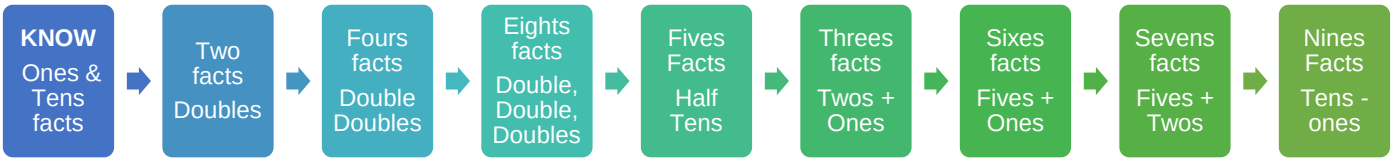
MULTIPLICATION STRATEGIES

General Information:

Traditionally, the multiplication facts (often referred to as the times tables) are taught in numeric order, i.e. the ones facts, followed by the twos, etc. By using the suggested strategies (and building on what students already know) an alternative order of introducing the facts can be applied.

If students know (or can quickly familiarise themselves) their ones and tens facts, the teacher would then introduce the twos (doubles), fours (double, doubles) and eights (double, double, doubles). The fives facts are the tens facts halved. The threes are the twos plus the ones. The sixes are the fives plus the ones. The sevens are the fives plus the twos and finally, the nines are the tens subtract the ones.



The multiplication strategies listed here and the alternative order that teachers may consider introducing the multiplication facts to students has come from the work of Professor Di Siemon (RMIT University).

FACT	DESCRIPTION	EXAMPLE
1	Students, quite early, will develop an understanding that multiplication by 1 does not change to the number. The use of the **groups of** strategy may support this understanding.	$5 \times 1 = 5$ This fact can be read as 5 groups of 1 object or 5 objects. $1 \times 5 = 5$ This fact can be read as 1 group of 5 objects or 5 objects.
2	Many students will be familiar with the twos facts as they understand they are linked with the skip counting by 2s (or even numbers) counting sequence. To help students apply this knowledge to other facts it is important to refer to the twos facts as the **doubles**. Although many students may be able to double the numbers from 1 to 6 (from playing games involving dice) they may need support to **double** larger numbers, including two-digit numbers.	To find the **double** of a number we multiply by 2 or add the number to itself. $Double\ 5\ is\ 5 \times 2\ or\ 5 + 5 = 10$ To **double** a two-digit (or larger number) we first partition the number using place value then **double** its parts. $Double\ 24$ $24 = 20 + 4$ $Double\ 20\ is\ 40\ and\ double\ 4\ is\ 8$ $\therefore 40 + 8 = 48\ or\ double\ 24\ is\ 48$
3	The threes facts can be thought of as the **twos** facts plus the **ones** facts. To multiply by 3, we can multiply the number by two, multiply the number by one then add the result.	$7 \times 3 = ?$ I know that $7 \times 2 = 14$ and $7 \times 1 = 7$ $14 + 7 = 21$ $\therefore 7 \times 3 = 21$
4	The fours facts can be thought of as the **double doubles**. To multiply by 4, we **double** the number twice.	$8 \times 4 = ?$ I know that $double\ 8\ is\ 16$ I can then $double\ 16$ by using partitioning. $16 = 10 + 6$ $Double\ 10\ is\ 20\ and\ double\ 6\ is\ 12$ $\therefore 20 + 12 = 32\ or\ 8 \times 4 = 32$
5	Although many students may be able to calculate the fives facts (as with the twos facts) using skip counting, another strategy is to use the tens facts and halve them. It is therefore important that students know how to **halve** numbers, in particular how to **halve** multiples of 10.	$6 \times 5 = ?$ I know that $6 \times 10 = 60$ To halve a number, I need to think of which number when added to itself will make my initial number. $Half\ of\ 60\ is\ 30$ $\therefore 6 \times 5 = 30$

6	The sixes facts can be thought of as the **fives** facts plus the **ones** facts or alternatively the **double** of the **threes** facts. To multiply by 6, multiply the number by 5, multiply the number by 1, then add the result. Alternatively, multiply the number by 3 and then double the result.	$7\times6=?$ I know that $7\times5=35$ and $7\times1=7$ $35+7=42$ Alternatively, I know that $7\times3=21$ $Double\ 21\ is\ 42$ $\therefore 7\times6=42$
7	For many students, the sevens facts are often perceived to be the most challenging of all the multiplication facts to remember. Instead if we use our knowledge of the **fives** and **twos** facts and partitioning to may be easier to find the solution. To multiply by 7, multiply the number by 5, multiply the number by 2, then add the results.	$8\times7=?$ I know that $8\times5=40$ and $8\times2=16$ $40+16=56$ $\therefore 8\times7=56$
8	The eights facts can be thought of as **double, double, double.** To multiply by 8, we **double** the number three times.	$6\times8=?$ I know that $double\ 6\ is\ 12$ I can then $double\ 12$ by using partitioning. $12=10+2$ $Double\ 10\ is\ 20\ and\ double\ 2\ is\ 4$ $20+4=24$ I can then $double\ 24$ $Double\ 20\ is\ 40\ and\ double\ 4\ is\ 8$ $\therefore 40+8=48\ or\ 6\times8=48$
9	To calculate the nines facts, you can use the **tens** facts and subtract the **ones** facts. To multiply by 9, we multiply the number by 10, multiply the number by 1, then subtract the result.	$8\times9=?$ I know that $8\times10=80$ and $8\times1=8$ $80-8=72$ $\therefore 8\times9=72$
10	Many students will be aware that to multiply by 10 we can multiply by 1 and "add a zero." Although this strategy will give the students the correct solution, the language is incorrect as adding a zero does not change the result. Instead, we should encourage students to say we that we **place a zero.** This helps to link the strategy with place value.	$7\times10=?$ Think about $7\times1=7$ Then to solve 7×10 I can record the solution to 7×1 and then place a zero at the end. $7\times10=70\leftarrow$

More Information:

Siemon, D. (2008). There's more to counting than meets the eye (or the hand) [PDF]. Retrieved from https://www.education.vic.gov.au/Documents/school/teachers/teachingresources/discipline/maths/assessment/theresmoretocount.pdf