Science

Sound Year 4

Remember when
Hearing is one of the five senses. (Y1)
Sounds can be combined using musical instruments. (Y1/Y2/Y3 - music)
Know the meanings for words like pitch, volume, vibration. (Y1/Y2/Y3 - music)

Sticky knowledge

- Sounds are made when a material vibrates.
- Vibrations from sounds travel through the air to the ear and then to the brain.
- Sounds can travel through solids, liquids and gases.
- The pitch can be altered by changing. e.g. the length and thickness of a guitar string, tautness of a drum skin.
- The volume can be increased and decreased by e.g hitting a drum harder/ softer.
- When you move further away from a sound source, the volume of the sound heard decreases and when you move closer it increases the sound.
- The volume of a sound depends on the strength of the vibrations.

Key vocabulary

amplitude
auditory
decibels
decrease
frequency
gas
insulation
intensity
liquid
outer, inner and middle ear
pitch
solid
sound
travel
vibrates
vibrating
vibration
volume
wave

National Curriculum

- 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.

Common Misconceptions
Some children may think:

- sound is only heard by the listener
- sound only travels in one direction from the source
- sound can't travel through solids and liquids
- high sounds are loud and low sounds are quiet.

	LO	Lesson outline
Lesson 1 LO: To know how sounds are made. Enquiry type: Observation	SK: Sounds are made when a material vibrates. Skill: To use straightforward scientific evidence to answer questions or to support their findings	Sounds like science PDF- Bust your windows | STEM **How vibrations in fabric, water and air cause sound?** **Blow up a balloon, hold it against your mouth and speak with your hand on the other side – what can you feel? Let the balloon go – what happens?** **Rice on a drum, bang and what happens to the rice? Put tuning fork in water and what happens to the water?** Extension – what is the longest sustainable vibration you can make? Practical activity. Class discussion for predictions and reasons for them. Brainstorming. Work in mixed ability groupings. Answer set of questions – For example, What has happened? What shows the vibrations?
Lesson 2 LO: To know the vibrations from sounds travel. Enquiry type: Observation	SK: Sounds are made when a material vibrates. Vibrations from sounds travel through the air to the ear and then to the brain. Sounds can travel through solids, liquids and gases. Skill: To use straightforward	| STEM BBC bitesize science **STEM 'Listen up' investigation –session 4 pardon** Diagram of ear showing sound travelling to the brain Children answer questions, complete sentences about how sounds are made through vibrations and travel to the ear and brain. Making string telephones and use outdoors to test- photograph in books and annotate using scientific vocabulary

	scientific evidence to answer questions or to support their findings.	Demonstrate sound travelling through liquid. Ring a bell underwater – can you still hear it?
Lesson 3 LO: To find patterns between the volume of a sound and what produced it. Enquiry type: Pattern Seeking	SK: The volume can be increased and decreased by e.g hitting a drum harder/ softer. Skill: To set up simple practical enquiries, comparative and fair tests.	**STEM - What factors affect the pitch and volume of sound.** | STEM **Video to watch** Children build instruments out of every day equipment, including tuning forks, elastic bands and pots, twanging rulers and beans in pots. Discuss how we can make it a fair test to solve the question. Children to work in pairs and decide. Change the variable (1 thing) if necessary to solve the question.They change the length and width of elastic bands and the length of the ruler to see what happens to the sounds. One variable at a time to investigate.
Lesson 4 LO: To find patterns between the pitch of a sound and the size of an object. Enquiry type: Pattern Seeking	SK: The pitch can be altered by changing. e.g. the length and thickness of a guitar string, tautness of a drum skin. Skill: To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	Children to understand the term pitch. Demonstrate using musical instruments, children order the instruments discuss order and properties of instruments to create the pitch. Questions to discuss and answer in books. What have the children found out? How does how hard or soft you blow effect the sound that is made? (volume) How does the length of the straw effect the pitch? Investigation: straw panpipes Cross curricular maths - Measure the straws. Record and draw the pan pipes and label the measurements. Conclusion/findings
Lesson 5 LO: To know that sounds get fainter the further away you are from the source. Enquiry type: Pattern Seeking	SK: When you move further away from a sound source, the volume of the sound heard decreases and when you move closer it increases the sound. Skill: To set up simple practical enquiries, comparative and fair tests. Where appropriate, take accurate measurements using standard units using a range of equipment including thermometers and data loggers	Investigate the effect of sound and distance? Children to predict and identify position of sound. Fair test- What do they need to think of. Distance when recorded , same sound to be used every time. Sound to be an alarm from a mobile. **Data loggers to measure distance -outdoors** **Record results in a table and bar graph.** Twitter to be used. EXT: Would a different sound generate different results? Consider pitch/volume of the sound. Link this to next lesson.
Lesson 6 LO: To plan a fair test. Enquiry type: Comparative and Fair test	SK: The volume of a sound depends on the strength of the vibrations. Skill: Record findings using bar charts and tables Use results to draw simple conclusions, make predictions for new values, suggest improvements and	Use findings from previous lesson to create an enquiry into how far different sounds will travel. Children to design their own enquiry to show that different sounds can travel different distances. Allow children to choose their noise makers (homemade/existing instruments, buzzer, bell, etc.) and work in groups to decide how it will be tested. Post-it note planner to be used in groups and then take photos of the planned investigation. Children to test their noise-makers preferably outside, and measure the distance at which they can still be heard.

	raise further questions	Opportunity to address misconception (dependent on results): high sounds are loud and low sounds are quiet.

	End of unit assessment	
Working towards	Working at Age related expectations	Working at a greater depth