Mathematics

Base 10 and Base 5
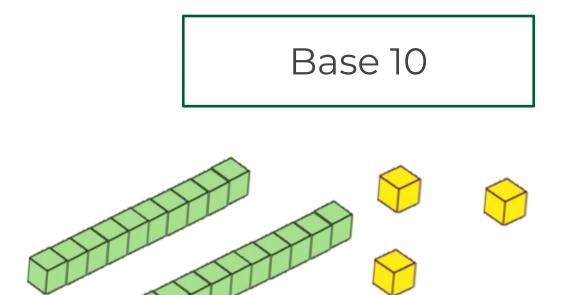
Mr Millar
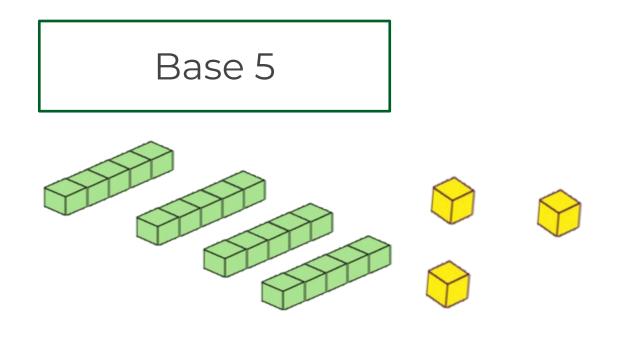
Try this

In the base 5 number system, we group units in groups of 5.

How would we represent 23 in the Base 5 system?

Base 10

Base 5

23 is _____ lots of 10 and _____ lots of 1

23 is _____ lots of 5 and _____ lots of 1

Connect

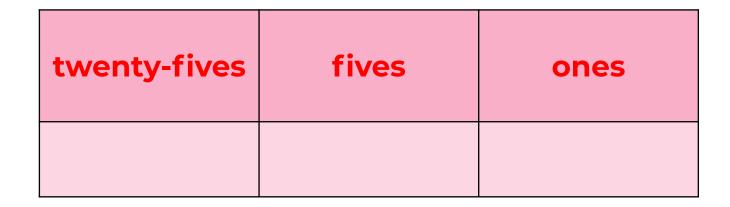In the Base 5 number system, the third column is twenty-fives.

Base 10

hundreds	tens	ones

=

Base 5

twenty-fives	fives	ones
2	4	1

hundreds	tens	ones
1	1	3

=

twenty-fives	fives	ones

Independent task

1. Write these Base 5 numbers in their equivalent in Base 10

32_5 41_5 401_5 332_5

Note: this means 3 lots of 5 and 2 lots of 1

2. Write these Base 10 numbers in their equivalent in Base 5

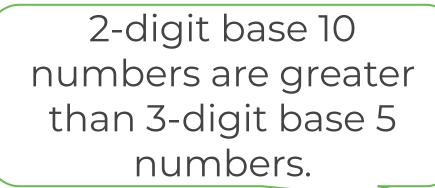16_{10} 26_{10} 46_{10} 112_{10}
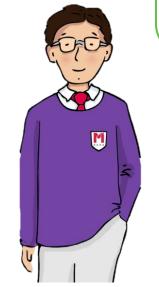
Note: this means 16 in our regular number system

Explore

Are the following statements always, sometimes or never true? If sometimes, find an example AND a counter-example

2-digit base 5 numbers are greater than 1-digit base 10 numbers.

2-digit base 10 numbers are greater than 3-digit base 5 numbers.

Answers

Try this

In the base 5 number system, we group units in groups of 5.

How would we represent 23 in the Base 5 system?

Base 10

Base 5

23 is 2 lots of 10 and 3 lots of 1

23 is 4 lots of 5 and 3 lots of 1

Connect

In the Base 5 number system, the third column is twenty-fives.

Base 10

hundreds	tens	ones
	7	1

=

Base 5

twenty-fives	fives	ones
2	4	1

2 x 25 = 50
4 x 5 = 20   71
1 x 1 = 1

hundreds	tens	ones
1	1	3

=

twenty-fives	fives	ones
4	2	3

4 x 25 = 100
2 x 5 = 10   113
3 x 1 = 13

Independent task

1. Write these Base 5 numbers in their equivalent in Base 10

32_5 41_5 401_5 332_5

17_{10} 21_{10} 101_{10} 92_{10}

2. Write these Base 10 numbers in their equivalent in Base 5

16_{10} 26_{10} 46_{10} 112_{10}

31_5 101_5 141_5 422_5

Explore

Are the following statements always, sometimes or never true? If sometimes, find an example AND a counter-example

Sometimes, eg $11_5 < 9_{10}$

but $41_5 > 9_{10}$

Sometimes, eg $95_{10} > 111_5$

but $85_{10} < 444_5$

2-digit base 5 numbers are greater than 1-digit base 10 numbers.

2-digit base 10 numbers are greater than 3-digit base 5 numbers.