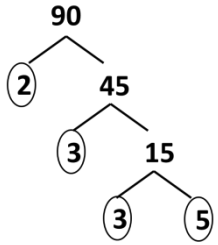
MATHEMATICS Unit 1: Numbers and the Number system	Year Group: 8 set 1-3

Key Vocabulary

Prime Number	Has exactly two different factors (1 and itself)
Prime Factor	A prime number that divides exactly into the given number
Prime Factorisation	Finding the factors of a number that are all prime
Product	Product means multiply
Highest Common Factor (HCF)	Largest factor common to two given numbers
Lowest common Multiple (LCM)	Smallest multiple common to two given numbers
Standard form 5 700 000 = 5.7×10^6 0.00075 = 7.5×10^{-4}	A way of writing down very large or very small numbers easily A number in standard form is a number between 1 and 10 multiplied by a power of 10
Significant figure (S.F) 6423 = 6000 to 1 S.F 0.0075 = 0.008 to 1 S.F	The first non-zero digit which tells you the size of a number, the most significant digit

Key facts / Diagrams

Express 90 in terms of its products prime factors

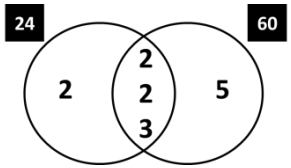


$90 = 2 \times 3 \times 3 \times 5$
$90 = 2 \times 3^2 \times 5$

Prime numbers up to 100:

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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Venn Diagram
What prime factors are in both 24 and 60?



2, 2, 3.

Significant figures:

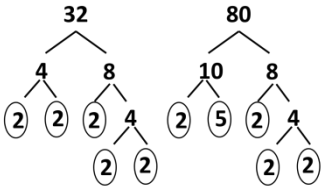
Examples:
87000 = 90000 to 1 s.f.
123.456 = 100 to 1 s.f.
0.00038 = 0.0004 to 1 s.f.

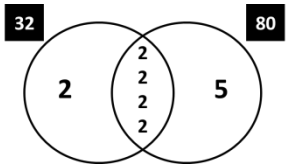
Common misconceptions

- 1 is not a prime number
- Some pupils may think rounding 34 974 to one significant figure is 3
  Correct answer is 30 000
- When converting between ordinary and standard form, some students incorrectly connect the power to the number of 0's
  $4.2 \times 10^5 = 4\ 200\ 000$ (incorrect)
  BUT this is 4 20 000

Worked examples

1. Using the prime factorisation method find the HCF and LCM of 32 and 80.





HCF = 2x2x2x2 = 16
LCM = 2x2x2x2x2x5 = 160

2. Write the following in standard form
a) 531 000 = 5.31×10^5
b) 0.0082 = 8.2×10^{-3}

3. Write the following as ordinary numbers
a) $3.7 \times 10^4 = 37\ 000$
b) $1.92 \times 10^{-2} = 0.0192$

4. Round the following to 1 S.F.
a) 683 100 = 700 000
b) 0.008294 = 0.008