A birthday cake candle timer

Your task

“Burning candles lose mass”. Use this knowledge to make a timer.

- Test your ideas

Based on a suggestion by S. Lindley.

Time

60 minutes.

Group size

2–3.

Equipment & materials

Eye protection.

Per group
Pins, clampstand, cork, heat resistant mats, card or stiff paper, wooden splint, plasticine or blu-tack to balance the splint, a timer, a 30 cm ruler, a pencil.

2 or 3 birthday cake candles (the candles with the spiral markings seem to work better than the plain candles).

Health & Safety notes

This is an open-ended problem solving activity, so the guidance given here is necessarily incomplete. Teachers need to be particularly vigilant, and a higher degree of supervision is needed than in activities which have more closed outcomes. Students must be encouraged to take a responsible attitude towards safety, both their own and that of others. In planning an activity students should always include safety as a factor to be considered. Plans should be checked by the teacher before implementing them.

You must always comply with your employer’s procedures and in some cases may decide that a particular activity is inappropriate in your situation. Further information on Health and Safety should be obtained from reputable sources such as CLEAPSS [*http://science.cleapss.org.uk/*] in England, Wales and Northern Ireland and, in Scotland, SSERC [*https://www.sserc.org.uk/*].

See 'In search of solutions’ additional handout.

If the candle is allowed to burn down too far it sets light to the splint. If the scale is too close to the flame it too may burn. Take care if any nearby activities are involving flammable or combustible substances.

Eye protection should be worn.

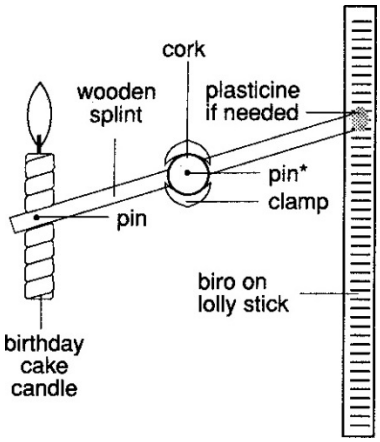
It is the responsibility of the teacher to carry out a suitable risk assessment.

Curriculum links

Balancing, friction.

Possible approaches

Students make a timer by fixing a birthday cake candle on one end of a splint, pivoted with a pin, in a cork held in a clampstand. They will need to find a way of making a scale against which the other end of the splint moves. This scale is then calibrated using a timer. The core of the problem is to get the splint to pivot easily - but not too easily. It is possible to get repeatable results, given care.



eg A birthday cake candle timer

- *the friction between the pin and the wooden splint is important. It can be altered by changing the amount of pressure of the pin against the cork.

Credits

Health & safety checked May 2018

Page last updated October 2018