Sound Cannon

PoS - identify how sounds are made, associating some of them with something vibrating
NaG - pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world
WS - pupils should make systematic and careful observations

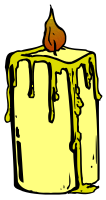
Making a Sound Cannon

Use the following materials to make your sound cannon:

Hollow cardboard tube

Cardboard disc, with a 1cm diameter hole in the middle (exit hole) This will be attached to the non-striking end of the sound cannon. You will also need two more discs; one with a 3cm hole in the middle and the other with a 0.5 cm hole.

Rubber (or suitable cloth) to stretch over the striking end of the cannon



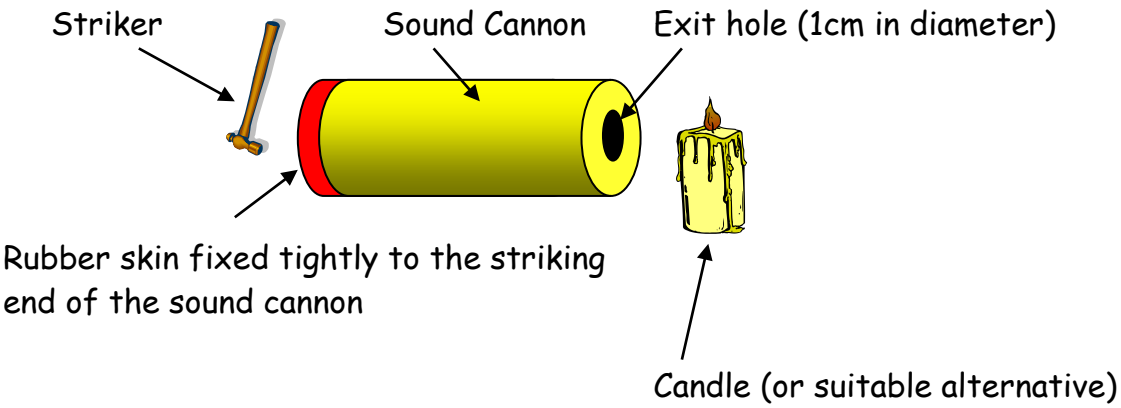
Candle (or suitable alternative e.g. a hanging thread or soft feather) placed approximately 5cm away from the hole in the cannon
(Remember health and safety - card burns!)

Hammer (or suitable striker) to hit the sound cannon

Sticky tape to help construct your cannon

Scissors to cut your materials

Make your Sound Cannon



Investigation

1) Before carrying out your investigation, **predict** what will happen to the candle flame (or alternative) when the striker hits the rubber skin.

2) Predict what will happen to the candle flame if:

a) The striker delivers one soft blow to the rubber skin
b) The striker delivers one hard blow to the rubber skin
c) The striker hits the rubber skin repeatedly with a number of soft blows

3) Carry out the following tasks and record what happens to find out if your predictions were accurate:

a) The striker delivered one soft blow to the rubber skin
b) The striker delivered one hard blow to the rubber skin
c) The striker hit the rubber skin repeatedly with a number of soft blows

4) Having observed and recorded what happens to the candle flame when striking the sound cannon, try to explain **why** this happened.

5) What is travelling out of the cannon's exit hole?

6) What will happen to the candle flame if the sound cannon was adapted to have an exit hole of 3cm in diameter?

Change the disc for one which has a 3cm diameter exit hole. Strike the cannon to see what happens and whether or not your prediction was accurate. Record your findings.

7) What will happen to the candle flame if the sound cannon was adapted to have an exit hole of 0.5 cm in diameter?

Change the disc with one that has a 0.5 cm diameter exit hole. Strike the cannon to see what happens and whether or not your prediction was accurate. Record your findings.

8) What would happen to your sound cannon if the tight rubber striking end was replaced with a loose cloth covering? Explain your prediction then carry out an investigation. Try to explain what happens and why.

Extension - Cut out the diagram below, paste it into your book and explain why it is possible for Ralph to hear the radio.

Think about how the sound is being produced, what it has to travel through to reach Ralph and what happens when it reaches Ralph's ear.