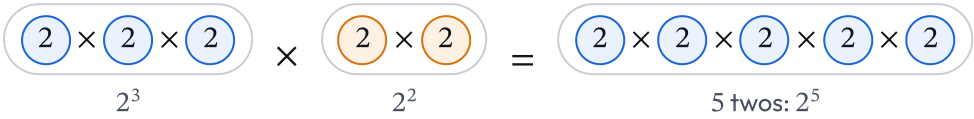
Names (pair) _____ Date _____

Multiplying Powers

Example

$2^3 \times 2^2$: three twos times two twos.



Nothing is added or multiplied "up top": we just **count all the factors**. $2^3 \times 2^2 = 2^5 = 32$.

Remember

To multiply powers with the same factor, count all the factors: $a^m \times a^n = a^{m+n}$. The repeated factor stays the same.

1 ON YOUR OWN Write as a product of factors, count them and write as one power. Then work out the value.

product of powers	product of factors	one power	value
$3^2 \times 3^2$			
$5^1 \times 5^3$			
$10^2 \times 10^3$			
$2^4 \times 2^4$			

2 ON YOUR OWN Write as one power.

$7^3 \times 7^5 =$ ☐

$10^4 \times 10^2 =$ ☐

$a^2 \times a^5 =$ ☐

$x \times x^4 =$ ☐

$3 \times 3^2 \times 3^3 =$ ☐

$5^2 \times 5^2 \times 5^2 =$ ☐

Names (pair) _____ Date _____

3 IN PAIRS **Find the mistake.** Ivan wrote: $2^3 \times 2^2 = 4^5$. Mia wrote: $3^2 \times 3^4 = 3^8$. What did each of them do? Write out the factors and correct it.

4 IN PAIRS **Discuss.** Can $2^3 \times 3^2$ be written as one power? What about 6^5? Work out both numbers.

(2) × (2) × (2) × (3) × (3)

$2^3 \times 3^2 =$ ☐ $6^5 =$ ☐

5 IN PAIRS CHALLENGE What is a million millions? A million is 10^6. Write $10^6 \times 10^6$ as one power of 10. How many zeros does the number have?

$10^6 \times 10^6 =$ ☐ zeros: ☐

6 ON YOUR OWN A square has side 10^2 cm. What is its area? Write it as a power of 10.

$P = 10^2 \times 10^2 =$ ☐ cm^2

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Rules mode: choose multiplying and watch the factors join into one power.

★ ON YOUR OWN **Exit card.** Write as one power and work out:

$5^2 \times 5^3 =$ ☐ = ☐