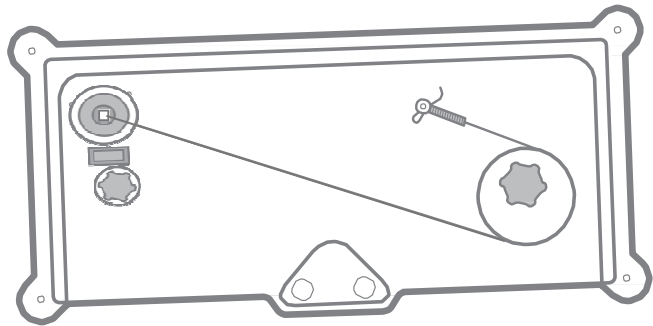


# SEEING SOUND

## Challenge

Use this exhibit to investigate how a string moves or vibrates to produce sound



## Think about.

Listen to the sound the string makes

## Think about.

Vibrations  
Patterns  
Tension

# SEEING SOUND

1. Switch on the speaker at the back. Use the dial to change the frequency at which the string is made to vibrate.

a. What happens to the string as the frequency increases?

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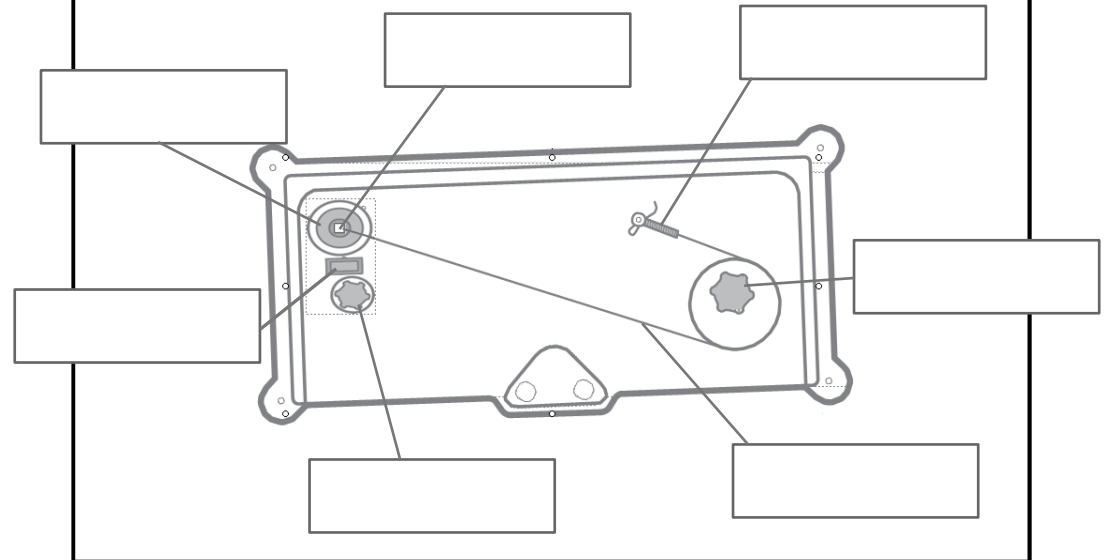
b. What happens to the sound that you hear as the frequency increases?

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2. Label the different parts of the exhibit.



Tension spring	String	Frequency adjuster	Vibrator
Loud speaker	Tension wheel	Frequency display	

# SEEING SOUND

## 3. Experiment: Changing the Tension

Keep the frequency constant and change the tension of the string by turning the tension wheel. Tension is a measure of how tight the string is.

a. Does the sound change as you increase the tension?

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b. If so, how?

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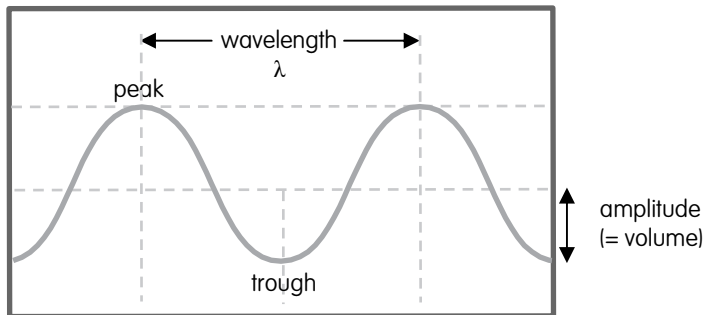


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**Sound is a wave of energy** – carried by vibrating particles. The energy and the wave move in the same direction — a bit like in a slinky. We can represent a sound wave in the way shown below:



# SEEING SOUND

## 4. Wavelength

Calculate the wavelength at different frequencies using the equation

$$\lambda = c \div f$$

**Where:**

$\lambda$  = wavelength in metres

$c$  = the speed of sound in air (**330m/s**)

$f$  = frequency (the number of vibrations per second) in hertz (Hz)

Speed of sound in air (m/s)	Frequency (Hz) (read this off the dial)	Wavelength (m)
330		
330		
330		

## 5. Fill in the gaps in the paragraph below

Sound is created when something is made to \_\_\_\_\_. Depending on the sound you \_\_\_\_\_ you cannot always see the vibration. The number of vibrations every second is called the frequency of the sound. You can change the pitch of a sound by making an object vibrate \_\_\_\_\_ or by changing the \_\_\_\_\_ of an object. Sound vibrations must travel through a medium for us to hear them. Sound can travel through mediums such as the \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. Sound cannot travel through a \_\_\_\_\_, where there are no particles to vibrate.

- |     |        |         |       |       |        |         |      |       |
|-----|--------|---------|-------|-------|--------|---------|------|-------|
| air | faster | vibrate | metal | glass | vacuum | tension | make | water |
|-----|--------|---------|-------|-------|--------|---------|------|-------|