

SECTION 14

Look back first at pages 54–56 of Numeracy Outcome 1 pack to remind yourself of the vocabulary used and what the different shapes of boxes mean.

Example 14a

Rearrange the following instructions into a flow chart for washing hair:



Solution:

Here is the solution to this very obvious problem:



This is a very simple example with only one decision box and no mathematical application at all, apart from its logic.

But you may well have seen something similar in a car maintenance manual.

Fault-finding charts are very similar to this.

Example I4b

Produce a flow chart to find if a number is divisible by 6 (for a person who doesn't know the 6 times table).

Solution:

For a number to be divisible by 6, it must be divisible by 2 and also by 3.

For example,

8 is divisible by 2 but not by 3, so it is not divisible by 6

15 is divisible by 3 but not by 2, so it is not divisible by 6

12 is divisible by 2 and also by 3, so it is divisible by 6

So we will need two decision boxes, one for divisibility by 2 and another for 3:

Here is the final result.

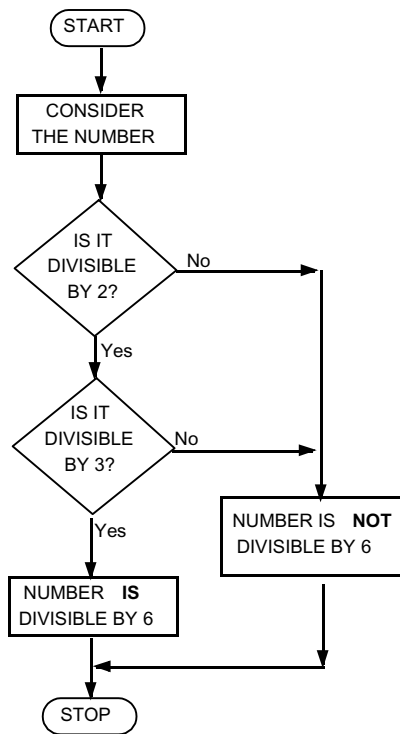
We try, as far as possible within the one chart, to keep the instructions 'yes' and 'no' going in consistent directions.

(Going right one minute for 'yes', then going right for 'no' immediately afterwards can be a bit confusing!)

Once you have got your chart ready, you should test it for a variety of situations which will take you along each possible route.

Only in this way will you know if it is correct or not. Try it out for the numbers 9, 10, 11 and 12.

Better still, give it to a colleague to try out. Other people are always better at picking up errors than the person who made the chart up in the first place (and this applies not just to flowcharts!).



Example I4c

Here we introduce the way of using decision boxes to deal with 'in between' situations.

Suppose you want to have several different rates of commission for a salesman.

Sales of under £10,000 gain 5% commission

Sales from £10,000 up to £20,000 gain 7% commission

Sales of £20,000 and over gain 10% commission.

Write a flow chart to calculate the commission.

Solution:

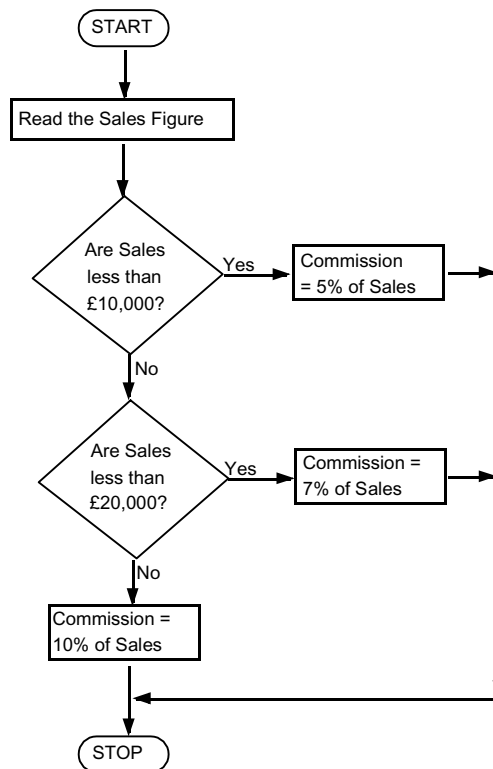
We only need two decision boxes to cope with all three situations:

'Are sales less than £10,000 ?' will deal with the 5% commission

'Are sales less than £20,000 ?' will deal with the 10% and also with the 7%, because answering 'no' to the first question and 'yes' to the second will give us our 'between £10k and £20k' sales figures.

If worded correctly, the decision boxes will also cope with sales of exactly £10k (7%) and exactly £20k (10%).

Here is the completed flow chart:





See if you can write flow charts for these situations:

1. To convert a temperature from degrees Fahrenheit to degrees Celsius you first subtract 32 from the Fahrenheit temperature, then multiply the result by 5 and finally divide by 9. The chart is to calculate the Celsius temperature from a given Fahrenheit temperature. [Put only one operation into each instruction box.]
2. In a Spanish holiday resort the cost of hiring a car depends on the size of engine. A car with an engine size of under 1 litre costs 4,000 pesetas per day and any engine size of 1 litre or over costs 5,000 pesetas per day. On top of this there is a charge for insurance of 1,000 pesetas irrespective of engine size or the duration of the hire. The chart is to calculate the total price paid for the holiday hire.
3. A D-I-Y store charges for delivery of bulky items. Delivery is free if the distance of the destination from the store is 3 miles or less. Between 3 and 10 miles there is a standard delivery charge of £15. Any distance over 10 miles is charged at £1.50 per mile. The chart is to calculate the delivery charge.
4. The discount offered by a shop during a sale depends on the original pre-sale price of the goods. Items under £40 are discounted by 5%; those between £40 and £79.99 bear a 7.5% discount; those between £80 and £119.99 are reduced by 10%; and finally goods originally priced at £120 or over are reduced by 12.5%. The chart is to calculate the price to be marked on the ticket.