



Proposal

SLQ Wiki Fabrication Lab 2024/07/25 05:18

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Design Brief

This activity was developed as part of a commission from Catholic Education (Brisbane) to develop loanable kits to aid teaching robotics and coding in schools.

Proposal

An Art/Science activity suitable for younger students (Yr 3+), demonstrating how electricity can actuate predictable motion, but without the use of coding or complex electronics.

Following this introduction, students could experiment with different movements possible by alternatively trained memory wire to develop kinetic artworks, simple machines or other devices (a list of possible variations is in the teacher notes found in the resources section below).

Development

Theory

Memory wire is trained to a shape by heating to a red glow (400C for 30 min optimal) while it is constrained in the required form. After rapid cooling (quench in water), the wire can be straightened. If heated to a critical temperature (which depends on the training temperature - see references), the wire will revert to the trained shape. If the ends of the straightened wire are fixed to something which is not too massive, then as the wire deforms with heat, it will move the object it is attached to.

Resistive heating was the method chosen to achieve this effect because it can be achieved simply using readily available materials, and also is instructive in creating simple electrical circuits.