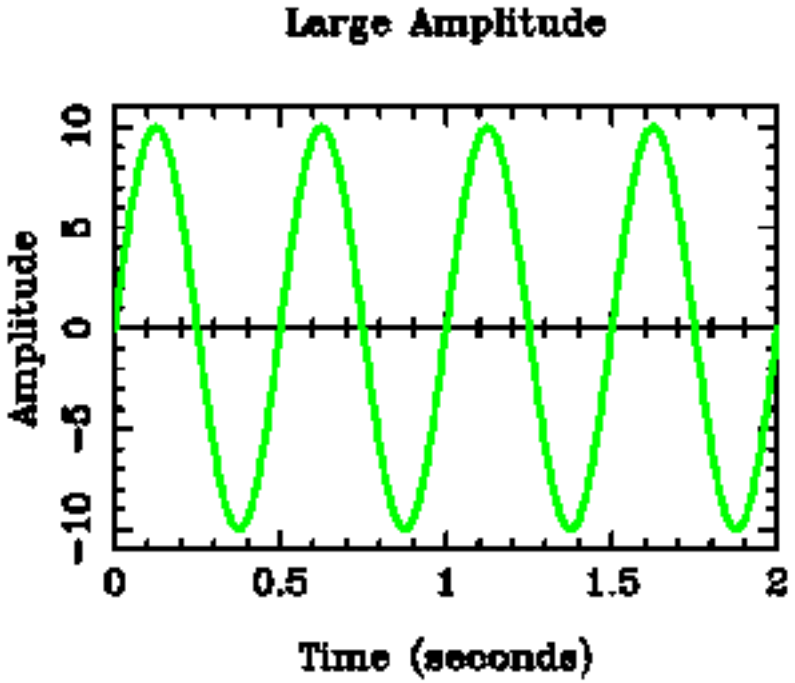


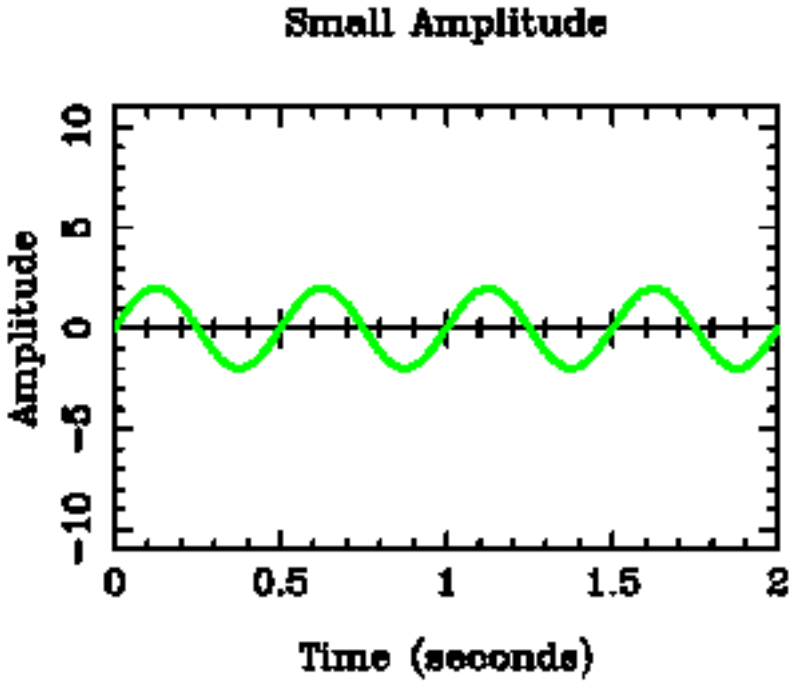
Whats the Amplitude?

A = ?

Waves: Amplitude

- **Amplitude** (**A**)– The size of the vibration.



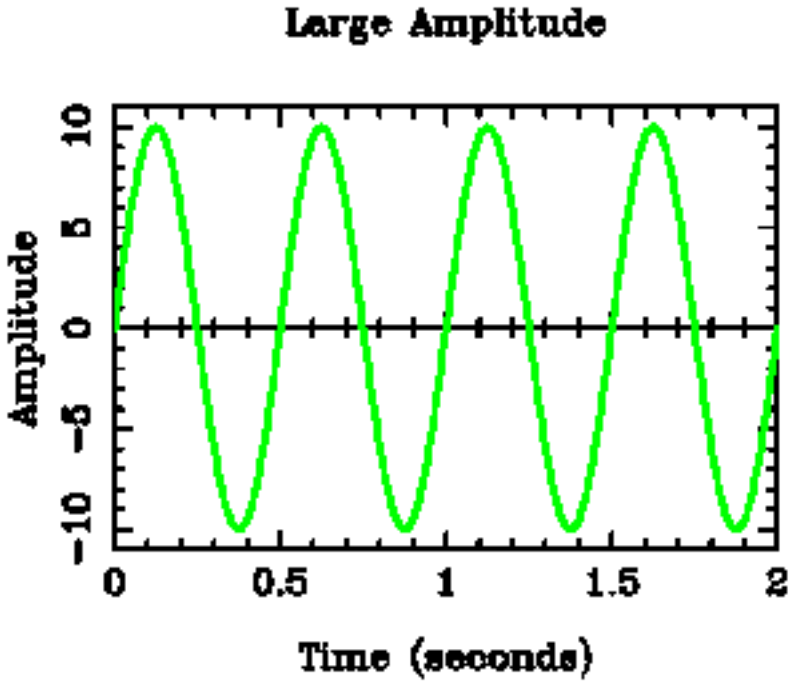


Whats the Amplitude?

A = 10

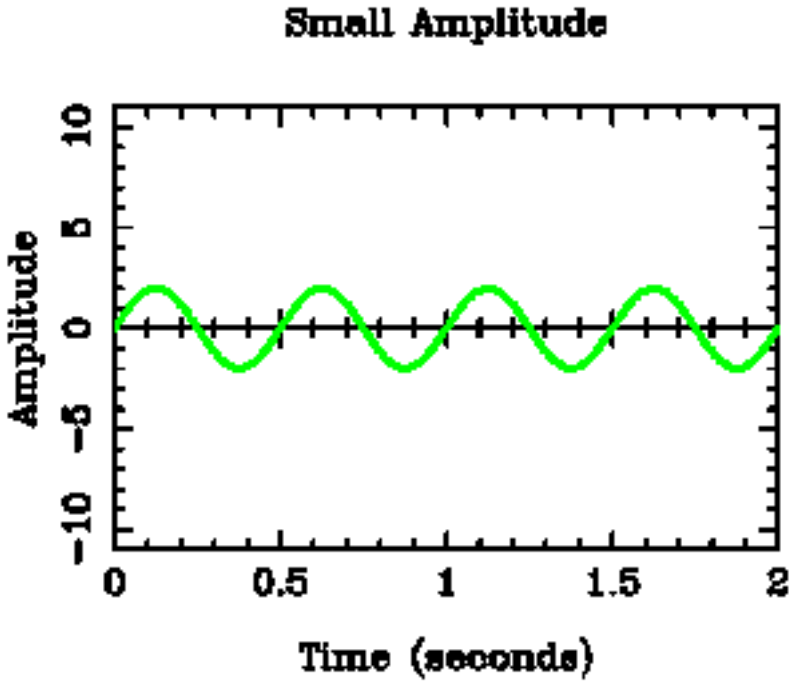
Waves: Amplitude

- **Amplitude** (**A**)– The size of the vibration.



Whats the Amplitude?

A = 10

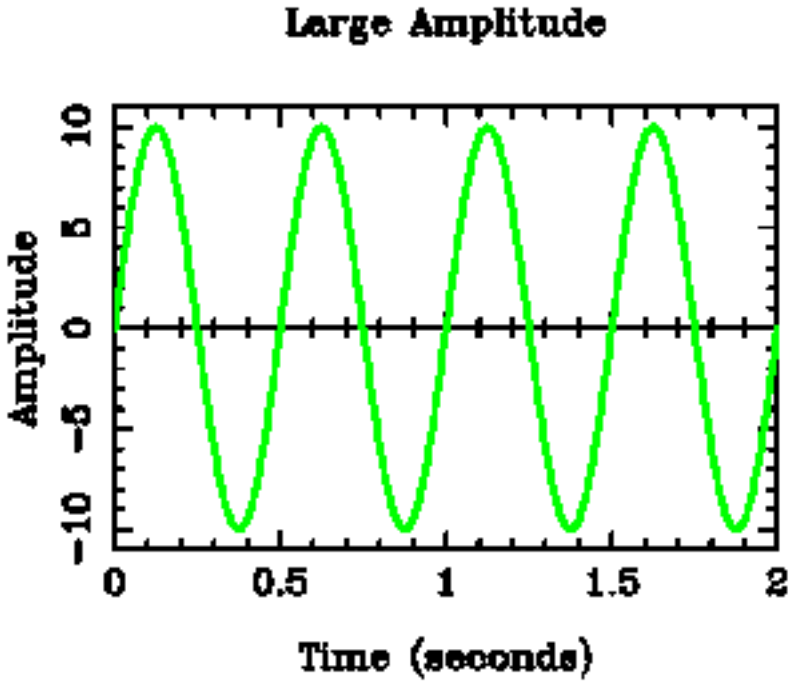


Whats the Amplitude?

A = ?

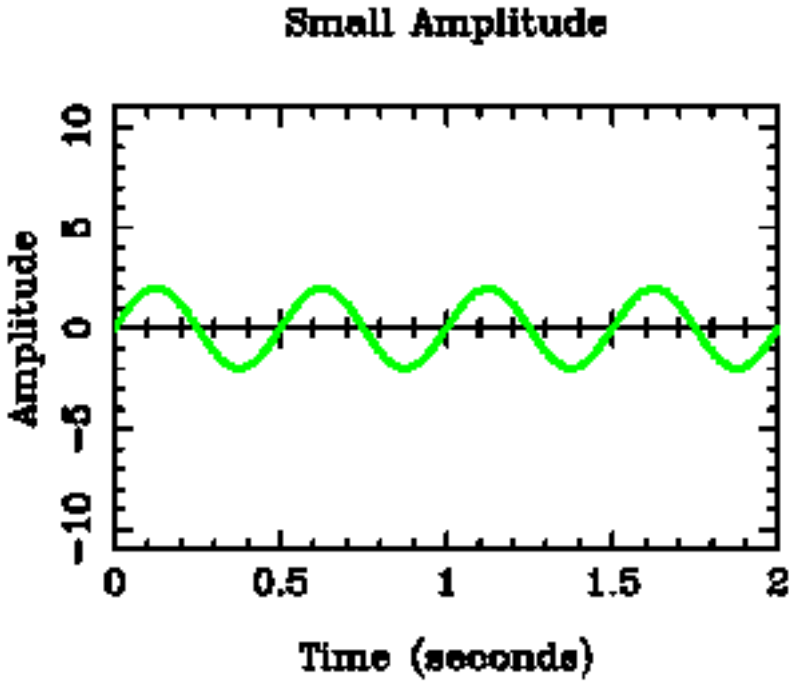
Waves: Amplitude

- **Amplitude** (**A**)– The size of the vibration.



Whats the Amplitude?

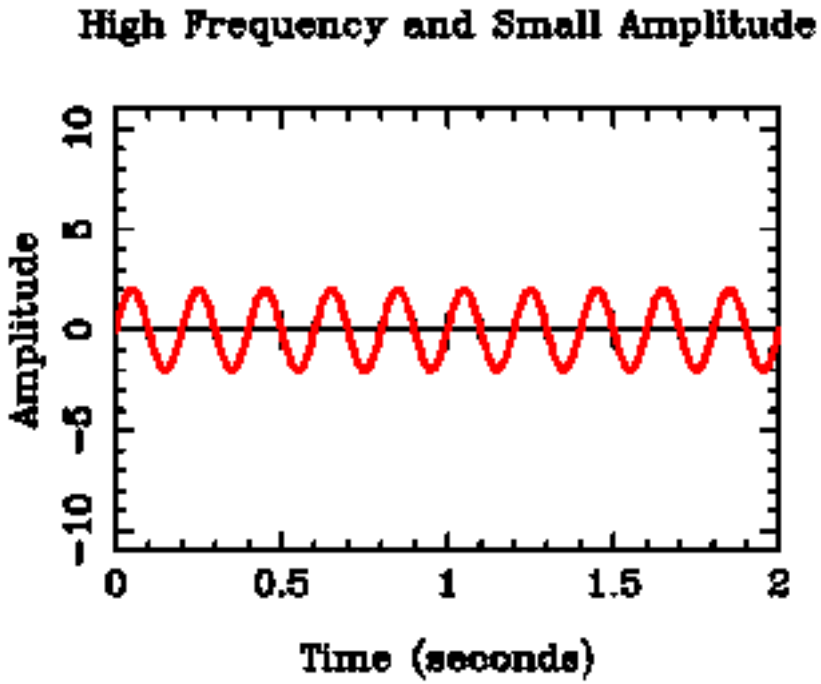
A = 10

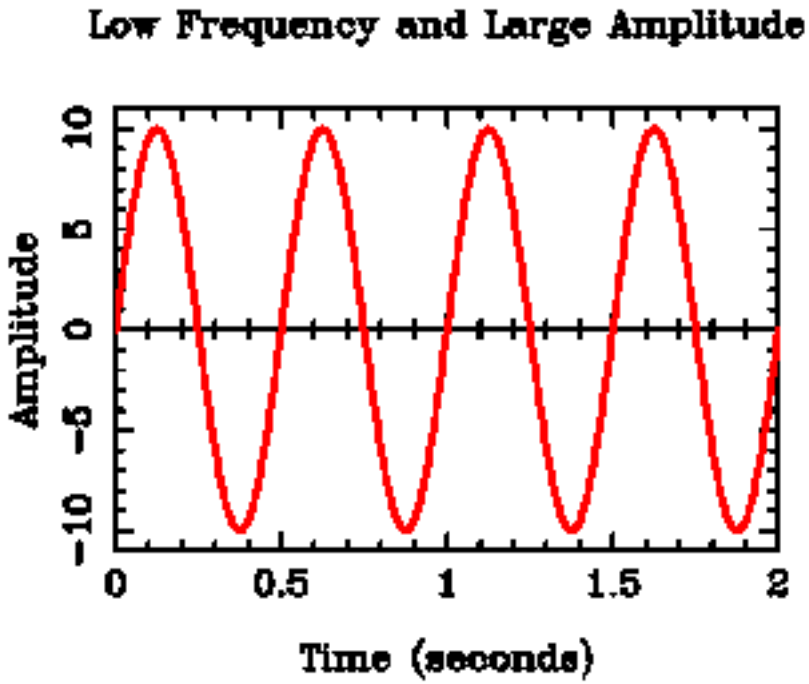


Whats the Amplitude?

A = 2

Waves: Frequency and Amplitude

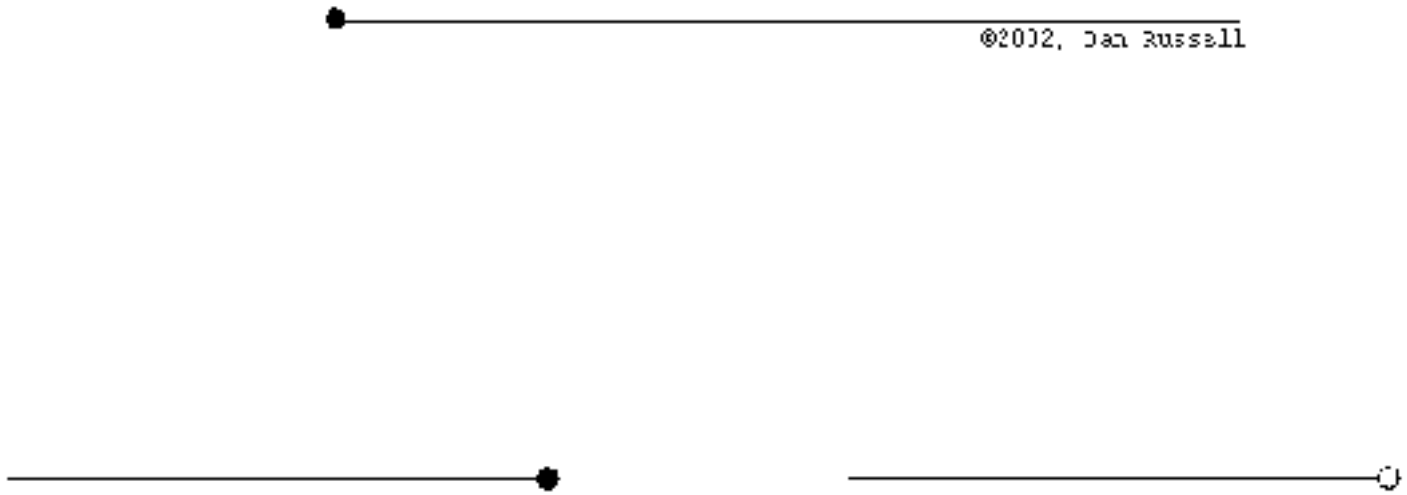




"Soft and High Pitch"

"LOUD and Low Pitch"

Waves: Traveling Pulse



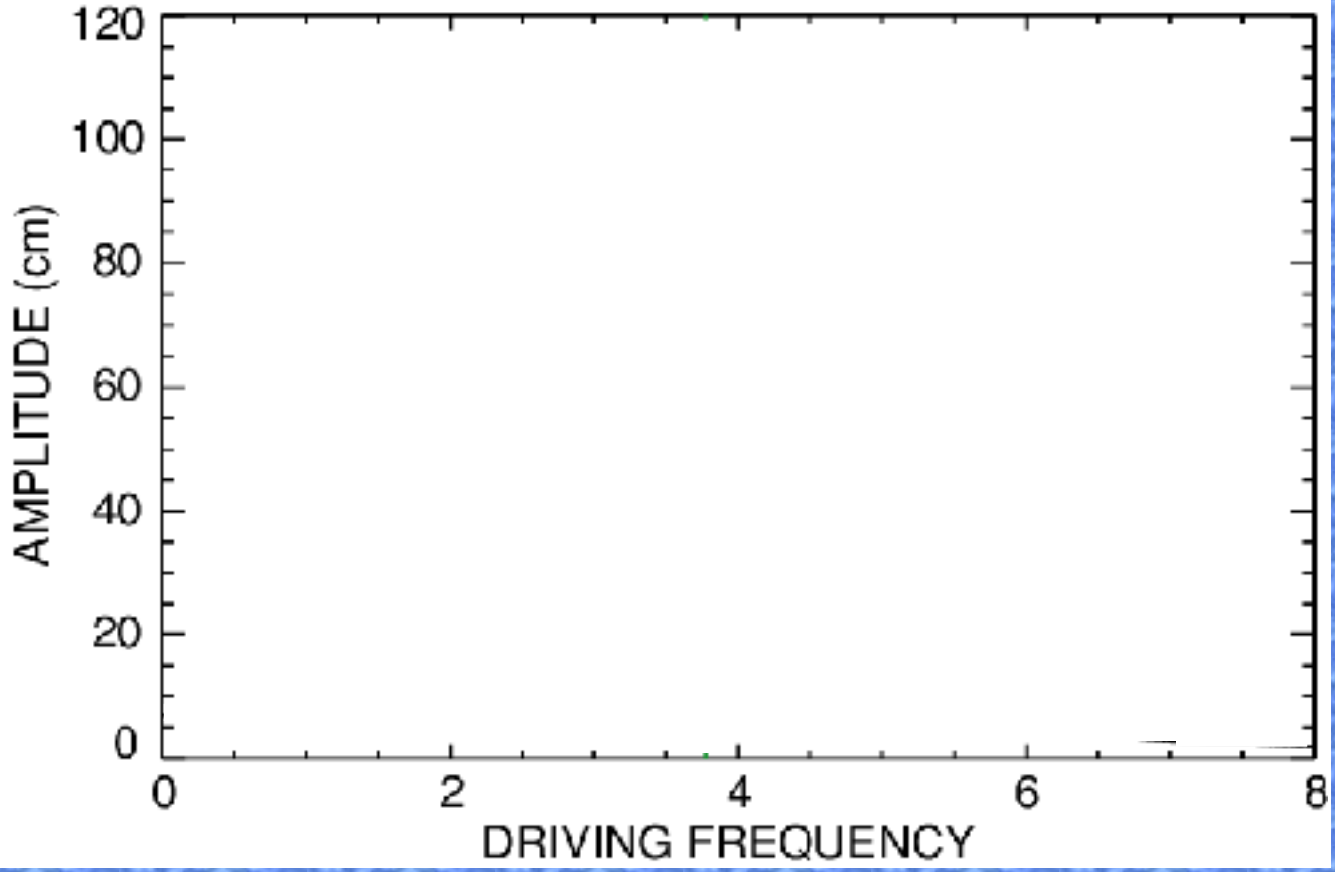
Waves: Resonance

- **Resonance** – Large vibrations when something is pushed at its natural frequency

Waves: Resonance

- **Resonance** – Large vibrations when something is pushed at its natural frequency

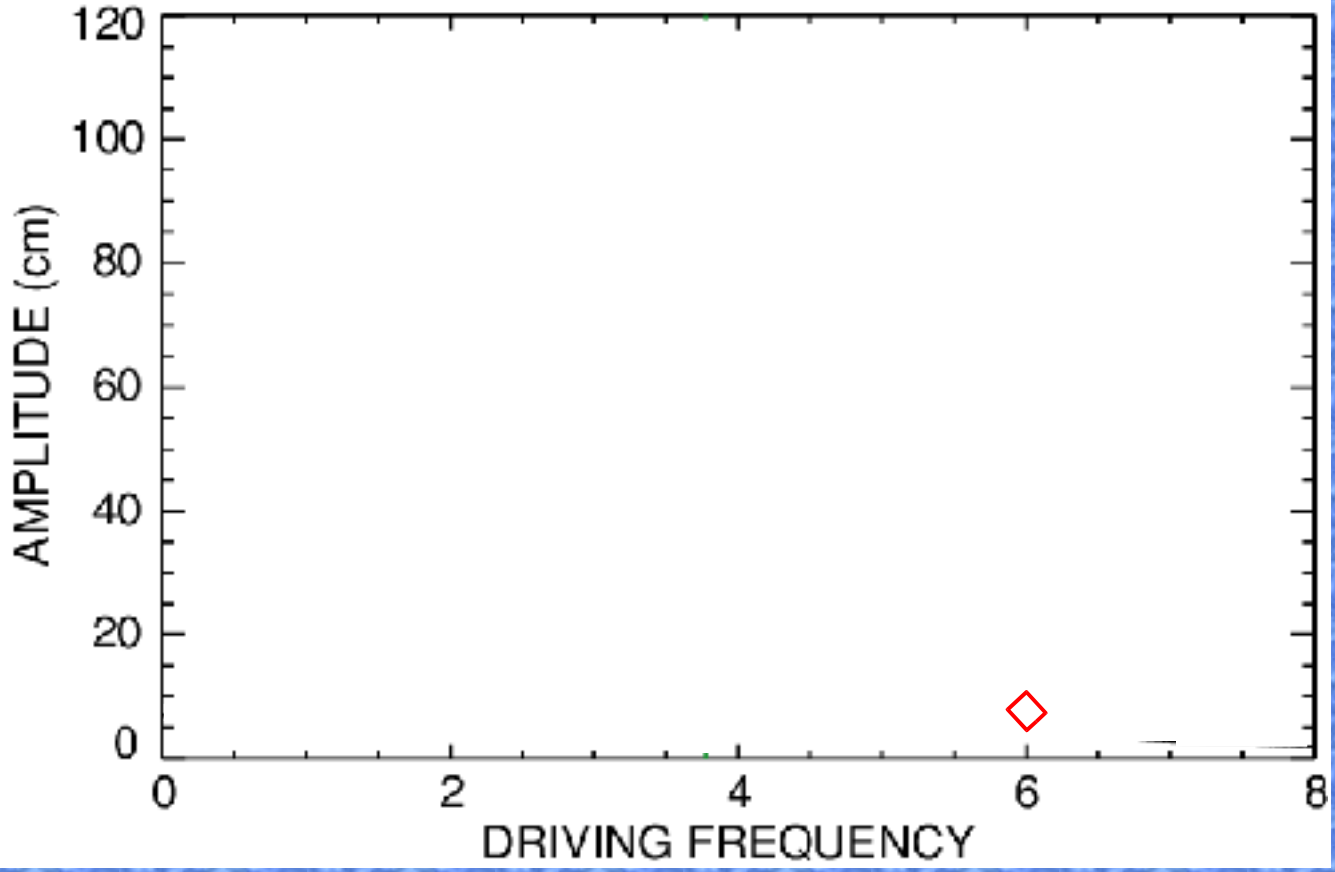
Frequency	Amplitude



Waves: Resonance

- **Resonance** – Large vibrations when something is pushed at its natural frequency

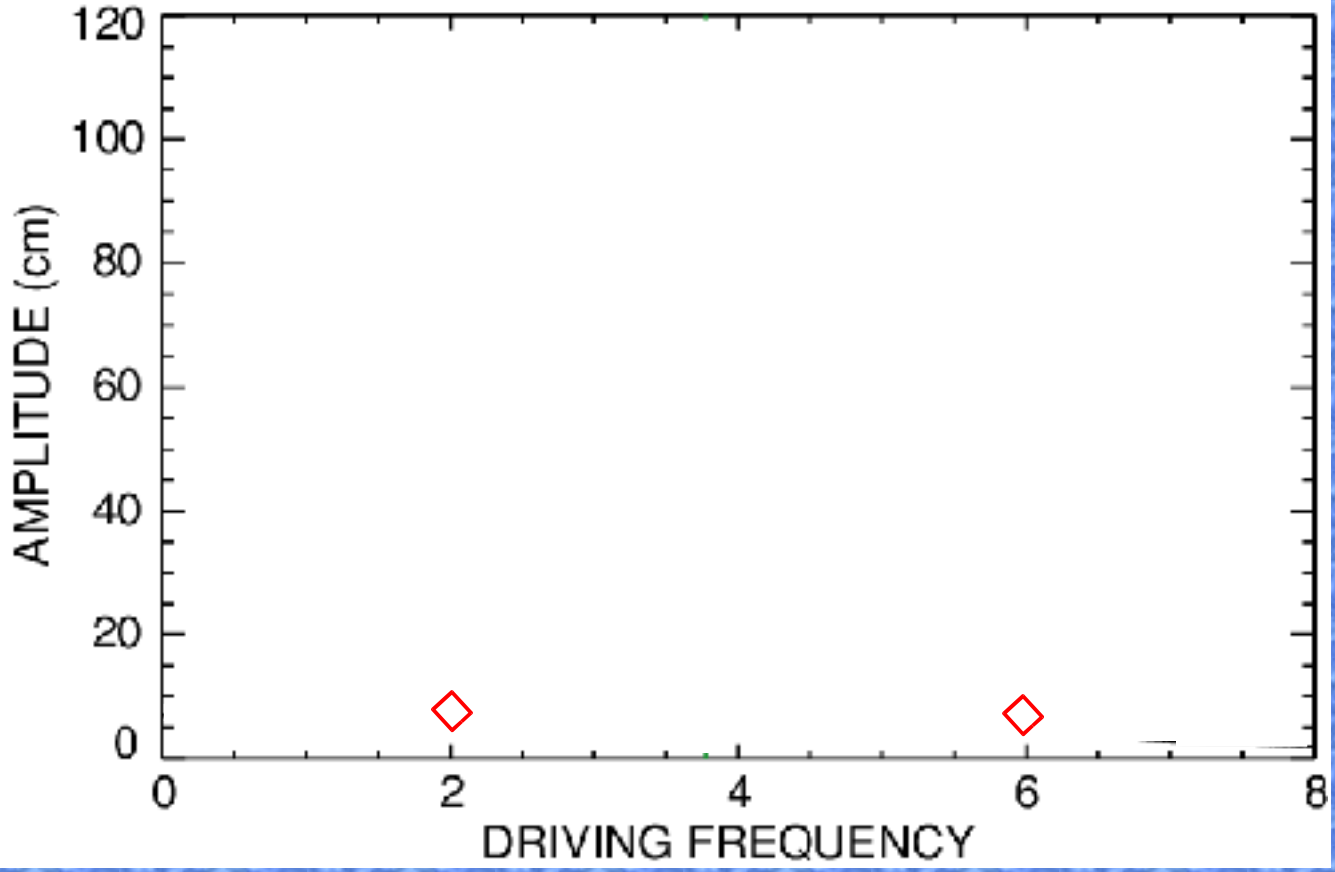
Frequency	Amplitude
6.0	8.0



Waves: Resonance

- **Resonance** – Large vibrations when something is pushed at its natural frequency

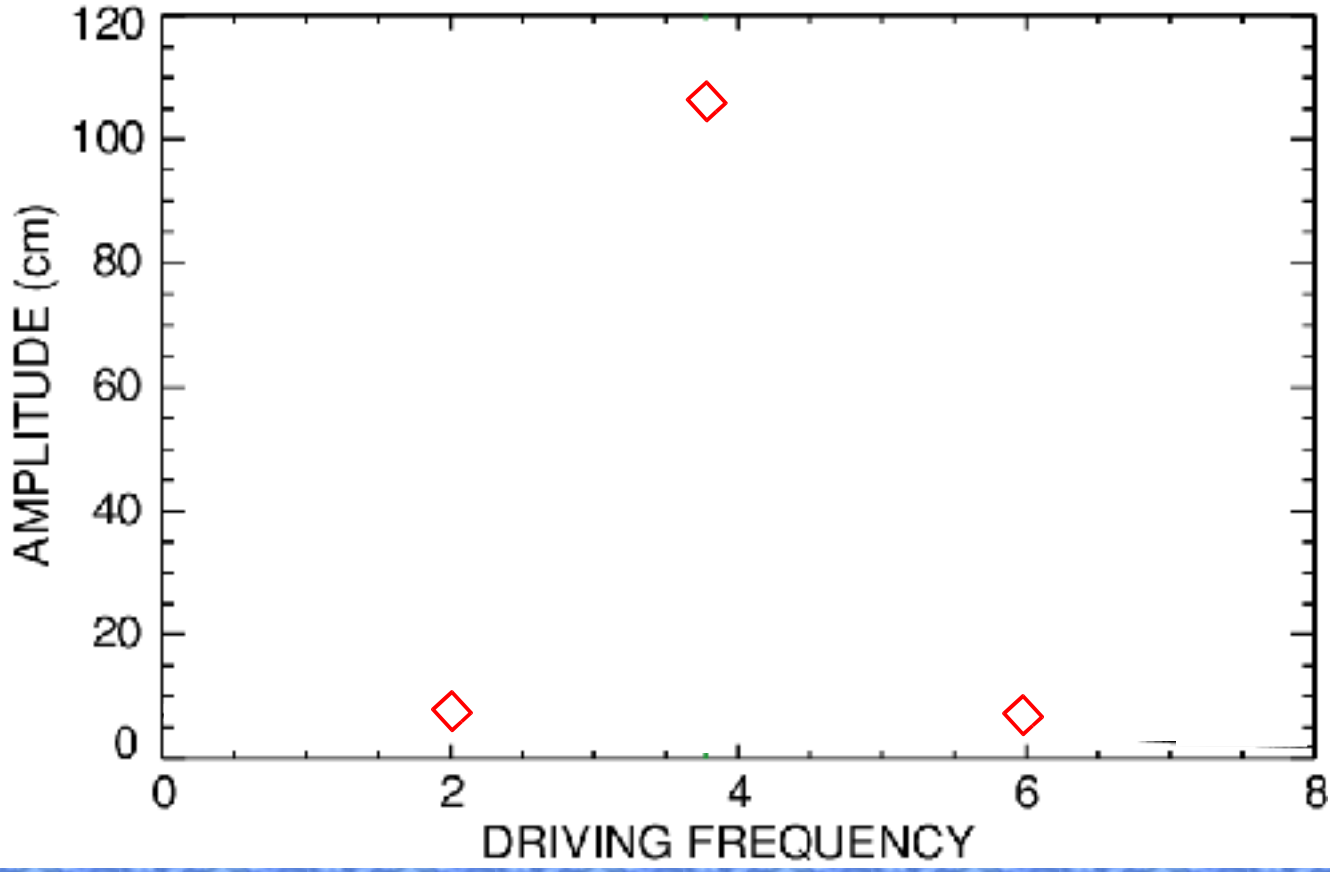
Frequency	Amplitude
6.0	8.0
2.0	8.0



Waves: Resonance

- **Resonance** – Large vibrations when something is pushed at its natural frequency

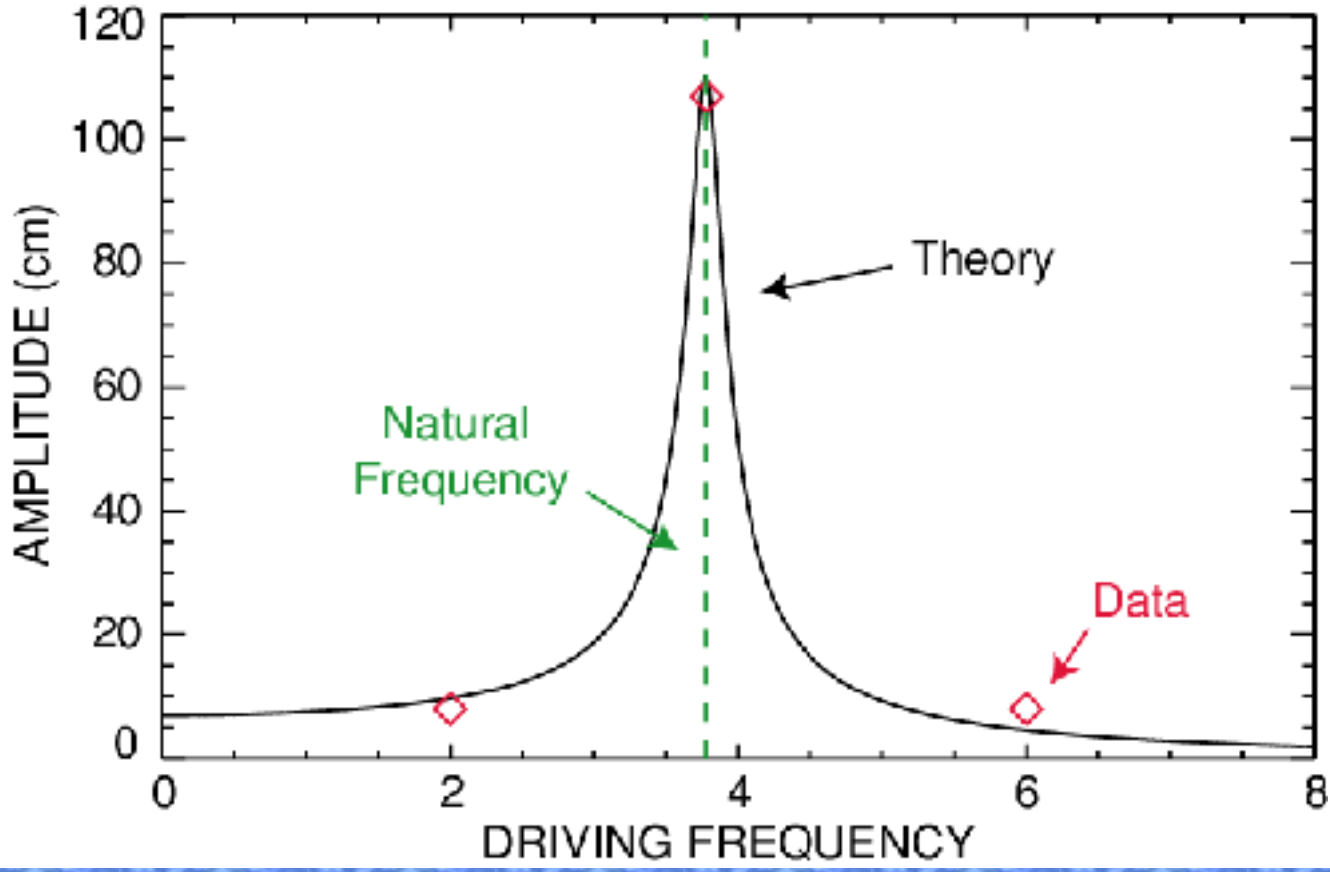
Frequency	Amplitude
6.00	8.00
2.00	8.00
3.78	107.00



Waves: Resonance

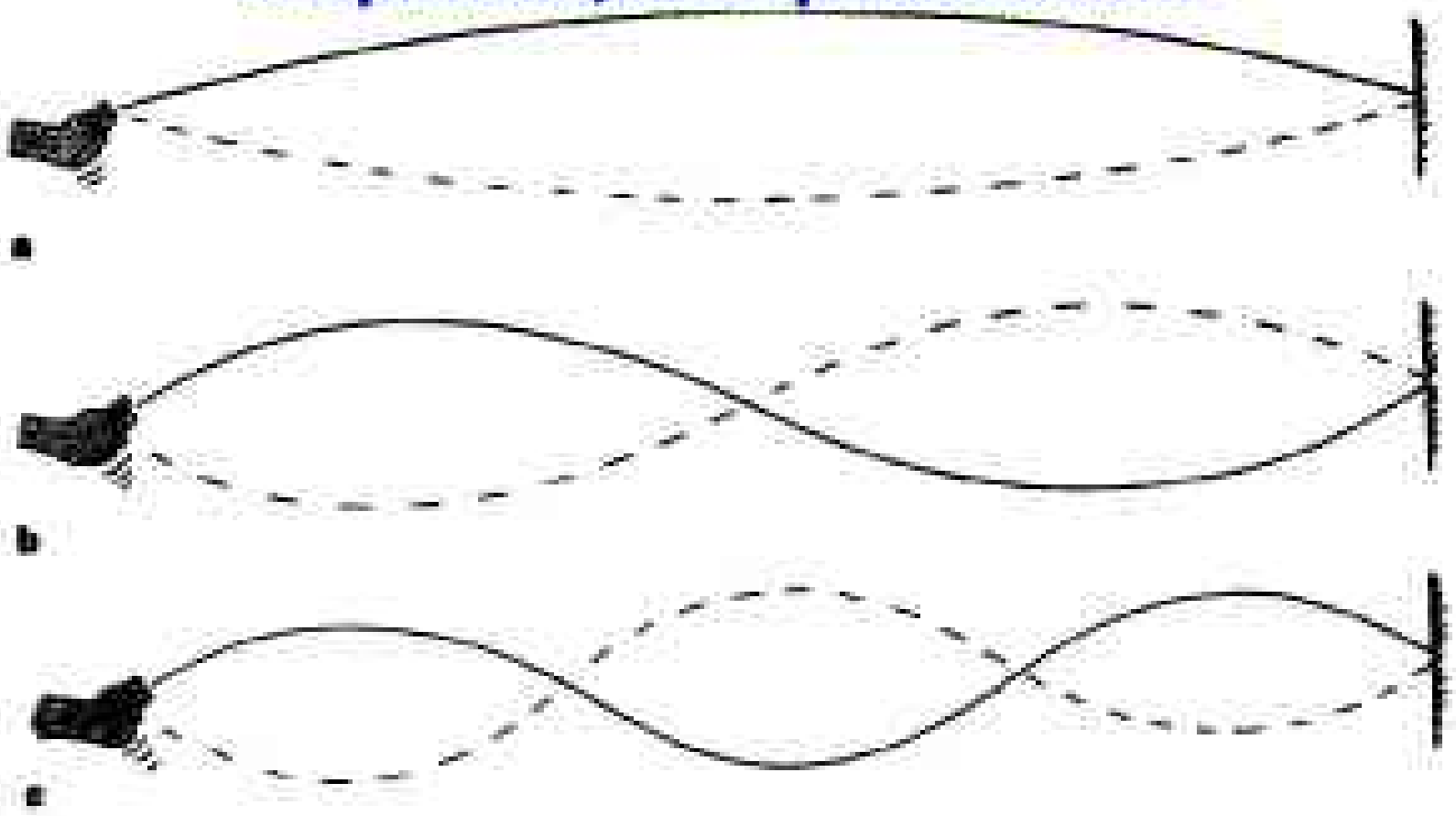
- **Resonance** – Large vibrations when something is pushed at its natural frequency

Frequency	Amplitude
6.00	8.00
2.00	8.00
3.78	107.00



Standing Waves

When the string vibrates at these natural frequencies, these patterns form:



Waves: Review