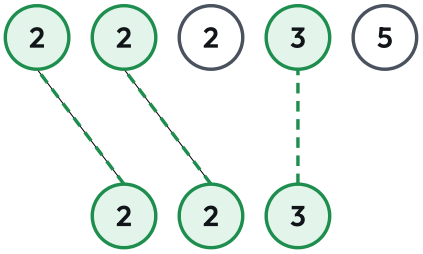
Names (pair) _____ Date _____

Divisibility from Prime Factors

Example



Is $2^3 \times 3 \times 5$ divisible by 12? Factorise $12 = 2^2 \times 3$ too. The number has three twos (two are needed) and one three (one is needed). **It is divisible**, and we never worked out the product.

And by $9 = 3^2$? Two threes are needed, but there is only one: **not divisible**.

Remember

A number is divisible by d if **every prime factor** of d appears in the number's prime factorisation **at least as many times** as it does in d.

1 ON YOUR OWN Is $2^3 \times 3 \times 5$ divisible by each number? Factorise the divisor and decide without working out the product.

divisible by	prime factors	
4		yes / no
6		yes / no
9		yes / no
10		yes / no
15		yes / no
16		yes / no
20		yes / no
25		yes / no

Names (pair) _____ Date _____

2 IN PAIRS Circle every number that $2^2 \times 3^2 \times 7$ is divisible by.

4 8 9 12 14 18 21 27 28 36

3 ON YOUR OWN **All the factors from the prime factors.** In each box, write the product of the row and column headings. How many factors does the number have?

$12 = 2^2 \times 3$

	1	2	2^2
1			
3			

factors: ☐

$18 = 2 \times 3^2$

	1	2
1		
3		
3^2		

factors: ☐

4 IN PAIRS **Discuss.** Is $3 \times 5 \times 7 + 1$ divisible by 7? Decide without calculating.

_____

_____

The Factors and Prime Factors app · otooly.com/factors

Factors from primes mode: the **Factor table** builds all the factors, and **Is it divisible?** gives new questions like task 1.

★ ON YOUR OWN **Exit card.** Is $2^2 \times 3 \times 5^2$ divisible by 50? **yes** / **no** Why?

☐