Imagine, Believe, Achieve

Springdale First School

Year 4 / Science / Sound

Children's prior learning in this area	Cultural Capital Opportunities	Key vocabulary and glossary
In Year 1: Know that hearing is a sense and we use ears to hear. **From the Music curriculum:** Will have some understanding that objects make different sounds and that sounds can be quiet or loud and high or low. They will have used the word 'pitch' in music. **In Year 3:** Understand the words 'source', 'waves' and 'travel' from their learning on light.	Exploration of musical instruments from around the world 	sound source wave vibrate / vibrations travel medium molecules volume / louder / quieter / decibels pitch / higher / lower fainter

Enquiry Question How are sounds made? How many different ways can sounds be made with musical instruments?	**Enquiry Question** How does sound travel from its source to an ear?	**Enquiry Question** What is volume? Does the strength with which we play an instrument affect the volume of the sound produced?
Working scientifically skill: gather and record results **Enquiry type:** Identifying, grouping and classifying	**Working scientifically skill:** evaluate (a demonstration)	**Working scientifically skill:** take measurements; draw conclusions; evaluate an enquiry **Enquiry type:** comparative and fair testing
Sound comes from a source and travels in waves. Sounds are made when objects vibrate. Vibrate means a rapid, small back and forth movement. Enquiry type: To identify and classify, scientists first identify different categories. Then they can classify these objects into those categories. WS – Gathering and recording results: To draw a simple table you need to identify how many columns are needed (one per category), identify how many rows are needed (maximum items in the category), choose the length the rows will total and divide this by the amount of columns, draw the header row, mark across where the column lines will be, draw the column lines, put the headings in the header row. *Practise: Explore a range of instruments and consider what parts are vibrating and how you make them vibrate.* *Apply: How many different ways can sounds be made with musical instruments? Classify instruments in groups.* *Practise: We do task drawing a table* *Apply: Fill in names of instruments within the table.*	Sound needs to travel through a medium because sound waves need molecules to move through. Sound can travel through different mediums – solids, liquids and gases. The source of sound vibrates and produces sound. The source's vibrations cause the molecules closest to it to vibrate. The molecules vibrate back and forth and transmit the sound to the next molecules. The sound vibrations move as sound waves from molecule to molecule. The sound waves travel in all directions. When the vibrations reach the molecules closest to your ear, they are transmitted intro your ear and along to your eardrum, which then passes the sound to the inner ear. Then, a message is sent to your brain to tell you what the sound is. WS – evaluating: Identify what is successful; identify what isn't sucessful; suggest improvements *Practise: Cloze procedure for sticky knowledge* *Practise:: Use a musical instrument as a sound source, netballs to represent air molecules and a drum to represent the ear drum. Work as a class to demonstrate how sound travels.* *Apply:Evaluate what is effective and ineffective and improve the demonstraton to more clearly represent the scientific knowledge – oral discussion and practical demos.* *Deepen: Which medium will sound travel through the quickest – solid, liquid or gas. Identify why using tick box statements.*	Volume is a measure of sound. It measures the strength of sound and how loud it is. The unit of measurement for volume is decibels. We measure how loud or quiet something is in decibels: db. WS: Taking accurate measurements: I do/we do with decibel meter – use visualiser to show how to take a reading. WS: A conclusion sums up **<u>what has been found out</u>** in an investigation. A conclusion **<u>uses the results</u>** of the investigation to answer the original question and **<u>explains the results</u>** using scientific knowledge. A conclusion will also include **<u>evaluation</u>** – reflecting on how reliable the results are, any unexpected results, any flaws and suggests improvements to the enquiry. *Check: Predict where 3 more sounds would go on the decibel scale. Practise: I do/we do using decibel meter on logger. Apply: Carry out investigation in groups. Enquiry question: Does the strength in which you play an instrument affect the volume? Take measurements and record on pre-given table. Depen: Teacher to show a graph of one group's results by connecting data logger to laptop. Guided discussion and modelled conclusion.*

Enquiry Question How can we plan an enquiry?	**Enquiry Question** What is pitch? Can you ask scientific questions that you could investigate?	**Enquiry Question** Can you ask scientific questions that you could investigate?
Working scientifically skill: take measurements **Enquiry type:** pattern seeking	**Working scientifically skill:** ask scientific questions **Enquiry type:** pattern seeking	**Working scientifically skill:** ask relevant questions; plan, perform and set up an enquiry; evaluate an enquiry **Enquiry type:** comparative and fair testing
Children will know how to use data logger to take measurements of volume and how to measure distance in metres. Children will be able to suggest ways in which to answer the question: *Does a sound get fainter as you get further away from a sound source?* Carry out investigation and answer the question, using results. After the enquiry, children will learn: Sound gets fainter the further away it is from its source. This is because sound spreads out as it travels. The sound vibrations travel through the molecules of the medium they are travelling in. The further the vibrations travel, the more they spread out. The more they spread out, the smaller the vibrations become. This causes the sound to get fainter and fainter until eventually they disappear and you can no longer hear the sound. *Practise: Plan enquiry through group and class discussion. Teacher to scribe a plan.* *Apply: Carry out enquiry in groups.* *Deepen: Teacher to connect data logger to computer to show a graph of data. Interpret results and answer the enquiry question in one or two sentences.*	The pitch of a sound is how high or low a sound is. Children know question words such as do, does, what, where, when, why, who, how, will. Children know the difference between relevant and irrelevant questions. Children know that some questions are testable and some are not. Children can begin to improve their questions using comparative language and showing a causal link in their question using the word 'affect'. *Practise: Create questions that lead to:* *I do: How does the thickness of the elastic bands on the elastic band guitar affect pitch?* *We do: How does the length of the straw on the straw flute affect pitch?* *You do: How does the amount of water in the glass bells affect pitch?* *Apply: Investigate these.* *Deepen: Interpret results by identifying patterns.*	Over two – three sessions. AFL opportunity for asking questions and planning enquiry Children know question words such as do, does, what, where, when, why, who, how, will. Children know the difference between relevant and irrelevant questions. Children know that some questions are testable and some are not. Children can begin to improve their questions using comparative language and showing a causal link in their question using the word 'affect'. Children can evaluate their enquiry by identify what was successful, what was not successful and be able to suggest improvements. *Practise: Write questions in groups on post-its related to string telephones and sound. Following modelling, improve questions. Plan enquiry.* *Apply: Carry out enquiry.* *Deepen: Conclude, evaluate and raise further questions.*