Binary Resource

Content:

Binary activity:

For this activity you will need ping pong balls with either a 0 or a 1 written on them, bin bags, and the binary alphabet attached below.

Split the class into groups. Within each group you need senders and receivers.

The teacher gives the senders in each group a letter to send across to the receivers. For example, the letter K (01001011). The receivers must not know the letter, as it is their job to work out the letter from the binary sequence they are given from the senders in their group.

Once each group has a letter the teacher throws out, at random, ping pong balls to the senders. Going with the letter K, the first number the senders must send across to the receivers is 0 (the first number in the binary sequence). If they are thrown a 0 then they pass it over to the receivers, however if it is a 1 then they put it in the bin (the bin bag). They are not allowed to hold on to the ping pong ball and use it later: the senders must either give the ball to the receivers or bin it.

As the receivers are being passed the ping pong balls from the senders it is important they keep the ping pong balls in order, otherwise they will find it difficult to work out what the letter is.

Hopefully each group will successfully send and receive a letter. When every group has sent and received their letter you can ask the receivers what letter they has and the senders need to confirm this. If the receivers have not been

able to work out the correct letter you can investigate what has gone wrong? Did the senders sent a wrong number? Did the receivers not keep the sequence?

An additional task, keeping the same idea. You call out one sender from each group and tell them they are now going to intercept the message by sending one incorrect digit across to the receivers in their group. For example: the binary sequence from K is 01001011. The interceptor needs to change one part of the sequence. So they could send across 010**1**1011. As you can see, the fourth digit has been changed from a 0 to a 1.

The result will either be the letter changes, or the receivers will not be able to identify the letter at all. Go around each group and see what the receivers have got.

Now you can reveal the interceptors. The point is to show what happens when instructions are not given correctly to the computer. Also, introduces the idea of how having information changed by hackers can cause massive problems.

If you have enough ping pong balls, you can always get the groups to send across a short phrase or a complete word. Note each letter has 8 digits making up their unique binary sequence, so the groups will know, after receiving 8 balls they have a new letter to work out.

Key Skills used:

- Numeracy
- Team work
- Communication
- Creativity
- Problem solving

Binary Alphabet

Upper case	
A	01000001
B	01000010
C	01000011
D	01000100
E	01000101
F	01000110
G	01000111
H	01001000
I	01001001
J	01001010
K	01001011
L	01001100
M	01001101
N	01001110
O	01001111
P	01010000
Q	01010001
R	01010010
S	01010011
T	01010100
U	01010101
V	01010110
W	01010111
X	01011000
Y	01011001
Z	01011010

Lower case	
A	01100001
B	01100010
C	01100011
D	01100100
E	01100101
F	01100110
G	01100111
H	01101000
I	01101001
J	01101010
K	01101011
L	01101100
M	01101101
N	01101110
O	01101111
P	01110000
Q	01110001
R	01110010
S	01110011
T	01110100
U	01110101
V	01110110
W	01110111
X	01111000
Y	01111001
Z	01111010

technocamps Playground computing

Binary Resources

We hope you use these resources in your classroom and hope to inspire you to develop and create your own imaginative ideas and activities.

If you have any questions, or would like any future assistance please email

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