

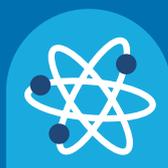
Suitable for  
3-7 years

- Solo
- Pairs
- Groups

Antonio's activity

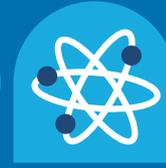
# Build a noisemaker

How to guide



# Antonio's activity

## Build a noisemaker

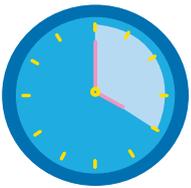


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### Aim

The aim of this activity is to explore noise – firstly how can we make something very noisy and secondly what can we do to reduce the noise.

This activity was inspired by the Wee Engineers Noisemaker Activity. You can see their full instructions and materials list on their website [here](#).



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### Time required

You might want to use a couple of sessions, one to introduce the noisemaker and then one to follow up with the noise reducer activity. ~15–20 minutes per activity.



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### Materials and equipment

- Containers – we used empty matchboxes (find 10 for £1.79 [here](#)). You could also use small gift boxes.
- Craft stick to connect to container to act as handle
- A mixture of materials to go inside your containers – e.g. things that will be quiet when shaken inside a box like ribbons, cotton wool, foam, scraps of material, pom poms, feathers and things that will be loud when shaken inside a box like buttons, coins, bits of old crayon, Lego pieces, paperclips. To start with stick with ~3 quiet and ~3 loud options, checking that they fit inside the containers you are using.

- You can always introduce further materials when allowing the children to come back and repeat the activity. Another change you could make at this stage is the choice of container – does it make a difference?
- A mixture of materials to cover your boxes e.g. cloth, paper, bubblewrap, silver foil, bigger containers, clothes
- Crafting supplies for adding materials to the boxes like tape, glue, rubber bands, string, pegs
- A mixture of objects to place as barriers e.g. cushions, table, cuddly toys, blankets, books, any kind of upright stand like a plastic section divider
- A toy rabbit and another cuddly toy



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## Health and safety

Supervise use of small parts.

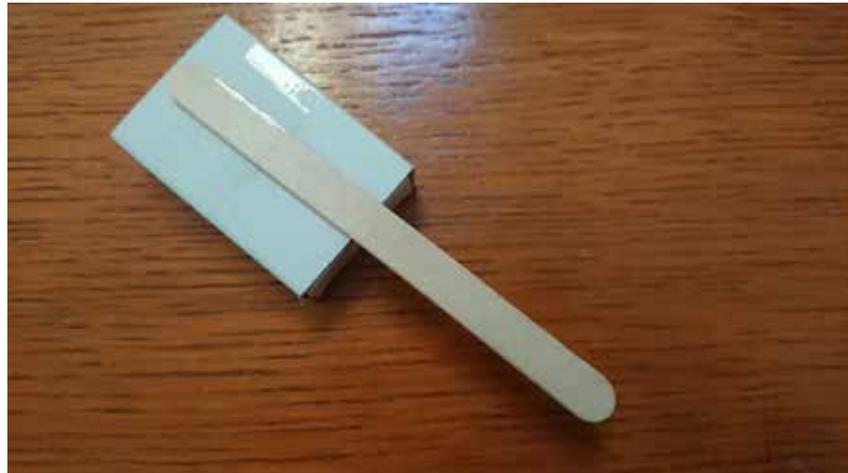


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## Building the Noisemaker

1. Introduce the activity with the selected cuddly toy (not the rabbit). We suggest using as a puppet who needs help to engineer a noisemaker for a party. Have the puppet show a noisemaker they have made (with e.g. pom poms in it) that is quiet. Ask the children for help to make it louder.
2. Invite the children to explore using different materials to create their noisemaker. You might want to pre-prepare the empty noisemakers (craft stick sellotaped to empty matchbox) or have the children assemble themselves depending on the time you have available and the age/ability of your children. They could also decorate the matchbox if they like.

3. Encourage the children to test their noisemakers and improve them, e.g. add more materials, use less materials, use different materials, use a mixture of materials. If you want, and if your computer has a working microphone, you could measure how loud the noisemakers are. Here are a couple of options: [Too Noisy App](#) or [Youlean loudness meter](#).



## Prompt questions

- How loud is your noisemaker? Does it make a difference how close you hold it to your ear/the measurement device?
- What materials did you choose? Why?
- Do you think you can make it louder?
- What did you change? Did it work? Why/why not?

## How does it work?

The noise made will depend upon the material(s) chosen (harder materials will tend to be more noisy whereas softer materials will absorb sound). The noise will also depend upon how many pieces of material are in the box (ask your children to count how many they have used) – there needs to be some room for them to move to be noisy. How the box is shaken will also influence the sound produced, with generally more vigorous shaking producing a louder sound.

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## Building the Noise Reducer

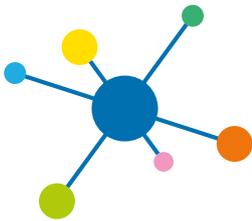
1. Read the story Rabbit's Nap
2. Show your toy rabbit and explain that the rabbit wants to go to sleep even while the noisemaker is being used (for use in this activity select the loudest noisemaker). Place the rabbit in a 'bed' a short distance from the table where you will be working. You could place the recording app here to measure the success in noise reduction (note – check that at the distance you choose and the noisemaker you have that the sound can be measured effectively).
3. Challenge the children to engineer a solution to reduce the sound made by the noisemaker. Ask the children for ideas of ways to reduce the sound. There are two strategies to try out – adding material to the noisemaker itself to dampen the sound and/or changing the path from source (noisemaker) to receiver (sleeping rabbit), e.g. by changing the distance between them or by placing a barrier between them.

## Prompt questions

- Can you add something to the noisemaker to make it quieter?
- What material did you choose?
- Did it make it quieter? Why? If not what else could you try? (Several layers of a material might be needed)  
Is there another material you could try?
- Can we shield the rabbit from the noisemaker sound?  
How could we do that?

## How does it work?

Covering the noisemaker with a soft material absorbs the sound waves and reduces the noise. By placing a barrier between the noisemaker and the rabbit sound waves are blocked and absorbed – again soft materials are likely to have worked best at absorbing the sound.



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## Engineering career links

Antonio who developed this activity is an acoustical engineer. He works on reducing sound from different types of transport from traffic noise to drones. He knows that such noise can be really annoying and be very bad for you, for example being exposed to too much loud noise can damage your hearing or noise can disturb your sleep and has even been linked with increased stress and heart disease. Other acoustical engineers might design large things like better-sounding concert halls, or small versions of loudspeakers or microphones, e.g. for mobile phones; they might also improve medical imaging, e.g. clearer ultrasounds or design quieter aircraft and cars or improve the design of homes to reduce noise impacts.



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## Extension ideas

Repeat the activity with different materials; try out our listening activity; ask the children to think of things that they find too noisy and see if they can come up with ideas and designs of how to reduce the sound.