

Powerful Thought

ACTIVITY

1. Hamid and Isabel were talking about how they worked out 2^6 .

I went $2 \times 2 = 4$,
 $4 \times 2 = 8$,
 $8 \times 2 = 16$,
 $16 \times 2 = 32$,
 $32 \times 2 = 64$.
 It took ages!



I thought
 $2 \times 2 \times 2 \times 2 \times 2 \times 2$
 would be the same as
 8×8 , and it was!

- Explain why $2 \times 2 \times 2 \times 2 \times 2 \times 2$ gives the same product as 8×8 .
- How do you think 3^4 could be worked out quickly using Isabel's idea?

2. Hamid and Isabel made this table showing powers of 2:

2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9	2^{10}
2	4	8	16	32	64	128	256	512	1 024

That's interesting ...
 $4 \times 8 = 32$ and
 $2^2 \times 2^3 = 2^5$, which is 32.



And $2^2 \times 2^5 = 2^7$, which is the same as 4×32 .

- They decided to investigate these equations:
 - $2^1 \times 2^5 = 2^6$
 - $2^3 \times 2^4 = 2^7$
 - $2^5 \times 2^5 = 2^{10}$
 Check whether each equation is true.
- Is there a pattern in these equations? If so, describe it.

3. a. Make up a table showing the powers of 3 up to 3^{10} .

3^1	3^2	
3	9	

- Does $3^2 \times 3^4 = 3^6$?
 - Does $3^5 \times 3^3 = 3^8$?
 Explain your answers.