

NC Purpose of Study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Intent	Implementation	Impact
At Broadway Junior School we believe that a high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational 'Big Ideas', pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. The staff here ensure that all children are exposed to high quality teaching and learning experiences, which allow children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills. They are immersed in scientific vocabulary, which aids children's knowledge and understanding not only of the topic they are studying, but of the world around them. We intend to provide all children regardless of ethnic origin, gender, class, aptitude or disability, with a broad and balanced science curriculum.	Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following: Science will be taught in planned and arranged blocks by the class teacher, to have a subject specific approach. This is a strategy to enable the achievement of a greater depth of knowledge. Through our planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning, so that all children keep up. Teachers build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence. Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.	The impact and measure of this is to ensure children not only acquire the appropriate age related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives. All children will have: - A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills - A richer vocabulary which will enable to articulate their understanding of taught concepts - High aspirations, which will see them through to further study, work and a successful adult life.

Key Vocabulary

Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation

Knowledge	Skills
- A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). - The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. - The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. - Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	- 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 - 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

Learning Objectives/End Points

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.

Key Questions/Learning Objectives/End Points

Lesson 1: Sound Hunt Around School

- Identify and describe a variety of sounds in the environment.
- Begin to associate sounds with the vibrations that produce them.
- Understand that sound is made when something vibrates.

Lesson 2: Vibration Stations

- Observe and describe how sounds are made by vibrations.
- Identify that vibrations from sound travel through materials.
- Link louder sounds to stronger vibrations.

Lesson 3: String Telephones – How Sound Travels

- Recognise that vibrations from sounds travel through a medium (solid) to the ear.
- Investigate how sound travels through different materials.
- Describe how vibrations move from one place to another.

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Lesson 4: Pitch and Volume

- Find patterns between the pitch of a sound and features of the object that made it (e.g. size, tension).
- Identify that volume is related to the strength of vibrations.
- Compare how pitch and volume can be changed.

Lesson 5: Volume and Distance

- Recognise that sounds get fainter as the distance from the sound source increases.
- Investigate and measure how volume changes with distance.
- Begin to understand sound energy and how it dissipates over distance.

Lesson 6: Sound Insulation

- Explore how different materials affect how sound travels.
- Investigate which materials are best at muffling or blocking sound.
- Apply understanding of sound travel to design simple sound insulation.

• Sound Hunt Children will explore the school environment to identify and classify different sounds, learning that sound is made when something vibrates. Using sound hunt checklists, they will investigate where sounds come from, how loud or quiet they are, and begin to think about how sounds travel to our ears	• Vibration Stations In this hands-on lesson, students will rotate through practical stations exploring how vibrations cause sound. Activities will include using tuning forks, guitars, and drums to observe and describe what happens when objects vibrate, helping them connect vibrations to the creation of sound.	• String Telephones Children will investigate how sound travels through solids by making and testing string telephones. They'll explore how the vibrations move along the string to carry the sound, and experiment with different materials and string lengths to observe changes in sound clarity.	• Pitch and volume This lesson introduces pitch and volume through interactive activities. Pupils will explore how changing the size, tension, or material of an object (e.g. rubber bands or xylophones) affects the pitch, and how force and vibration strength influence volume.	• Sound and distance Students will conduct investigations to discover how the volume of a sound changes as the distance from the source increases. Using simple listening tests, they'll collect data and discuss how sound waves lose energy over distance.	• Insulating sound Children will explore how different materials can block or absorb sound. They'll test various everyday materials (cotton, bubble wrap, cardboard, etc.) to build a simple "ear defender" or quiet box, and use results to suggest the best materials for soundproofing.
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Careers	
Linking Curriculum Learning to Careers Discuss how the skills developed in this unit are used in a range of careers, including: • Sound Engineer • Musician • Music Producer • Audio Technician • Acoustic Engineer • Audiologist • Architect • Construction Engineer • Radio Presenter or Producer • Product Designer Transferable skills such as Pattern spotting Curiosity Observation Investigation Problem solving Teamwork Communication Research Organisation Attention to detail Classification Data handling Critical thinking Decision making Creativity Resilience Responsibility Confidence	Learning from Career and Labour Market Information • Children explore careers linked to sound, including sound engineer, musician, music producer, acoustic engineer, audiologist, architect, hearing specialist, audio technician and product designer. They learn that knowledge of sound is important in industries such as entertainment, construction, technology and healthcare. Addressing the Needs of Each Pupil • Practical investigations give all children opportunities to recognise and develop their own strengths. Children can take on different roles, such as investigator, equipment manager, recorder, sound tester or presenter, demonstrating that workplaces need people with a range of skills. • Linking Curriculum Learning to Careers Children learn how scientific knowledge about sound is used in real jobs. Sound engineers control volume and improve sound quality, musicians use their understanding of pitch, architects and engineers consider sound insulation when designing buildings, and audiologists investigate how people hear sounds. • Encounters with Employers and Employees Where possible, children could meet or hear from a musician, sound engineer, audiologist, radio presenter, construction worker or engineer. Visitors can explain how they use their knowledge of sound in their work. • Experiences of Workplaces Enrichment opportunities could include visiting a theatre, music venue, recording studio, radio station, construction project or university science department. Children can explore how sound is used and controlled in different workplaces.