The Binary Number System

aka The Base-2 Number System

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Aims

- Understand the basics of the binary number system

- Convert binary numbers to decimal numbers

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Decimal Revision Activity

- Place the squares on your desk in the correct order

- Fill in the blank square

Decimal Revision Activity

- Place the squares on your desk in the correct order

- Fill in the blank square

- Place counters on the squares to represent the 4 digit number 3126

1000	100	10	1
3	1	2	6

3 x 1000

3126

1000	100	10	1
3	1	2	6

3 x 1000 +

1 x 100

1000	100	10	1
3	1	2	6

3 x 1000 +

1 x 100 +

2 x 10

1000	100	10	1
3	1	2	6

3 x 1000 +

1 x 100 +

2 x 10 +

6 x 1

3126

1000	100	10	1
3	1	2	6

3 x 1000 +

1 x 100 +

2 x 10 +

6 x 1 = 3126

Binary (base-2) Number System

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  - Each new column is 10 times the previous column value.
  - There are 10 numbers (0 – 9).

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- In the binary (base-2) number system:
  - Each new column is 2 times the previous column value.
  - There are ? Numbers (? - ?)

Binary (base-2) Number System

- In the decimal (base-10) number system:
  - Each new column is 10 times the previous column value.
  - There are 10 numbers (0 – 9).
- In the binary (base-2) number system:
  - Each new column is 2 times the previous column value.
  - There are 2 numbers (0 – 1)
  - Known as "binary digits" or "bits"

Conversion Activity

- convert binary to decimal
- convert decimal to binary

- e.g. what is 1101 in decimal
- e.g. what is 9 in binary

Worksheet

- Pick a decimal number (random, age, door number, etc) write the binary in the boxes on the worksheet.

- Swap worksheets with the person next to you.

- Convert their binary number to decimal.

- Did you get their number correct?

- Try a longer binary number.

What's the point?

- Binary is simple – only 2 different digits.
- Computers are made of millions of tiny electronic switches (transistors).
- So what?

What's the point?

- Binary is simple – only 2 different digits.
- Computers are made of millions of tiny electronic switches (transistors).
- We can easily represent 0s and 1s using switches.
- 0 = off, 1 = on

"There are 10 kinds of people in the world – those that understand binary, and those that don't."