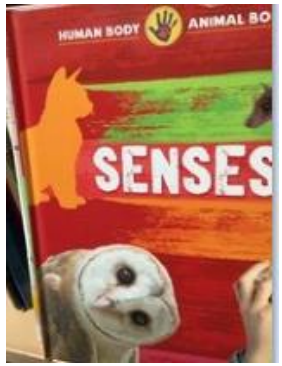
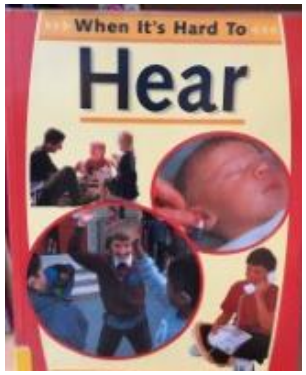
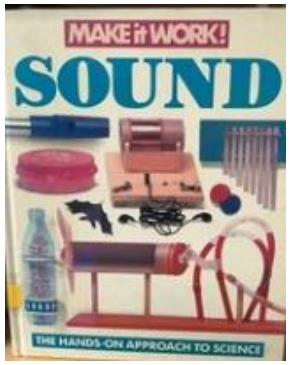
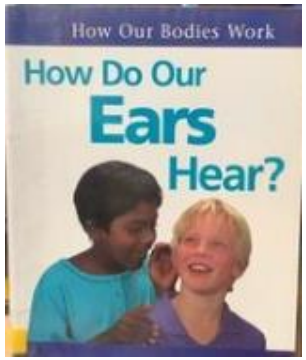
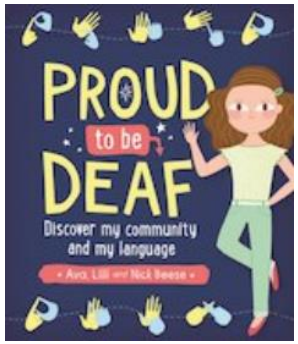
BILSTON CHURCH OF ENGLAND PRIMARY

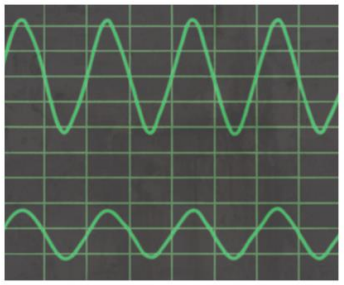
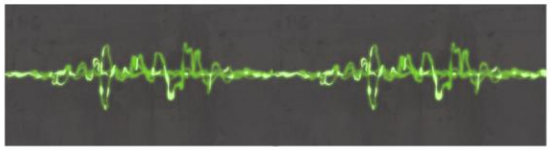
MEDIUM TERM PLANNING

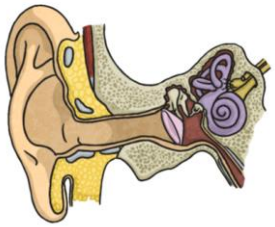
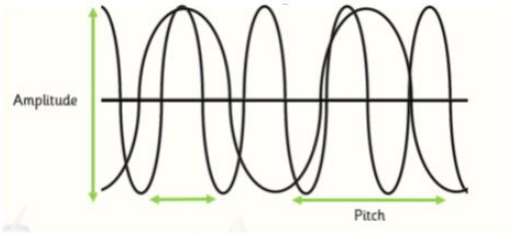
Subject	Topic/Key Question	Year Group	Term	Time Allocation
Science	Good Vibrations - Sound	4	Autumn 2	10 hours
 Library	 Library	 Library	 Library	 Reading for pleasure books
End of lower Key stage 2 Outcomes	Asking relevant questions and using different types of scientific enquiries to answer them. 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			

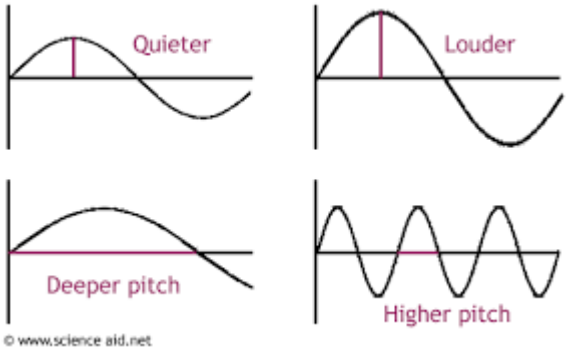
	or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.
End of Unit Outcomes	I can identify how sounds are made, associating some of them with something vibrating. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a sound and the strength of the vibrations that produced it. I can recognise that sounds get fainter as the distance from the sound source increases.
Vocabulary	vibrate vibration vibrating air medium ear hear sound volume pitch faint fainter loud louder string percussion woodwind brass insulate.

Lesson Sequence	Time Allocation	Key Question/WALT	Teaching Activities	Resources
Lesson 1	2 hours	**WALT:** describe what we know about sounds.	**Working Scientifically** Identifying differences, similarities or changes related to scientific ideas and processes.	Collins connect lesson 1

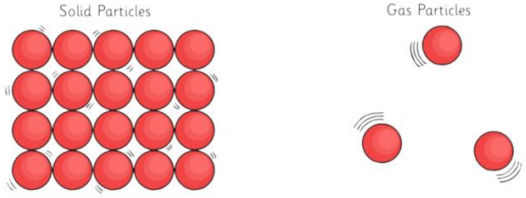
What do we know about sounds?		WILF: I can identify and describe different types of sound. I can say how some sounds are made. I can talk about how sounds might be changed.	To describe what we know about sound • Create a thought shower about what they know about sound. • Listen to a sound clip from Connect Collins and discuss what they can hear – can they identify any sounds? • Discuss the word vibration. • Model rice vibrating on a drum skin. • Model a tuning folk vibrating in a bowl of water – what do they observe? • Children to explore a range of instruments that are played in different ways. Can they identify what is vibrating in the instrument to cause a sound?	Twinkl
Lesson 2 How do sounds travel?	2 hours	WALT: investigate how sounds travel. WILF: I can describe how sounds travel. I can test how sounds travel through different materials. I can use my evidence to justify my ideas about how sounds travel.	**Working Scientifically** Using straightforward scientific evidence to answer questions or to support their findings. To investigate how sounds travel. To explore how we can make instruments louder and quieter • Review what a vibration is. • Mini investigation: Give the children a drum with rice on it. Bang it 3 times 1st softly, 2nd with some force, 3rd bang it as hard as you can without bursting the skin. What do you observe is happening? • Discuss the observations that they can see. • Discuss the vibrations are linked to the amplitude of the sound wave	Video clip Collins Connect lesson 3 Twinkl

			 • Quieter sounds have a smaller amplitude, and louder sounds have a bigger amplitude. • Loud • Quiet • Ask how do these different sounds reach our ears? Discuss children's ideas. • Share video clip… https://www.bbc.co.uk/education/clips/z9h6n39 • Explain that sound can travel through solids, liquids and gases. • Sound travels as a wave, vibrating the particles in the medium it is travelling in. So in our example, when you hit the drum, the drum skin vibrated. This made the air particles closest to the drum start to vibrate as well. The vibrations then passed to the next air particle, then the next, then the next. This carried on until the air particles closest to your ear vibrated, passing the vibrations into your ear.  • Talk to the children about sound hitting the ear drum. • Once in your ear, the vibrations travel into the ear canal until they reach the eardrum. The eardrum passes the vibrations through the middle ear bones	

			(the hammer, the anvil and the stirrup) into the inner ear. The inner ear is shaped like a snail and is called the cochlea. Inside the cochlea, there are thousands of tiny hair cells. Hair cells change the vibrations into electrical signals that are sent to the brain through the hearing nerve. The brain tells you that you are hearing a sound and what that sound is.  • Children sequence the sound particles from a guitar to an ear.	
Lesson 3 How can we change the pitch of a plucked note?	2 hours	**WALT:** explore the different notes that plucked bands make and discover how to alter the pitch of a sound. **WILF:** I can explore ways to change the pitch of a plucked band. I can describe how the length and thickness of the	**Working Scientifically** Using results to draw simple conclusions. To explore the different notes that plucked bands make and discover how to alter the pitch of a sound • Review the loud and quietness of sound waves and how amplitude demonstrates this.  • Introduce the concept of pitch to the children. • Use vocabulary high and low.	Collins connect lesson 6 Twinkl Drum, rice Paper straws.

		string or band affects the pitch.	• Share this video … https://www.bbc.co.uk/education/clips/zsqw2hv • Discuss with the children that the pitch is represented by the frequency of a sound wave. The closer together the higher pitch as there is a higher frequency. The further apart the lower the pitch the lower the frequency. • Demonstrate the changing of pitch by making a simple set of panpipes. • Children to use straws to make their own panpipes. • Draw a diagram and annotate the drawing with sound waves to demonstrate their understanding. 	
Lesson 4 How do sounds change as we move away from the source?	2 hours	**WALT:** measure how the loudness of a sound changes as the distance from the source increases. **WILF:** I can take careful measurements.	**Working Scientifically** Setting up simple comparative tests. Making systematic and careful observation and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. To measure how the loudness of a sound changes as the distance from the source increases. To investigate how to make the best string telephone.	String, paper cups Collins connect lesson 5 Twinkl

		I can record my measurements. I can present my data in a graph.	• Discuss travelling sounds. • Sounds get quieter as the distance between the sound source and your ear increases. • Sounds travel as vibrations. As the sound waves travel, the particles of whatever they are travelling through vibrate, or move quickly on the spot. The further the vibrations travel, the more they spread out. As they spread out through more and more particles, the vibrations become smaller and smaller. This causes the sound to get quieter and quieter. • Think of dropping a leaf into a pond. The very first ripples directly around the leaf will be very large, but as the ripples spread out across the pond, they will get smaller and smaller until eventually they disappear. • This is why sounds get quieter and quieter as you move further away from the source, until you eventually can't hear the sound at all. • Take the children outside and model how it is harder to hear over distances as the sounds ripple. Model this by lining the children up on the playground and talking and walking backwards. Ask children to raise their hand when they can no longer hear you. • Go back inside and ask children… Can you think of any devices that transmit sound over a distance, or ways of making sounds louder so that they travel further? • Telephones are used to transmit the sound of people's voices over long distances. When you speak into a telephone, the sound energy in your voice is turned into electrical energy, which is transported down a wire to the other person's telephone. The electrical	

			energy is converted back into sound energy, and they can hear what you are saying! **Telephone Transmission** How does your telephone work? The string and the cups are solid, so the particles are much closer together than the particles in the air, which is a gas. The sound energy can travel from particle to particle far easier in the solid string telephone, so the sound of your voice is louder over the same distance than it was in the air.  Make a string telephone to explore how sounds travel over a distance. **You will need:** Two paper cups A compass or sewing needle to make holes in the cups; Approximately 20m length of string (kite string works well).  **What to do:** 1. Use the compass or sewing needle to carefully poke a hole in the bottom of each cup. You may need to ask an adult to help you. 2. Thread the string through the holes and tie a knot at each end to stop it pulling through the cups. 3. You and your partner should each hold a cup and move apart so that the string is tight. 4. Take turns talking into your cup while your partner listens in their cup. E-Learning link - Create a podcast in a group on Garageband. Children write a script explaining how to make a string telephone and their findings. Then they record their podcast.	
Lesson 5	2 hours	**WALT:** measure how the loudness of a sound changes as	**Working Scientifically** Setting up simple comparative tests.	

How do sounds change as we move away from the source?		the distance from the source increases. **WILF:** I can take careful measurements. I can record my measurements. I can present my data in a graph.	Making systematic and careful observation and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers To measure how the loudness of a sound changes as the distance from the source increases. • Explain to the children that we are going to replicate the experiment that was shown in the previous lesson on the playground. Children are going to make a sound and measure the distance. • Children are going to make different sounds and then measure the distance of when they can no longer hear the sound. • Clap, thigh slap, stamped foot, sniff and cough. • Discuss with the children how they will maintain a fair test and what the variables could be. • Ask the children to consider how they are going to record their findings. • Carry out the practical task. • Draw conclusions.	