The Spoton Guide to GCSE Foundation Mathematics

CONTENTS OF THE SPOTON GUIDE (Y10&Y11)

These are in both texts, to provide flexibility.

The emphasis here is on non-calculator skills, with a particular stress on mental agility. Many of the sections within the topics open with items that can be used as mental/oral starters and the techniques taught/reviewed here should be repeated regularly over the weeks following their introduction

The course should start with Topic 1. This contains the number techniques that will be assumed thereafter throughout the course. The rest of the topics are independent and can be done in any order. Any techniques required within a topic that are taught elsewhere, will be repeated at the point where they are required.

Spoton

Optional Teachers' COPYMASTER
Resource & Assessment Packs for Spoton
The wirobound packs contain:

- Teachers' Guide (plus a few answers)
- 4 worksheet masters
- End of topic Revision Sheets
- End of topic Assessments
- Revision and Assessment Answers

The CDs contain:

- the contents of the wirobound packs plus
- a large bank of exam-style revision questions, organised to match the topics in the text (both with spaces for making up exam papers and without spaces for revision material)

Y10 Spoton (wirobound): £40
Y10 Spoton CD: £50
Y11 Spoton (wirobound): £40
Y11 Spoton CD: £50

EXTENSION SAMPLE from "Graphs and Functions"

E16.2: Carbon–dating

An American chemist, W.F. Libby developed the technique of Carbon–Dating in the late 1940s and for it received the 1960 Nobel Prize for Chemistry. Carbon–14 is a radioactive isotope of carbon. It is formed at a constant rate by cosmic rays bombarding the atmosphere. Carbon–14 is absorbed by all living creatures and eventually the rate of absorption equals the rate of decay. For most of the life of any living body, the amount of Carbon–14 in the body is constant. Once the plant or animal dies, it no longer absorbs Carbon–14 but the Carbon–14 in the body continues to decay.

1. For wood $N = 6.68 \times 0.999879^t$ where t = the time in years since death and N = the number of atoms /minute/gram.
   Make a table giving the values of N for t = 1000, 2000, … , 6000.
   Plot the values on a graph and join with a smooth curve.
   Use the graph to solve questions 2 & 3:
2. Occasionally, peat–cutters find whole trees buried in the peat bog. These trees are extremely old. The wood is black, very hard and beautiful. It makes fine but very expensive furniture. Recently an oak tree was dug out of a bog in Ireland. For this tree, the value of N was 4.32.
   How old do you estimate the bog oak is?
3. The half–life of Carbon 14 is the time it takes to for its radioactivity to decrease by half.
   What is the half–life of Carbon 14 ?

Carbon–dating is not sufficiently accurate to date an object precisely but it can be used to give an approximate age. This is because the atmospheric levels of Carbon–14 have fluctuated. Carbon–dating is best used in conjunction with other methods of dating,

Scientists in the far distant future will have problems using this method to date objects from this time on, as nuclear bomb testing has raised the amount of Carbon–14 in the atmosphere by over 50%.