contents and sample pages

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Why do Some Students Have Difficulty Learning the Tables?

Students appear to have little difficulty learning sporting and entertainment facts and trivia. Students also learn to read and spell hundreds of words and yet they struggle to remember the basic multiplication facts. Clearly for the most part while memory does play a role in learning the basic multiplication facts, it is not the most important factor and should not be blamed for students not learning them. It is acknowledged, however, that there are some students with poor memories that will need to rely on using strategies to reconstruct the basic multiplication facts.

Experience suggests that students who rely solely on memorising the basic multiplication facts are making the job of learning the 'tables' much harder than it needs to be. Consider the symbols shown in the grid below. Imagine trying to remember each individual symbol. It would certainly be difficult. However, on deeper examination of the grid certain patterns become obvious that making the job of learning the symbols much simpler. For example, consider the first row and the first column – the symbols are all the same. Likewise focus on the second row and column. Now look at the sixth column and the sixth row.

Clearly looking for, and using *patterns* will assist students to reduce the number of table facts that need to be memorised. Further examination of the symbols in the grid will indicate that the symbols are repeated on either side of the diagonal that runs from the top left of the grid to the bottom right. Consider the last column and row. What pattern can you spot?

Many of the activities contained in the Activities section focus on the patterns to be found in the multiplication grid. Students are less likely to notice the patterns when the basic multiplication facts are printed in the traditional 'table format' [See right of p. 6].

	♣	♦	♥	♠	❖	✚	✫	★	☆	✪	○
♣	♣	♣	♣	♣	♣	♣	♣	♣	♣	♣	♣
♦	♣	♦	♥	♠	❖	✚	✫	★	☆	✪	○
♥	♣	♥	❖	✫	☆	♦♣	♦♥	♦❖	♦✫	♦☆	♥○
♠	♣	♠	✫	✪	♦♥	♦✚	♦☆	♥♦	♥❖	♥★	♠○
❖	♣	❖	☆	♦♥	♦✫	♥♣	♥❖	♥☆	♠♥	♠✫	❖○
✚	♣	✚	♦♣	♦✚	♥♣	♥✚	♠♣	♠✚	❖♣	❖✚	✚○
✫	♣	✫	♦♥	♦☆	♥❖	♠♣	♠✫	❖♥	❖☆	✚❖	✫○
★	♣	★	♦❖	♥♦	♥☆	♠✚	❖♥	❖✪	✚✫	✫♠	★○
☆	♣	☆	♦✫	♥❖	♠♥	❖♣	❖☆	✚✫	✫❖	★♥	☆○
✪	♣	✪	♦☆	♥★	♠✫	❖✚	✚❖	✫♠	★♥	☆♦	✪○
○	♣	○	♥○	♠○	❖○	✚○	✫○	★○	☆○	✪○	♦○○

x 8

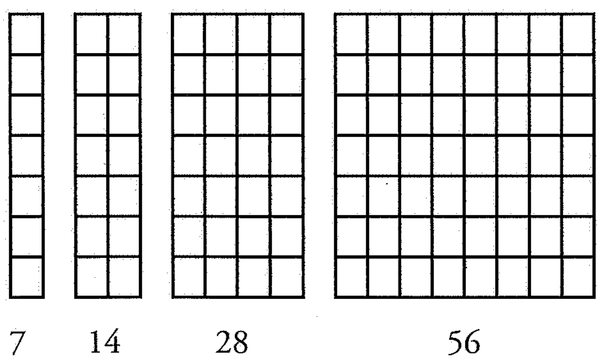
The strategies previously discussed when dealing with the 'two times' and 'four times table' may be applied to the learning of the 'eight times table'. However, there is an added advantage at this point because the students will already have developed fluency with the 'two and four times tables'. ***Some students may not make the connection with these related 'tables' so they need to be made explicit.***

Colouring the multiples of four and eight will help students to spot the relationship between the 'four and eight times table'.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

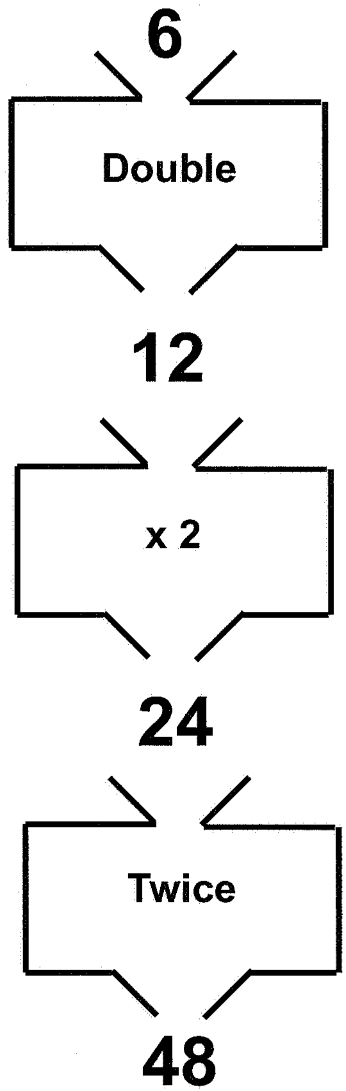
Most students will notice that when colouring in the multiples of eight, every fourth cell has already been coloured. Doubling the 'four times table' produces the 'eight times table'.

Another form of doubling strategy may also be used. For example, to work out 7 x 8 would involve doubling 7, doubling again and then double again.



This strategy may be summarised as **double-double-double.**

Function machines (see below) can be used to introduce the double-double-double strategy. Explain that when a number enters a function machine it is changed before it comes out the other side. Six eights are forty-eight may be calculated using the double-double-double strategy as illustrated by the function machines below.



It should be noted that the the basic multiplication fact 7 x 8 = 56 and the equivalent 8 x 7 seem to cause the most difficulty for students and adults. (See page 60, Devlin, K. (2000) *The Mathematical Gene*. London: Weidenfeld & Nicholson)