

### Q1

A car has broken down on the isolated, winding Cumbrian roads. There's a garage 2000 metres away, along a flat coastal route.

- It needs a minimum force of 900 N to push the car along a flat road. What is the minimum energy the driver needs to get the car to the garage?
- There's another garage 1400 metres away, but it's higher up in the fells along a steep road. The pushing force here would have to be 1700 N. Calculate the total work done if the driver chooses this garage instead.
- The driver decides he doesn't want to push the car uphill so he chooses the garage on the flat road. Halfway there he notices the road's been resurfaced. It now only takes 700 N to push the car. What is the total energy consumption by the time he gets to the garage?

### Q2

The weightlifter's back in the gym. He's working on loads of different machines this time.

- The weightlifter lifts 50 kg 40 times. Each time he lifts the load 30 cm. Calculate the work done.
- This time he does 20 lifts, then bumps the load up to 80 kg and does 10 more. How much work is done this time?
- The weightlifter moves on to another machine which raises the load 65 cm. How much energy does he use doing 15 lifts of 80 kg?
- How many lifts of 60 kg (raising the load 65 cm) would use 10 530 J of energy?

### Q3

Five secretaries are participating in an annual 'pull the boss' competition.

- What is the work done by the secretaries together if they move the boss 150 m with a force of 240 N?
- What is the work done by the secretaries together if they move the boss 1600 m with a force of 130 N?
- How far did they move the boss if they used 6120 J and used a force of 200 N?
- What was the work done by each of the secretaries if all five of them worked equally, and together they pulled the boss 675 m with a force of 150 N?