



## Investigation of good conductors, poor conductors and insulators.

A good conductor has a low resistance and will produce a high pitched tone when using the CONTINUITY setting of Squeekie.

A poor conductor has a high resistance and will give a very low pitched or no tone when using the CONTINUITY setting of Squeekie. On the INSULATION setting, it will give a low to medium pitched tone.

An Insulator has an extremely high resistance and will give a very low pitched or no tone when using the INSULATION setting of Squeekie.

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.

- (a) Test the following materials and tick the box which best describes the material. Touch the free ends of the crocodile clip leads onto the sample. Select between CONTINUITY and INSULATION as necessary.

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

(b) Find 10 different objects/materials, enter their names into the table below and then test the items as before.

Item / Material	Good conductor	Poor conductor	Insulator

Try to summarise your results for the items you have tested so far.

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- (c) Test the following liquids.  
 To limit the damage the liquids may do to the crocodile connecting leads, clip a piece of copper wire into each of the leads and then dip the copper wires into the liquids.  
 Dry the copper wires on a tissue before testing the next liquid.

NOTE: Liquids are easily spilt - take great care. Mop up any spills that you make.  
 Some liquids are harmful - take great care not to get the liquids into your eyes.

Liquid	Good conductor	Poor conductor	Insulator
Tap water			
De-ionised water			
Distilled water			
Vinegar			
Fizzy pop			
Wine			
Salt solution			
Sugar solution			
Washing up liquid			
Orange juice			

Try to summarise your results for these liquids.

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**Further investigations.**

- (d) Work with a friend for this investigation.  
Set Squeekie to the INSULATION setting.  
Clip a piece of copper wire into each of the crocodile clip leads and hold the leads so that the copper wires are near but not touching.  
Get your friend to strike a match and then hold the flame so that both of the copper wires are in the flame.

- (i) What do you hear?

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- (ii) What happens when the flame is removed?

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- (iii) How would you classify a flame?

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- (iv) What use could you make of this ability of a flame to conduct electricity?

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- (e) Use the Internet or books to explain why some materials conduct electricity and others do not. Remember to quote your sources of information.

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