

TEACHER'S GUIDE

HALLÉOOJAMAFLIPAPHONE

EPISODE 1 OF 3

MAKE IT, TEST IT

Thinking as a Scientist



CONTEXT

This suite of three episodes have been written to enable pupils to respond creatively to the Halléoojamaflipaphone. They are designed to inspire curiosity, discussion and collaboration between pupils and teachers, and to encourage an appreciation of how science and engineering come together to make a difference in the world around us.

The three episodes are sequential and develop ideas and skills from previous learning opportunities.

Children will be able to work scientifically by doing a comparative investigation:

- to plan an enquiry, recognising and controlling variables where necessary
- to pose a scientific question
- to determine the difference between an evaluation and a conclusion

Children will learn:

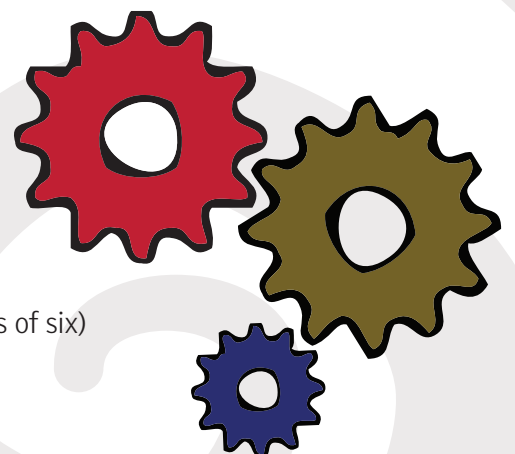
- to associate sound with vibration
- to find patterns between the volume of a sound and the strength of the vibrations that produced it.
- to construct a simple circuit including cells. Wires switches and motors

RESOURCES

Working speaker, cling film, cornflour (demo)

Sandwich wrap plastic tray, Mixed materials to cover the sandwich box. electric motor, switch, wires, crocodile clips, battery, dried peas and other items to shake for sound (example pasta shapes dried and soaked, lentils, cotton wool) (pupil activity enough for groups of three)

Balloons, 5p coin, a small nut from a bolt (demonstrate or undertake in groups of six)



EPISODE OUTLINE

Pupils act as scientists to make and test a simple device. The novel device has been called an 'audiobot'. The audiobot is a simple sound maker but instead of a human doing the shaking an electric motor is used to provide consistent vibration. In this way, what was originally an 'uncontrolled variable' can now be controlled and pupils can carry out a fair test by changing the object in the shaker or the surface of the shaker and observe the outcomes.

The episode encourages pupils to clearly define 'independent variables' and 'dependent variables'. Pupils must decide which to control for their test.

EPISODE DETAIL

SLIDE 1:

Pupils watch a short demonstration of dancing cornflour gloop on a sound speaker. The aim is allow pupils to make the link sound and movement. There are a range of Youtube films to help prepare for this demonstration.

Cover the speaker with cling film and put some mixed water and cornflour onto the cling film. Switch the speaker on and play music. Ask pupils to observe until they are ready to act out the movement that they see. The class become the dancing goo. Switch off the music and what happens to the dancing? Switch on the music and what happens to the dancing. Do not explain the term 'vibration' at this stage.



SLIDE 2:

Provide pupils in groups of three with a laminated 'Thinking Red Hand' tablemat (Pupil Challenge Sheet 1:1). Ask pupils to note on each finger, with whiteboard marker pen, an item that makes a sound. Encourage unique answers different from others on the table.

Now, play the 'Last Person Standing' game - ask all the children to stand with one hand in the air with 5 fingers straightened. Go around the group asking each person to read out a word. If their word is read out they must put a finger down, and when eventually all their five fingers have gone they must sit down. Keep going until there is only one hand still up – this person is the 'winner'.

On the slide reveal the keyword 'vibration'. Ask pupils to check each of their five items on their hand to confirm if vibration can be the connecting concept. Add in the keyword vibration to the placemat and discuss any anomalies.

SLIDE 3:

Explain to pupils that they are going to make a sound maker and use it investigate. In particular they will be doing comparative tests. Be explicit and identify the independent variables and dependent variables. This is often done using planning posters and post it notes. For more information about this approach visit

www.pstt-cpd.org.uk/ext/cpd/dips/resources/pdfs/Sc1-Planning-Posters.pdf

Develop with pupils the need to control the vibration and not simply have a human shaker. The use of a simple circuit and a motor creates a simple device that is a sound maker machine. In this episode the sound maker machine is called an 'audiobot'. Pupils set up the circuit and make their own audiobot. Pupils use the audiobot to carry out scientific tests.

There is a Pupil Hint Sheet (1:1) to support the making of an audiobot.

SLIDE 4:

Pupils share a sentence of their scientific conclusion or findings from their experiment. To be a good conclusion there must be a cause and effect in the same sentence, e.g. If we change this, will this happen. Teachers may need to support this with examples and explanation at this stage.

An evaluation is distinctive from a conclusion because it refers to the investigation design and not the findings. A conclusion refers to the interpretation of findings. 'Pupil Challenge Sheet 1:3' is provided and can be copied in addition to the information on the slide.

SLIDE 5:

This slide prompts teachers to elaborate on developing conclusion writing as pupils complete a table as though they were marking the work of a peer. A mix of conclusions and evaluation are given. Pupils are required to determine which is which and offer advice on how they can be improved.

SLIDE 6:

To conclude the episode the teacher should draw the pupil's attention to balloon that is pre-blown up and tied with a 5p coin inside. Ask pupils to investigate the sound made by vibrating the coin in the balloon.

Now encourage the pupils to think as a scientist and to apply what they have found with the 5p inside the balloon to consider what difference putting a small nut instead it would do, instead of the 5p piece. Show the pupils a sample nut for them to see and consider, given enough time to talk about this and then allow them to have a find out by using pre-blown balloons with a nut inside.

Caution: DO NOT allow pupils to blow into a balloon with an item inside it as risk of choking.



HOMELINK:

A Chat Challenge: List five devices in the home that make a sound when switched on.

WEBSITES:

Post it note method: www.pstt-cpd.org.uk/ext/cpd/dips/resources/pdfs/Sc1-Planning-Posters.pdf

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