28 STEM Squeekie

EQUIPMENT

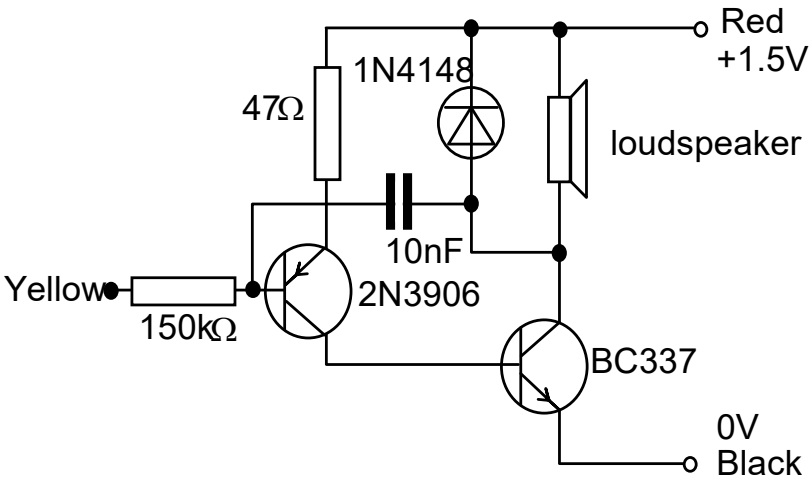
- 1 x drilled hardboard, 10cm x 10cm
- 1 x 10cm x 10cm cardboard base
- 2 x bent 22.5cm paper clips
- 1 x 22.5mm paper clip
- 30cm x 2cm thick aluminium foil
- 3 x countersunk M3 x 16mm bolts
- 3 x M3 nuts
- 3 x M3 washers
- 1 x 9.5mm x 2cm drilled hardboard
- 1 x 2cm x 2cm drilled hardboard
- 1 x squeekie unit
- Prit-stik type glue
- Blu-tak

RISKS

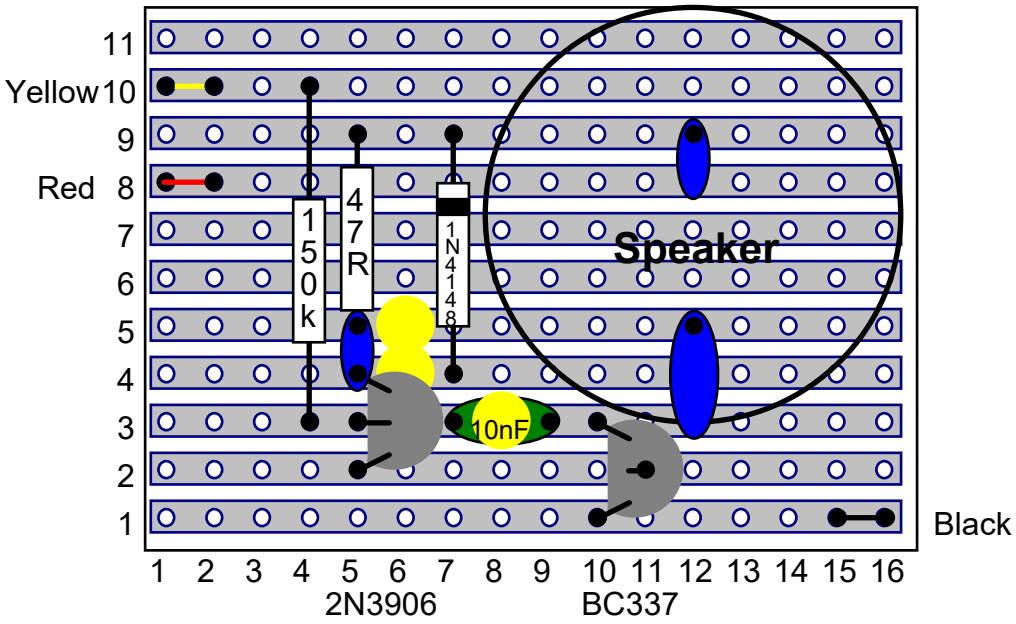
Tiny items - do not eat
Pierce injuries from screw drivers
Do not short circuit cell (battery).
Do not connect squeekie to ANY powered device.

SQUEEKIE UNIT

The circuit diagram for the Squeekie unit is shown below.



The loudspeaker is a small 8Ω device.
The Squeekie units can be made on strip board, 11 strips by 16 holes
The view is looking down on the components.
Yellow circles are breaks in the copper strip, Blue ovals are solder blobs to bridge the copper strips.


11
Yellow 10
9
Red 8
7
6
5
4
3
2
1
150k
47R
1N4148
Speaker
10nF
Black
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2N3906
BC337

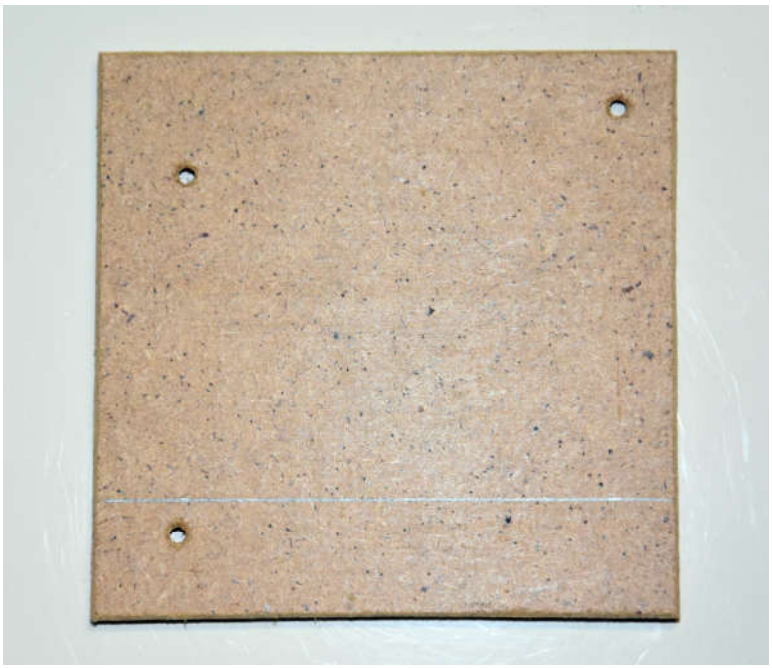
Construction

1). Aluminium foil.

Need - Glue, scissors and a pencil.

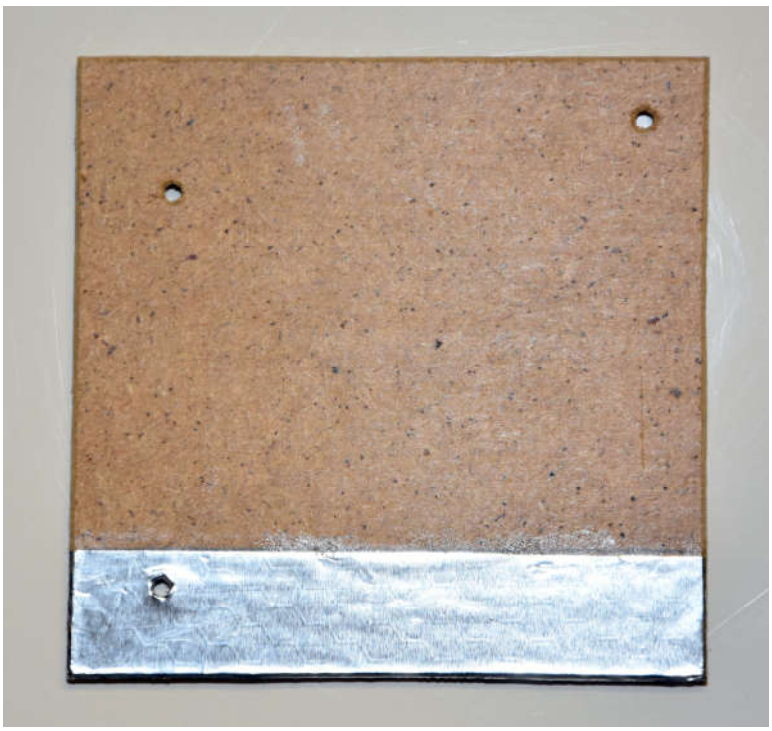
Need - 1 × baseboard and a strip of aluminium foil. Note the aluminium foil is delicate.

Baseboard



Neatly write your name on the base board.
Apply glue to the marked lower part of the baseboard.
Carefully stick a strip of aluminium foil onto the baseboard.
Cut off any excess.

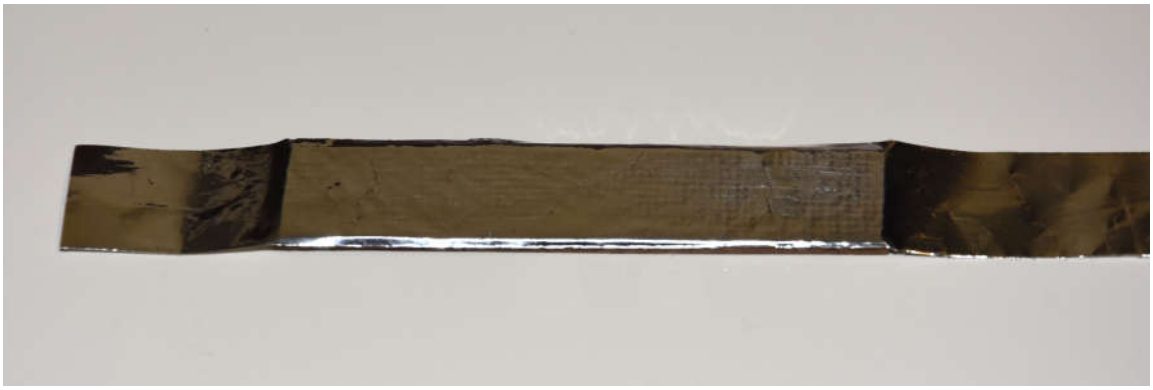
Carefully push the point of a pencil through the aluminium into the hole.



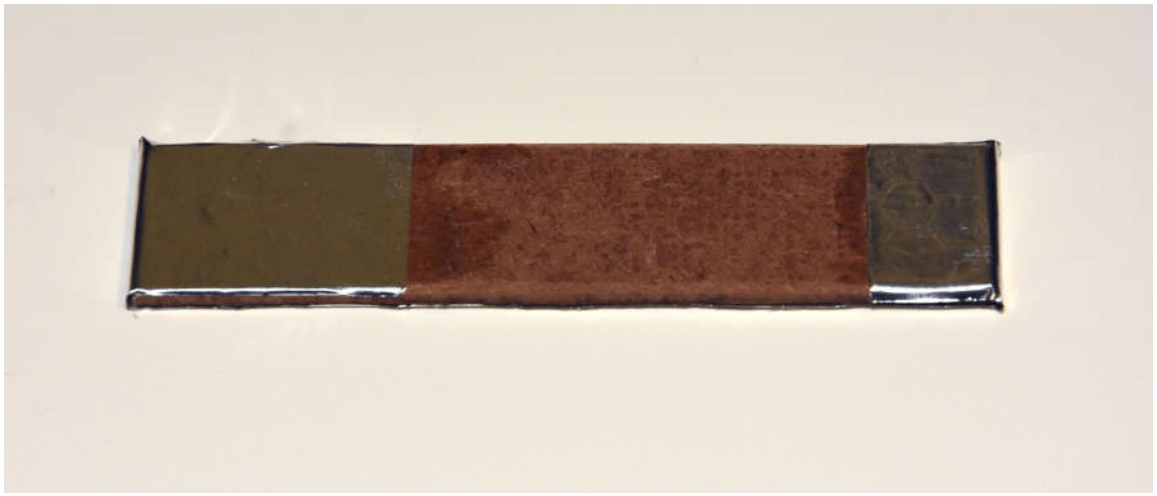
To make the morse code key, you will Need the two pieces of board shown below.

Put a good coat of glue on the rough side of the longer piece of board.

Carefully stick a strip of aluminium foil over the glue.
It MUST extend beyond the ends of the board.



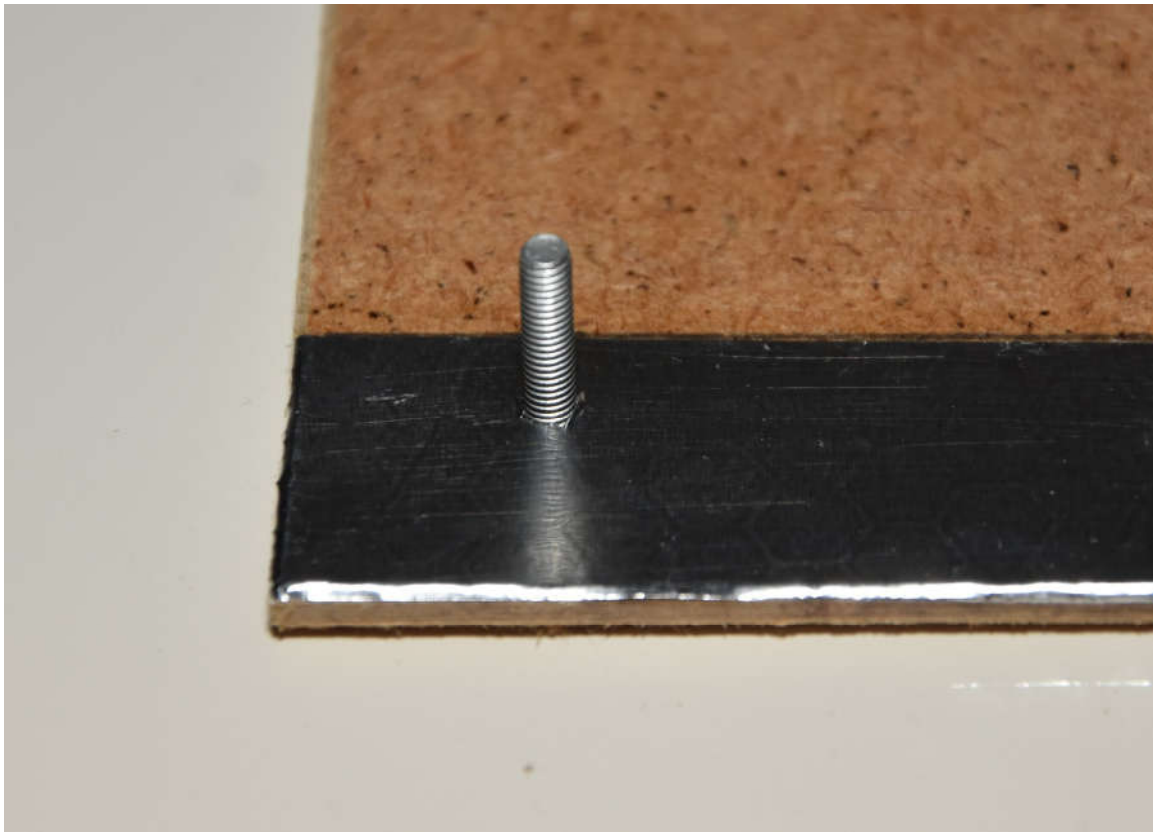
Turn the board over and put glue on each end of the board.
Fold over the aluminium foil and stick on to the board.
Ensure that the aluminium foil covers the hole in the board.



Push the point of a sharp pencil through the aluminium foil to remake the hole.

Bolts, washers and nuts are used to fix parts to the baseboard.
Need - 3 × bolts, 3 × nuts and 3 × washers.

Carefully, push a bolt through the hole in the aluminium foil on the base board.



Need - 2 × bent paper clips and 1 × straight paper clip.

Put one of the bent paper clips over the bolt and then place a washer on top.
Make sure the paper clip is the right way round.

Carefully screw a nut onto the bolt.
Hold the nut and paper clip with your finger and thumb of your left hand and **CAREFULLY** tighten the bolt with a screwdriver in your right hand.

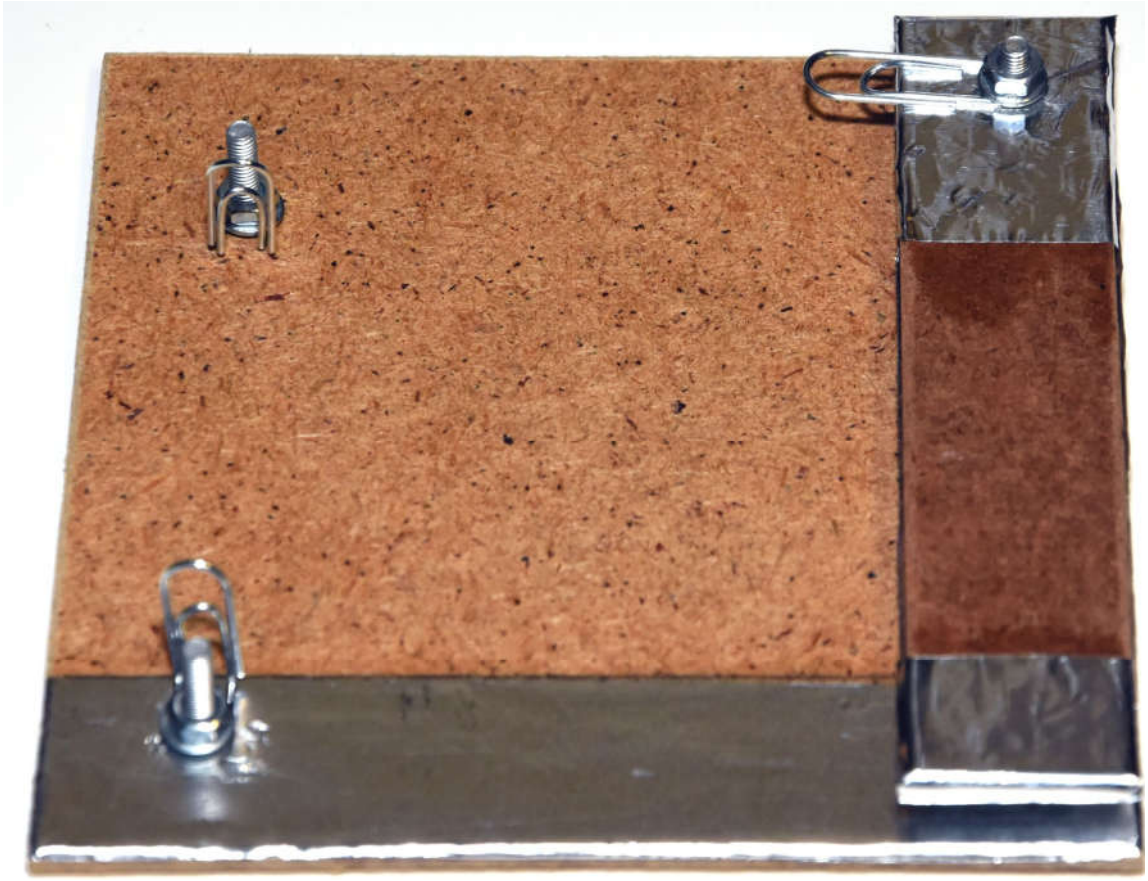
This makes the negative connection for the 'AA' cell.

Use another bolt, paperclip, washer and nut to make the positive connection for the 'AA' cell.

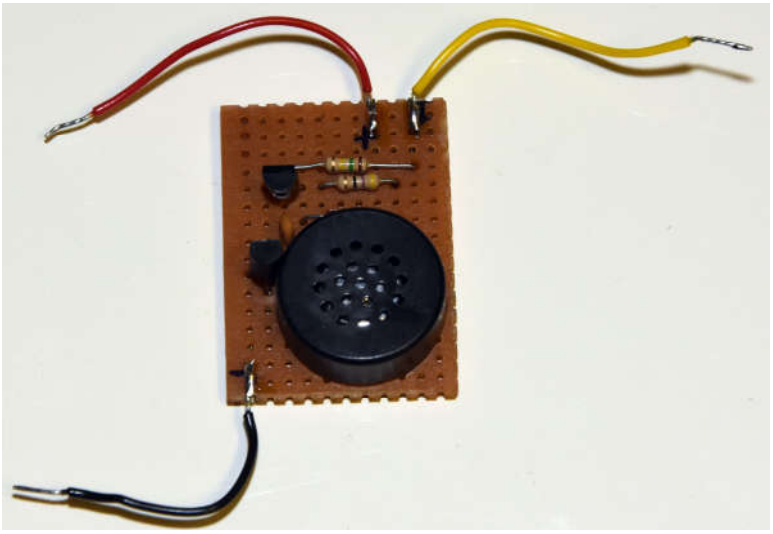
Need - AA cell.
Check that an 'AA' cell fits in between the paperclips.

Put a bolt through the last hole in the base board and then fit the small, square piece of board onto the bolt.

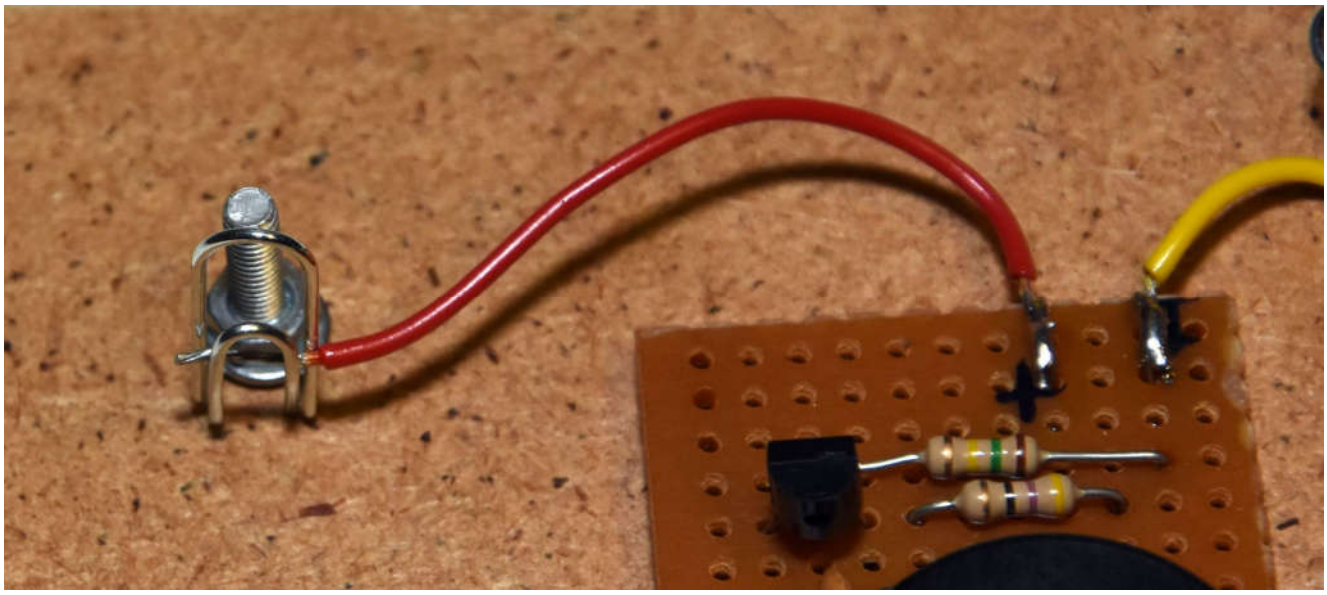
Put the morse key board onto the bolt.
Put a paperclip onto the bolt with the lip pointing down.
Put a washer onto the bolt.
Screw a nut onto the bolt and carefully tighten with a screw driver.



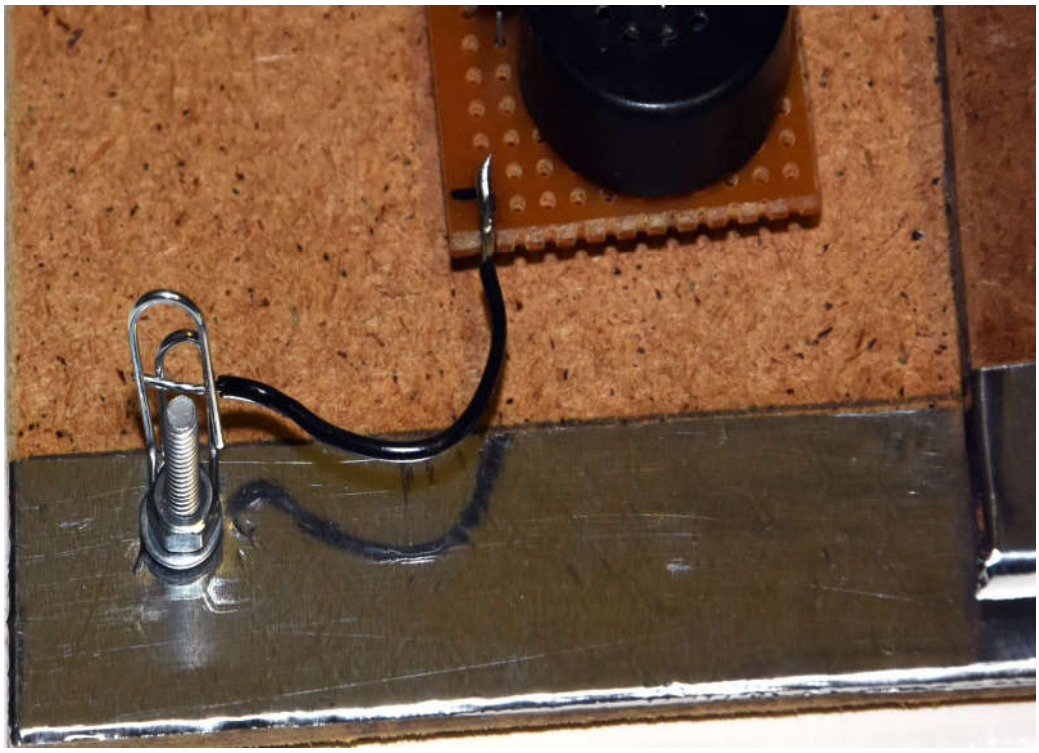
Need - 1 × squeekie oscillator.
The oscillator has three leads.
The red lead goes to the + connection of the AA cell.
The black lead goes to the – connection of the AA cell.
The yellow lead is the control input and goes to the morse key.



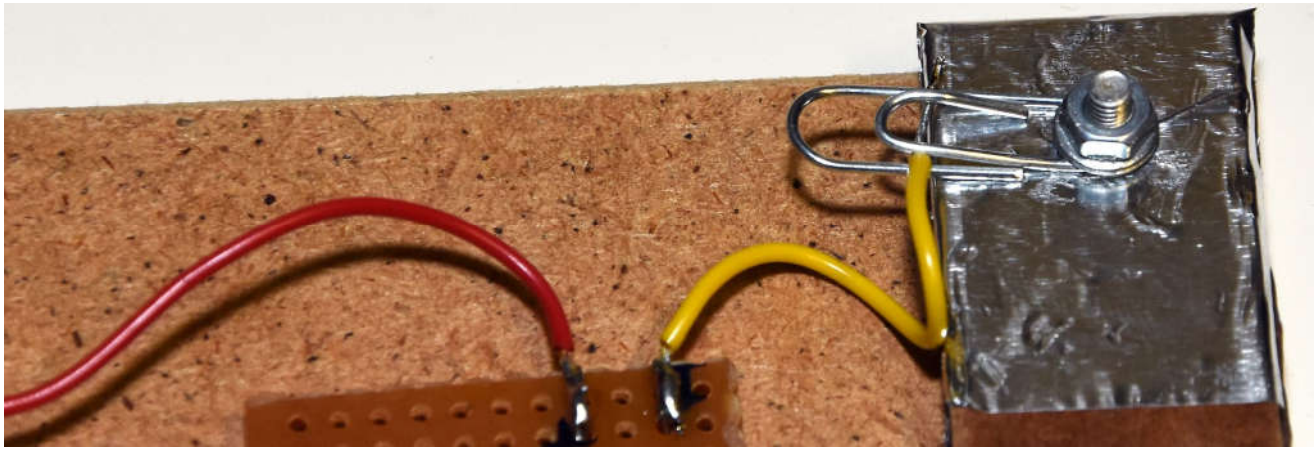
Ensure that the bared part of the red lead is put in between the parts of the paper clip making the positive cell connection.



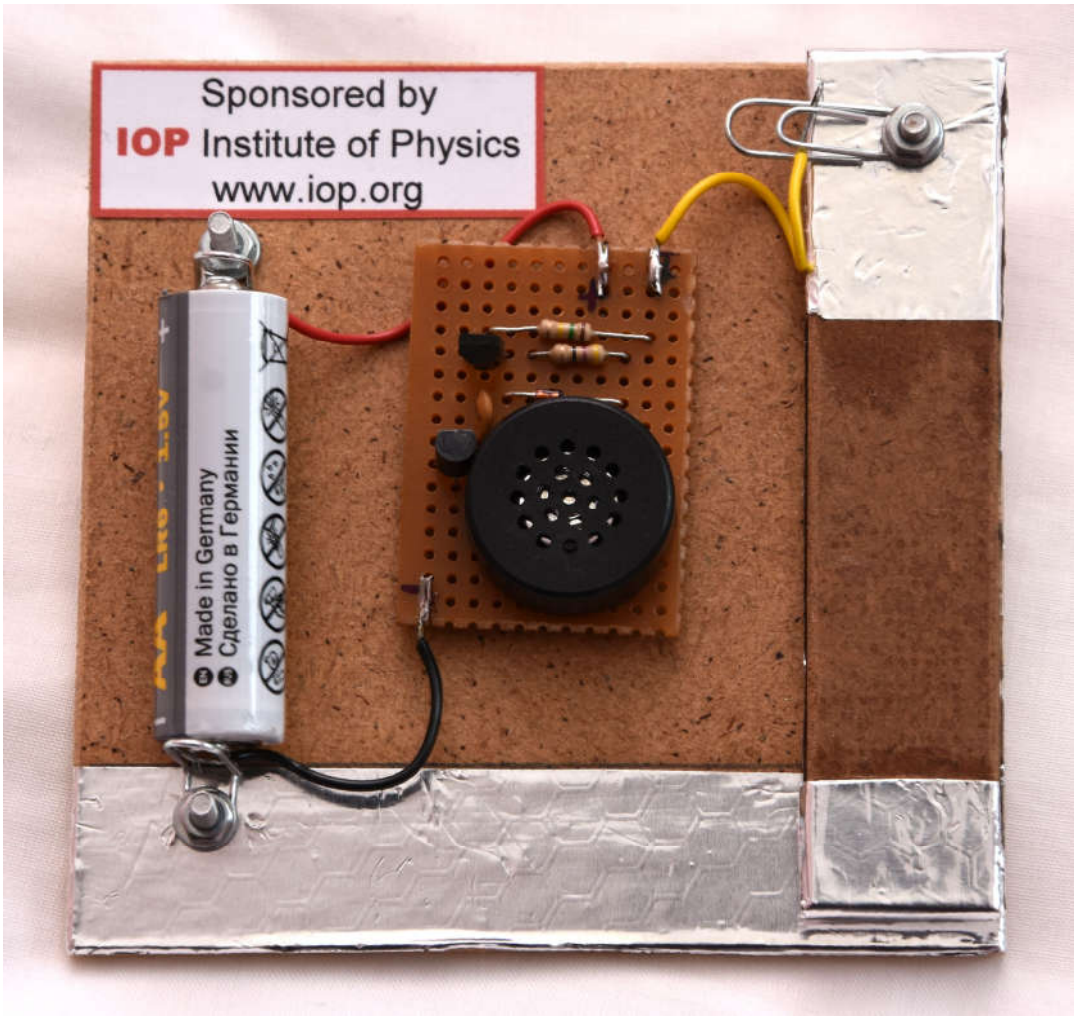
Ensure that the bared part of the black lead is put inbetween the parts of the paper clip making the negative cell connection.



Ensure that the bared part of the yellow lead is put inbetween the parts of the paper clip on the morse key.



Put a small piece of Blu-tac under the oscillator to fix it to the baseboard.
Put two small pieces of Blu-tac onto the baseboard where the AA cell fits.
Put an AA cell in between the paper clips and push into the Blu-tac.



Press the morse key. If all is well a sound will be heard.
If not, check the connections and check that the cell is making good contact with the paper clips.

NAME: ……

Using Squeekie to test conductivity.

Clip the BLACK lead to the negative (black) bolt of the 'battery' connector, and the RED lead to the morse key bolt.

Touch the test wires onto the object being tested.
If Squeekie makes a high note, it is a good conductor.
If Squeekie makes a low note or croaks, it is a poor conductor.
If Squeekie is silent, it is an insulator.

Test the following materials and tick the box which best describes the material.

When you are using the INSULATION setting, ensure that your fingers do not touch the contacts as your fingers are poor conductors and your results will be incorrect.

Material	Good conductor	Poor conductor	Insulator
Paper			
Wood			
Plastic			
Copper			
Iron nail			
Cardboard			
Tin can			
Rubber			
Pencil lead			
Glass			
Aluminium			
Potato			
Potato skin			
Stone			

Using Squeekie to test devices.

NEVER CONNECT TO ANY DEVICE CONNECTED TO THE MAINS ELECTRICITY OR THAT CONTAINS A BATTERY

Device	Notes
Fuse	
Cable	
Diode	
LDR	
Thermistor	
Capacitor	
Switch	
Playdoh	
Water	
Vinegar	
Milk	