PRACTICAL TASK

LED DESK LAMP

BACKGROUND
Light Emitting Diodes (LEDs) once only gave out a feeble light and were only used as indicators. They are now set to become the most important source of light in homes and many portable products such as torches. Small and powerful LEDs are used for reading lights and desk lights because of their small size and low current consumption.

WHY A READING LAMP?
LEDs are ideal for lamps that give a bright source of light over a small area. Many famous designers have created small lamps for use on a table or desk – and now is your opportunity to join their ranks and create a skeleton lamp that uses a center-of-gravity trick to stand upright.

DESIGNING AND MAKING A BALANCING SKELETON LAMP
The basic lamp consists of two aluminium rods that form the structure of the lamp and also conduct electricity to the LED. This kind of structure is now common in LED lamps because the low voltage does away with the need for insulation. The lamp stands up if the mass of the battery box that hangs underneath the table surface balances the much longer, but lighter, arm holding the LED.

1. Using much thinner wire, make a half size model of the lamp and tape on found objects or coins to represent the battery.

2. When you are happy with your design, you can scale it up by bending the aluminium rods and fastening on the battery box with elastic bands to ensure that it balances.
3. Decide how you will connect the battery box to the rods. You could, for example, use heat-shrink sleeving. This contracts to about 2/3 its diameter when heated with a hot air gun. A couple of ideas are pictured below:

- **Wires clamped in a lasercut holder**
- **Wires attached using plastic end cap**
- **Wires attached using heat-shrink sleeving**
- **Battery holder attached using cable ties**

4. Decide how you will fix the LED to the rods. A neat way of doing this is to use heat-shrink cable. An alternative is to use screw terminals or plastic end caps.

**WHAT NEXT?**
You might consider designing and making a second lamp based on what you have learned from the first. You might also think about additions — e.g., a reflector for the top.

**MORE INFORMATION**
For more information about LEDs have a look at the following website:

www.mindsetsonline.co.uk/c21te