SCIENCE
YEAR 5-6
Cycle B – Unit 12

Sound

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RANGE

How things work

4. how different sounds are produced and the way that sound travels

KEY VOCABULARY

wave
vibration
pitch
volume
loudness
insulation
muffle
tension
generate
variables
line graph
reliability
scale

Developing thinking

(Plan-Develop-Reflect integrated into activities)

LNF - Main Numeracy Strands covered*

Strand:
Developing numerical reasoning.

Element:
Represent and communicate.
Review.

Strand:
Using data skills.

Element:
Collect and record data; Present and analyse data; nterpret results.

**Refer to LNF Numeracy framework for details of specific skills within each element.*

LNF – Literacy (writing) opportunities

Element: Organising information and ideas
Writing accurately

Writing to inform, explain and persuade

Developing ICT

School to identify and provide opportunities for developing this skill within the scope of the unit.

Curriculum Cymreig

School to identify and provide opportunities for developing this skill within the scope of the unit.

Personal and social education

School to identify and provide opportunities for developing this skill within the scope of the unit.

Science – Medium Term Planning (half term)

Year Group	**5-6**	Term	**Cycle B – Unit 12**	Unit Title	**Sound**

Range: ***How things work***
4. how different sounds are produced and the way that sound travels

Cross Curricular Links:

Skills (Principal skills in bold italics)	**Suggested activities**	**Resources and web links**	**Assessment Opportunities**
PLAN ***Identify gaps in prior knowledge*** Ask relevant questions	**1. Big Question: What do you know about sound?** **Sound: NGfL KS2 science** Introduce topic and elicit pupils' ideas about the nature of sound, how it's generated and how it travels etc. Consider using : • true-false game, odd-one-out activity or online interactive activities • Concept Cartoon and/or video clip. Pupils raise questions or create their own true false cards. Or • Challenge pupils to draw and explain how sound travels and reaches our ears. • Begin to create a graffiti board of pupils' questions. Begin to create a KWL grid. Challenge pupils to say *how* they intend to find things out. List sources of information that are available.	http://resources.hwb.wales.gov.uk/VTC/2009-10/science/cripsat/e33-sound/index.html http://ngfl-cymru.echalk.co.uk/index.htm Concept Cartoons	Use preferred diagnostic strategy/tool
PLAN ***Search for relevant information*** Ask relevant questions **DEVELOP** ***Use prior knowledge to explain*** **REFLECT** Decide whether the method was successful	**2. Big Question: How is sound made?** Allow pupils to explore a selection of instruments, tuning forks, buzzers, elastic bands and other devices that emit sound. **Introduce the skill – Finding information and explaining** • Introduce question**:** *How is sound generated?* • Allow pupils opportunity to explore a range of tuned and percussion instruments. • What do pupils notice about how sound is generated? Can they feel any vibrations? • Can they find out any additional information from books and/or websites? • Model an effective internet search. Which sites are more reliable? Why. **Practise the skill – Finding information and explaining** • Pupils to explore instruments and devices and report back their findings. • Search for and access information about sound generation. • Report back to class. • Produce an ideas poster detailing their new knowledge. **To write to inform** **Text type: non-chronological report**	Variety of books, websites etc http://resources.hwb.wales.gov.uk/VTC/2009-10/science/cripsat/e33-sound/index.html http://www.echalk.co.uk/ http://www.bbc.co.uk/education/topics/zgffr82	***Can pupils find and use a variety of information and ideas? (Level 4)*** ***Can pupils find and use relevant information and ideas? (Level 5)***

PLAN Plan the method to be used **DEVELOP** ***Make careful observations*** ***Form considered opinions*** **REFLECT** Describe how they have learned	**3. Big Question: Does sound travel through all materials?** **Introduce the skill – Making observations and forming conclusions** Use Concept Cartoons to trigger discussion – do pupils think sound travels through all materials? Water? Wood? Outer space? Will they be able to hear an alarm bell sealed in a plastic bag and immersed in water? • How will pupils explore and answer this question? Groups discuss and outline a plan/method. • What will they 'measure'? • How will they record their findings? **Practise the skill – Making observations and forming conclusions** • Allow pupils to undertake the exploration and tabulate their qualitative findings • Some pupils may elect to use the datalogger to measure sound and may therefore record which material allows the most/least sound to travel through. • Discuss findings? What do pupils notice? • What are the conclusions they can draw from their work? • List the materials that sound is able to pass through? **To write to explain** **Text type: science write-up**	http://resources.hwb.wales.gov.uk/VTC/2009-10/science/cripsat/e33-sound/index.html http://ngfl-cymru.echalk.co.uk/index.htm	***Can pupils make qualitative observations and use standard equipment? (Level 4)*** ***Can pupils select the appropriate measuring equipment? (Level 5)*** ***Can pupils draw conclusions and form considered opinions? (Level 4)***
PLAN Plan the process/method to be used Control hazards and risks **DEVELOP** ***Use equipment correctly*** ***Make comparisons and identify trends or patterns*** **REFLECT** Link learning to similar situations within and outside school.	**4. Big Question: How do sounds change? What is pitch and volume?** Review knowledge on sound generation and how sound travels. Allow pupils to explore stringed and percussion instruments. How is size and/or type of string related to the nature of the sound produced? **Introduce the skill – Use apparatus correctly and make comparisons** • Groups to list observations. • Does the larger drum produce a 'lower' sound? How do thicker strings behave? • Explore different sized tuning forks. • Introduce terms pitch and loudness. **Practise the skill – Use apparatus correctly and make comparisons** • Challenge pupils to sort the assembled instruments into groups according to the pitch of the sound they produce. • Are pupils able to sort using a Venn or Carroll diagram? • Can pupils describe their groupings? What characterises lower pitched instruments? Higher pitched instruments? How is pitch changed? • How can we make a sound louder? • Can pupils measure this? (datalogger)	http://resources.hwb.wales.gov.uk/VTC/2009-10/science/cripsat/e33-sound/index.html http://www.echalk.co.uk/ http://www.bbc.co.uk/education/topics/zgffr82	***Can pupils make qualitative observations and use standard equipment to measure using SI units? (Level 4)*** ***Can pupils select the measuring instruments that allow them to make accurate measurements? (Level 5)*** ***Can pupils identify patterns and trends? (Level 4)***

PLAN Outline the plan/method **DEVELOP** ***Make careful observations using digital equipment*** ***Check observations by repeating them*** **REFLECT** Suggest how the method could have been improved	**5. Big Question: How far does sound travel?** Show pupils video clip of noisy workplaces and/or activities. Discuss sound pollution and potential damage to human hearing from loud noises. **Introduce the skill – Check observations by repeating them for reliability** • Review the datalogger and allow all pupils to familiarize themselves with recording dB. • Challenge pupils to either devise a test to find out which mobile phone ring tone is the loudest and/or travels the furthest or • Investigate how the loudness of a sound changes as you move further away from the sound source. • Introduce the concept of repeat readings to ensure reliability. **Practise the skill – Check observations by repeating them for reliability** • Pupils to select a testable question. Outline plan/method and carry out. • Option 1: which mobile phone ring tone is the loudest or travels furthest? (bar chart) • Option 2: investigate how the loudness of a sound changes as you move further away from the sound source (line graph). • Record observations – tabulate and consider 3 repeat readings for reliability. • Discuss average – mean, mode and median.	Dataloggers Selection of devices and/or mobile phones	***Can pupils select the measuring instruments that allow them to make accurate measurements? (Level 5)*** ***Do pupils consider reliability? (Level 5)***
COMMUNICATION ***Communicate using tables bar and line graphs*** **REFLECT** Suggest how the method could have been improved	**6. Big Question: How far does sound travel? …cont.** **Practise the skill – Using bar charts and line graphs** • Review knowledge of graph types – explain nature of categoric and continuous data. (Words plotted against numbers produces a bar chart; numbers plotted against numbers produces a line graph.) • Produce bar chart or line graph (depending on chosen variables). • More able pupils: construct their own bar chart, selecting axes and scales. • What patterns can pupils describe from their findings? **To write to explain and inform** **Text type: science write-up**	'Science Enquiry Games' book 'Which graph?' pupil sheet http://nces.ed.gov/nceskids/createagraph/	***Can pupils select the appropriate type of graph to use? (Level 5)*** ***Can pupils use line graphs to describe the relationship between two continuous variables? (Level 5)***
PLAN ***Identify key variables in a fair test, including independent, dependent and control*** **DEVELOP** ***Use equipment correctly*** **REFLECT** Describe how they have learned	**7. Big Question: Can you insulate against sound?** Introduce the question: Which material blocks sound most effectively? Allow pupils to explore materials. What do pupils predict? Why? **Introduce the skill – Identifying key variables in a fair test** • Challenge pupils to list all the variables on post-it notes and diamond rank the factors that are more or less important for sound insulation. • Ensure pupils list all key variables. Help them identify independent, dependent and control variables. **Practise the skill – Identifying key variables in a fair test** • Help pupils raise a testable question and plan accordingly using planning template. • How will they generate a constant sound source? • What equipment will they require? How will they record their results? • More able pupils: they may wish to record how the thickness of one type of material affects the sound that passes through (thickness v sound level gives a line graph.) • How will they ensure reliability? • Pupils to carry out investigation. • Review findings.	Card sort activity Planning templates Dataloggers Selection of materials Alarm clocks Egg timers	***Can pupils identify all key variables, including independent, dependent and control? (Level 5)*** ***Can pupils select the measuring instruments that allow them to make accurate measurements? (Level 5)***

COMMUNICATION ***Communicate using tables bar and line graphs*** **REFLECT** Suggest how the method could have been improved	**8. Big Question: Can you insulate against sound? Cont.** Review previous task. **Practise the skill – Using bar charts and line graphs** • Review knowledge of graph types – explain nature of categoric and continuous data. • Type of material plotted against sound level gives a bar chart. • Number of layers of material plotted against sound level gives a bar chart • Thickness of material plotted against sound level produces a line graph. • Produce bar chart with support. • More able pupils: construct their own bar chart, selecting axes and scales and/or complete line graph with support. • What patterns can pupils describe from their findings? • Write a formal letter – pupils plan and write a letter from the council to tenants explaining which materials are best to insulate walls from noisy neighbours. **To write to explain and persuade** **Text type: persuasive letter**	'Which graph?' pupil sheet http://nces.ed.gov/nceskids/createagraph/	***Can pupils select the appropriate type of graph to use? (Level 5)*** ***Can pupils use line graphs to describe the relationship between two continuous variables? (Level 5)***
DEVELOP ***Use some prior knowledge to explain*** **REFLECT** Begin to evaluate outcome against success criteria	**8. Big Question: What have we found out about sound?** **Introduce the skill – Use prior knowledge to explain** • Show pupils new concept cartoon linked to sound topic and/or use template to create their own cartoon. Discuss. • How have pupils' ideas moved on? • Pupils create their own science randomizer game. • Review the work on sound, pitch and volume. List new ideas and knowledge. • Challenge pupils to write a poem to explain ideas on sound.		***Can pupils explain using some scientific ideas? (Level 4)*** ***Can pupils explain using simple models? (Level 5)***

REFLECT ***Describe how they have learned, and identify the ways that worked the best.*** Link the learning to similar situations, within and outside school.	Revisit initial diagnostic assessment. Can pupils demonstrate understanding at end of topic and discuss new skills learned and/or practised?	Use preferred AfL strategy	***Can pupils describe how they have learned and identify the ways that worked the best? (Level 4)*** ***Can pupils identify the thinking/learning strategy they used? (Level 5)***
Evaluation			