Flowchart Investigations: Explorations in Mathematics
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Think of a number, double it, add 4, multiply by 5, divide by 10, add 4, subtract the number you first thought of, add 1 and the answer is?

How many of us have used this type of problem as an end of lesson filler or an introduction to problems in algebra? In Foster's book this is Flowchart 11, one of twenty interesting and diverse flowchart problems.

The book aims to stimulate mathematical activity, to encourage learners to pose questions, to ask "what if?", to develop conjectures and to generate proofs. The varied problems included should ensure these aims are met.

The activities range from the 'Magic' of Flowchart 11 to a series of problems based on simple operations (add 10, divide by 3 or add and double, or add and square...). There is work here to challenge and interest pupils within Key Stages 3 and 4 (and beyond) and each flowchart can be used at different levels. The notes accompanying "add 10, divide by 3" show why the algorithm gives the result it does, supports it with a section of a spreadsheet and then relates it to staircase and cobweb diagrams before giving a generalization of the method. This structure appears in all twenty flowcharts and there are useful references to texts and websites.

A flowchart based on tossing a coin gives an understanding of probabilities and expected values. There is a geometric flowchart investigating intersecting lines and regions and another is based on logo-type constructions of spiral-type shapes. The famous 1089 problem and related ones are included as well as those fascinating recurrence relations that generate happy numbers or relate cubes of digits and digit sums.

A minor niggle was that four of the investigations would have benefited from an instruction to *write down the number* in an appropriate place but otherwise this short but useful book has a lot to commend it.

There is something in *Flowchart Investigations* for everybody and I would suggest every mathematics department should have a copy of it and use it!

p.s. and the answer is…..7.

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