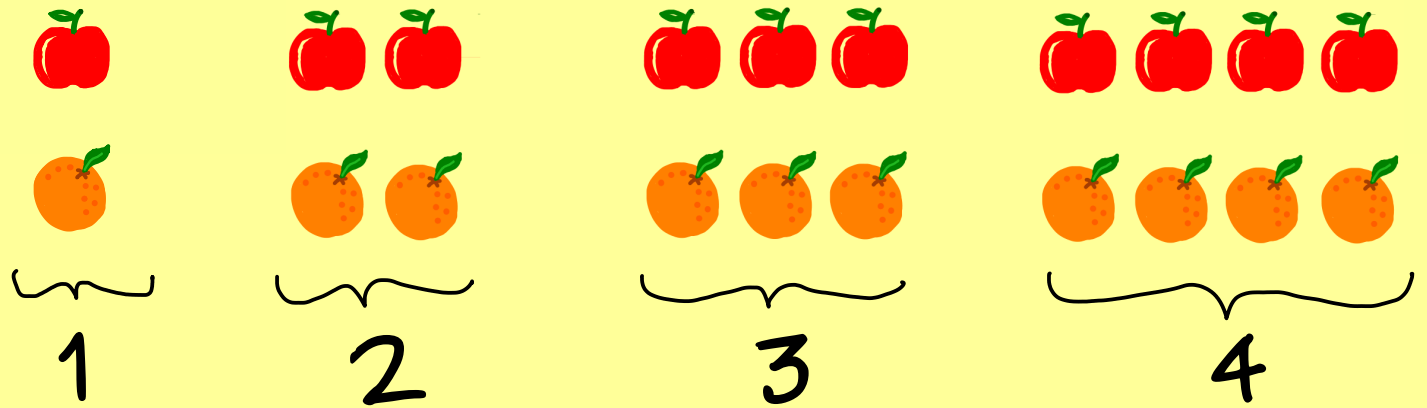




The Bright Side of Mathematics

Start Learning Numbers – Part 1

Natural numbers



$$\mathbb{N} = \{1, 2, 3, 4, \dots\}$$

$$\mathbb{N}_0 = \{0, 1, 2, 3, 4, \dots\}$$

$$0 := \emptyset \text{ empty set}$$

$$1 := \{0\} \text{ set with one element}$$

$$2 := \{0, 1\} \text{ set with two elements}$$

$$3 := \{0, 1, 2\} \text{ set with three elements}$$

$$4 := \{0, 1, 2, 3\} = 3 \cup \{3\}$$

$$\vdots$$

Axiom: There is a set $\mathbb{N}_0$ with the properties: (a) $0 \in \mathbb{N}_0$

$$(b) \forall x: x \in \mathbb{N}_0 \rightarrow x \cup \{x\} \in \mathbb{N}_0$$

And $\mathbb{N}_0$ is the smallest set having these two properties.

Successor map: $s: \mathbb{N}_0 \rightarrow \mathbb{N}_0$
 $x \mapsto x \cup \{x\}$, $s(6) = 7$