

Problem Solving: A Door Latch Lock Mechanism

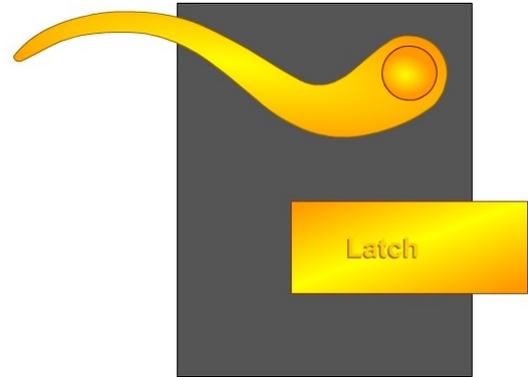
Learning objective

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

Situation

The diagram opposite illustrates an idea for a latch lock.

The idea is that when the door handle is lowered, the latch is drawn into the door and when the handle is raised, the latch moves out again.



Problem solving

Devise a way of:

1. making the latch move into the door when the door handle is lowered
2. moving the latch back out again when the handle is raised
3. automatically raising the handle from the lowered position when it is released.



What you must do

- You should work through each of the questions below, recording your ideas using notes and sketches.
- Analyse the problem so that you understand it fully.
- Decide whether there should be door handles on both sides of the door or on just one side.
- If you decide to have handles on both sides of the door, decide whether they should be connected.
- Name the motion of the handle
- Name the motion of the latch.
- Think about mechanisms that will convert the motion of the handle into the motion of the latch.
- Draw mechanisms that will move the latch when the door handle is lowered and raised again.
- Devise a way of automatically raising the handle from the lowered position when it is released.
- Draw your best design.
- Evaluate your design and modify it if necessary.

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

- product analysis - take a lock apart and analyse it
- library search / computer software search
- internet search
- experiments - model your ideas
- 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.