

Learning Intention :

WALT identify the base number and the index number. Expand and simplify indices.

Success Criteria: I know what is a base number. How do the powers work? I can expand 5^4 As a multiple of a base number.

[Video](#)

$$5 \times 5 \times 5 \times 5 \times 5 = 5^6$$

The base is multiplied by 6 times, therefore, the index is 6


EXAMPLE 1

- a Write $5 \times 5 \times 5 \times 5 \times 5 \times 5$ in index form.
- b Write the answer for part a in words.
- c State which number is the base and which is the index.

- a 5 is repeated 6 times. $\therefore 5 \times 5 \times 5 \times 5 \times 5 \times 5 = 5^6$
- b 5^6 means '5 to the power of 6'.
- c The base is 5 and the index is 6.

Exercise 4A

- 1 Complete the following.
 - a Write $2 \times 2 \times 2 \times 2 \times 2$ in index form.
 $2 \times 2 \times 2 \times 2 \times 2 = 2^{\square}$
 - b Write the answer from part a in words.
_____ means '_____ to the power of _____'.
 - c State which number is the base and which is the index.
The base is _____ and the index is _____.
- 2
 - a Write $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7$ in index form.
 - b Write the answer from part a in words.
 - c State which number is the base and which is the index.
- 3
 - a Write the following in index form.
 - i $4 \times 4 \times 4$ ii $9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9$
 - b Write the answer from part a in words.
 - c State which number is the base and which is the power.
- 4
 - a Write the following in index form.
 - i $6 \times 6 \times 6 \times 6 \times 6 \times 6$ ii $10 \times 10 \times 10 \times 10$
 - b Write the answer from part a in words.
 - c State which number is the base and which is the exponent.
- 5 Write the following products in index form.
 - a $8 \times 8 \times 8 \times 8 \times 8 \times 8 \times 8 \times 8 \times 8$ b $10 \times 10 \times 10$
 - c 12×12 d $6 \times 6 \times 6 \times 6$ e $9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9$

Index, power and exponent
all mean the same thing. 

Now working with the variables

[Indices practice](#)

Try some other stuff

Algebra in Action

EXAMPLE 2

- a Write $p \times p \times p \times p$ in index form.
 b Write the answer for part a in words.
 c State which part is the base and which is the index.

- a p is repeated 4 times. $\therefore p \times p \times p \times p = p^4$
 b p^4 means p to the power of 4.
 c The base is p and the index is 4.

6 Complete the following.

- a Write $k \times k \times k \times k \times k$ in index form. $k \times k \times k \times k \times k = k^5$
 b Write the answer from part a in words. _____ means '_____ to the power of _____'.
 c State which number is the base and which is the index. The base is _____ and the index is _____.


7 a Write the following in index form.

- i $w \times w \times w \times w$ ii $a \times a \times a \times a \times a \times a \times a \times a \times a \times a$
 b Write the answer for part a in words.
 c State which part is the base and which is the index.

EXAMPLE 3

Write the following in expanded form.

- a 4^3 b h^5

Expanded form means as a repeated product. 

- a Base is 4 and index is 3. $\therefore 4$ is written out 3 times.
 4^3 in expanded form is $4 \times 4 \times 4$.
 b Base is h and index is 5. $\therefore h$ is written out 5 times.
 h^5 in expanded form is $h \times h \times h \times h \times h$.

8 Complete to write the following in expanded form.

- a $5^6 = _ \times _ \times _ \times _ \times _ \times _$
 b $12^3 = _ \times _ \times _$
 c $j^5 = _ \times _ \times _ \times _ \times _$
 d $v^7 = _ \times _ \times _ \times _ \times _ \times _ \times _$

9 Write the following in expanded form.

- | | | | |
|----------|---------|---------|---------|
| a 1^6 | b 7^8 | c 6^3 | d 2^4 |
| e 10^2 | f 3^2 | g 8^5 | h 4^5 |
| i l^7 | j t^2 | k f^4 | l a^9 |
| m y^5 | n d^5 | o k^3 | p m^8 |



Information on NZ by

Eg GDP rate per capita, Literacy rate, Male/ female population in %, Birth and death rate, Life expectancy, employment, social welfare, retirement age, Gun laws, crime rate, diseases, resources consumption such as Petrol, renewable energy, fossil fuel, clean water, metals, wood, coal, hydroelectric power

Find this information for NewZealand and think about another country which is a poor country

