Race to 90s and Back

Number of Students: Pairs or small groups

Materials:

- 1 game board per group
- 1 Spinner (0-9) per group
- 1 Spinner (0-30) per group
- 1 paper clip per group
- 1 pen or pencil (for spinner) per group
- Counters selection of different colours (1 counter of each colour per person)

Preparation:

Sufficient spinners need to be photocopied / printed

Spinner sheets need to be cut (two spinners per page)

Sufficient game boards need to be photocopied / printed.

Spinners and game boards can be laminated for longevity, although this is not strictly necessary.

How :

The game board is placed within reach of all the players.

Players begin by placing their counter on the zero on the game board. For each turn, a player spins both spinners, adds the indicated number to the number their counter is currently on, and moves to the new total. For example, if a player is on 12 and they spin a twenty and a 9, they add 29 to 12 and so move to 41.

When a player's total is more than 99, on their next move and all subsequent moves, instead of adding the numbers spun, they subtract them. The first player to get to 9 or less (or off the edge of the board) is the winner.

Students initially determine the calculations using the board (up or down rows being + or -10s, right and left, + or – 1s). Teachers should then explicitly show students the connection between the board and a written strategy (see supplement). Students can then progress to use pen and paper methods, in conjunction with the visual cues provided by the chart, before they move to using pen and paper methods or mental calculation to state the total before moving their counters to check their answer.

Addition and Subtraction - Number Chart Supplement

Bridging understanding from materials to written strategies:

If students are to work flexibly with written algorithms, clear connections need to be made between the material support and each aspect of the written strategy. An example of these connections is shown below:

Number Chart - Subtraction

Written form	Matching chart support
34 – 28	
(Subtracting 10s first)	
34	Starting at 34 on the chart
-20	Moving down 2 rows
= 14	Marker lands here
- 8	Moving back 8 spaces, particularly noting that a new row is started after 4 spaces
= 6	Marker finishes here
or	
34 – 28	
(Subtracting 1s first)	
34	Starting at 34 on the chart
- 8	Moving back 8 spaces, particularly noting that a new row is started after 4 spaces
= 26	Marker lands here
-20	Moving up 2 rows
= 6	Marker finishes here

Note: It is not important at this point whether the 10s or 1s are subtracted first. Either way eventually yields to an efficient mental technique and also paves the way for the understanding of later algorithms for dealing with bigger numbers. In many ways, subtracting the 10s first often seems to be a more 'natural' way of proceeding.

Number Chart - Addition

Written form	Matching chart support
34 + 28	
(Adding 10s first)	
34	**Starting at 34 on the chart**
+20	**Moving down 2 rows**
= 54	**Marker lands here**
+8	**Moving forward (to the right) 8 spaces, particularly noting that a new row is started on the 6th space**
= 62	**Marker finishes here**
or	
34 + 28	
(Adding 1s first)	
34	**Starting at 34 on the chart**
+ 8	**Moving forward (to the right) 8 spaces, particularly noting that a new row is started on the 6th space**
= 42	**Marker lands here**
+20	**Moving down 2 rows**
= 62	**Marker finishes here**

Note: It is not important at this point whether the 10s or 1s are added first. Either way eventually yields to an efficient mental technique and also paves the way for the understanding of later algorithms for dealing with bigger numbers. In many ways, adding the 10s first often seems to be a more 'natural' way of proceeding.