6 Feeling the cold

Y5: Interpret negative numbers in context

Mikey found the lowest recorded temperatures for four different places.

Thessaloniki, Greece, Europe	Lowest recorded temperature −14° C
Cairo, Egypt, Africa	Lowest recorded temperature 1° C
Singapore, Asia	Lowest recorded temperature 19° C
Edinburgh, Scotland, Europe	Lowest recorded temperature −15° C

1. Where was the lowest temperature recorded?

2. Which places have never gone below freezing (0°C)?

3. Put the places above into six pairs, such as 'Cairo and Edinburgh'. Find the difference between the temperatures of all the pairs.

Vostok, Antarctica

4. The highest and lowest recorded temperatures in Vostok are ⁻89.2°C and ⁻13.6°C. Which is which?

   Vostok is the coldest place on Earth. Which of these statements are true? Explain your reasoning.

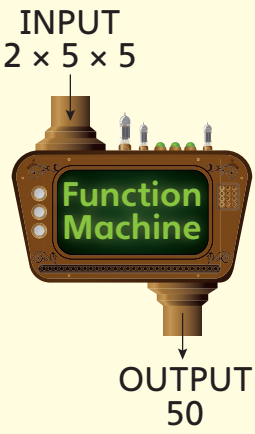
The temperature in Vostok has:

- never been above freezing (0°C)
- never been ⁻100°C
- never been ⁻20°C
- never been ⁻80°C
- never been ⁻13°C
- never been ⁻89°C

18 Prime factor machine

Y5: Know and use the vocabulary of prime numbers

1. This machine multiplies numbers together but only uses prime numbers.



What numbers does the machine make from these prime numbers?

2 × 2 × 2	3 × 7
2 × 13	2 × 5 × 11

2. What numbers between 8 and 20 can the machine make?

3. Are there any numbers that cannot be made by multiplying prime numbers together?

Explain how you decided.

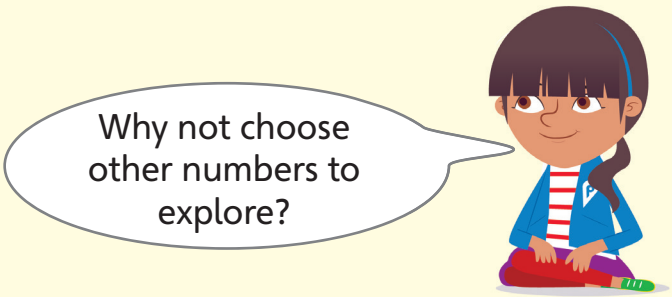
4. Which prime numbers does the machine multiply together to make:

a) 30?

b) 63?

c) 85?

d) 98?



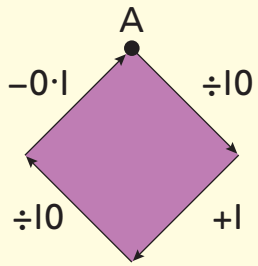
25 Round the shape

Y5: Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

1. Start at A with a 1-digit number.

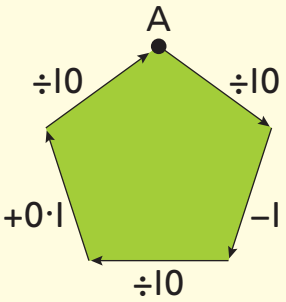
Follow the arrows and record the numbers as you move round back to A. Do this several times.

What do you need to multiply your final number by to get back to your starting number?



2. Start at A with a 2-digit number.

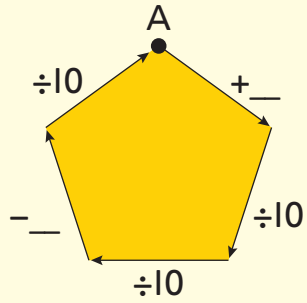
What do you need to multiply your final number by to get back to your starting number?



3. In this pentagon the start number is 1000 times as big as the final number.

What could the addition and subtraction be?

Can you find a rule connecting the size of the subtraction and the addition?



32 Vegetable boxes

Y5: Compare and order fractions; identify, name and write equivalent fractions

T **1.** Two-fifths of the vegetables in a box are courgettes. Three-tenths of the vegetables are potatoes. Are there more courgettes or potatoes?

A box contains four types of vegetable.

$\frac{3}{8}$ of the vegetables are potatoes. $\frac{1}{4}$ are carrots.

$\frac{5}{16}$ are onions. There is 1 leek.

S **2.** Are there more:

a) potatoes or onions? b) onions or carrots?

3. How many of each type of vegetable are there?

D **4.** If there are the same fractions of potatoes, carrots and onions as before, but now there are 2 leeks, how many vegetables must there be?

Explain your reasoning.

4. The two closest sets where one has four clubs:
Set 1 contains Man United, Arsenal, Leicester and Stoke who together have 198 682 seats
Set 2 contains the rest of the teams with a total of 197 460 seats (1222 fewer than Set 1).

Key questions
"What total number of seats do Hull and Arsenal have? Can you find the answer mentally?"
"Which two clubs together have exactly 9988 seats fewer than Man United?" [Hull and Everton]

17 Factor table

Number – Multiplication and division
Identify multiples and factors

1. Complete table:

Number	Factors	Number of factors
1	1	1
2	1, 2	2
3	1, 3	2
4	1, 2, 4	3
5	1, 5	2
6	1, 2, 3, 6	4
7	1, 7	2
8	1, 2, 4, 8	4
9	1, 3, 9	3
10	1, 2, 5, 10	4
11	1, 11	2
12	1, 2, 3, 4, 6, 12	6

2. a) 1 **b)** 12 (with 6 factors) **c)** 4 (with factors 1, 2, 4) and 9 (with factors 1, 3, 9).

3. Numbers with an odd number of factors are 1, 4, 9, 16 and 25. These are all square numbers.

4. 10, 20, 30. These are all multiples of 10.

Key questions
"Which number up to 30 has the most factors?"
"What are the common factors of 14 and 28?"

18 Prime factor machine

Number – Multiplication and division
Know and use the vocabulary of prime numbers

1. 8, 21, 26, 110

2. $8 = 2 \times 2 \times 2$, $9 = 3 \times 3$, $10 = 2 \times 5$, $12 = 2 \times 2 \times 3$, $14 = 2 \times 7$, $15 = 3 \times 5$, $16 = 2 \times 2 \times 2 \times 2$, $18 = 2 \times 3 \times 3$, $20 = 2 \times 2 \times 5$.

3. The only numbers that cannot be made by multiplying prime numbers are prime numbers themselves (or the number 1). All others can be expressed as the product of prime factors.

4. a) $2 \times 3 \times 5$
b) $3 \times 3 \times 7$
c) 5×17
d) $2 \times 7 \times 7$

Key questions
"Is 51 a prime number? Try dividing it by other prime numbers to check."
"What number is made by multiplying the first 3/4/5 prime numbers together?"

19 Multiplication mistakes

Number – Multiplication and division
Multiply numbers with up to 4-digits by a 1-digit number using a formal written method

1. The 4 thousands in the answer should be 8 thousands. Children may notice that 4 thousands were not carried over from the hundreds column.

2.
a) The 3 ten-thousands should be 5 ten-thousands. An estimate such as 6000×9 shows the answer should be nearer to 54 000.
b) The 9 thousands should be 7 thousands. An estimate such as 6000×8 shows the answer should be less than 48 000.
c) The answer should be 42 234, rather than 13 234. The final 6×7 was incorrectly performed as an addition $6 + 7$.

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