

Topic: Hearing, Vibration and Sound

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Issues tackled:

1. Key ideas, use of language and terminology– Describing sounds.
2. Investigative skills – Investigating noise.
3. ICT – Using a CRO.

Issue 1: Key ideas, use of language and terminology – Describing sounds

Prior knowledge and experience:

Possible tasks:

Preparation for tutorial:

1. Prepare a glossary of the key words in this topic (key words might include loud, soft, quiet, high, low, pitch, noise pollution, frequency, amplitude, wave, loudness, volume, dynamics).
2. Produce a concept map of the following scientific words: quiet, soft, low, pitch, wave, loudness, volume, dynamics, frequency, amplitude.

Possible activities during tutorial:

1. Present glossary and discuss words with different scientific and everyday meanings (e.g. wave, pitch, volume).
2. Present the concept map and explain how you would use it with pupils of different abilities.

AST Input:

- Highlight any misconceptions arising from the activities.
- Advise / refer to possible teaching material.

Reading: Subject knowledge and understanding

Cleminson, A. (ed) (2003). **Brunel University Physics Materials** contains resources for trainees to use to improve their subject knowledge using a self taught approach under [Waves, Light and Sound](#).

Subject pedagogy

Useful websites and applications

<http://science.howstuffwork.com>

Resources: Tasks 1 and 2

QCA Scheme of work

www.standards.dfes.gov.uk/schemes3 and select Science Key Stage 3, then unit 8L Sound and Hearing.

Issue 2: Investigative skills – Investigating noise

Prior knowledge and experience:

Possible tasks:

Preparation for tutorial:

1. Investigate sound levels around the school, using a portable decibel meter or sound sensor and datalogging kit. Evaluate the appropriateness of this investigation for a KS3 class.
2. Devise an investigation into the sound insulating properties of different materials.

Possible activities during tutorial:

1. Present findings and plans.
2. Demonstrate the equipment and method proposed.

AST Input:

- Discuss the health and safety implications of Sc1s concerning sound and possible work outside the lab.
- Discuss issues for pupils with hearing impairment.
- Discuss different ways for groups of pupils to present their findings from an investigation.

Reading: Subject knowledge and understanding

Several published KS3 schemes suggest investigations on this topic; see texts/resource packs for information. E.g. **Spotlight Science 8**, Nelson Thornes, Cheltenham.

Subject pedagogy

Sang, D. and Wood-Robinson, V. (Eds), (2002), **Teaching Secondary Scientific Enquiry**, ASE/John Murray, London. Most of the book is relevant, particularly pages 13-15.

Useful websites and applications

<http://www.primaryresources.co.uk/science/science.htm>

Resources: Task 1

Sound sensor and datalogger or decibel meter.

Task 2

As requested by trainee but possibly buzzer and cell, box to contain them, various insulating materials and sound sensor or decibel meter.

Issue 3: ICT – Using a CRO

Prior knowledge and experience:

Possible tasks:

Preparation for tutorial:

1. Learn how to use a CRO to show different amplitudes and frequencies.
2. Plan a starter using ICT for a lesson on sound.

Possible activities during tutorial:

1. Demonstrate the use of a CRO.
2. Present starter and discuss the advantages and disadvantages of using ICT to teach sound.

AST Input:

- Demonstrate correct use of the CRO with a microphone and a signal generator. Discuss common problems/fault finding.
- If possible demonstrate the use of a sound sensor and computer to display a waveform.

Reading: Subject knowledge and understanding

Subject pedagogy

D. Sang (ed); **Teaching Secondary Physics**, ASE, Hertfordshire, pages 51 – 53 oscilloscope demonstration.

Useful websites and applications

Resources: Task 1 and AST Input

CRO with signal generator, connector, loudspeaker and microphone.

D. Sang (ed); **Teaching Secondary Physics**, ASE, Hertfordshire, pages 51 – 53 oscilloscope demonstration.