Year 4 – Sound	**Main Outcomes:** • 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.	**Focus:** Science – physics

What should I already know?

Not studied until year 4.

What I will do

I will have weekly or blocked science lessons. In lessons, I will be taught a skill and I will gain knowledge and understanding through the process of scientific enquiry (observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources).

Possible lines of enquiry

- Explore and identify the way sound is made through vibration in a range of different musical instruments from around the world.
- Find out how the pitch and volume of sounds can be changed in a variety of ways.
- Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.
- Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound.
- Make and play their own instruments by using what they have found out about pitch and volume.

Vocabulary	Meaning
amplify	to increase the strength or amount of something; to make louder
amplitude	the size of a **vibration**
ear drum	a thin flap of skin that stretches tight like a drum and **vibrates** when **sound** hits it.
energy	the ability to do work
factor (variable)	any one of the elements of the test which could be changed
frequency	the rate of **vibration** of a (**sound**) wave
gas	particles with no fixed shape or volume
light	electromagnetic radiation on the electromagnetic spectrum that can be perceived by the human eye
liquid	particles whose shape does change, it is not rigid
loud(ness)	a full, powerful **sound** or **sounds** (how **loud** something is)
medium	a material such a **solid, liquid or gas**
muffle	to dull a **sound**
noise	a **sound** or **sounds**, especially when it is unwanted, unpleasant, or loud
particles	an extremely tiny piece of matter
pitch	how high or low a **sound** is
quiet	marked by little or no **noise**
sign language	a way of communicating using hand gestures and movements, body language and facial expressions, instead of spoken words
silent	when there is no **sound**
solid	particles whose shape does not change on their own – it is rigid
sound	**vibrations** travelling through a **medium**
sound-proof	to block **sound waves**
sound waves	**vibrations** that we can hear
source	anything or place from which something comes
transmit/ travel	send from one place to another
vibrations	the rapid back-and-forth motion of an object
volume	how **loud** or **quiet** a **sound** is

Resources

Hamilton Science planning: sound https://www.hamilton-trust.org.uk/science/year-4-science/sound-listen/ (all planning also saved on SharePoint).

Knowledge and Skills Map – Science at Estcots School

Knowledge to understand

When something **vibrates**, a sound is made.	There are many kinds of **sounds** and many ways of making **sound**, e.g. musical instruments make **sounds** when the air inside them **vibrates**.
Sound is a form of energy, which can travel through a medium such as the air (a **gas**), or other materials such as brick (a **solid**) or water (a **liquid**).	When an object (or source) **vibrates**, the **vibrations** (or **sound waves**) travel through the air (or other medium) into your ear, causing your eardrum to **vibrate**. These **vibrations** send messages to your brain, allowing you to sense the **sound**.
The **volume** of a **sound** depends on the strength of the **vibrations**.	**Volume** is how loud or quiet a **sound** is. Strong **vibrations** cause loud **sounds**. Weak **vibrations** cause quiet **sounds**. Sometimes we need to **amplify sound** and sometimes we need to reduce (or **muffle**) it.
Vibrations get weaker as they travel further.	The further away you are from the source of a **sound**, the quieter (or fainter) it is.
The **pitch** of a **sound** depends on the size, height and tension of an object.	**Pitch** is how high or low a **sound** is. The **pitch** is higher when the vibrating object is small, short or tight. The **pitch** is lower when the vibrating object is large, long or loose.
Sound travels more slowly than **light**.	We see lightning before we hear thunder because **light** (at a speed of around 300 million metres per second) travels much faster than **sound** (which moves at 340 metres per second).

Skills to learn

- 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.

Cross-curricular (music)

- understand and explore how music is created, produced and communicated, including through the inter-related dimensions: pitch, duration, dynamics, tempo, timbre, texture, structure and appropriate musical notations

Equipment to become familiar with

A range of musical instruments, including those that they design and make themselves.

Evidence of Learning

Science books
Photos
Videos
Pupil conferencing
Teaching and learning observations
Learning walks
Data analysis

How will I know what I've learnt?

See KS2 teacher assessment exemplification for science

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf

See also Hamilton Science_Assessment_Y4 (saved in planning folder on Sharepoint).

KS2 quizzes:

https://gcequiz.com/quiz/ks2-science-quizzes

https://churchfieldsjunior.com/test-your-skills-science/