ST LAWRENCE C.E. PRIMARY SCHOOL LEARNING JOURNEY

SUBJECT: Science UNIT: Sound TERM: Spr 1 YEAR GROUP: 4

THE BIG QUESTION	
How do we hear sounds?	
END OF UNIT OUTCOME	Create a double page spread answering the question – how do we hear sounds?
OBJECTIVES	• 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.
Safety in Science	CLEAPPS
CONCEPT: Diversity	Evelyn Glennie
LESSON 1 QUESTION	**How are sounds made?**
KEY KNOWLEDGE	**Know that sounds are made when objects vibrate.** - sound travels in waves. - the vibration makes the air around vibrate which travels into our ears through waves.

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	- the bigger the vibration the louder the sound and smaller vibration produce quieter sounds. - the size of the vibration is called the amplitude e.g. quieter sounds = smaller amplitude. **Know that Evelyn Glennie is a deaf musician who feels the vibrations to create her music.** Evelyn Glennie was born in 1965.		
RICH TASK	Introduce The Big Question – what do they already know? Explore KO – copy in book after title page and paper copy home. Pluck a string on an instrument or bang a drum and let the children feel the vibrations – How do you think sounds are made? Watch: How we can hear sounds – vibrations https://www.bbc.co.uk/bitesize/topics/zgffr82/articles/zstr2nb Children to see and feel the vibrations of sound in a variety of ways, fill in table in science books. - Drum and Rice – notice that the more the rice moves (the larger the vibration) the louder the drum sounds - Vibrating Voice Box – notice that that the louder their voice the stronger the vibration! - Musical instruments – investigate which part is vibrating - Rubber bands – what happens when you pluck a rubber band? Watch clip about Evelyn Glennie: Earthling Stories: Feeling Sound - Evelyn Glennie		
SUPPORT AND CHALLENGE	S – sentence starts for recording, paired/group work C – what is the link between loudness and the size of the vibration?		
KEY VOCABULARY	Sound Vibrate Waves Ear Louder Quieter Amplitude	**RESOURCES**	KS2 Music / Science: What is sound? - BBC Teach
LESSON 2 QUESTION	**How does sound travel to the ear?**		
KEY KNOWLEDGE	**The vibration makes the air around vibrate which travels into our ears through waves. The brain hears the vibrations and turns it into sound.** - when the vibrations in the air enter the ear, they cause the eardrum to vibrate, which in turns passes the vibrations to the small bones inside the ear. - the vibrations then cause the fluid inside the cochlea to move the small hairs inside, which send messages to the brain which are interpreted as sounds.		

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<table>
<tr><td>RICH TASK</td><td colspan="3">Retrieval practice activity – True or false? “Sounds are made when things vibrate.” ✔ “Louder sounds have smaller vibrations.” ✗“Your voice box vibrates when you talk.” ✔Revise KO

Invite 5 or 6 children to the front of the class to be your volunteers.
- 1 student is the sound source (holding something that makes a sound, such as a bell).
- 1 student is the eardrum (holding the drum).
- 4 students are air molecules between the source and the eardrum.
- Place all of the volunteers in a line, facing the class, with 3–4 feet of space separating them.
Ask the students to act out the following sequence of events:
• The first student rings the bell (or other sound-making device).
• The second student (air molecule) begins to vibrate (wiggle), moves toward the third student (air molecule) and touches them.
• The third student, feeling the touch of the second student, starts to vibrate and move towards the fourth student. In the meantime, the second student returns to their original place.
• The vibration continues down the line until it reaches the last student, who bangs the drum (eardrum) when the last air molecule reaches them.

How sound waves enter the ear
How are sounds detected? - BBC Bitesize

Statements given about how we hear, children to order with a partner. Children create a comic strip to show how we hear sound using the ordered statements. Label a diagram of the ear.</td></tr>
<tr><td>SUPPORT AND CHALLENGE</td><td colspan="3">S – comic strip with missing key words, word bank
C – What would happen if the ear drum didn’t vibrate?</td></tr>
<tr><td>KEY VOCABULARY</td><td>Sound
Vibration
Waves
Ear
Ear drum
Cochlea
Brain</td><td>RESOURCES</td><td>Instrument
Drum
Statements
Comic strip template
Ear diagram and word bank</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>LESSON 3 QUESTION</td><td colspan="3">What is soundproofing?</td></tr>
<tr><td>KEY KNOWLEDGE</td><td colspan="3">Know that sounds can travel through solids, liquids and gases vibrating the particles.
- sounds can be absorbed this is called soundproofing.
- some material are better at soundproofing than others.</td></tr>
</table>

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<table>
<tr><td>RICH TASK</td><td colspan="3">Retrieval practice activity – key word retrieval
Revise KO

Recap particles in a solid, liquid and gas. Ask the children does sound travel through solids, liquids and gases? Use their own experiences at school e.g. we can hear other classes and we know that sound waves travel through the air so we can hear.

Children to try paper cup and string activity to show sounds travelling through solids (see link).

Demonstrate listening to sounds underwater (see link). Sound travels faster through water than in the air, animals that live underwater are able to hear sounds more clearly.

Children to write an explanation of how sounds can travel through solids, liquids and gases in their books using the ideas of particles and vibrations.

<u>Investigation</u>
Which material would be the best for soundproofing?
- Change - Decide on materials, children are going to use to create ear muffs (use headphones with material wrapped around) – bubble wrap, paper towel…
- Measure – play a piece of music each time to see if the person can hear it (recording observations of what they can hear)
- Same – children to come up with what we need to keep the same
- Prediction, table of results and conclusion</td></tr>
<tr><td>SUPPORT AND CHALLENGE</td><td colspan="3">S – sentence starters and word bank
C – suggest improvements for ear muffs thinking about thickness, density and particle movement</td></tr>
<tr><td>KEY VOCABULARY</td><td>Sound
Solid
Liquid
Gas
Particles
Vibrating
Absorb
Soundproofing</td><td>RESOURCES</td><td>7 Cool Sound Science Experiments for Kids | Article

Paper cups
String
Container of water
Empty plastic bottle (bottom cut off)

Headphones
Bubble wrap
Cotton wool
Paper towels
Material</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>LESSON 4 QUESTION</td><td colspan="3">What is pitch?</td></tr>
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KEY KNOWLEDGE	**Know that the pitch of the sound is how high or low the sound is.** - the pitch of a sound depends on the features of objects e.g. A tight drum skin gives a higher pitched sound than a loose drum skin.		
RICH TASK	Retrieval practice activity – true or false statements (see flipchart) Revise KO Watch video to introduce pitch. Ask for volunteers to play a series of drums to see how the pitch varies with size. Can children make high, loud sounds, low, soft sounds, etc? Other children can suggest ways of changing the pitch and loudness, e.g. different beater, different position on skin. Do you notice or observe anything about how high and low sounds are made? Look at the shape or size of the skin or the whole instrument. Create a straw pan flute – this will show how the length of the straw can affect the pitch of the sound waves. Record in their science books and explain the key things that are important about a sound's pitch.		
SUPPORT AND CHALLENGE	S – sentence starts and word bank C – compare the drums and straws – what is the same about how pitch changes?		
KEY VOCABULARY	Pitch High Low Sound	**RESOURCES**	What is pitch? https://www.bbc.com/bitesize/articles/z3j3jty 7 Cool Sound Science Experiments for Kids | Article / Sound = Vibration, Vibration, Vibration - Science World from 2 mins Straws Sellotape Musical instruments
LESSON 5 QUESTION	**What happens when you move further away from a sound?**		
KEY KNOWLEDGE	**Know that sound spreads out as it travels.** - sound gets fainter as the distance from sources increases. - the bigger the vibration the louder the sound and smaller vibration produce quieter sounds. - the size of the vibration is called the amplitude e.g. quieter sounds = smaller amplitude.		
RICH TASK	Retrieval practice activity – walkabout bingo Revise KO Investigation		

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<table>
<tr><td></td><td colspan="3">What happens when you move further away from a sound?
- Change – distance from sound
- Measure – how loudly you can hear the sound
- Same – same sound and volume
- Prediction, table of results and conclusion

Play a musical instrument with children all standing close together – describe the sound. Each time get children to take one step back and play the instrument again. What do the children notice – write a brief explanation about what we did and what they noticed into their Science book.</td></tr>
<tr><td>SUPPORT AND CHALLENGE</td><td colspan="3">S – sentence starts and word bank
C – use key scientific vocabulary</td></tr>
<tr><td>KEY VOCABULARY</td><td>Sound
Vibrations
Quieter
Louder
Amplitude
Distance</td><td>RESOURCES</td><td>Metre sticks
instrument</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>LESSON 6 QUESTION</td><td colspan="3">How do we hear sounds?</td></tr>
<tr><td>KEY KNOWLEDGE</td><td colspan="3">Revision of key knowledge</td></tr>
<tr><td>END OF UNIT OUTCOME</td><td colspan="3">KO quiz
Create a double page spread answering the question – how do we hear sounds?
Must include key words: vibrations, sound waves, pitch, particle (solid), soundproofing, ear</td></tr>
<tr><td>SUPPORT AND CHALLENGE</td><td colspan="3">S – word mat and scaffolded structure
C – challenge checklist</td></tr>
<tr><td>KEY VOCABULARY</td><td>Sound
Vibrations
Quieter
Louder
Amplitude
Distance
Pitch
High
Low
Soundproofing
Absorb
Particles
Ear drum</td><td>RESOURCES</td><td>KO quiz
Word mat</td></tr>
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