




## Learning Scientific Skills Outside the Classroom

### Scientific Skills

Predicting	Recording	Concluding
Country of Origin	Suggested Age Range	Suggested Theme
 Spain	9 - 10	Sound
Location outside the classroom		Benefits of using this location
Outside on the playground		A large quiet outdoor space is needed to complete the activities
Learning Objectives – Scientific Skills		Learning Objectives – Knowledge
To make predictions based on their prior knowledge and understanding To record observations using annotated diagrams and a table To present their findings in a written conclusion using relevant scientific language		To know that sound is made up of sound waves To know that sound waves can move energy because sound is a type of energy To investigate how long it takes for different sounds to be reduced to low levels
Key Vocabulary		
Scientific skills vocabulary – predict, predicting, hypothesis, justify, record, recording, conclude, conclusion, explain, measure Knowledge vocabulary – sound, sound waves, ear drum, vibration, intensity, volume, loud, amplitude, decibel, noise		
Resources / Equipment		
<ul style="list-style-type: none"> <li>Equipment for 'Ripples on water' – tuning fork, bowl of water, paper, pencil</li> <li>Equipment for 'Sound you can see' – porex/polystyrene balls, speaker, paper, pencil</li> <li>Equipment for 'Can you hear it?' – Tibetan bowl, musical triangle, shakers</li> </ul>		
Teaching Activities		
<p><b>Explain</b> – Today they will be investigating different properties of sound using four research questions:</p> <ul style="list-style-type: none"> <li>What happens if we place a tuning fork in and on water?</li> <li>What happens if porex/polystyrene balls are placed on a loudspeaker playing loud sounds?</li> <li>How far can sound travel in air?</li> <li>Where are the loudest sounds in the local environment?</li> </ul>		
<p><b>Activity 1: Ripples on water from a tuning fork</b></p> <p><b>Predict</b> – Children make a prediction about what will happen when a tuning fork is placed on the surface of water/in the water and give a reason.</p> <p><b>Activity</b> - Children tap turning forks against a book (or rubber bung but not a tabletop) and observe what happens if they dip it into a bowl of water. Repeat activity and touch the surface of the water. The children holding the tuning fork should explain what they felt when the fork was hit and touched the water.</p>		
<p><b>Record and conclude</b> – Children draw what they see and write a conclusion explaining whether their prediction was correct. (Waves move on the water surface because of the movement of the tuning fork being transferred)</p>		
<p><b>Activity 2: Polystyrene balls on a loudspeaker</b></p> <p><b>Predict</b> – Children make a prediction, with a reason, about what will happen when porex/polystyrene balls are placed on a loudspeaker which is connected to a source of sound (radio, record player, noise generator) and the sound is louder and quieter.</p>		





**Activity** – Children place porex/polystyrene balls on a loudspeaker and then turn on the music. They observe what happens to the balls and will investigate what happens to the balls if you change the volume (amplitude) of the sound. If a sound source is available to vary the frequency, then the children can observe the motion of the balls if the frequency is changed.

**Record and conclude** – Children draw an annotated diagram which demonstrates their findings and write a conclusion explaining whether their prediction was correct.

### Activity 3: Can you hear it?

**Predict** – Children make a prediction, with a reason, about how far the sound made from a musical instrument will travel before they can no longer hear it.

**Activity** – Children work in pairs – one child makes a sound with each of the percussion instruments and the other child walks away from the instrument. The second child counts the number of steps until they can no longer hear the sound. The volume of sound from the different instruments needs to be considered.

**Record and conclude** – Children record the numbers of steps taken for each instrument in a table. They use this data to write a conclusion explaining whether their prediction was correct.



### Activity 4: The Noise busters



**Explain** –The loudness of sound is related to the amplitude of a sound wave and can be measured with a decibel scale. A noise level about 85 decibels is harmful.

**Activity** – Measure noise level in different locations around the school and local environment using a decibel meter. Draw graphs to show the readings.

**Discuss** – Which locations had a noise level which would be considered harmful? Discuss the consequences of noise pollution.

### Examples of children’s work and teacher comments from country of origin



*The health and safety issues of these activities should be brought to the children’s attention.*