

D. Background knowledge – Multiplication."

1. CONCEPTS:

Product (Answer of a multiplication sum vermenigvuldigingsom)	times more	times larger."
Groups of		

2. Multiplication can be seen as:

- Repeated addition of the same number
 $2 + 2 + 2 + 2 = 4 \times 2 = 4 \text{ keer } 2 = 4 \text{ groups of } 2$

- The inverse process of division..

To check if the answer to a multiplication sum is correct, the sum can be divided or done in reverse.

<u>MULTIPLICATION</u>	<u>DIVISION</u>
$ \begin{array}{r} 134 \\ \times \quad 12 \\ \hline 1268 \\ + 1340 \\ \hline 1608 \end{array} $	$ \begin{array}{r} 134 \\ 12 \overline{) 1608} \\ \underline{12} \\ 40 \\ \underline{36} \\ 48 \\ \underline{36} \\ 48 \\ \underline{48} \\ 0 \end{array} $

3. Factors and Multiples:

Multiples of numbers are those numbers that are repeatedly added to themselves and then added to each answer.

E.g. Multiples of 6 : M_6 : 6 ; 12 ; 18 ; 24 ; 30 ; 36 ; ...

Factors are numbers that can divide into other numbers without leaving a remainder. **E.g. Factors van 12 :** F_{12} 1 ; 2 ; 3 ; 4 ; 6 ; 12

Therefore a factor x factor = product

HINT:

Knowing multiples can help you with your tables

4. Properties of multiplication:**Commutative property:**

Multiplication of numbers can be done in any order

$$\text{E.g. } 3 \times 4 = 4 \times 3$$

Associative property:

When more than two numbers are multiplied together, the operation can be done in any order.

Distributive property:

$$\text{E.g. } 2 \times 5 + 3 \times 5 = 5 \times (2 + 3)$$

REMEMBER: If an 'x' stands before a bracket, it can be omitted.

$$\text{E.G. } 3 \times (5 + 4) = 3(5 + 4)$$

5. Methods of multiplication:

There are basically 3 methods in which multiplication can be done,

METHOD 1 VERTICAL	METHOD 2 FACTORS	METHOD 3 DISTRIBUTIVE PROPERTIES
$\begin{array}{r} 43\,458 \\ \times \quad 256 \\ \hline 260\,748 \text{ (43\,458 x 6)} \\ 2\,172\,900 \text{ (43\,458 x 50)} \\ \hline 8\,691\,600 \text{ (43\,458 x 200)} \\ 11\,125\,248 \end{array}$	$\begin{aligned} 42 \times 12 &= 42 \times 6 \times 2 \\ &= 42 \times 2 \times 3 \times 2 \\ &\quad (2 \times 3 = 6) \\ &= 84 \times 3 \times 2 \\ &= 252 \times 2 \\ &= 504 \end{aligned}$	$\begin{aligned} 142 \times 34 &= 142 \times (30 + 4) \\ &= (142 \times 30) + (142 \times 4) \\ &= 4260 + 568 \\ &= 4828 \end{aligned}$

6. Multiply by 10 and the multiples of 10

- When a number is multiplied by 10, it means that it becomes 10 times larger.
e.g. $240 \times 10 = 2400$
- When a number is multiplied by 100, it means that it becomes 100 times large
e.g.. $1\,400 \times 100 = 140\,000$

- Numbers that are multiplied by other multiples of 10.

$$\begin{aligned} \text{.g. } 12 \times 30 &= 12 \times (10 \times 3) \\ &= 12 \times 10 \times 3 \\ &= 120 \times 3 \\ &= 360 \end{aligned}$$

7. Multiplying by a whole number::

The answer is greater than the original number.

$$\text{e.g. } 16 \times 2 = 32$$

8. Vermenigvuldiging deur 'n breuke:

The answer is smaller than the original number.

$$\text{e.g. } 16 \times 0,2 = 3,2$$

9. Identity number;

The identity number of multiplication is '1', because when a number is multiplied by '1', the value of the number does not change.

$$\text{e.g. } 12 \times 1 = 12$$

10. All numbers multiplied by '0' result in '0'.

$$\text{e.g. } 3 \times 0 = 0$$