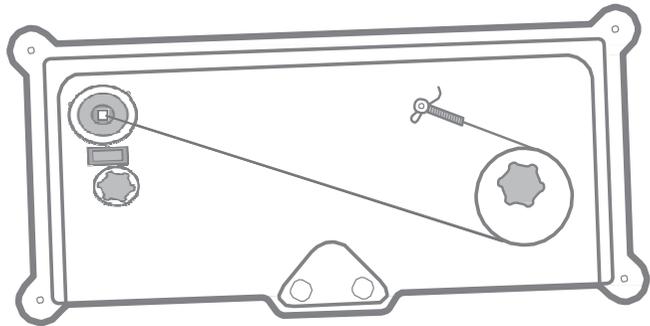


# SEEING SOUND

## Challenge

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



### Think about.

Listen to the sound the string makes

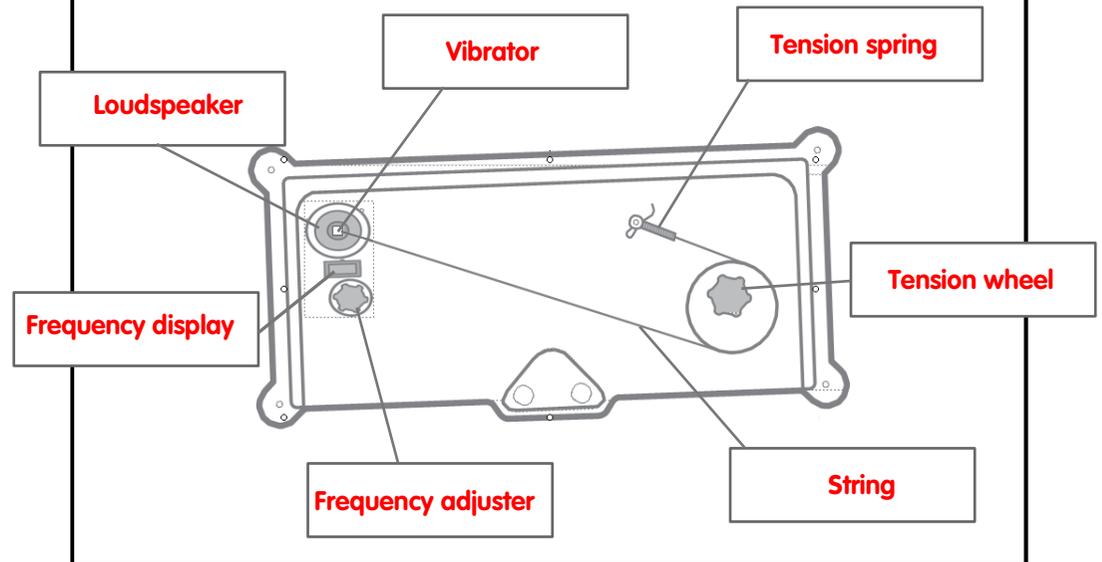
### Think about.

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?  
**It becomes tighter / tauter, vibrates faster and moves from side to side less.**
  - b. What happens to the sound that you hear as the frequency increases?  
**The pitch increases / It get higher**

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.

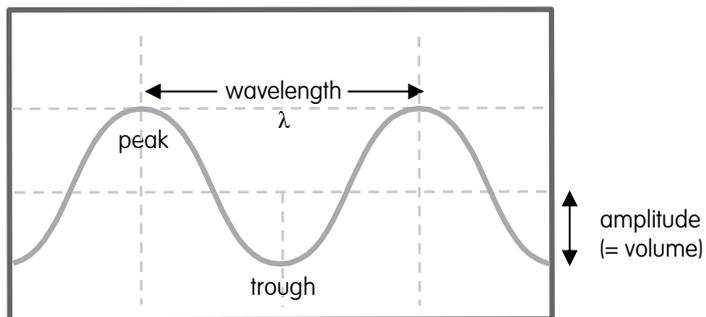
a. Does the sound change as you increase the tension?

**Yes**

b. If so, how?

**The pitch increases / It get higher**

**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 **vibrate**. Depending on the sound you **make** 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 **faster** or by changing the **tension** of an object.

Sound vibrations must travel through a medium for us to hear them. Sound can travel through mediums such as **air**, **metal**, **glass** and **water**. Sound cannot travel through a **vacuum**, where there are no particles to vibrate.

air faster vibrate metal glass vacuum tension make water