Problem Solving: Pedal Bin Mechanism
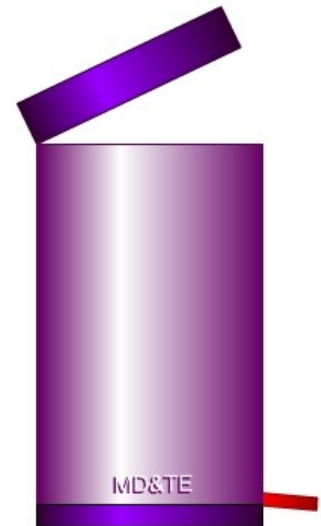
Learning objective

To develop students' problem solving capability by guiding them through a mechanical systems problem.

Situation

Pedal bins are a convenient place to store rubbish until the rubbish is finally removed for recycling or disposal. One advantage of pedal bins is that the lid is lifted, i.e. swung open, simply by stepping on a pedal.

As designs for pedal bins have improved, pedal bins have become an essential part of many people's fashion items, in homes, offices and school etc.

The pedal bin system

The known parts of the pedal bin system are:

- the input is Human energy pressing on the pedal
- the output is a lid that swings open
- the lid swings and closes when the input is removed.

Problem solving

1. Devise a mechanism that will lift the pedal bin lid when the pedal is pressed down and lower it again when the pedal is released.
2. Devise a method of keeping the lid open without continually pressing down on the pedal.
3. Devise a structure that will hold the various parts of the pedal bin mechanism in place.

What you must do

1. Analyse the problem so that you understand it fully.
2. Make a list of mechanisms that would swing the pedal bin lid open when the pedal is pressed, using notes and sketches to record your ideas.
3. Choose the mechanism that solves the problem the most effectively.
4. Use notes and sketches to illustrate your best design, showing modifications that you have made to the structure of the bin and the bin lid.
5. Evaluate your design and modify it if necessary.

You may use research methods to find information about suitable mechanisms, e.g.

- product analysis
- library search / computer software search
- internet search
- experiments - model your ideas, e.g. in card
- interview - ask an expert.

Success criteria

You have:

- Analysed the problem and have worked independently and with others to find solutions to it.
- You have used research methods to find information.
- You have recorded ideas and your research findings.
- You have used your research and other ideas to develop a solution to the problem.
- You have produced an accurate drawing or model of your solution to the problem.
- You have evaluated your solution to the problem and modified it if necessary.