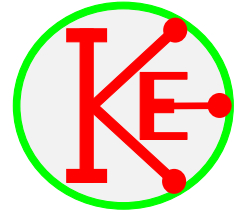


'Musical' Play-Doh and Squeekie.



Commercial Play-Doh is essentially a mixture of flour, water, salt, boric acid, mineral oil and food colouring.

As a result of the salt and acid it will conduct electricity.

However, Play-Doh does not have resistance properties like a normal material.

This is because the amount that the Play-Doh conducts depends on the current passing through the Play-Doh and the number of electrons liberated from the salt and acid.

If Play-Doh is used as in a potential divider circuit, then the voltage along the Play-Doh will vary with length. Squeekie can be modified to enable this to be tested.

For this two contacts for the Play-Doh will be needed.

The electrical contacts for the Play-Doh can be made from off cuts of printed circuit board.

Lead free solder is melted onto the freshly cleaned copper on the circuit board to form tin plated contacts for the Play-Doh, as tin corrodes much less quickly than copper.

Stranded wire is soldered to the contacts for the Play-Doh so that they can be connected to the Squeekie circuit, **red** for the positive and **black** for the negative.

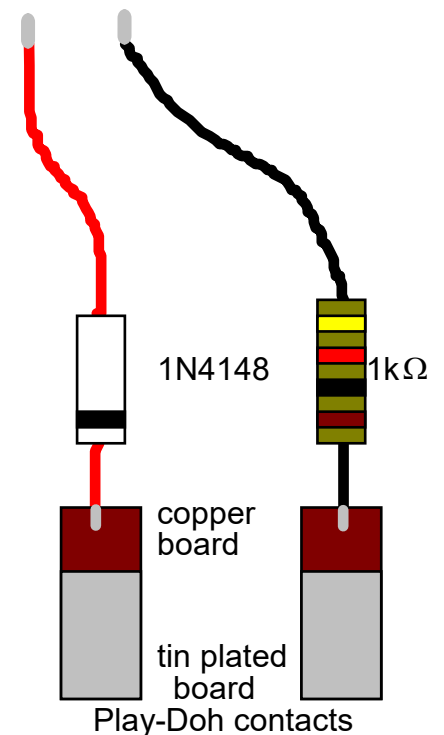
The **red** lead is cut into two and a 1N4148 diode is connected as in the diagram.

The diode must be the correct way round.

The **black** lead is cut into two and a 1kΩ resistor is connected as in the diagram.

The diode and resistor should be protected by wrapping tape around or by using heat shrink tubing.

This will prevent the wires breaking on the diode and resistor if they are bent.



If copper contacts are used for the Play-Doh, they will corrode quickly.

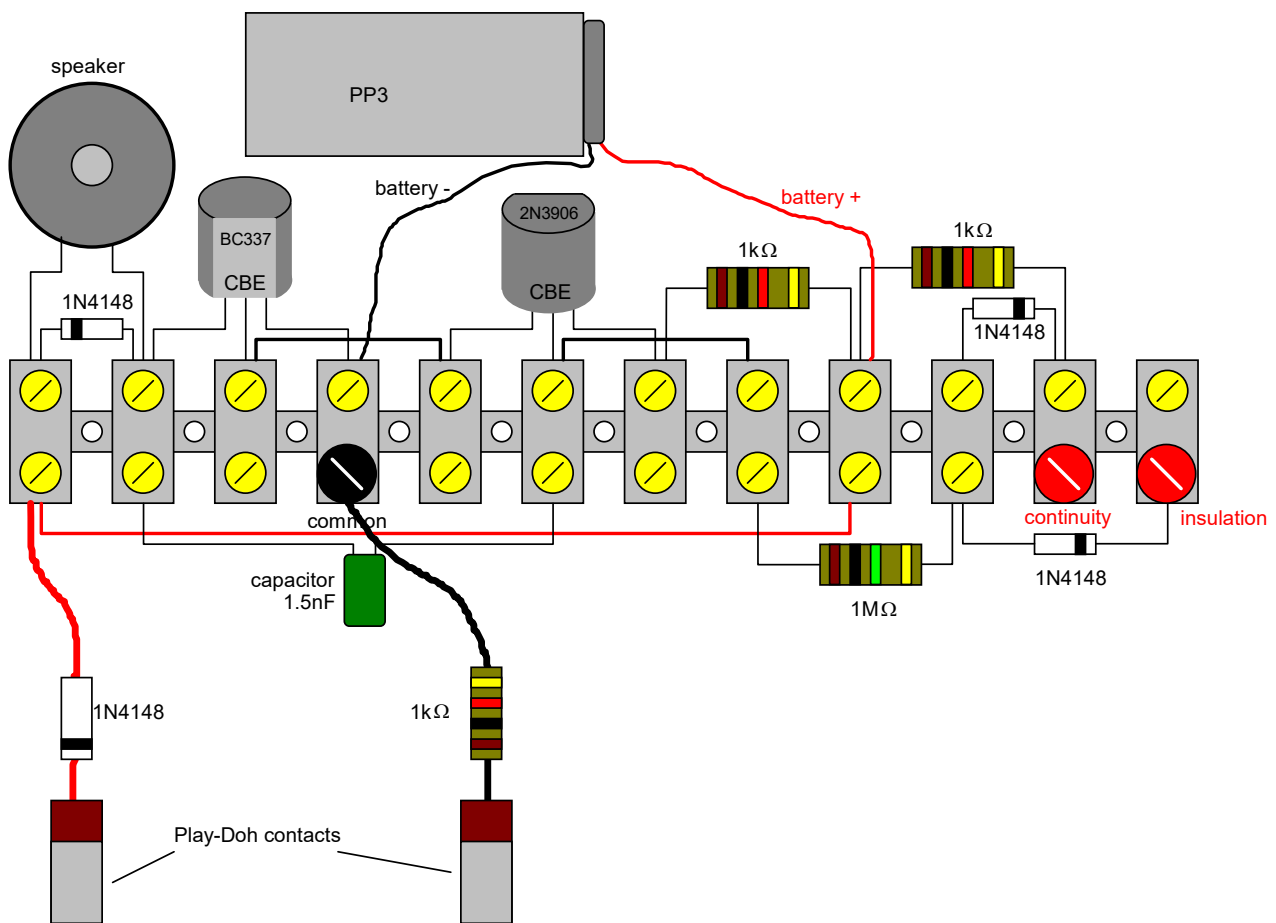
The image below shows the effects on both copper and tin contacts after a few minutes use.



Connecting the Play-Doh contacts to Squeekie

The contacts are connected to Squeekie as in the diagram below.

The contacts should not be allowed to touch any other part of Squeekie as they could cause damage to the Squeekie components.



Experiments

- (a) Roll a long 'sausage' of Play-Doh and place one end on each of the Play-Doh contacts.
Connect one end of the red crocodile clip lead to Continuity terminal on Squeekie and touch the other crocodile clip onto the Play-Doh.

- (i) What do you hear?
- (ii) Describe what happens if you touch the crocodile clip onto different places on the Play-Doh.

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- (b) Connect the red crocodile clip lead to the Insulation terminal on Squeekie.
Touch the other end onto the Play-Doh.
Are there any difference compared to the previous results to the experiments?

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- (c) (i) With the red crocodile clip lead connected to the Insulation terminal on Squeekie, hold the other end in one hand and touch the Play-Doh with your other hand.
Describe what happens.

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- (ii) Explain why this happens.

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- (d) Using either the Continuity or Insulation setting of Squeekie, experiment with trying to play a tune by touching different places on the Play-Doh.

- (i) Briefly describe what you did.

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- (ii) Complete the diagram below to show where the different notes were on the Play-Doh.
Add measurements from the positive electrode for each note.



Further investigations.

- (e) Instead of having a uniform 'sausage' of Play-Doh, investigate how making the one end thicker than the other affects the musical notes.
Using a diagram, describe your results below.

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- (f) Investigate how the musical notes are affected by a different shape (e.g. a large square) for the Play-Doh
Using a diagram, describe your results below.

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