



Universität
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Swiss Nanoscience Institute



A Christmas-themed sonic pistol

You can use a sonic pistol to extinguish candle flames – it makes a change from blowing them out yourself!

What you'll need:

- a balloon
- an empty toilet paper roll
- adhesive tape
- a pencil
- an elastic band
- scissors
- card
- a needle
- a tealight
- a lighter

Instructions:

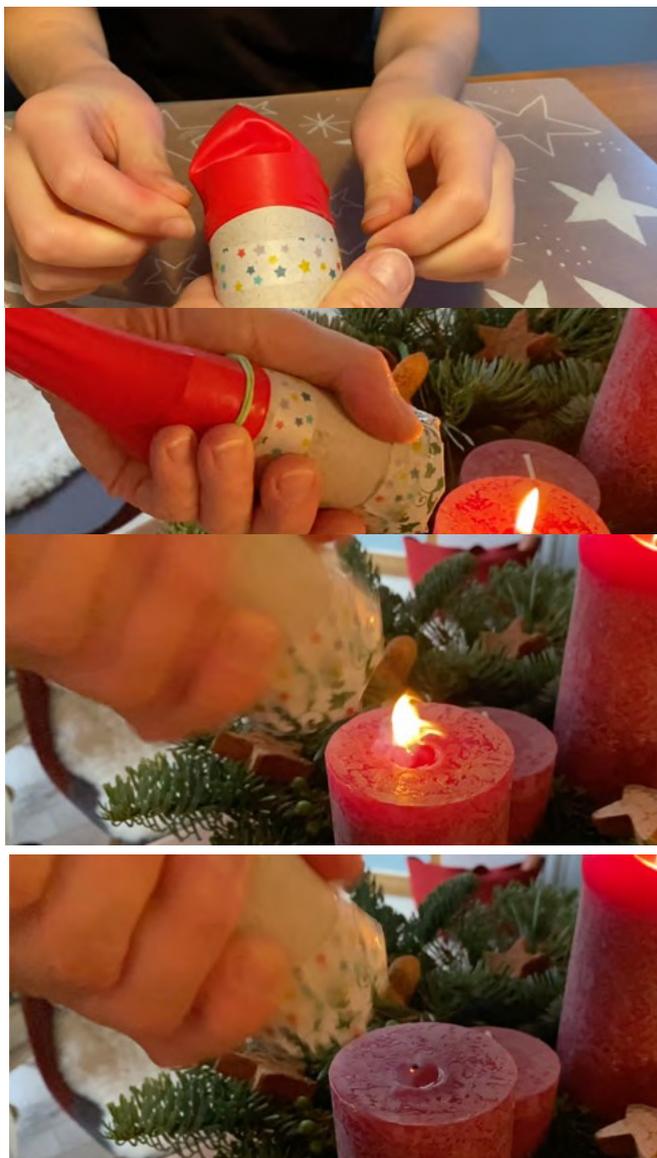
- Place the toilet paper roll on the card and draw round the base with the pencil. Draw another larger circle around 1 cm apart from this one.
- Cut out the larger circle.
- Next, make a series of cuts into the card from the outer edge to the inner circle.
- Fold the resulting flaps inward.
- Attach this lid to the toilet paper roll using adhesive tape. Start with small strips of tape, and then wind a longer piece round the whole thing.
- Using the needle, poke three small holes in the middle of the disc.
- Cut the neck off a balloon, and stretch the rest of it over the other end of the toilet paper roll. Fix the balloon firmly in place with an elastic band.
- Light the tealight and prepare your sonic pistol. Please ask an adult to join you as you are experimenting with fire.



- Aim the holes in the lid toward the flame, pull the balloon back and let it go.
- It's a good idea to support your arm and hand to keep them steady.
- If the flame doesn't go out the first time, try again. You can try adjusting your aim, moving the pistol a little closer or pulling the balloon further back.

What happens and how does it work?

- When you release the balloon, you will hear a sound.
- This happens because the movement sets the air molecules inside the tube in motion, producing a soundwave.
- These air molecules escape through the holes in the card, and the soundwave is enough to extinguish the tealight.
- In this experiment you can hear the sound just before you see the effect. This is because it takes a small amount of time for the soundwave to reach the flame.



If you'd like to find out more



Check out our other experiments involving sound. In the instructions you'll find lots of interesting information about sound and how it travels, and why we are able to hear sounds, notes and noises.