

# Back of an Envelope

If you combine simple approximations and elementary arithmetic you can find good estimates to answer all sorts of interesting questions. This kind of calculation is often called a ‘back of the envelope’ calculation because it is so simple that it could be done on the back of an envelope.

We will go through the first question together. Copy out the working on the board.

- 1 (a) Roughly how many sides of paper do you use during a school day?
- (b) Roughly how many sides do you use each week?
- (c) Roughly how many sides of paper does this work out at per year?
- (d) Assume that an exercise book contains around 80 sides of paper. About how many exercise books does this mean that you get through each year?
- (e) There are approximately 4 million pupils aged 11–16 in the UK. About how many exercise books do they use each year?
- (f) It takes about 15 trees to make a tonne of paper. About how many trees are cut down each year just to make exercise books for secondary schools in the UK?

Now use the same ideas to answer questions 2–8. Don’t feel that you need to answer all the questions.

- Use sensible estimates and simple calculations. **Don’t just guess.**
- Write down the assumptions you make when estimating, and the method you use when calculating.

- 2 (a) Roughly how many desks are there at OHS?
  - (b) Roughly how many pupils are there at OHS?
  - (c) About how many desks are there for pupils aged 11–16 in the UK?
  - (d) Assume that one tree can make 50 desks. How many trees does this mean have been cut down to make desks for pupils aged 11-16 in the UK? How does this compare with your answer to question 1?
- 3 How many pairs of jeans are there in the UK?
  - 4 How many cans of soft drink are drunk in Oxford each week?
  - 5 How much water is flushed away in toilets, or from baths, in the UK in a single day?
  - 6 How many chips are eaten each day at lunchtime in UK schools?
  - 7 How much does it cost their owners to feed all the cats in the UK for a year?
  - 8 On average each household in the UK is sent something like two junk mail letters each week. How many trees does all this mail use up in a year?