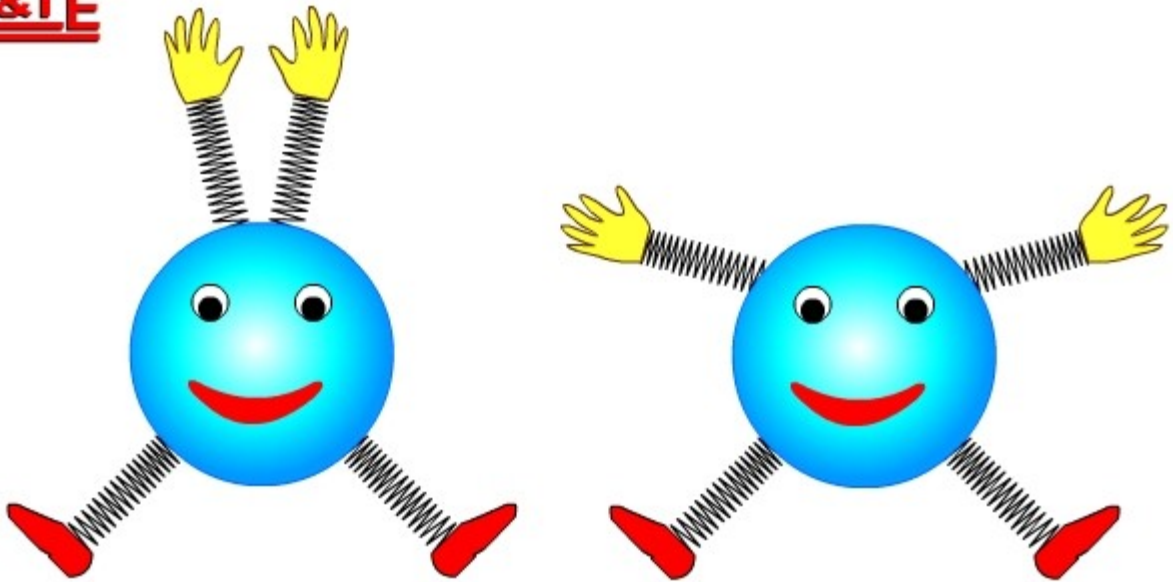


Waving Shop Display

MD&TE



Introduction

A shop owner wants to attract attention to the shop window display. The shop owner knows that movement attracts attention so she has decided that a number of simple characters with waving arms should be used.

Design Brief

Devise a method of making a wooden, plastic, metal or card character wave its arms up and down continuously in a shop window.

Specifications

- The character must have arms that move up and down continuously.
- The character must be large enough to be seen from a short distance, e.g. 10 metres.
- There must be a way of starting the arms waving and stopping the arms waving.
- The waving arms character must be a complete working system that shop keepers can use without having to use tools to install it, or to stop and start it.
- The waving character must withstand continuous use, i.e.
 - it must not fall apart during use
 - it must not overheat
 - moving parts in contact must not wear out
- The waving arms character and drive system must be safe to use.
- The waving arms character must have a bright, colourful finish.

Learning Objectives

Students will develop their D&T capability by designing and making an original product of good quality that satisfies the requirements of the design brief.

By the end of the assignment, students will know that:

- movement attracts attention
- mechanisms are used to:
 - transmit motion and force
 - convert one type of motion and force into another type of motion and force
- a mechanical system consists of input, process/control and output blocks and may incorporate feedback in the system, e.g. a heat sensor that monitors the temperature of a motor and switches it off when it gets too hot
- the effects of friction must be considered when designing mechanisms
- safety must be considered when designing the waving display and safety features must be incorporated into it
- when choosing materials, designers must consider:
 - the cost of the material
 - the physical properties of the material
 - the effect of the material on the environment, i.e. the effects of:
 - mining
 - transporting the raw materials to the processing plant
 - processing the raw material
 - manufacturing processes use to make products
 - the ease with which materials can be used to make products using the tools available
 - the ease with which products can be recycled
- risk assessments of the hazards should be carried out
- ready made components such as gears and pulleys may be incorporated into mechanical systems
- safe working practices should be adopted when making the waving display.

Success criteria

Each student:

- has designed and made an original product that satisfies the given design brief and specification
- has demonstrated an understanding of mechanisms by choosing appropriate devices to create the movement required by the design
- has considered the positive and negative effects of the use of the materials chosen to make the waving display
- has strived to achieve quality in marking out, cutting, shaping, finishing and joining the chosen materials
- has assessed the risks associated with working with the tools and materials chosen for the project and has worked safely throughout the assignment
- has evidence of having evaluated his/her work.