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| **Homemade drum and earmuffs** |
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| Making drums and earmuffs from different materials, to test the amount of noise they make and dampen |
| **Subject(s):** Science**Approx. time:** 70 – 90 minutes |  | **Key words / Topics:** * Dampen
* Drum
* Drum skin
* Earmuffs
* Sound
* Volume
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| **Suggested Learning Outcomes**  |  |  |
| * To make a drum and test the amount of noise made.
* To make a set of earmuffs and test how well they dampen sound.
* To investigate the effects of different materials on sound.
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| **Introduction** |  |  |
| This is one of a set of resources developed to support the teaching of the primary national curriculum. They are designed to support the delivery of key topics within maths and science. This resource focusses on making drums and earmuffs, using different materials to investigate their effect on sounds.Musical instruments bring joy and entertainment to millions of people in the world every day. But do you know how they work? Let’s find out! |
| **Purpose of this activity**In this activity learners will develop their knowledge and understanding of sound. They will make a drum using different materials and test how each material affects the sound. They will then make a set of earmuffs using different materials and test how well each material dampens the sound.This activity could be used as a main activity to develop knowledge and understanding of how sound works, or as part of a wider scheme of learning focussing on sound and musical instruments. |
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| **Activity** |  | **Teacher notes** |
| **Introduction (2-5 minutes)**Teacher to explain that learners are going to make and test a drum and a set of earmuffs using different materials. **Making the drum (15-20 minutes)**Teacher to hand out materials and equipment needed to make the drum. Teacher to demonstrate how to make the drum using the teacher presentation as a guide. Learners to follow the instructions on the presentation and the teacher demonstration to make their drum.**Testing the drum (20-30 minutes)**Learners to use their drumsticks to tap the ‘skin’ of the drum a few times and listen to what happens.Learners to replace the ‘skin’ with different materials. Teacher to ask learners what the difference is in the sound of each material.**Making the earmuffs (15-20 minutes)**Teacher to hand out materials and equipment needed to make the earmuffs. Teacher to demonstrate how to make the earmuffs using the teacher presentation as a guide. Learners to follow the instructions on the presentation and the teacher demonstration to make their earmuffs.**Testing the earmuffs (20-30 minutes)**Learners to place the card strip around the top of their head so that the cotton wool is over their ears. Learners to clap their hands a few times and consider what effect the earmuffs have on the sound.Learners to try different materials instead of the cotton wool. Ask learners which works best at dampening the sound and why. |  | This activity could be carried out as individuals or in small groups. This lesson can result in a high volume of sound in the classroom, which can be partially reduced by working in teams.**Making and testing the drum**The plastic bag acts as the ‘skin’ of the drum. Any container, bowl, bucket or other similar object can be used as the body of the drum, as long as it has an open top. The ‘skin’ of the drum should be secured as tightly as possible to achieve the best sound. Learners could think about the difference in loudness, pitch etc. of each material. Different materials could include tissue paper, normal paper, different fabrics etc. Pencils or small pieces of wood could be used as drumsticks. Alternatively, learners could tap with their hands.**Making and testing earmuffs**Learners cold use PVA glue to attach the cotton wool or use double sided sticky tape to attach it in place. The earmuffs need to cover the whole of each ear to be effective, so will need to be sized appropriately. Learners could also decorate their earmuffs for extra visual appeal and/or to personalise them.The cotton wool should dampen the sound – i.e. it cannot be heard as loudly as when the earmuffs are not being worn. Different materials could include cardboard, foam material or polystyrene. Get learners to think about which materials work well and which don’t, and why that is. E.g. polystyrene does not dampen the sound well because it has holes in it and therefore the sound vibrations can get through more easily.  |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| Pre-make drums and earmuffs so learners can concentrate on testing them.Provide a template for cutting out the drum ‘skin’ for each material. |  | Decorate the drum and earmuffs to personalise them and add visual appeal.List different applications for earmuffs. E.g. for safety when protecting ears against noisy machines or loud music at a concert. |
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Container, bowl or bucket for the drum body
* Different materials for the drum skin, such as plastic bags, tissue paper, normal paper and assorted fabrics
* Drumsticks (pieces of wood or pencils could be used instead)
* Strips of card
* Scissors
* Different materials for the earmuffs, such as cotton wool, cardboard, foam or polystyrene
* PVA glue, glue sticks and/or sticky tape
 |  | icon-ppt Teacher presentation – Homemade drum and earmuffs |
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| **Additional websites** |  |  |
| * **WikiHow – How to make a homemade drum:** Instructions on how to make a drum at home. <https://www.wikihow.com/Make-a-Homemade-Drum>
* **Making earmuffs:** Examples of earmuffs made by a primary school as part of their science and design and technology lessons. <https://www.oldtown.calderdale.sch.uk/making-earmuffs/>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Show examples of different drums and earmuffs made in the classroom.
* Recap how sound travels from the point where it is created to the human ear.
 | **Extension** (Options)* Decorate the drum and earmuffs to personalise them and add visual appeal.
* List different applications for earmuffs. E.g. for safety when protecting ears against noisy machines or loud music at a concert.

**Plenary*** Discuss the findings of the activity – what materials were best at creating sound (drums) and what materials were best a dampening it (earmuffs).
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| **The Engineering Context** film |
| * Sound engineers try to ensure that music is recorded in a way that produces good results for the listener. It is extremely important that they understand how sound is both created and dampened, and which materials work well for this.
* An understanding of how sound is both created and dampened is vital to the development of products for the music industry. For example, musical instruments, earphones, speakers and portable music players.
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| **Curriculum links** |
| **England: National Curriculum**ScienceKS2 Year 4 Sound:* 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.
 | **Northern Ireland Curriculum**KS2 – The world around usMovement and energy:* the causes and effect of energy, forces and movement.
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| **Scotland: Curriculum for Excellence**SciencesVibrations and waves:* SCN 1-11a
* SCN 2-11a
 | **Wales: National Curriculum** ScienceKS2 – How things work:* how different sounds are produced and the way that sound travels.
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| **Assessment opportunities** |
| * Formal teacher assessment of drums and earmuffs produced by learners.
* Questioning of learners during demonstrations and making/testing.
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