

National Curriculum Objectives:*(Statutory Requirements)*

- 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 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

Experimental and investigative work focuses on:

Planning an investigation:	Obtaining and evaluating evidence:
<ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them. • Setting up simple practical enquiries, comparative and fair tests. 	<ul style="list-style-type: none"> • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • Identifying differences, similarities or changes related to simple scientific ideas and processes. • Using straightforward scientific evidence to answer questions or to support their findings.

Most children will:

- **Explain** that sounds are made when objects vibrate.
- **Draw** diagrams to show the vibrations creating sounds.
- **Describe** how sound travels through solids, liquids and gases.
- **Understand** why some materials are better at muffling sounds.
- Alter the pitch of a sound and **explain** how this is achieved.
- Present results in their own tables and **identify** patterns in these
- Evaluate **explanations**

Some will progress less and will:

- **Understand** that sounds are made when objects vibrate.
- **Describe verbally** what happens when objects vibrate.
- **Recognise** that sound travels through solids, liquids and gases.
- **Identify** materials which are better at muffling sounds.
- **Understand** what the term pitch means.
- Present measurements in provided tables

Others will progress further and will also:

- **Explain** why some materials are better at muffling sounds.

Key vocabulary:

Previously taught: hearing, ears, senses, sound, sources, high, low, soft, loud, quiet, shake, further away, nearer, pluck, rattle, ring, silence, direction

New: pitch, loudness, vibration, muffle, tuning, soundproofing.

Session	Learning Objectives	Introduction	Main activity	Application and review	Resources
1	I can identify how sounds are made	<p>Introduce the topic of Sound.</p> <p>Brainstorm all the things the children know/think they know about sound – create a class mind map and display in classroom throughout topic (this can be added to in the future).</p> <p>Look at a range of musical instruments (stringed, drums etc), how is the sound produced? Let the children experiment!</p>	<p>Discuss the children's ideas (could write on flipchart any significant pieces of vocabulary or ideas?)</p> <p>Then introduce 5 activities and ask the children to describe what they see or feel</p> <ul style="list-style-type: none"> record observations on a sheet and stick into book <p><i>Emerging – Table with vocabulary</i> <i>Expected – Table provided</i> <i>Exceeding: Produce own table</i></p> <ul style="list-style-type: none"> Rice to put on a drum – what happens to the rice when you hit the drum? Tuning fork in water – what happens to the water when the fork is put in it once being tapped on the desk? Feel of larynx when they hum. A ruler clamped to the table and tapped at one end. Partially blown up balloon pinched between thumb and finger. <p>Once children have been to each activity, gather ideas – what do each of these sources of sound have in common? They are all visibly vibrating. Explain that all sounds are made when objects vibrate.</p> <p>Watch the YouTube video clip http://www.youtube.com/watch?v=ERDJw7BO61U and discuss what they see. (stop clip at 1:24)</p> <p>Children then to draw what they saw happening in one of the activities and write an explanation to go with it e.g. when I hit the drum, the rice jumped up and down. This was because the skin of the drum was vibrating, creating the sound. (<i>Emerging to work with teacher- shared writing</i>)</p>	<p>How do they think sound waves are created? Discuss.</p> <p>Then watch a video clip explaining this http://www.youtube.com/watch?v=ovMh2A3P5k</p> <p>(If a slinky is available, could use this to demonstrate!)</p>	<p>Musical instruments – stringed, drums etc</p> <p>Rice</p> <p>Tuning forks</p> <p>Cups for water</p> <p>Rulers and clamps</p> <p>Balloons</p> <p>Table to write down observations</p> <p>Slinky</p>
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2	I can show that sounds travel through different materials	<p>Recap last week's lesson.</p> <p>Watch Learning Zone Class Clips – Understanding Sound http://www.bbc.co.uk/learningzone/clips/understanding-sound/1604.html (pick up on the idea of loud and soft as mentioned in the video)</p> <p>Ask children to play 'verbal tennis' in partners on words that describe sounds (loud, quiet, vibration etc)</p>	<p><u>Activity 1</u></p> <p>Ask for silence from the children ☺ what can they hear outside the classroom? How has the sound travelled to their ears? Get the children to record this in their books – discuss and write up key words on the board.</p> <p><i>Emerging – shared writing</i></p> <p><u>Activity 2</u></p> <p>Explain that we are now going to test how sound travels through solids, liquids and gases. Show the children a range of resources and allow them time to think about how they can test this e.g. make a string telephone, playing an instrument under water, knocking on the table whilst an ear is pressed to it. Working in table groups (<i>mixed ability</i>), children to come up with an experiment on each table – if time, could then test out each other's experiments too so they have more to compare and write about.</p> <p>Once they have decided what they are going to test, get them to write a prediction (model one first on flipchart). Then discuss how they will record their findings –</p>	<p>What have the children found out? Which material is the best for sound to travel through? Why?</p>	<p>Cans (with holes)</p> <p>String</p> <p>Water</p> <p>Musical instruments</p> <p>Table of results for Emerging children</p>

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			<p>children to draw a table (<i>emerging provided with a table</i>) – test, material sound had to travel through, result.</p> <p>Carry out test and record results.</p> <p>Children to write a conclusion – link to prediction (modelled writing).</p>		
3	<p>I can explain how the ear works</p> <p>I can plan an investigation and make predictions based on what I already know</p>	<p>Watch video clip http://www.youtube.com/watch?v=HMXoHKwWmU8 (quite long so you may want to stop at certain parts to discuss)</p> <p>Children to label parts of the ear, and then write a couple of sentences about what happens in the ear when the sound reaches it (Emerging children-sheet that has missing words which they fill in and a word bank).</p>	<p>Explain that the ear is sensitive (as it said in the video), so sometimes, we need to protect our ears – can they think of any jobs and any ways in which people protect their ears from loud noises?</p> <p>Explain the problem – Mr McKenna received a letter from an angry neighbour telling him that when he plays the drums in his house, it is far too noisy and disturbs his neighbours. Can the children help Mr McKenna to sound proof his room?</p> <p>Over the next two weeks, they are going to plan and test a range of materials to answer the question “Which material is best for muffling sound?” (explain the word muffling).</p> <p>Ask children to suggest different approaches e.g. wrapping up a stop watch or alarm clock in different materials and see which is the best materials; increase the number of layers etc.</p> <p>Children begin to plan experiment ask them to write a prediction themselves in their books (recap work from previous week) and their apparatus list. Method will be done next session.</p>	<p>Make a list of the equipment the children need for the experiment next week.</p> <p>Ask children questions based on their plan to see if they have understood what they are supposed to be testing.</p>	<p>How the ear works missing words sheet for Emerging</p> <p>Word bank for Expected/ Exceeding</p> <p>Diagram of the ear to label</p> <p>Pretend letter from neighbour</p>
4	<p>I can carry out a fair test and collect reliable results</p>	<p>Recap on how the ear works and our plan to test which materials work best to prevent vibrations from sources reaching the ear.</p> <p>Children to recap how they are going to test these materials. Get them to fill out the method part of their experiment (Emerging to have scaffold) – modelled writing.</p> <p>Discuss <u>how</u> they will record their results too.</p>	<p>Children to set up their tests once method is written. Check for fair testing – ask each group to explain their fair testing. Will they get reliable results? Do they need to improve anything to ensure fair testing?</p> <p>Children carry out tests – record their findings.</p> <p>Collate all findings as a class – answer the questions on their table using the results sheets.</p> <p>EXT: write a letter to neighbour explaining how the room will be soundproofed and why the material chosen is the best.</p>	<p>What materials are the best at muffling sound?</p> <p>Can you think of any other situations where you might need to muffle sound?</p>	<p>Variety of materials – dependent on children’s ideas</p> <p>Scaffold for Emerging to write method</p> <p>Questions to answer once findings are collated</p>
5	<p>I can</p>	<p>What is pitch? (How high or low</p>	<p>Record sentences into their book based on what they’ve just done and seen (sheet to</p>	<p>Children to play</p>	<p>Bottles filled</p>

	<p>understand how to alter the pitch of a sound</p>	<p>the sound is) – write on flipchart and display throughout lesson.</p> <p>Provide children with a variety of different equipment/instruments e.g. bottles and water, recorders, elastic bands, stringed instruments, different sized instruments) – challenge them to make a higher/lower pitched sound.</p> <p>How have they done this?</p> <p>Play this game – will help with understanding of pitch and volume: http://www.bbc.co.uk/schools/scienceclips/ages/9_10/changing_sounds.shtml</p>	<p>have drum, bottle and guitar on it) –Emerging children to have a scaffold. Can the children explain what happens in each picture?</p> <p>Children are then set the task of making their own `guitar` – essentially using a cardboard box and elastic bands! Their challenge is to have a variety of pitches on their `guitar` – how will they achieve this? (by cutting the elastic bands to different lengths).</p> <p>Take a picture of their `guitar, stick in book and an explanation as to how it works and how the pitch changes.</p> <p><u>Loudness and pitch:</u> Children discover that loud and quiet sounds are produced by big or small vibrations and that high or low pitched notes are produced by fast or slow vibrations at http://resources.hwb.wales.gov.uk/VTC/16022007/sound_loundness/lesson.html Ensure children use comparative language too.</p>	<p>their `guitars` – can we stand them in order to get the lowest pitch and the highest pitch?</p>	<p>with water</p> <p>Stringed instruments</p> <p>Recorders</p> <p>Elastic bands</p> <p>Sheet with a picture of a drum, bottle guitar</p> <p>Emerging to have a sheet to fill in the blanks.</p>
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6	<p>I can recognise that sounds get fainter as the distance from the sound source increases</p>	<p>Split the children into two groups – one group to have musical instruments and the others do not. Send group 1 to one side of the classroom and group 2 to the other side. Group 1 to play instruments. What do they hear?</p> <p>Repeat the same thing again, except this time, children with instruments to be on the field – what can children in the classroom hear?</p> <p>Do the same thing again and increase distance between the two groups. What is happening each time?</p>	<p>Get the children to write a few sentences to explain what has just happened (they should be able to recognise that the sound gets fainter the further away they are).</p> <p>Explain that today, they are going to be working in small groups and they will become Mountain Tribes – let them think up a name for their tribe! Their job is to come up with an effective method of communication to send messages the length of the field, as if they were in the mountains communicating to one another.</p> <p>Get them to think about:</p> <ul style="list-style-type: none"> - The type of instrument they will need to use - Their surroundings when the message is being sent (e.g. will they hide in trees or use an opening to send the message through?) - How hard they hit the instrument - Its pitch <p>Working in groups (and on sugar paper?) children to answer these key questions above and plan their experiment. (Photograph the sugar paper and stick a picture into children’s book as evidence).</p>	<p>Move to the field and get the children to test out their ideas – can we hear their message of communication clearly?</p> <p>Which was the best one? Why?</p>	<p>Musical instruments</p> <p>Sugar paper</p>