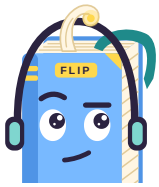
Name _____ Date _____

# Prime or not?

A prime number has exactly two factors: 1 and itself.

## 1 Learn




7 counters only make one row: 1 × 7. So 7 has exactly **two factors**, 1 and 7. It is a **prime number**. 6 can also make 2 × 3, so 6 is a **composite number**.



**7**: only 1 × 7 → **prime**

**6**: 1 × 6 and 2 × 3 → **composite**

**Learn by heart: the primes up to 19**

2 3 5 7

11 13 17 19

1 is **not** prime: it has only one factor.

**Example: is 51 prime?**

Test the small primes in order.

2? No: 51 is odd.

3? 51 ÷ 3 = 17. **Yes!** So 51 = 3 × 17.

51 has more than two factors, so it is **composite**.

For any number up to 100, testing 2, 3, 5 and 7 is enough.

**Flip's tip:** odd does not mean prime! 9, 15, 21 and 51 are odd, but they are all composite. And 2 is the only **even** prime.

**Warm up:** write **P** for prime or **C** for composite.

| 4 ☐ | 9 ☐ | 13 ☐ | 19 ☐ | 21 ☐ |
|---|---|---|---|---|

**Grown-ups:** ask your child to prove a number is composite by saying a factor pair ("21 is 3 × 7"). To be prime, there must be no pair except 1 × the number.

Name _____ Date _____

## 2 Try it together a child and a grown-up, about 10 minutes




### Prime sieve

**You need:** two different coloured pencils. Take turns with each step.

1. Cross out **1**: it is not prime.
2. Ring **2** in colour. Then cross out every other **multiple of 2** (4, 6, 8…).
3. Ring **3**. Cross out every other multiple of 3 that is not crossed out yet.
4. Do the same for **5**, then **7**.
5. Ring every number that is left. They are all prime!

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |

How many primes are there up to 50? _____

Odd numbers you crossed out: _____

**Grown-ups:** ask "Why could we stop after 7?" Every composite number up to 50 has 2, 3, 5 or 7 as a factor. The next prime, 11, only matters from 121 (11 × 11).

## 3 Practise

**A.** Draw a ring round every **prime number**.

9 11 15 17 21 23 27 29 33 37 39 51

# Prime or not?

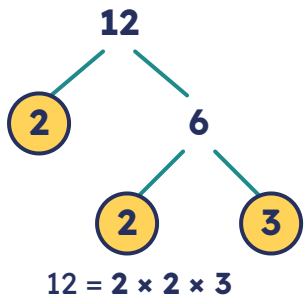
Scan to play this chapter in the game

Name _____ Date _____

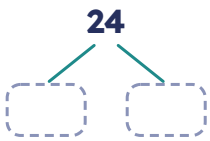
**B.** Prime or composite? If it is composite, prove it with a factor pair.

| Number | Prime or composite? | Factor pair (if composite) |
|---|---|---|
| 57 | | |
| 43 | | |
| 91 | | |
| 61 | | |
| 87 | | |
| 49 | | |

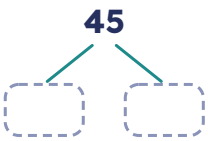
**C. Prime factors** are factors that are prime. A factor tree splits a number until every end is prime.



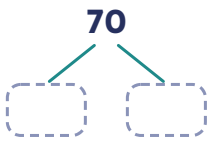

12 = **2 × 2 × 3**




24 = _____




45 = _____




70 = _____

## Challenge

Mia says, "All odd numbers are prime." Is she right? Give an example to explain.

_____

_____

_____

## I can...

Tick when you can.

- ☐ say the prime numbers up to 19
- ☐ check whether a number up to 100 is prime
- ☐ write a number as a product of prime factors