

Year Group	4
Term	Spring 2
Subject	Science

Topic	Sound
Curriculum Intent	To recognise how sounds are made and investigate how the volume and pitch can be changed.

Key Vocabulary	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, energy, particles, echo, vacuum, materials, reflect, absorb, insulate, defenders
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Scientific Skills	• To ask questions to explore theories and ideas about sound • To set up simple practical enquiries that compare sound insulation properties of different materials • To take accurate measurements using a range of equipment, including sound loggers • To gather, record and presenting data in a variety of ways to help answer questions • To record findings using simple scientific language, bar charts and tables • To report on findings from enquiries in a variety of ways • To use results to draw simple conclusions, suggest improvements and raise further questions • To use straightforward scientific evidence to answer questions or to support their findings
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Scientific Knowledge	• To identify how sounds are made, associating some of them with something vibrating. • To recognise that vibrations from sounds travel through a medium to the ear. • To find patterns between the pitch of a sound and features of the object that produced it. • To find patterns between the volume of a sound and the strength of the vibrations that produced it. • To recognise that sounds get fainter as the distance from the sound source increases.
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Week	Learning Objective	Activities	Outcome
1	Identify how sounds are made. NCR: Identify how sounds are made, associating some of them with something vibrating Scientific Enquiry: Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusion	https://www.bbc.co.uk/teach/class-clips-video/music-science-ks2-what-is-sound/zbnmhbk - Intorduction What is sound Explore making sounds with a range of objects (what is the source of the sound?), such as musical instruments and other household objects. Introduce key scientific vocabulary. Explore how sounds are made by vibrations – observe the vibrations on different musical instruments. Demonstrate: e.g. Tuning fork and water to see effect of vibrations/ Listening through a balloon feel the vibrations / feel own vibrations when you speak. Recognise that to hear sounds we need vibrating apparatus to interpret the sound: DE experts presentation ignore slides 114/5/16 Activity: Label the diagram of the parts of the ear Challenge: orally or in writing / pictures produce and explanation about how sound is created.	To know that sound is made through vibrations.
2	Explore how vibrations from sounds travel through a medium to the ear.	Using a range of information sources and practical enquiry explore how sound travels from the source to the ear. Using the presentation slides, explore with the children how sound moves through different mediums, such as air, liquids and gases. Enable the children to discover that	that sounds can travel through air, liquids and solids Explain how sound waves travel through air, liquids and solids

	Scientific Enquiry: Identifying differences, similarities or changes related to simple scientific ideas and processes	sound cannot travel through space because it is a vacuum Activity: Allow the children to explore 4 different experiments to observe how sound travels in solids, liquids and gases. Use the handout to fill in the children's observations. Challenge Task: Ensure the children use their knowledge of the structures of particles in a solid, liquid and air to explain what happened in each experiment and why.	Compare how sound waves travel through air, liquids and solids
3	To explore sound insulation. NCR: Recognise that vibrations from sounds travel through a medium to the ear Scientific enquiry: Setting up simple practical enquiries, comparative and fair tests	Recap on the previous learning by asking the children the following questions: Can you explain why sound travels faster through a solid than it does through the air? Why can't you hear sounds in space? Plan out a full investigation to find the outcome to a statement/question. Generate statements around insulation properties. Collect data using sound loggers. Analyse and draw conclusions to generate further questions to explore. Measure sounds through different insulation materials. Example Activity: Challenge the children to create their own ear defenders. Instruct the children to construct their defenders using two cardboard tubes and sticky tape. Provide the children with a variety of materials for them to explore, such as foil, cotton wool, bubble wrap, fabric, card or paper. Ask them to test which material makes the best ear defenders by filling the cups with the materials	• Understand that some materials absorb sound and some materials reflect sound • Understand that materials that absorb sound are sound insulators • Explain why some materials absorb sound Keywords materials, absorb, insulate, defenders, reflect

		and testing how well they insulate the sound. Ask the children to record their results using the handout. Challenge Task: Can they think of any more materials that they think would be suitable to use as ear defenders? Can they explain why?	
4	Explore volume. NCR: Find patterns between the volume of a sound and the strength of the vibrations that produced Working Scientifically: To generate questions to explore the pitch or volume using different instruments. To plan a fair test, collect data to find an answer to a statement/ Make systematic and careful observations using a range of equipment including data loggers. Recording and reporting findings, drawing conclusions based on results.	Children will learn about how loud and quiet sounds are created. Introduce them to decibels as a unit of measure. Before the children start their investigations, teach them how to measure the volume of sound using a decibel meter, which you can get on a phone or tablet app. Children will explore altering the volume of a sound. Possible investigation: Explain to the children that they will be investigating louder and quieter sounds. They will investigate how dropping a weight from different heights onto a drum affects the volume of the sound produced. They can use the handout to record their results and translate these results onto a line graph. They must attempt to explain the relationship between the height of the weight and the volume of the sound made, ensuring they understand that the height of the weight will affect how much energy/power is being used to hit the drum. Challenge Task: In the children's conclusion, they must discuss how the volume of the drum affects the height of the sound waves that are created.	Understand that the volume of sound is measured in decibels Understand that the volume of a sound is dependent on how much energy or power the sound source is given Understand that as the volume of sound increases so too does the amplitude, or height, of the sound waves

5	Explore pitch. NCR: Find patterns between the pitch of a sound and features of the object that produced. Working Scientifically: Identifying differences, similarities or changes related to simple scientific ideas and processes	Children will explore the idea of pitch and how high pitch and low pitch sounds are created. Give the children the opportunity to play with instruments and have practical experience of high and low pitched sounds. Investigation Challenge: Make a musical instrument Give the children time to play and explore the resources before they start the main activity. Ask the children to create an instrument. They can do this by blowing or tapping tubes of water, creating instruments with elastic bands, making a paper xylophone with varying thicknesses of paper tubes or making different sized shakers. Once their instruments have been made, can the children play a tune as well as experiment with the volume? Challenge Task: Challenge the children to follow a pitch pattern. Can their instrument play a low pitch to a high pitch to a middle pitch sound? N.B. resources required <i>for making musical instruments: for example, boxes, kitchen rolls, elastic bands of different thicknesses, a selection of storage boxes, rice, lentils or beans, card, scissors, glue, tape, string, glass tubes/bottles or drinking glasses of different sizes, spoons and pencils.</i>	Understand that pitch is how low or high a sound is Understand that pitch is caused by the speed of the sound source's vibrations Understand how a sound wave is different for a high pitch and a low pitch
6	Explore sounds from near and from far. NCR: Recognise that sounds get fainter as the distance from the sound source increases	Think and discuss how sound travels. Explore how the volume of sounds change as they travel. This lesson should bring together all they have learnt about how sound vibrations travel. Use a range of information sources to find out how it travels through different materials – air, water in a vacuum.	Understand that sound fades as it travels Understand why sound fades as it travels

	Working Scientifically: Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Generate questions to explore – how far sounds travel? Does pitch affect how far it travels? A PNQ question challenges the children to think of something positive, something negative, and a question – what if humans had bat hearing? Safe? Unpleasant? New ways to communicate? The children will investigate how the volume of sound changes as they get further away from a sound source. (Playground investigation).	Explain the relationship between distance and volume
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