SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

"Journeying together with Jesus Christ, we learn to love and love to learn."

Medium Term Planning
Creative Learning Journey

Year Group: Year 3&4	**Topic:** Sound	**Term:** Autumn 2

National Curriculum Links(Ref: NC 2014)

- 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:

- asking relevant questions and using different types of scientific enquiries to answer them
  setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- 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
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- 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.

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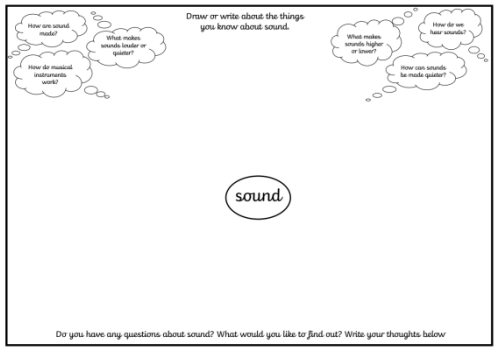
Knowledge and Skills Objectives	Activity	Differentiation
Lesson One I can identify sound sources and explain how these sources vibrate, creating sound. **I know sounds are made by something vibrating.** **I know and understand how sounds are interpreted by the ear.** I know that vibrations from sounds travel through a medium to the ear. Working Scientifically I can ask questions and enquiries to answer them. I can make careful observations.	**Mind map** what is already known about sound.  **Introduction:** use PPT, ask children to listen to music and identify how sounds are made by different instruments 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. **Task 1:** Children to create sounds by using various classroom objects in a variety of ways (take photographs). *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.*	**SEN –** scribe their responses or provide sentence openers. **LA** - **Task 1:** Complete investigation sheet to record what they observed in each **MA** - investigation (provide word bank for LA). **HA** - **Task 2:** record children's observations on f/c and take a picture of it for a Pic Collage. **Main Learning:** label the ear (differentiated) **Challenge:** Can sound travel through all materials?

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I can record findings using scientific language, drawings & labelled diagrams	Discuss vibrations using the PPT to support. Set up 4 enquires for the children to rotate around with prompt discussion cards (take photographs) 1) rice on a drum 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 Enquiry Rice on a drum skin Elastic band Ruler on a desk Tuning fork in water How did you make the object vibrate? What happened when the object vibrated? What did you hear when the object vibrated? **Task 2:** String telephones. Briefly discuss the history of the telephone. When? Who? How? (You could use this to support the learning or just use the facts on the PPT	

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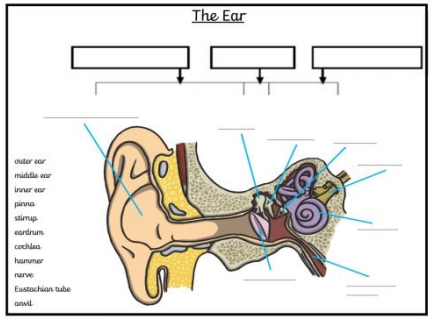
	https://www.youtube.com/watch?v=qWUP9EigdjY) Give out string telephones of different lengths. Can children make their voice travel through them? How far did it travel? What caused the sound? Explain that the sound we created caused vibrations (take photographs). Watch to consolidate their learning: https://www.youtube.com/watch?v=3yqB2KFwJCo **Main Learning:** Learn about how the ear interpreting sounds. Watch a supporting video clip: https://www.youtube.com/watch?v=-bKy02f1pD4 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. 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.  **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	

Resources:

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

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Lesson Two I can describe how vibrations make sound and how they travel to the ear. **I can find patterns between the volume of a sound and the strength of the vibrations that produced it.** Working Scientifically I can make systematic and careful observations taking accurate measurements using standard units I can use a range of equipment including thermometers and data loggers I can gather, record, classify and present data in a variety of ways to help in answering questions	**Introduction:** Ask, how can we create louder / quieter noises? TTYP then give feedback. Show with a glockenspiel - banging harder / softer. Repeat with a triangle. **Task 1:** Tell the children we are going to investigate how the strength in which we hit the drum affects the volume. 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. **Main Learning:** 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. **Plenary:** 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 https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zqtdpbk	**SEN –** write a simple prediction and to complete a simplified table. The graph could be make out of Lego or building blocks. **LA** – **Task 1**: take photographs for a Pic Collage. **MA** – **Main Learning**: record predictions, complete table and make a graph (differentiated) **HA** – HA could draw all in to books. **Challenge:** What does volume mean? What does pitch mean?

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I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables I can report on findings from enquiries through the presentations of results and conclusions.		
Resources: glockenspiel triangle coins worksheets		
Lesson Three I can find patterns between the pitch of a sound and the strength of the vibrations that produced it. Working Scientifically I can make systematic and careful observations.	**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. **Task 1:** Give out different musical instruments to each table (xylophone,	SEN – draw observations from main learning LA – **Task 1**: Take photographs for a Pic Collage. MA – **Task 2**: Children to circle images and then explain why. HA –

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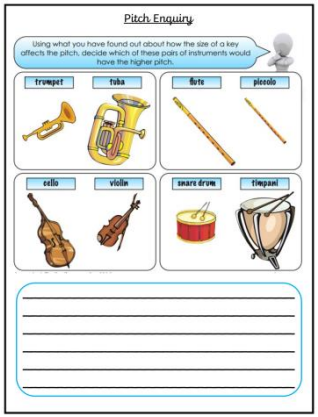
I can gather, record, classify and present data. I can record my findings. I can report on findings from enquiries. I can use results to draw simple conclusions, make predictions for new values.	glockenspiel, guitar) Children will move around in a carousel and vary the pitch of the instrument. Record 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. **Task 2:** 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  **Main Learning:** 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	**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?

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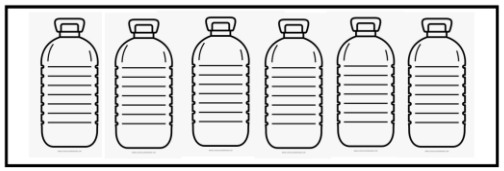
	pitch of the sound produced? Children to think, pair, share their ideas. Show the next pictures showing bottles with different levels on water in. How do you think the pitch of the sound produced would be different for each of these bottles? Can you order the bottles from the highest sound to the lowest sound? As a class, predict what order they will go in.  **Plenary:** Review how we achieve different pitches. 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	
Resources: glockenspiel xylophones guitars recorders bottles water images worksheets		
Lesson Four I can recognise that sounds get fainter as the distance	**Introduction:** Ask, How does sound actually travel? TTYP then give feedback. Clear any misconceptions. Show supported diagrams to reinforce.	**SEN** – pre-drawn tables and charts. **LA** –

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from the sound source increases. <u>Working Scientifically</u> I can set up practical enquires. I can make systematic and careful observations. I can gather, record, classify and present data. I can record my findings. I can report on findings from enquiries. I can use results to draw simple conclusions, make predictions for new values. I can use straightforward scientific evidence to answer questions or to support their findings.	Explain that: ***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.* **Task 1:** 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). Can children here that noise? Every 30 seconds, get that child to move forward 5 steps or 5 metres. Repeat until children can hear the noise. Record data in a chart. Can children describe what happens to the noise as the child was nearer. **Task 2:** Tell the children that they are going to investigate how distance affects how well we hear sound. Equipment: dice, mini-wipeboard Method: working in groups, a child will roll the dice onto a hard surface. Can the sound be heard? If so tick table of results. Move a set distance away e.g. 5 steps, 2 metres. Repeat. Continue until the sound cannot be heard. What was the total distance? Repeat with musical instruments. **Task 3:** Review the results. Get the children to record into a bar	**MA** - **Task 1:** Children to write and draw about what happened. **HA** - **Task 2:** take photographs for a Pic Collage Children to complete table of results **Task 3:** draw and create a bar graph (differentiated) Children to write about what they found out and to suggest reasons for this. HA – draw own tables and charts. **Challenge:** How could we make this a fair test? Suggest reasons for this.

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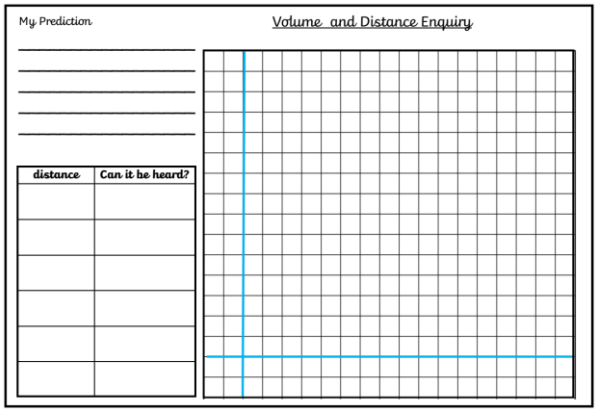
	chart.  **Plenary:** show some of the bar charts. Are any different? If so, why? What are the factors for this? Explain that we all hear sound differently; wind could have been a factor or someone might have hit the instrument using a different strength. Was this a fair test then? Could certain instrument be heard more than others? Why would this be? Conclude the results.	
Resources: metre sticks dice wipe-boards musical instruments worksheets		
Lesson Five I can find patterns between the volume of a sound and the	**Introduction:** 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	**SEN** – support when interpreting the table into a graph.

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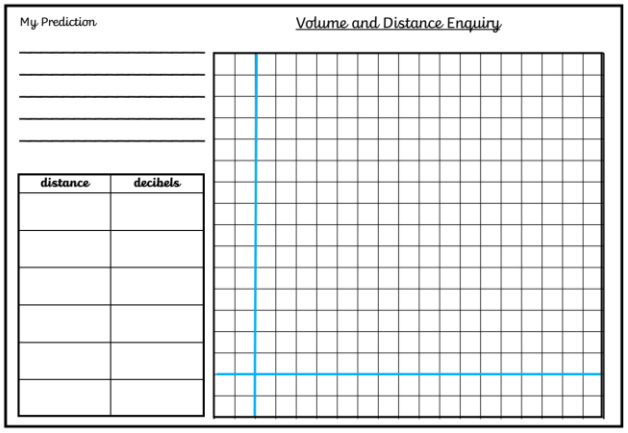
strength of the vibrations that produced it I can explore how sounds get fainter as the distance from the sound source increases. <u>Working Scientifically</u> I can set up practical enquires. I can make systematic and careful observations. I can gather, record, classify and present data. I can record my findings. I can report on findings from enquiries. I can use results to draw simple conclusions, make predictions for new values. I can use straightforward scientific evidence to answer	sound can travel at 343 metres per second and at 761.2 mph. **Task 1:** 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. **Task 2:** Children to record their results into a line graph.  **Plenary:** Conclude together what we found out. Children to write their conclusions in their books.	**LA** – **MA** – **HA** **Task 1:** Take photographs of the children and create a pic-collage. Complete table of results. **Task 2:** Children to draw a line graph. HA draw their own. LA create a bar graph from Lego.

questions or to support their findings.		
Resources: Metre sticks footballs ipads worksheets		
Lesson Six I can investigate the best material that insulates sound. Working Scientifically I can gather, record, classify and present data. I can record my findings. I can report on findings from enquiries. I can use results to draw simple conclusions, make predictions for new values.	**Introduction:** Context: the next door neighbour plays their music very loud – how can the noise be made quieter in your room? Children to discuss – feedback. **Task 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.  	**SEN –** **LA** – **Task 1:** Groups to have their own planning poster to complete. **MA** – **Task 2:** Take photographs of children completing task **HA** – **Main Learning:** Groups to create a feedback poster on what they have found out. **Challenge:** Why do builders use ear defenders?

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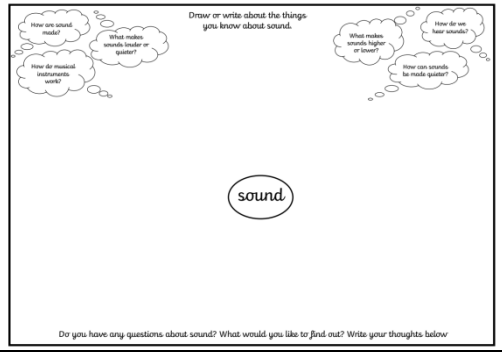
	Task 2: Explore the properties of materials that are going to be used Equipment: a box for a noise device (phone), plaster board, wood, bubble wrap, egg boxes, towel. Method: Put phone or stopwatch with alarm in a box, cover with material. Either use sound recorder or decide on degrees of loudness. To change the variable: change material or the amount of layers. **Main:** Children to predict. Carry out x 3. Take the mean measurement. Record. Evaluate. **Plenary:** Children to feedback – discuss. Conclude. **Mind Map** what has been learned about sound.  	

Resources:

Investigation poster (large and small) boxes bubble wrap egg boxes towels wood plaster board large poster paper worksheets

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Applied Write Opportunities:
Non- chronological text about sound

Home Learning:
Make a guitar with varied lengths and thicknesses of strings

Key Vocabulary

Tier 2:

speed of sound	volume	eardrum	inner ear	outer ear	middle ear	pitch	high/low-pitch	vibration	volume
loud	quiet	fainter	predictions	method	equipment	results			

Tier 3:

decibel	amp	amplitude	cochlear	ear canal	particles	wave	instrument	hammer	anvil
stirrup	insulator								