



Today Science Club are going to.....

MAKE SOME NOISE!

SOUND:

Sound occurs when something **VIBRATES**. **Vibrating objects make sound**. Sound passes to our ears and this is how we hear. Sound travels through air or other materials such as stone, water, glass and brick. Sound cannot travel through a vacuum. We hear sound when the vibrating sound hits our ear drums. The more energy in the vibration the louder the sound, i.e. the harder you hit something the louder the sound. The pitch is how high or low the note is. The shorter the vibrating object, the higher the pitch of the note.

Sound is measured in Decibels (Db).

The speed of sound in air is 767 m/s but is 4x faster in water. Is this **faster than light(ning?)**. The sound of thunder is produced by rapidly heated air surrounding lightning which expands faster than the speed of sound. We will now try to break the speed of sound with a **WHIP**.

Activity 1: You will try and make different pitched sounds by adding different amounts of water into glasses, wetting your finger and rubbing it around the top of the glass. Which has the highest pitch?



Hint: This will depend on the amount of air remaining

Activity 2: We will look at how sound waves travel by having two cans joined by a piece of string.

Activity 3: Usually we can't see vibrations move but we are going to use a **VORTEX CANNON** so we can see them.

We are going to do 2 experiments:

- 1) Knock over stacked plastic cups with air vibrations by pushing opposite box sides together. How far away is it until it doesn't work? Which sized-hole is best? Why?
- 2) Normally you can't see air vibrations but you can if you fill the box with smoke!



Note to parents: We have made air vortex cannons using a large cardboard box with various shaped holes in the side (see above). We used these to knock over stacked plastic cups on tables. We also used a smoke machine to show the movement of air. If you want to try this at home goto: www.youtube.com/watch?v=4b2SV3ASUxY. Any questions please email: HassellScienceClub@gmail.com

Sound Quiz

- The sound of the ocean in a seashell is caused by:
 - Local noises** around you that are **altered** by the shell
 - The **sound of your blood** coursing through your body
 - The **sound of the ocean**
 - Nothing**, you can't hear anything in a shell
- Which** produces the **higher note** when you blow over it? An **empty bottle** or a **½ full bottle**?
- A **rock concert** produces at least **110 Decibels** of noise. How long do you need to get exposed before you get hearing damage? **1 hour, 1 minute, 5 minutes or 2 hours**?
- As you keep hitting a bottle when it is filling with water, does the sound **get higher, stays the same, or get lower**?
- The harder you hit a drum, the **louder the sound**, the **lower** or higher **pitch** of the sound?
- Why do people using loud noisy drills often wear ear muffs? Because they look nice, to stop their ears getting cold, or very loud sounds can damage your ears?
- What is a good material for a floor to muffle the sound of footsteps? Carpet, metal or wood?
- Long or repeated exposure to noise **over 85 Decibels** can cause hearing loss. **Which** of the following everyday sounds **does not exceed** this level? Electrical hand drill, lawnmower, iPod at maximum level or a vacuum cleaner?
- In **which** does sound move **fastest**? Water, air at room temperature, space or steel?
- Which** of the following is **true**?
 - Light travels faster than sound
 - Light and sound travel at the same speed
 - Sounds always travels faster than light
 - Sound sometimes travels faster than light