Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: Science Year: UKS2 Year 4 - Sound

NC/PoS:

- 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.

Prior Learning (what pupils already know and can do)

Know that the sense of hearing is linked to the ear. Know that there are loud and quiet sounds. Know sounds can be high or low. Know that there are many different sources of sounds.

End Goals (what pupils MUST know and remember)

- Know that sounds are made by continuous vibrations and the vibrations sends waves into the ear
- Know that sound can travel through varied materials and give examples – solid (metal, stone, wood), liquid (water) and gas (air)
- Know that the louder the sound (the stronger the vibrations) and sounds become fainter as the distance increases
- Know that high pitch means fast vibrations and low pitch is slower vibrations

Key Vocabulary: sound, energy, vibrations, vibrate, vibrating, ear drum, cochlea, stirrup, hammer, anvil, auditory nerve, medium, solids, liquids, gases, pitch, higher, lower, frequency, volume, louder, quieter, strength, feint, distance

Session 1: Recap: hearing sense linked to ear. type of sounds – high/low, loud/quiet

Children learn that sound is a form of energy that can be heard by living things and is produced when something vibrates. A vibrating object makes the air or material next to it vibrate as well, so the vibrations travel through the air in a wave

Suggested activities:

Watch https://www.youtube.com/watch?v=aWieHpsZ7ik What is sound? BBC Teach

Use of tuning forks – hit on a solid object and place in a bowl of water

Use of rice/ seeds on a drum to see vibrations

Place hands on vocal cords, say aargh and feel the vibrations

Vocabulary: sound, energy, vibrations, vibrate, vibrating, wave, bang, blow, shake, and pluck

Session 2: Recap: How are sounds made? How does sound travel?

Children learn that the ear drum passes vibrations to the middle ear bones which are the hammer, anvil and stirrup. The stirrup pushes against the cochlea which contains thousands of tiny hair cells which change the vibrations to electrical signals. The auditory nerve sends electrical signals to the brain.

Suggested activities:

https://www.youtube.com/watch?v=r-c5GpoD8wI how the ear works

Vocabulary: ear drum, cochlea, stirrup, hammer, anvil, auditory nerve

Session 3: Recap: how does the ear work?

Children learn that sound can travel through a variety of materials (wood, brick, water and glass) but not through a vacuum

Suggested activities:

https://www.youtube.com/watch?v=0PlBNOCOAuk How does sound travel?

- *Can sound energy travel through solids?* Students place their ears on a desk or table as they tap or scratch on the top. They compare that to the same sound made when their ear is not pressed to the table.
- *Can sound energy travel through liquids?* Fill a large bowl or bucket (metal works best) with water. One student taps two spoons together under the water. Two other students observe and compare the tapping sound they hear, as heard through the air and as heard by placing an ear against the bowl.

Sound travels faster through solids as the molecules are closer together.
Vocabulary: medium, solids, liquids, gases

Session 4: Recap: Name mediums sound travels through
Children learn the pitch is the highness or lowness of a note. The pitch of the sound is due to the frequency of the vibration. Frequency is the number of vibrations per second. If the particles vibrate quickly the sound produced will be high
The shorter the vibrating object, the higher the pitch of the note. The larger the vibrating object, the lower the pitch of the note - it's deeper. The tighter the string or elastic band, the higher the pitch of the note.

Suggested activities:

- https://www.youtube.com/watch?v=_wHx_tBfu5c changing pitch using a ruler
- Make a set of pan pipes using paper straws (shorter straw, higher pitch)
- Use a set of 4 small bottles with differing heights of water in and blow across the top (in bottles with more air, vibrations are slower, so the pitch is lower)
- Stretch different length elastic bands over a margarine tub
- (The shorter bands will vibrate faster, producing a higher pitch)

Vocabulary: pitch, higher, lower, frequency

Session 5: How might the pitch be altered?
Children learn the harder you hit something, the more energy the vibrations have so the louder the sound
Suggested activities:
Using a drum, cymbal (range of instruments) compare

Quietest	Quieter	Quiet	Medium	Loud	Louder	Loudest
Pressing a drum with finger	Scratching a drum	Scrapping a drum	Tapping a drum	Hitting the drum	Hitting the drum hard	Bashing the drum really hard

Measure decibels using a data logger around the school
Vocabulary: volume, louder, quieter, strength

Session 6: Recap: How do you make a sound louder?
Children learn vibrations lose energy as they travel further and further and that sounds get fainter as the distance from the sound source increases
Suggested activities:
Carry out an investigation to explore what happens to sound as it gets further away
Vocabulary: feint, distance

Link to careers: Audio engineer
https://www.youtube.com/watch?v=S9WnYUUBl84 What does a sound engineer do?

Scientists who have helped develop understanding in this field:
The modern study of waves and acoustics is said to have originated with **Galileo Galilei** (1564–1642), who elevated to the level of science the study of vibrations and the correlation between pitch and frequency of the sound source.

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