SW9 Partnership SCIENCE Medium Term Plan: Year Group: 4 Term: Teacher:

TOPIC	NATIONAL CURRICULUM	KEY VOCABULARY	POSSIBLE TRIP
SOUND (1)	• 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.	**TIER 2 (Academic):** Identify, observe, pattern, measure, faint, feature, relationship. **TIER 3 (Topic Specific):** Vibration, wave, volume, pitch, tone, amplitude, frequency, decibel (dB), medium, vacuum, sound waves, sound source, distance, attenuation, pinna, eardrum, ear canal, ossicles, cochlea, auditory nerve, soundproofing.	Orchestral acoustics workshop. **Horniman Museum Music Gallery**: Displays hundreds of international musical instruments, allowing children to observe how instrument dimensions, string thickness, and materials alter pitch and volume. **Science Museum** – Features dedicated acoustic exhibits where pupils can make physical sound vibrations visible and test how sound waves travel through varied materials.
PRIOR LEARNING	**Y1 and Y3:** Human body senses (hearing) and physical forces/movement.		

	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
ENQUIRY QUESTION	How are sounds generated and made visible?	How does sound travel through solid, liquid, and gas media?	What is the relationship between vibration strength and volume?	How do the physical features of an instrument alter its pitch?	Why do sounds become fainter as distance increases?	How do our ears capture sound vibrations and process them?
LEARNING OBJECTIVES	To identify that vibrations generate sound waves and observe physical vibrations.	To investigate sound transmission through solid, liquid, and gaseous media.	To find patterns between vibration strength (amplitude) and volume.	To investigate patterns between object features (length, thickness, tension) and pitch.	To measure how sound volume decreases (attenuates) over increasing distance.	To describe the structure and function of the human ear in detecting sound.
ACTIVITY **WORKING SCIENTIFICALLY SKILLS**	**OBSERVING:** Strike tuning forks into water cups; place rice grains on drum skins to visualize physical vibrations across varying strikes.	**COMPARATIVE TESTING:** Listen to a ticking timer through air, wooden desks, and submerged underwater speakers to compare conduction across media.	**PATTERN SEEKING:** Pluck guitar strings/elastic bands gently vs hard; record vibration size and decibel levels using sound meters.	**PATTERN SEEKING:** Compare pitch produced by varying ruler overhang lengths, elastic band thicknesses, and tuning bottle water levels.	**COMPARATIVE TESTING:** Walk away from a constant sound source; record decibel drop at 2m, 5m, 10m, and 20m using digital sound meters.	**MODELLING:** Construct a working eardrum model using a bowl, cling film, and rice grains; trace the path from pinna to auditory nerve.

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ASSESSMENT	Explain that all sounds originate from physical material vibrations.	State that sound requires a material medium (solid, liquid, or gas) to travel.	State pattern: larger vibrations (higher amplitude) produce louder sounds.	State pattern: shorter, thinner, or tighter objects vibrate faster, producing a higher pitch.	State pattern: sound waves spread out, causing volume to get fainter over distance.	Diagram and label outer ear (pinna), ear canal, eardrum, ossicles, and cochlea.
END POINT ASSESSMENT	Pupils can prove that all sounds originate from physical vibrations, demonstrate how sound travels through solids, liquids, and gases, explain amplitude in relation to volume, correlate object size/tension to pitch, map the anatomy of human hearing, and present scientific evidence clearly.					
HIGHER ORDER QUESTIONS	If a tree falls in a forest and no ears are around, does it make a sound?	Why can whale songs travel hundreds of miles through sea water compared to air?	Why does hitting a drum harder change its volume but not its pitch?	Why does an adult's voice usually have a lower pitch than a child's voice?	Why can you hear a siren clearly from 5 meters away but barely from 500 meters away?	Why does having two ears on opposite sides of our head help us pinpoint sound direction?
FURTHER OPTIONAL QUESTIONS/BIG QUESTIONS FOR DISPLAY	Can sound travel through outer space where there is no air? Why does a short ruler produce a higher pitch than a long ruler when twanged on a desk? How do our ears transform shaking air into music in our brains? Why do loud sounds cause permanent hearing damage?					
INCLUSION & ADAPTATION	Tactile feel of vibrating tuning forks against fingertips; visual water splash observation.	String telephone activity demonstrating direct sound conduction through taut string.	Visual volume meter with Low/High colour scales (Green=Soft, Red=Loud).	Color-coded tuning bottles sorted by pitch order (High to Low).	Walk-away distance testing with large visual ground step markers.	Large 3D ear anatomy puzzle with color-coded path arrows.
GREATER DEPTH	Research slow-motion video capture of vocal cord vibrations during speech and singing.	Research particle density impact on sound speed (steel vs water vs air vs vacuum).	Graph decibel amplitude levels against force input on scatter graphs.	Calculate wave frequency relations (Hz) across different musical instrument notes.	Plot sound attenuation curves on line graphs and analyse inverse-square relationship.	Research cochlear implants and how modern bio-engineering restores hearing loss.