Year 4 – Sound



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| National Curriculum Outcomes: Knowledge   * 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 sounds 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 | | | | | | National Curriculum Outcomes: Working Scientifically   * Asking simple questions and recognising that they can be answered in different ways * Observing closely, using simple equipment * Performing simple tests * Identifying and classifying * Using their observations and ideas to suggest answers to questions * Gathering and recording data to help in answering questions | |
| Children might work scientifically by:  Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and plat their own instruments by using what they have found out about pitch and volume. (*Taken from the National Curriculum*) | | | | | |
| Links to prior learning  **Year 1** – Associate the sense of hearing with ears | | Links to future learning  **KS3** - Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. Sound needs a medium to travel, the speed of sound in air, in water, in solids. Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. | | | | | |
| Key Vocabulary  Sound, vibrate, vibration, pitch (high, low), volume (loud, quiet), hear, hearing, ear | | Common Misconceptions   * Children may think sound is only heard by the listener * They may think that sound can only travel in one direction from a sound source, and that it can’t travel through solids or liquids * Children often confuse the terms high/loud and low/quiet | | | | | |
| Important scientists  **Alexander Graham Bell** – Scottish-born American scientist who invented the telephone  **Galileo Galilei –** Italian scientist who investigated the frequency and pitch of sound waves  **John MacAdam-Roads Chester** – invented earmuffs | | STEM Career Links  **Audiologist** (studies sound and its properties)  **Audio Technician** (responsible for using sound recording equipment)  **Physicist** (studies physics)  **Sound Engineer** (deals with sound for broadcasts or performances) | | | | Links to real life   * What is your favourite sound? * How do musical instruments make different sounds? * How far away can you be from your friend on the playground and still hear them? * How can sounds keep us safe? | |
| Important knowledge/facts the children need to know   * Sounds are made when objects vibrate. The vibration makes the air around the object vibrate and the air vibrations enter your ear. You hear them as sounds. * Sound waves travel to the ear. Sound waves can travel through solids (such as metal, stone and wood), liquids (such as water) and gases (such as air). * The pitch of a sound is how high or low the sound is. A high sound has a high pitch and a low sound has a low pitch. A tight drum skin gives a higher pitched sound than a loose drum skin. A smaller object will often make a higher pitched sound than a larger object if the shape, materials and other properties of the objects are the same. * The loudness or volume of a sound is how loud or quiet the sound is. A nail hit hard makes a loud sound. A nail hit gently makes a quiet sound. * A sound appears quieter the further away it is. | | | | | | | |
| Suggested Enquiry Activities | | | | | | | |
| Identifying and Classifying   * Sort musical instruments based on a range of criteria | Comparative and Fair Testing   * What is the effect of distance from a sound source on the volume/amplitude of a sound? (data logging opportunity) * How well do different materials insulate against sound? * What is the best material to make ear muffs to insulate against sound? | | Observation over Time   * How does the noise level in our classroom change over the course of the day? (data logging opportunity) | | Pattern Seeking   * Does the length of string between our cup/tin can telephone have an effect on what we can hear? * How does the amount of water in a bottle affect the pitch of the note? | | Research using Secondary Sources   * How do our ears work? * How do musical instruments work? |
| **National Curriculum Statements** | | | | **Outdoor Learning Activities** | | | |
| * Recognise that sounds get fainter as the distance from the sound source increases | | | | Pupils measure how the volume of a sound changes as they move away from the sound source. | | | |

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| Wow Factor Experiences   * Create musical instruments and put on a performance (you could look at examples of performances by Stomp for inspiration) * Create tin can telephones * Carry out the cross curricular ‘Growing Music’ project form the PSTT (see weblinks below) | | |
| Maths Links   * Use data loggers to create a line graph showing noise level over the course of a day in the classroom, then analyse the data: *Why is there a spike here? When do you think playtime happened? Why does the line drop to zero here?* * Investigate which materials are best at insulating sound then use the data collected to justify choice of materials to make ear defenders. | Literacy Links   * Write an explanation of how tuning a guitar, piano or violin changes the pitch of the sounds produced. | Broader Curriculum Links  **Design & Technology:** Create a musical instrument  **Music:** Compose and perform a piece of music using a home-made instrument, either solo or as part of an orchestra  **History:** What musical instruments/singers/genres of music were popular in the time period we are currently learning about? |
| Book Links  Peace at Last – Jill Murphy  What the Ladybird Heard – Julia Donaldson  The Sound of Silence – Katrina Goldasito & Julia Kuo | | |
| Helpful Weblinks  Assessment exemplification (could also be useful with planning ideas) – <https://www.planassessment.com/product-page/examples-of-work-sound-y4-hamza>  Teacher CPD on sound (free) – <https://www.reachoutcpd.com/courses/upper-primary/sound/>  BBC Class Clips relating to sound (useful videos) – <https://www.bbc.co.uk/bitesize/topics/zgffr82/resources/1>  STEM Learning’s online resource library for this unit - <https://www.stem.org.uk/resources/community/collection/12746/year-4-sound>  PSTT Growing Music Project - <https://pstt.org.uk/resources/curriculum-materials/growing-music> | | |

NB: This module should be taught **before children have done the Year 4 work on Animals including Humans**. This means they will be able to apply the vocabulary they have learned in this unit in different contexts. It should also be taught **before the year 4 work on States of Matter** as then children will have had a good introduction to classification with more familiar things (animals) before tacking classification of the less familiar (materials and states of matter).