

ALL ABOUT BINARY – ACTIVITY 1 – COUNT THE BUGS

Introduction

Welcome to Stage 1. The fun and excitement formally starts here!

Before going to the main activities, here is a simple exercise for you to start with.

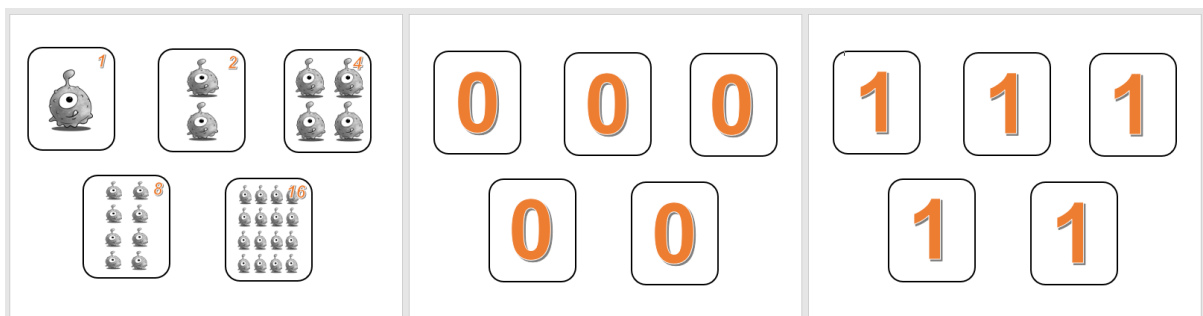
Counting is the very basic skill that you must master in order to understand binary numbers. If you think you already have mastered it, here is an extra challenge for you.

What are the materials needed?

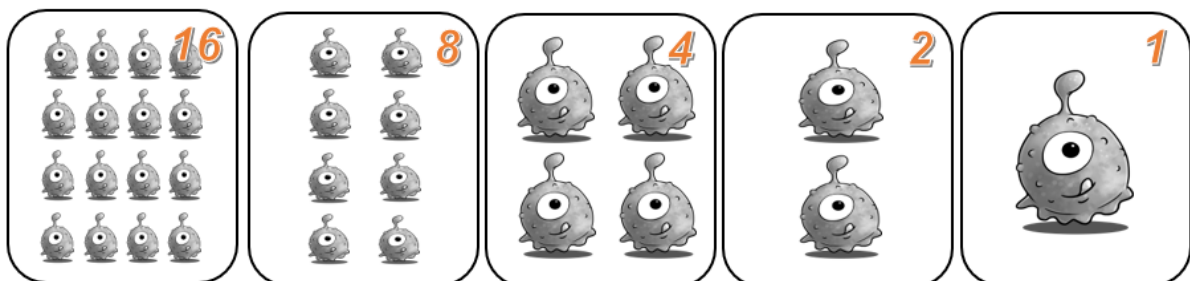
For this simple exercise, you need a set of cards containing 1-16 code bugs (these are the **BUG CARDS**), ones and zeroes (these are the **CODE CARDS**) – these are provided in the link below.

First....download the Binary Numbers Card Game by clicking on this link

Then print the sheets and cut around the cards. You should now have 3 sets of cards;
~ the bug cards
~ the ones
~ the zeroes



Next...arrange the **BUG CARDS**. Place them in a row, in number order, highest first. Like this;



The **BUG CARDS** are what you will use to *decipher* a binary code.

The **CODE CARDS** are what you will use to *make* the binary code.

The binary numbers – **0** and **1** – will work like a switch for the **BUG CARDS**. A **1** will switch **ON** a **BUG CARD** while a **0** will switch **OFF** a **BUG CARD**. Then, adding up all the switched **ON** cards will give you the decoded answer.

Lets have a practice before we go on to ACTIVITY 2

Underneath each **BUG CARD**, place a **CODE CARD** card in this order; first a **0**, then a **1**, then a **0**, then a **0**, then a **1**. Like this;

The diagram illustrates the decoding process. At the top, five bug cards are shown with their respective values: 16 (four bugs), 8 (two bugs), 4 (two bugs), 2 (two bugs), and 1 (one bug). Below these are five code cards with the binary digits 0, 1, 0, 0, 1. A green circle highlights the code card '1' under the 8-value bug card, and another green circle highlights the code card '1' under the 1-value bug card. A green line connects these two circles to the equation $1 + 8 = 9$.

Each **CODE CARD** tells you which **BUG CARD** is switched **ON** and which is switched **OFF**.

Next, add together all of the **BUG CARDS** that are switched **ON**. **9** your answer and you have deciphered the binary code!

This tells us that binary code **01001** is for the number **9**.

Why don't you try a few?

$$0 \quad 1 \quad 0 \quad 0 \quad 1 \quad = \quad 9$$

$$1 \quad 1 \quad 0 \quad 0 \quad 0 \quad =$$

$$0 \quad 0 \quad 0 \quad 0 \quad 1 \quad =$$

$$0 \quad 0 \quad 1 \quad 1 \quad 1 \quad =$$

And here's the answers to check if you got them right 😊

$$0 \quad 1 \quad 0 \quad 0 \quad 1 \quad = \quad 9$$

$$1 \quad 1 \quad 0 \quad 0 \quad 0 \quad = \quad 24$$

$$0 \quad 0 \quad 0 \quad 0 \quad 1 \quad = \quad 1$$

$$0 \quad 0 \quad 1 \quad 1 \quad 1 \quad = \quad 7$$