New Town Primary School
Nurturing Brilliance, Inspiring Ambition

Year 5 Maths Knowledge Organiser

Powers of 10

Power	Expression	Standard Form
10^1	10	10
10^2	10x10	100
10^3	10x10x10	1000
10^4	10x10x10x10	10000
10^5	10x10x10x10x10	100000
10^6	10x10x10x10x10x10	1000000

Place Value

Millions			Thousands			Units		
		1	4	6	2	7	9	5
hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

Expanded Form:
1,000,000 + 400,000 + 60,000 + 2,000 + 700 + 90 + 5

Word Form: one million, four hundred sixty-two thousand, seven hundred ninety-five

Standard Form: 1,462,795

Round these numbers to the nearest...

...10		...100		...1000	
48 →	50	209 →	200	3456 →	3000
87 →	90	2867 →	2900	5349 →	5000
184 →	180	3467 →	3500	89231 →	89000
145 →	150	1095 →	1100	37849 →	38000

Converting LENGTH Units

x 1000 → x 100 → x 10
Km   m   cm   mm
÷ 1000 ← ÷ 100 ← ÷ 10

	Fraction	Decimal	Percentages
	$1/1$	1.0	100%
	$3/4$	0.75	75%
	$2/3$	0.66	66.6%
	$1/2$	0.5	50%
	$3/8$	0.375	37.5%
	$1/3$	0.33	33.3%
	$1/4$	0.25	25%
	$1/5$	0.2	20%
	$1/8$	0.125	12.5%
	$1/10$	0.1	10%

Roman Numerals

I	1	XXI	21	XLI	41	LXI	61	LXXXI	81
II	2	XXII	22	XLII	42	LXII	62	LXXXII	82
III	3	XXIII	23	XLIII	43	LXIII	63	LXXXIII	83
IV	4	XXIV	24	XLIV	44	LXIV	64	LXXXIV	84
V	5	XXV	25	XLV	45	LXV	65	LXXXV	85
VI	6	XXVI	26	XLVI	46	LXVI	66	LXXXVI	86
VII	7	XXVII	27	XLVII	47	LXVII	67	LXXXVII	87
VIII	8	XXVIII	28	XLVIII	48	LXVIII	68	LXXXVIII	88
IX	9	XXIX	29	XLIX	49	LXIX	69	LXXXIX	89
X	10	XXX	30	L	50	LXX	70	XC	90
XI	11	XXXI	31	LI	51	LXXI	71	XCI	91
XII	12	XXXII	32	LII	52	LXXII	72	XCII	92
XIII	13	XXXIII	33	LIII	53	LXXIII	73	XCIII	93
XIV	14	XXXIV	34	LIV	54	LXXIV	74	XCIV	94
XV	15	XXXV	35	LV	55	LXXV	75	XCV	95
XVI	16	XXXVI	36	LVI	56	LXXVI	76	XCVI	96
XVII	17	XXXVII	37	LVII	57	LXXVII	77	XCVII	97
XVIII	18	XXXVIII	38	LVIII	58	LXXVIII	78	XCVIII	98
XIX	19	XXXIX	39	LIX	59	LXXIX	79	XCIX	99
XX	20	XL	40	LX	60	LXXX	80	C	100
								D	500
								M	1000

Numbers to the right of 0 (zero) are positive

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

Numbers to the left of 0 (zero) are negative

Vocabulary- Number

Prime numbers	A number that is divisible only by itself and 1 (e.g. 2, 3, 5, 7, 11).
Composite (non-prime) numbers	A composite number has more than two factors.

Long Multiplication
Multiplying by a Two-Digit Number

154 × 26

1 Write the numbers above each other in the correct columns.

```
    1 5 4
  ×   2 6
```

2 First, multiply the ones in the three-digit number by the ones in the two-digit number.

4 ones × 6 ones = 24 ones = 2 tens and 4 ones

Write 4 in the answer section and regroup the 2 tens by writing 2 above the tens column.

```
      2
    1 5 4
  ×   2 6
        4
```

3 Next, multiply the tens in the three-digit number by the ones digits in the two-digit number and add any regrouped tens.

5 tens × 6 = 30 tens + 2 tens = 32 tens = 3 hundreds and 2 tens

Write 2 in the answer section and regroup the 3 hundreds by writing 3 above the hundreds column.

```
    3 2
    1 5 4
  ×   2 6
      2 4
```

4 Finally, multiply the hundreds in the three-digit numbers by the ones digits in the two-digit number and add any regrouped hundreds.

1 hundred × 6 = 6 hundreds + 3 hundreds = 9 hundreds

Write 9 in the answer section.

```
    3 2
    1 5 4
  ×   2 6
    9 2 4
```

Short Division
Dividing by a One-Digit Number

84 ÷ 6

1 Partition 84 into tens and ones.

Work out how many 6s divide into 80 so that the answer is a multiple of 10.

In this case, the highest multiple of 10 divisible by 6 is 60.

Partition 84 into 60 and 24 then divide each number by 6.

Combine the totals.

2 Combine the totals.

```
  1 0 + 4
6 6 0 + 2 4
```

3 This can be shortened to:

```
    1 4
6 8 ²4
```

Square Numbers

The product of a number multiplied by itself.

e.g. 10 × 10 = 100

which can be shown as:

$10^2 = 100$

10 squared = 100

10 × 10 = 100

1^2	1 × 1 =	1
2^2	2 × 2 =	4
3^2	3 × 3 =	9
4^2	4 × 4 =	16
5^2	5 × 5 =	25
6^2	6 × 6 =	36
7^2	7 × 7 =	49
8^2	8 × 8 =	64
9^2	9 × 9 =	81
10^2	10 × 10 =	100

Prime Numbers

A natural number greater than 1 with no divisors other than 1 and itself.

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

Cube Numbers

Formed by multiplying a digit by itself 3 times.

e.g. 10 x 10 x 10 = 1000
which can be shown as:
$10^3 = 1000$
10 cubed = 1000
10x10x10 cube

1^3	1 x 1 x 1 =	1
2^3	2 x 2 x2 =	8
3^3	3 x 3 x 3 =	27
4^3	4 x 4 x 4 =	64
5^3	5 x 5 x 5 =	125
6^3	6 x 6 x 6 =	216
7^3	7 x 7 x 7 =	343
8^3	8 x 8 x 8 =	512
9^3	9 x 9 x 9 =	729
10^3	10x10x10=	1000

Addition with 5-Digit Numbers: Column Method

1
```
  3 2 2 9 4
+ 3 4 5 1 5
```
Place the numbers one on top of the other, lining up the digits carefully.

2
```
  3 2 2 9 4
+ 3 4 5 1 5
          9
```
Add the ones and write the answer under the ones.

3
```
  3 2 2 9 4
+ 3 4 5 1 5
        0 9
     1
```
Add the tens and write the answer under the tens. Regroup any hundreds under the hundreds column.

4
```
  3 2 2 9 4
+ 3 4 5 1 5
      8 0 9
     1
```
Add the hundreds, including any hundreds that you may have regrouped.

5
```
  3 2 2 9 4
+ 3 4 5 1 5
    6 8 0 9
```
Add the thousands and write the answer under the thousands.

6
```
  3 2 2 9 4
+ 3 4 5 1 5
  6 8 0 9
```
Add the ten thousands.

7
```
  3 2 2 9 4
+ 3 4 5 1 5
  6 6 8 0 9
```
Check your answer. ✓

Rounding to decimal places

Rounding to decimal places is exactly like rounding whole numbers – you just have more numbers (and therefore greater accuracy).

3.2⁴⁸

3 is the units digit.

2 is worth 2 tenths, and is the first decimal place.

4 is worth 4 hundredths, and is the second decimal place.

8 is worth 8 thousandths, and is the third decimal place.

You will sometimes see "decimal place" shortened to "d.p."

3.248 rounded to 1 d.p.

3.248   3.2|48 → 3.2

1ˢᵗ dp 3.2 — Look at the next digit. 4 stays down - stay at 3.2.

3248 rounded to 2 d.p.

3.248   3.24|8 → 3.25

2ⁿᵈ dp 3.24 — Look at the next digit. 8 rounds up - go to 3.25.

Subtraction: 5-Digit Column Method

1
```
  38291
- 18636
```
Place the numbers one on top of the other, lining up the thousands, hundreds, tens and ones. Subtract the ones (the answer is 1 - 6 is negative).

2
```
  38²⁸¹9¹1
- 18636
      55
```
Exchange 10 from the 90 to make 10 ones. You can't add lot annotations because the author has disabled commenting in this document.

3
```
  38²⁸¹9¹1
- 18636
     655
```
Subtract the hundreds (the answer is 200 - 600 is negative). Exchange 1000 from the 30000 to make 1200. Subtract the hundreds (1200 - 600 = 600).

4
```
  ²38²⁸¹9¹1
- 18636
    9655
```
Subtract the thousands (the answer is 1000 - 8000 is negative). Exchange 10 000 from the 20 000 to make 17 000. Subtract the thousands 17 000 - 8000 = 9000.

5
```
  ²38²⁸¹9¹1
- 18636
   19655
```
Subtract the ten thousands 20 000 - 10 000 = 10 000.

6
```
  38291 👍
- 18636
   19655 ✓
```
Check your answer.

Vocabulary- Measurement

Perimeter	The continuous line forming the boundary of a closed geometrical figure.
Area	The extent or measurement of a surface or piece of land.
Volume	The amount of space that a substance or object occupies, or that is enclosed within a container.

Vocabulary- Angles

Degrees	a unit of measurement of angles
Obtuse angle	An angle whose measure is greater than 90° and less than 180°
Reflex angle	Reflex angles are angles measuring greater than 180° and less than 360°
Acute angle	An acute angle ("acute" meaning "small") is an angle smaller than a right angle. The range of an acute angle is between 0 and 90°

Vocabulary- Fractions

Equivalent fractions	Equivalent fractions can be defined as fractions with different numerators and denominators that represent the same value or proportion of the whole.
Improper fractions	A fraction in which the numerator is greater than the denominator, such as 5/4.
Mixed fractions	A whole number and a fraction combined into one "mixed" number/mixed fractions. Example: 1½ (one and a half) is a mixed fraction.

ACUTE ANGLE RIGHT ANGLE OBTUSE ANGLE REFLEX ANGLE