



# SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy



Year Group: Year 3 & Year 4	Term: Autumn 2 (Cycle B)	Topic: Sound
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### National Curriculum Links

Pupils in Key Stage Two should be taught to:

- 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

### Working Scientifically:

- ask relevant questions and using different types of scientific enquiries to answer them  
setting up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future Learning
<ul style="list-style-type: none"> <li>• Explore how things work. (Nursery)</li> <li>• Describe what they see, hear and feel whilst outside. (Reception)</li> <li>• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>• Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. (KS3)</li> <li>• Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3)</li> <li>• Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3)</li> </ul>

- Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3)
- Auditory range of humans and animals. (KS3)
- Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3)
- Waves transferring information for conversion to electrical signals by microphone. (KS3)

### Common Misconceptions

- pitch and volume are frequently confused, as both can be described as high or low. 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.

### Sustainable Development Goals and Catholic Social Teaching

Sustainable Development Global Goals would be perfect to fit with this unit of learning:

These Catholic Social Teaching strands would be perfect to fit with this unit of learning:

Applied Write Opportunities	Enrichment Opportunities
<p>Non-chronological text about sound</p>	
Assessment Opportunities	
<ul style="list-style-type: none"> <li>• Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear</li> <li>• Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects</li> <li>• Can use data to identify patterns in pitch and volume</li> <li>• Can explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium</li> </ul>	
Key Vocabulary	
<p><u>Tier Two:</u>            sound, source, volume, vibrate, vibration, travel, pitch (high/low), faint, quiet, loud, eardrum, inner ear, outer ear, middle ear, ear canal, wave(s), particles, instrument,</p> <p><u>Tier Three:</u>            insulation, insulate, insulator, decibel, amp, amplitude, cochlear, hammer, anvil, stirrup</p>	

Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson One</u> I know sounds are made by something vibrating.</p> <p><u>Working Scientifically:</u></p>	<div data-bbox="533 300 1500 518" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b><u>Prior Assessment Task:</u></b></p> </div> <p><u>Starter Question:</u></p> <p><u>Introduction:</u> use PPT, ask children to listen to music and identify how sounds are made by different instruments</p> <p>Then Ask, How is sound is created? Then ask, How do we interpret sound? TTYP then take feedback. Tell children that we will look at these questions in more detail over the topic.</p> <p><u>Activity 1:</u> Children to create sounds by using various classroom objects in a variety of ways (take photographs). <i>Tell the class that sound is caused when objects vibrate. The vibrations cause waves in the air that enter your ear and you hear them as sound.</i></p> <p>Discuss vibrations using the PPT to support. Set up 4 enquires for the children to rotate around with prompt discussion cards (take photographs)</p> <ol style="list-style-type: none"> <li>1) rice on a drum</li> </ol>	<p><u>SEND:</u> Scribe their responses or provide sentence openers.</p> <p><u>Year 3:</u></p> <p><u>Year 4:</u> -</p> <p><b>Task 1:</b> Complete investigation sheet to record what they observed in each investigation (provide word bank for LA). <b>Task 2:</b> record children's observations on f/c and take a picture of it for a Pic Collage.</p> <p><b>Main Learning:</b> label the ear (differentiated)</p>

- 2) tuning forks in water
- 3) elastic bands
- 4) ruler on a desk

*Remind the children that sounds are caused when objects vibrate. The vibrations cause waves in the air that enter your ear and you hear them as sound.*

Did they see the vibrations?

Vibrations, Creating		
<b>Use a drum skin</b>		
How did you make the object vibrate?	What happened when the object vibrated?	What did you hear when the object vibrated?
<b>Use a hand</b>		
How did you make the object vibrate?	What happened when the object vibrated?	What did you hear when the object vibrated?
<b>Use a desk</b>		
How did you make the object vibrate?	What happened when the object vibrated?	What did you hear when the object vibrated?
<b>String fork in water</b>		
How did you make the object vibrate?	What happened when the object vibrated?	What did you hear when the object vibrated?

Activity 2:

String telephones.  
Briefly discuss the  
When? Who? How?

You could use this to  
just use the facts on the

history of the telephone.

support the learning or  
PPT

Challenge:

Can sound travel through all materials?

Resources

- variety of musical instruments
- drum
- elastic bands
- tuning forks
- beaker of water
- ruler
- string telephones
- worksheets

rice

<https://www.youtube.com/watch?v=qWUP9EigdJY> )

Give out string telephones of different lengths. Can children make their voice travel through them? How far did it travel? What caused the sound?  
Explain that the sound we created caused vibrations (take photographs).

Watch to consolidate their learning:

<https://www.youtube.com/watch?v=3yqB2KFwJCo>

Activity 3:

Learn about how the ear interpreting sounds.

Watch a supporting video clip: <https://www.youtube.com/watch?v=-bKyO2f1pD4>

Show a 3D ear model of an ear or cut-through diagram to reinforce, referring to the parts of the ear: *outer ear, middle ear, inner ear, eardrum, cochlea, anvil, hammer, stirrup and ear canal*

Explain what their functions are.

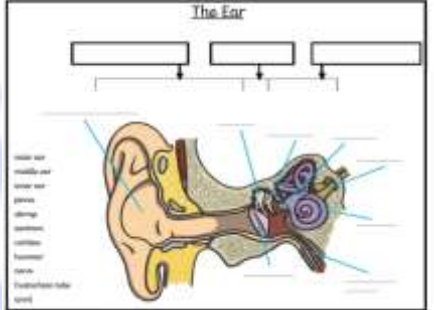
Plenary

Children to summarise their learning.

Watch

<https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zstr2nb>

<https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zx9hcj6>

	<p>Label a cut-through diagram of the ear and describe the function of some of the parts. Describe how the ear interprets sound based on video and information given.</p>		
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Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Two</u> I can find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p><u>Working Scientifically:</u></p>	<div data-bbox="560 710 1590 813" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b><u>Prior Assessment Task:</u></b></p> </div> <p><u>Starter Question:</u></p> <p><u>Introduction:</u> Ask, how can we create louder / quieter noises? TTYP then give feedback. Show with a glockenspiel - banging harder / softer. Repeat with a triangle.</p> <p><u>Activity 1:</u> Tell the children we are going to investigate how the strength in which we hit the drum affects the volume.</p>	<p><u>SEND:</u> write a simple prediction and to complete a simplified table. The graph could be make out of Lego or building blocks.</p> <p><u>Year 3:</u> <b>Task 1:</b> take photographs for a Pic Collage.</p> <p><b>Main Learning:</b> record predictions, complete table and make a graph (differentiated)</p> <p><u>Year 4:</u> HA could draw all in to books.</p> <p>-</p>

	<p>Record with a sound recorder app: dB Sound meter or a sound decibel meter and show this to the children when the drum is banged with different degrees of strength. Conclude findings.</p> <p><u>Activity 2:</u> Investigate the above further: drop a coin from different heights (further the distance – stronger the force) every 10cms. Observe and listen what happens (vibrations) repeat 2 more times. Take the mean decibel by using sound decibel app. Can children predict what the next measurement will be form 10cm further away? Repeat this activity for every 10cm. Record results. Represent results in a pre-prepared line graph.</p>	<p><u>Challenge:</u> What does volume mean? What does pitch mean?</p>
<p>Resources</p>		<p>Plenary</p>
<p>glockenspiel triangle coins worksheets</p>		<p>Conclude the results as a class. Tell the children that sound waves look different for loud and quiet sounds. Show them the two images on the PPT, and discuss which one is which. Can they children suggest why that might be? Watch <a href="https://www.bbc.co.uk/bitesize/topics/zgffr8_2/articles/zqtdpbk">https://www.bbc.co.uk/bitesize/topics/zgffr8_2/articles/zqtdpbk</a></p>

<p>Knowledge and Skills Objectives</p>	<p>Activity</p>	<p>Differentiation</p>
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Lesson Three

I can find patterns between the pitch of a sound and the strength of the vibrations that produced it.

Working Scientifically:

**Prior Assessment Task:**

Starter Question:

Introduction:

Play 2 different cords of a guitar (Low/high). Can children identify the different pitches? Play again. Discuss.

Children to identify high /low pitch. Show the children that the cords are different width and some are tighter than others.

Watch: <https://www.stem.org.uk/resources/elibrary/resource/315610/what-factors-affect-pitch-and-volume-sound>

**Tell the children that the term 'pitch' describes how high or low a sound is and 'volume' describes how loud or quiet a sound is.**

Activity 1:

Give out different musical instruments to each table (xylophone, glockenspiel, guitar) Children will move around in a carousel and vary the pitch of the instrument. Record how they achieved this. What is the science behind it? (different lengths, sizes, position etc.)

**Tell the children that the smaller keys make higher sounds than the lower keys.**

Activity 2:

**Resources**

glockenspiel

SEND:

draw observations from main learning

Year 3:

**Task 1: Take photographs for a Pic Collage.**

Year 4:

**Task 2: Children to circle images and then explain why.**

**Main Learning: Children to draw bottles in order and explain what happened and why.**

Challenge:

Do you think the size of the bottle would make any difference to the pitch or the volume of the sound?

**Plenary**

Review how we achieve different pitches.



xylophones  
guitars  
recorders  
bottles  
water  
images  
worksheets


Look at the picture of the flute and explain how it works and how the pitch is changed. Do you think the sound produced would be higher or lower if more keys were covered? Why? Give the children a recorder to investigate pitch. Take feedback



Ask, why they think that smaller instruments or bottles with less water in or recorders with more holes covered make higher sounds than larger instruments. Encourage children to think about what happens to the sound vibrations that are produced by the source. Watch <https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/z3j3jty>

Activity 3:

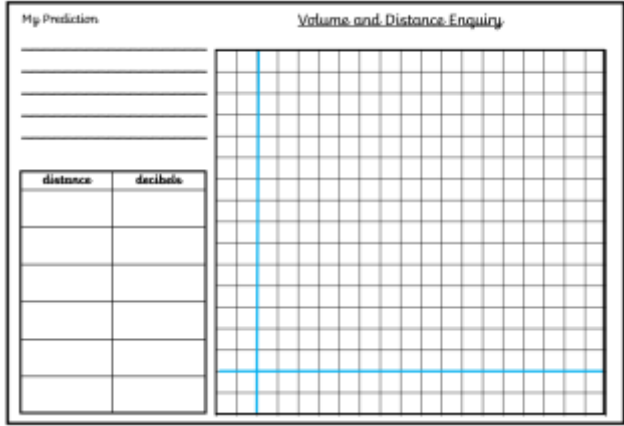
Demonstrate how to blow across the top of a bottle to produce a sound. Show children the picture of an empty bottle on the PPT and explain that the air inside the bottle is vibrating. How do you think we could change the pitch of the sound produced? Children to think, pair, share their ideas. Show the next pictures showing bottles with different levels of water in. How do you think the pitch of the sound produced would be different for each of these bottles? Can you order the bottles from the highest sound to the lowest sound?

	<p>As a class, predict what order they will go in.</p> 	
Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Four</u> I can recognise that sounds get fainter as the distance from the sound source increases</p> <p><u>Working Scientifically:</u></p>	<div data-bbox="562 632 1592 727" style="border: 1px solid black; padding: 5px;"> <p><b><u>Prior Assessment Task:</u></b></p> </div> <p><u>Starter Question:</u></p> <p><u>Introduction:</u> Ask, How does sound actually travel? TTYP then give feedback. Clear any misconceptions. Show supported diagrams to reinforce. Explain that: <i>Sound vibrations travel in a wave pattern, and we call these vibrations sound waves. Sound waves move by vibrating objects and these objects vibrate other surrounding objects, carrying the sound along. ... Sound can move through the air, water, or solids, as long as there are particles to bounce off of.</i></p> <p><u>Activity 1:</u> Get a child to stand far away from the classroom and show children how far away they are (perhaps measure the distance). Predict how far away will it be until we hear the clap? Child to make a noise (clap).</p>	<p><u>SEND:</u> pre-drawn tables and charts.</p> <p><u>Year 3:</u></p> <p><u>Year 4:</u></p> <p><b>Task 1:</b> Children to write and draw about what happened.</p> <p><b>Task 2:</b> take photographs for a Pic Collage Children to complete table of results</p> <p><b>Task 3:</b> draw and create a bar graph (differentiated) Children to write about what they found out and to suggest reasons for this.</p> <p>HA - draw own tables and charts.</p>



		Could certain instrument be heard more than others? Why would this be? Conclude the results.
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Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Five</u></p> <p>I can find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>I can explore how sounds get fainter as the distance from the sound source increases.</p> <p><u>Working Scientifically:</u></p>	<div data-bbox="577 550 1608 646" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b><u>Prior Assessment Task:</u></b></p> </div> <p><u>Starter Question:</u></p> <p><u>Introduction:</u> recap on the last lesson where we investigated distance and sound. Tell the children that the speed of sound is very quick: the speed of sound can travel at 343 metres per second and at 761.2 mph.</p> <p><u>Activity 1:</u> Tell the children that we are going to investigate the relationship between distance and volume. In groups, children will have a football and an iPad (with a sound recording app). Method: get child 1 to stand 5 metres away with iPad. Child 2 to hold a metre stick. Child 3 to drop ball form 10 cm. Child 1 to record the volume (decibels) Predict what the volume will be for another 10cm. Repeat this for another 10cm. Carry on until 100 cm.</p> <p><u>Activity 2:</u></p>	<p><u>SEND:</u> support when interpreting the table into a graph.</p> <p><u>Year 3</u> <b>Task 1: Take photographs of the children and create a pic-collage. Complete table of results.</b></p> <p><u>Year 4</u> <b>Task 2: Children to draw a line graph. HA draw their own. LA create a bar graph from Lego.</b></p>
<p><b>Resources</b></p>		<p><b>Plenary</b></p>
<p>Metre sticks</p>		

footballs ipads worksheets	Children to record their results into a line graph. 	Conclude together what we found out. Children to write their conclusions in their books.
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Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Six</u>            I can investigate the best material that insulates sound.</p> <p><u>Working Scientifically:</u></p>	<p><b><u>Prior Assessment Task:</u></b></p>  <p><u>Starter Question:</u></p> <p><u>Introduction:</u></p>	<p><u>SEND:</u></p> <p><u>Yea</u> <b>Task 1:</b> Groups to have their own planning poster to complete.</p> <p><u>Yea</u> <b>Task 2:</b> Take photographs of children completing task</p> <p>-</p>

Context: the next door neighbour plays their music very loud – how can the noise be made quieter in your room? Children to discuss – feedback.

Activity 1:

Use the large investigation poster at the front of the class to demonstrate how to plan. Then, children to complete their individual or group planning sheets.

The poster is titled 'PLAN' and is divided into several sections for planning an investigation:

- We are investigating:** A line for writing the topic.
- The variables we could change:** A 2x3 grid of yellow boxes.
- The variables we could measure/observe:** A 2x3 grid of blue boxes.
- We will change:** A single yellow box.
- We will measure/observe:** A single blue box.
- Our question is:** A line for writing the question.
- If we change:** A yellow box, followed by **what will happen to:** a blue box, and a question mark.
- To make it a fair test we will keep these factors the same:** A 2x3 grid of yellow boxes.
- Our predictions are:** A 2x2 grid of pink boxes.

**Main Learning:** Groups to create a feedback poster on what they have found out.

Challenge:

Why do builders use ear defenders?

Resources

Activity 2:

Explore the properties of materials that are going to be used

Equipment: a box for a noise device (phone), plaster board, wood, bubble wrap, egg boxes, towel.

Method: Put phone or stopwatch with alarm in a box, cover with material. Either use sound recorder or decide on degrees of loudness.

To change the variable: change material or the amount of layers.

Activity 3: Children to predict. Carry out x 3. Take the mean measurement. Record. Evaluate.

Plenary

Children to feedback – discuss. Conclude.

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