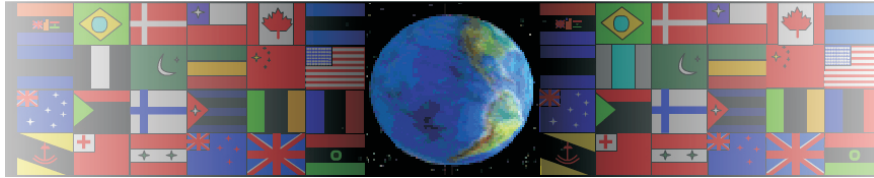


MATERIALS

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On behalf of The World Association of Technology Teachers

W.A.T.T.



World Association of Technology Teachers

The 'Materials Exercise' can be printed and used by teachers and students. It is recommended that you view the website section 'Graphics' (www.technologystudent.com) before attempting the design sheet.

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SMART MATERIALS - SHAPE MEMORY ALLOY (SMA)

HELPFUL LINK - <http://www.technologystudent.com/equip1/sma1.htm>

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SMA wire is sometimes called '_____', as it is composed of _____ and _____. On first sight this special wire looks like ordinary wire and even has many of the same properties. It can be _____ to form complex shapes quite easily and it _____ electricity. However, it is very expensive when compared to ordinary steel or even copper wire. However, it has properties that make it very special:

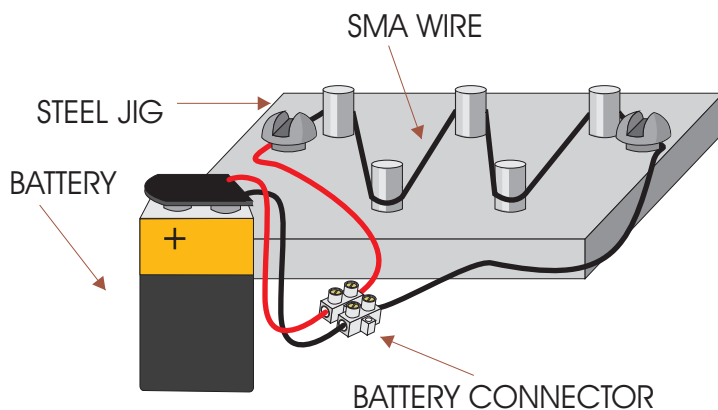
The wire has a _____ - for example, if it is folded to form a shape and then heated above _____ (centigrade) it returns to its _____ shape.

The material can also be '_____' to remember a shape. This can be achieved by folding the wire to a particular shape and clamping it in position. The wire is then heated for a approximately _____ at precisely 150 degrees or pass an electric current through the _____ wire. If the wire is now folded into another shape and then placed in hot water it returns to the original 'programmed' shape.

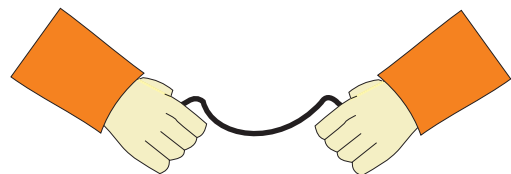
conducts original nickel programmed titanium five minutes
memory Nitinol 90 degrees folded SMA

Below are diagrams that represent programming the shape of SMA wire and returning it to its original shape. Add notes to each diagram to help explain each stage.

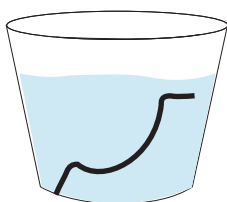
1.



2.



3.



4.

