


<p><b>Timing</b> 3 sessions of approximately 45 minutes (Session 2 may need additional times outside the lesson)</p>	<p><b>Children will</b></p> <ul style="list-style-type: none"> <li>• Begin to think about the difference between data and information</li> <li>• Measure sound levels in the classroom using a datalogger (discrete data)</li> <li>• Record outside noise and create a line graph to show the changing levels (continuous data)</li> <li>• Investigate insulators of sound and present findings</li> </ul>
<p><b>e-safety links</b>  I can explain the importance of communicating kindly and respectfully</p>	<p><b>Objectives</b></p> <p><b>Handling Data</b></p> <ul style="list-style-type: none"> <li>• I can organise data in different ways.</li> <li>• I can collect data and identify where it could be inaccurate.</li> <li>• I can use a datalogger to record and share my readings with my friends.</li> </ul>
<p><b>Links to other learning</b>  <b>Mathematics:</b> Use appropriate software and apps to present and interpret data. Use the information to solve one and two step problems. Interpret data collected with data loggers.  <b>Science:</b> Explore and identify how sound is made and investigate the effects of insulating against sound e.g. using a datalogger.</p>	
<p><b>Resources</b> Data logger or App: <a href="#">Too Noisy app for iPad / Android</a> <a href="#">or Too Noisy Online Lite for Chrome</a> Google Science Journal App <a href="#">Decibel 10<sup>th</sup></a> App (talk to children about closing Ads) Easysense Q/ Vu datalogger, TTS Logbox / LogIT Explorer or other</p>	<p><b>Preparation</b></p> <ul style="list-style-type: none"> <li>• The main activity for this session was taken from NAACE Primary Science curriculum ideas in 2016</li> <li>• Identify the data logger or app to use with your learners             <ul style="list-style-type: none"> <li>○ Look for information on the manufacturer’s website for lesson ideas and how-to guides: <a href="#">Easysense</a>, <a href="#">LogIt</a>, <a href="#">TTS Easysense support sheet</a> available.</li> <li>○ Google Science Journal can be installed on tablets, phone or Chromebooks (note you will need to allow access to microphone and camera). Open the app, add a new experiment (+) and open the sensor card. Click the <b>Settings</b> cog on the first sensor and select only the <b>Sound sensor</b>.</li> <li>○ Decibel 10<sup>th</sup> App can be used to take individual readings or you can email a line graph of continuous data. This can be used in place of a datalogger if you do not have one. You will need to talk to the children about ignoring advertisements if you use this app.</li> </ul> </li> <li>• You will need materials for insulating sound e.g. cotton wool, straw, wool. Children could bring in materials to test.</li> <li>• Download Powerpoint <a href="#">Y4 Data and Information</a>. Check difference between data, information and knowledge.</li> </ul>

	Expectations	Activity	Success Criteria
1	<p><b>Handling Data</b></p> <p>I can organise data in different ways</p> <p>I can collect data and identify where it could be inaccurate</p> <p>I can use a datalogger to record and share my readings with my friends</p>	<p><b>Using a datalogger</b></p> <ul style="list-style-type: none"> <li>• Show the output of sound level recording on the app or data logging software you are using. How do we change what this looks like?</li> <li>• Discuss how data is recorded such as bar graphs and pie charts. How can we begin to collect this data?</li> <li>• Explain that we are now going to use a datalogger/app to show how sound levels can decrease with distance from the sound. If you have a piano or keyboard, play a continuous sound and ask children to come closely around the keyboard – can they hear the sound clearly? (If you can do this in the school hall, the results will be better).</li> <li>• Ask children to move away to the furthest corner of this room – can they still hear the sound? Is it as loud or less loud? Take their predictions about how loud the sound will be in various distances from the keyboard.</li> <li>• Use the datalogger/app to record the sound at a sequence of distances from the source – 0m, 1m, 2m etc – use the <a href="#">snap shot option</a> on data logging software for taking one off sound readings for each distance.</li> <li>• Use IWB to review the plan and plot the data collected.</li> <li>• You may see an anomaly in the data e.g. you may find that the sound does not diminish in a linear fashion – take suggestions about why this could be so.</li> <li>• Discuss the following questions:                         <ul style="list-style-type: none"> <li>○ 'What happens to the sound level generally as the distance from the keyboard increased?'</li> <li>○ 'Why do you think the sound level did not reduce to zero?'</li> <li>○ 'How far from the keyboard do you think you would have to be before you could hear no sound?'</li> </ul> </li> <li>• How did we know what the data we collected meant? Talk about units of measure – decibels and metres.</li> </ul>	<p><b>Gold: Can I interpret data recorded with a datalogger?</b></p> <p><b>Silver: Can I talk about the data I collect with a datalogger?</b></p> <p><b>Bronze: Can I use an datalogger to record data?</b></p>

	<ul style="list-style-type: none"> <li>• Use <a href="#">Year 4 Data and Information presentation</a> to build understanding of data and information. Go through slides getting children to talk in pairs to see if they can answer questions.             <ul style="list-style-type: none"> <li>○ Slide 2: We need to know what the data is for it to become information. We can learn something from it to increase our knowledge.</li> <li>○ Slide 4: Get children to talk in pairs to see if they can work out what the numbers could be. Clue: all less than 31.</li> <li>○ Slide 5: We now know the numbers are dates, but is this information yet? We need a context for the dates.</li> <li>○ Slide 6&amp;7: Children should recognise the dates are birthdays. What information does this give us? Do children recognise we still don't know who the birthdays relate to?</li> <li>○ Slide 8&amp;9: We know whose birthday it is so we can send a card but what sort of card should we send? Do children recognise they don't know the age? Who is the oldest? Who is the youngest?</li> <li>○ Slide 10: Do the children recognise this is now a date of birth? Who is the oldest? Who is the youngest? Who hasn't started school yet? What sort of card should we send?</li> </ul> </li> <li>• Slide 11: What knowledge did we gain from using the datalogger/sensing app? Do children recognise that we didn't really find out anything very useful. Tell them we will be investigating something more useful in the next lesson.</li> </ul>	
<p><b>Handling Data</b></p> <p>2 I can choose an appropriate tool to help me collect data</p> <p>I can present</p>	<p><b>Investigating traffic noises and other noises outside your classroom</b></p> <ul style="list-style-type: none"> <li>• Tell the children that School governors have been worried about noise outside the classroom affecting how well they concentrate on their work. How can we investigate?</li> <li>• Use paired chat or group working for children to talk through:             <ul style="list-style-type: none"> <li>○ What needs to be investigated</li> <li>○ How it can be investigated</li> </ul> </li> </ul>	<p><b>Gold: Can I use technology to investigate a problem?</b></p> <p>Silver: Can I use technology to record and show data in a chart or graph?</p> <p>Bronze: Can I use technology</p>

<p>data in an appropriate way</p>	<ul style="list-style-type: none"><li>• Check children relate this to the experiences using a datalogger /app in the previous session. They will be recording sounds levels of noise / traffic as it passes the school and sounds outside the classroom but within the school e.g. transition between lessons.</li><li>• Agree the process for collecting data. Log the sound at a useful time(s) of day and, at the same time, record the noise with a tablet, microphone or laptop. Thjs will be used to support the analyse later.</li><li>• You will need to discuss what sound level is appropriate for working – this will depend on the type of work.</li><li>• Create hypothesises prior to survey:<ul style="list-style-type: none"><li>○ ‘What happens to sound levels as the traffic passes / things happen outside the classroom?’</li><li>○ ‘How has the size of the vehicle / type of activity outside the classroom effected the noise recorded?’</li><li>○ (‘How does speed affect the sound recorded?’)</li></ul></li><li>• OR<ul style="list-style-type: none"><li>○ ‘What kinds of noises happen while we work?’</li><li>○ ‘Which sounds affect how well we concentrate?’</li><li>○ What is an appropriate sound level to work at?</li></ul></li><li>• You may want to capture snapshots of sounds for children to interpret block graphs or to record sounds over a particular period.</li><li>• View the line graph / block chart plotted together. Ask the children what sounds influenced the line graph. Listen to the recorded sound to see if children can identify where on the line graph different sounds occurred. Discuss how high/low the decibels (dB) were during the experiment.</li><li>• <b>Optional:</b> Extend the investigate to agree the appropriate sound level for different activities in the classroom; quiet individual working, paired chat time, group activities.</li></ul>	<p>to help find something out?</p>
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	<ul style="list-style-type: none"> <li>Ask the children 'What was data?, What was information? What knowledge was gained. You could refer back to slide 11 of <a href="#">Y4 Data and Information Powerpoint</a>. Are the children beginning to recognise that data only makes sense when it has a context?</li> </ul>	
3	<p><b>Handling Data</b></p> <p>I can choose an appropriate tool to help me collect data</p> <p><b>Investigating insulators of sound</b></p> <ul style="list-style-type: none"> <li>Homework - Prior to lesson ask children to bring items that may form good insulators of sound such as a shoe box full of shredded newspaper or cotton wool.</li> <li>Explain that we are going to conduct an experiment to investigate which materials are good insulators of sound. We are going to suggest materials that could be used to insulate our classroom. What equipment could we use to collect this data?</li> <li>Take suggestions from the children – they should contribute the suggestion of datalogger or sensing app.</li> <li>Ask the children to predict from the examples other children have brought into school, hypothesise which items may form good insulator of sounds. Position a tablet or other source of sound in a similar position in each one of the insulated shoe boxes etc. Keep the sound/music at a constant volume as part of a fair test.</li> <li>Children can work as small groups to record sound using app/datalogger.</li> <li>Collect feedback from the groups in to a chart/table or annotated screen shots of software. List findings and explain reasons why some materials are better than others.</li> <li>Children can present their findings using a presentation tool or software and comment upon each other's findings.</li> <li>Talk about how we have turned the data we collected into information for other people. What knowledge have we gained?</li> </ul>	<p>Gold: Can I explain why some materials are better sound insulators than others?</p> <p>Silver: Can I carry out a fair test to find out which materials are good insulators of sound?</p> <p>Bronze: Can I think of what might make a fair test?</p>