Subject	Term	Unit
Science - Year 4	Summer 1	Sound

Intent

At Hurst Hill, we nurture young scientists by fostering curiosity and developing strong scientific knowledge and enquiry skills. Children learn to investigate, observe and evaluate confidently, understanding how science shapes the past, present and future while building firm foundations for lifelong scientific learning.

Prior knowledge	National Curriculum
This the first time the children will have come across the topic of sound The topic on light and on materials may come in useful.	• identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases.

What?	Children will learn how sounds are made and how they can be changed with regards to volume and pitch.
Why?	This is the only time the children will encounter the subject of sound at primary school.
How?	Through observation of making sounds. Through recording information from experimentation.

Vocabulary	
Amplitude	A measure of the strength of a **sound wave**.
Decibel	A measure of how loud a sound is.

Electricity	A form of **energy** that can be carried by wires and is used for heating, lighting and providing **power** for a range of devices.
Energy	The **power** from **sources** such as **electricity** that makes machines work or provides heat.
Frequency	A measure of how many times per second a **sound wave** cycles.
Medium	Something that makes it possible to transfer **energy** from one location to another.
Pitch	How high or low a sound is.
Power	**Energy**, in particular **electricity**, that is obtained in large quantities from a fuel **source** and used to operate lighting, heating and machinery.
Sound waves	Invisible waves that travel through air, water and solid objects as **vibrations**.
Source	Where something comes from.
Transmit	To pass from one place or person to another.
Travel	How something moves around.
Vibrations	Invisible waves that move quickly.
Volume	How loud or quiet a sound is.

Objective	Learning
Can I prove that sounds are vibrations?	**Pattern Seeking** **Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world** A sound is a thing that can be heard, and the object that produces a sound is known as a source. Sounds are made when an object vibrates: these vibrations, even though you can't see them, lead to vibrations in the air close by, which travel to the ear and make the eardrum vibrate. Messages are sent to the brain, which recognises the vibrations as sounds. Using this information, is there anything you could use that would make sound waves visible to prove that they are caused by vibrations? For example, could a tuning fork be used? Show the children different ways in which we prove sound is made by vibrations- rice on a drum, tuning forks, using the inside of a speaker, a balloon in front of a speaker- watch videos or experiment- record findings in words and pictures.
Can I explain that sound has to travel through a medium to get to our ear?	**Research** Investigate where we can hear sounds from. Go on a sound walk- can we hear children in the hall? Through a window? Sound has to travel through a medium to produce sound waves, such as air, water, glass, and even more solid materials like stone and brick. This is why you can sometimes hear your neighbour's loud music playing from the other side of a wall! Use a tuning fork- hit the fork, can we hear it? Now put the fork on the table. Can we hear it now? Why? Explain that the vibrations are travelling from the fork, through the table, making that vibrate and then through the air which vibrates to our ear. Ask children to draw and explain. Discuss the phrase 'In space no one can hear you scream'. Ask the children to think why. Explain there is no air in space- it is a vacuum. The air cannot vibrate so we can't hear anything. Again, draw and explain.

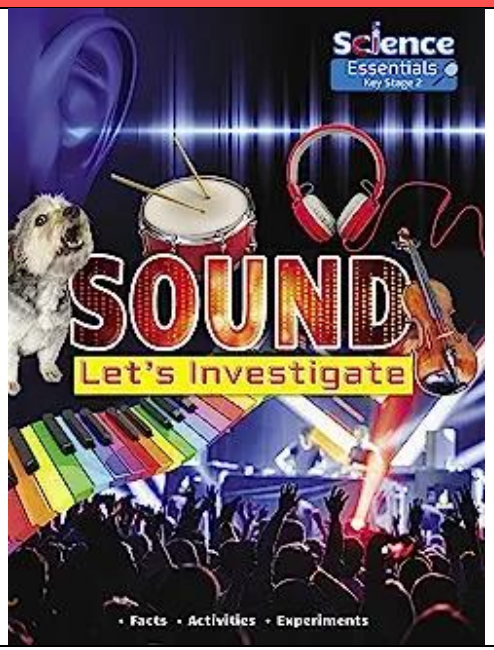
Can I explain how the vibrations of an instrument change when the volume it's played at changes?	**Identifying and Classifying** When a sound is created by a little amount of energy, a weak sound wave is produced, which doesn't travel far. Because of this, it only makes a quiet sound. A vibration created by lots of energy makes a powerful sound wave, which therefore makes a loud sound. The volume of a sound is measured in decibels, whilst the strength of the sound wave itself is measured according to its amplitude.
Can I explain what happens to the sound I am making if I get further away from you?	**Identifying and Classifying** The closer you are to the source of a sound, the louder it will be. Because of this, the further you are away from the source of a sound, the quieter it will be. Ask children to work in pairs or small groups. Have an instrument and ask them to move further away from each other. Measure the distance travelled and ask them to note down what happens to the sound. Ask them to explain why this might have happened. Where have the vibrations gone as they moved further away. Think about the loss of energy.
Can I explain which instrument makes the highest/lowest pitch sound and Why?	**Identifying and Classifying** High pitch sounds (like the squeak of a mouse) are created by short sound waves, whilst low pitch sounds (like the roar of a lion) are created by long sound waves. The number of times a second that the sound wave cycles is measured according to its frequency. Every family of instruments in an orchestra has high and low pitched instruments. For example, the trumpet is one of the highest pitched brass instruments, whilst the tuba is one of the lowest pitched. Generally speaking, the smaller an instrument, the higher the pitch, and vice versa. Look at different instruments and predict what sort of pitch the instruments will make. Record and test. Look at a guitar strum the string. As the string gets shorter, see how the pitch gets higher. Explain why this happens. Short string, shorter sound waves, higher pitch.
Can I describe the amount of liquid in a bottle and the pitch it makes?	**Pattern Seeking** The more liquid that a bottle contains, the lower the pitch it will generate when someone blows across the top. Equally, the less liquid that a bottle contains, the higher the pitch will be. This is because when someone blows across the top of the bottle, the air molecules vibrate and produce sound waves. Using this information, what does this tell you about how a sound wave, and therefore the pitch that's created, is affected by the empty space in the bottle?

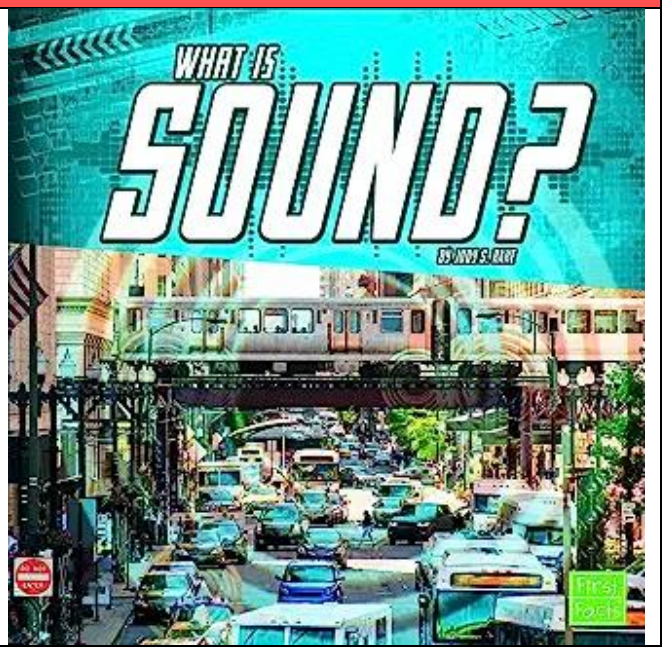
	Each group have a bottle filled with water. Predict what will happen as water is poured out. What will happen to the pitch? Record down observations as the tip 100ml of water out each time.

Websites

Sound - Year 4 Science - BBC Bitesize
Sound - Listen Up! - Year 4 | Teaching Resources (tes.com)
Year 4: Sound | STEM

Recommended Reads





Golden Thread

Sound