

WA6MNAUN3

Understanding number

Core + Challenge

Prime and Composite Numbers

I can use arrays and factors to decide whether a number is prime or composite, and explain why.

Name: _____ Date: _____ Score: _____ / 57

Key idea

A **factor** divides a number exactly, with nothing left over. The factors of 6 are 1, 2, 3 and 6.

A **prime** number has exactly **two** factors: 1 and itself. It makes only **one** array: a single row.

A **composite** number has **more than two** factors, so it makes more than one array.

1 is neither prime nor composite: it has only one factor. Example: 6 is composite, 7 is prime.

$6 = 1 \times 6$



$6 = 2 \times 3$



$7 = 1 \times 7 \text{ only}$



Factors of 6



A

Warm up draw arrays, list and sort

/ 16 marks

Write the multiplication and the number shown by each array. 1 mark each.

1 $\square \times \square = \square$



2 $\square \times \square = \square$



3 $\square \times \square = \square$



4 $\square \times \square = \square$



Is the number **prime** or **composite**? Circle one. 1 mark each.

5 **9** prime / composite

6 **13** prime / composite

7 **21** prime / composite

8 **2** prime / composite

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Draw **every** rectangular array for the number on the grid. (2×4 and 4×2 count as the same array.) 1 mark each.

9 Every array for 5

10 Every array for 8

11 Every array for 10

12 Every array for 9

List **all** the factors of each number. 1 mark each.

13 Factors of 12

14 Factors of 17

15 Factors of 20

16 Factors of 18

B Practise *use the skill*

/ 22 marks

- 1 Use the chart as a sieve. Shade every **composite** number: the multiples of 2, 3, 5 and 7, but **not** 2, 3, 5 and 7 themselves. Leave 1 unshaded. Circle the numbers that are left (except 1). How many **primes** are less than 50? [3 marks]

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

Answer: _____

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- 2 Mr Tan sets out chairs in equal rows for a school assembly. He wants **more than one** row and **more than one** chair in each row. **a)** Can he do this with **23** chairs? Explain. **b)** Show one way to do it with **21** chairs. [2 marks]

Answer: _____

- 3 A gardener plants **24** seedlings in equal rows. Draw every different rectangular array on the grid. Is 24 prime or composite? Explain. [3 marks]



Answer: _____

- 4 Complete the table. [3 marks]

Number	All its factors	How many factors?	Prime, composite or neither?
15			
19			
27			
31			
1			

- 5 Find the **two** prime numbers between 80 and 90. Show why **87** is not prime. [2 marks]

Answer: _____

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- 6 The school fete is in **November 2026**. Circle every **prime** date on the calendar. [2 marks]
How many prime dates are there?

M	T	W	T	F	S	S
						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						

Answer: _____

- 7 Complete the **factor rainbow** for 30. Write the factors in order, then join each factor pair with an arc. You may not need every box. [2 marks]

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- 8 Write each even number as the **sum of two prime numbers**: a) 16 b) 24 c) 30 [3 marks]

a) 16 = _____

b) 24 = _____

c) 30 = _____

- 9 a) Ella's locker number is a **prime** number between 30 and 40. Its digits add to 4. [2 marks]
What is it? b) Jack's locker number is between 40 and 50 and has **exactly three**
factors. What is it?

Answer: _____

C**Think it through** *explain your thinking*

/ 10 marks

- 1 Zara says, "All odd numbers are prime." Do you agree with Zara? Explain, with examples. [2 marks]

- 2 Mia says, "57 is prime, because it is not in the 2, 5 or 10 times tables." Do you agree with Mia? Explain. [2 marks]

- 3 **Always, sometimes or never true?** "When you add two prime numbers, the answer is even." Circle one and give examples. [2 marks]

Always / Sometimes / Never

- 4 Which number is the **odd one out**? 21, 31, 51, 91. Explain. [2 marks]

- 5 Sort these numbers into the table: 2, 9, 15, 23, 4, 29, 33, 18. Why does one box have only **one** number in it? [2 marks]

	Even	Odd
Prime		
Composite		

D

Challenge *stretch yourself*

/ 9 marks

- 1 Find **all** the numbers from 1 to 30 that have **exactly three** factors. What do you notice about them? [3 marks]

Answer: _____

- 2 My age is a **prime** number and I am younger than 20. My mum is **30 years older** than me, and her age is **also prime**. Find **all** the possible ages for me. [3 marks]

Answer: _____

- 3 Some chairs can be set out in **exactly three** different rectangular arrays (2×6 and 6×2 count as the same). **a)** Find the **smallest** number of chairs that works. **b)** Find two more numbers less than 30 that work. [3 marks]

Answer: _____

How did I go?

Warm up ___ / 16 Practise ___ / 22 Think it through ___ / 10 Challenge ___ / 9 **Total** ___ / 57

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