

# The number sense

## From the INFANT STAGE

- **Number sense is something innate.** It is a capability that facilitates better adaptation to the environment by allowing small quantities of elements to be distinguished.
- **Babies** already have informal mathematical knowledge.  
They can see if “there is more here than there” or “this has the same amount as that.”
- They also realize that “add” means that there is more and “take out”, “separate from”, that there is less.
- **Around 2 or 3 years of age**, the use of fingers plays a role fundamental
- **Schooling** allows numerical sense to develop progressively, serving as a basis for learning the Arabic numeral system. (Canfield and Smith, nineteen ninety six; Saxe, 1991; Starkey, 1992; Wynn, 1992 and 1996).

# evolutionary look

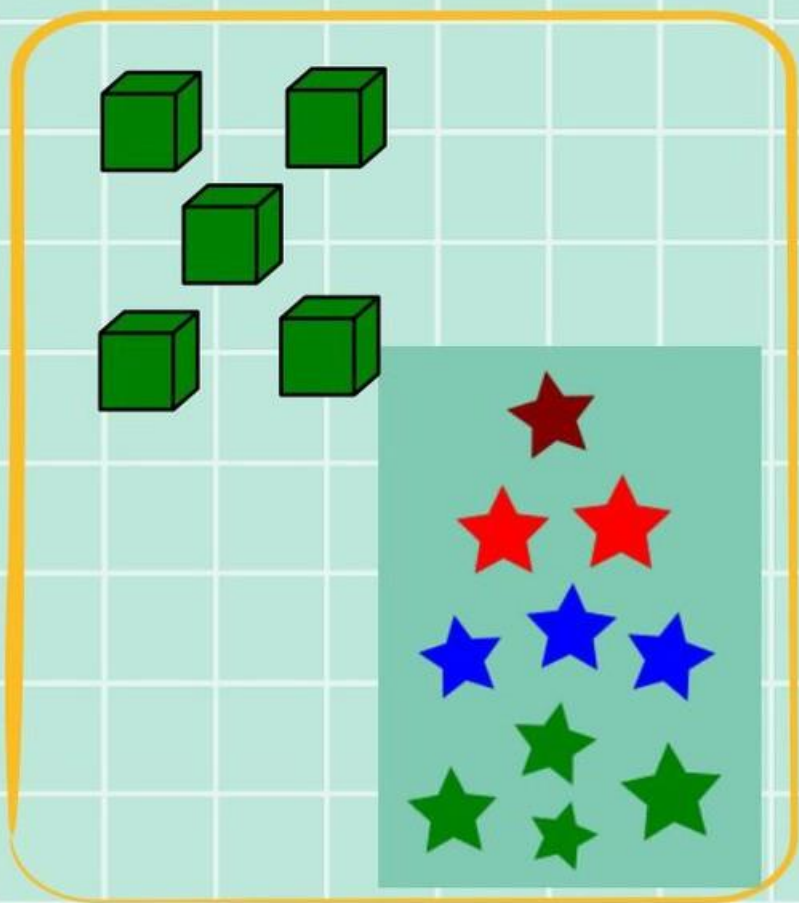
**First arithmetic abilities**  
Counting and counting extensions  
3/4 years

**Counting strategies**  
5 years

**Additive properties**  
6/7 years

**Place value of numbers**

**Problem resolution**



**Counting: Add 4+3**

1 2 3 4

1 2 3

1 2 3 4 5 6 7

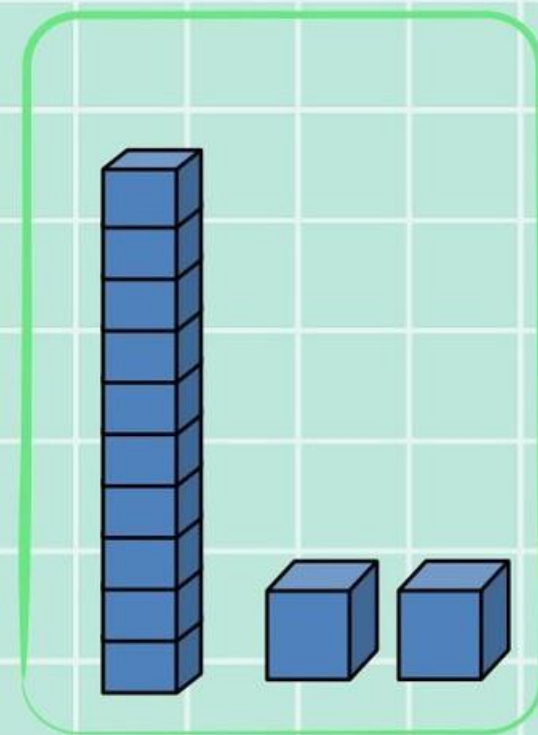
1 2 3 4 5 6 7

**Additive compositions**

$4+3=; 4+4-1$

$6+8=6+6+2$

Addition and subtraction algorithm with Arabic system  $5+3; 9-5$



I have 8 walnuts.  
I ate 3  
How many nuts remained?  
How many are there?

Own adaptation. Sources: Josetxu Orrantia and Txerra G. Guirles

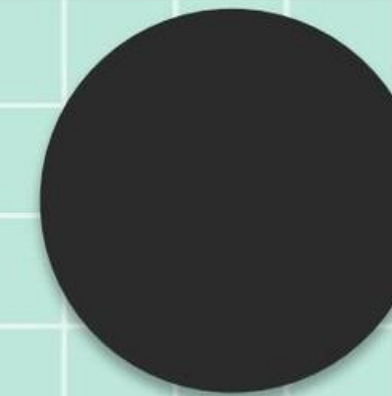
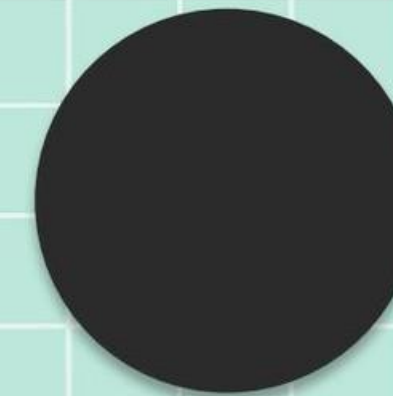
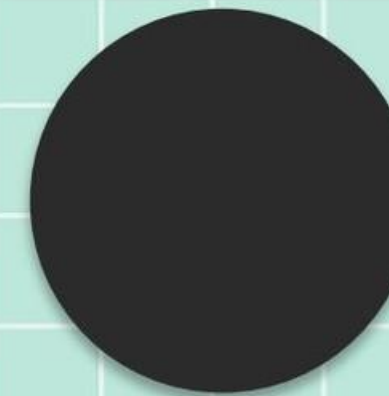


# Infant Stage and 1st cycle of Primary

## Phase 1

### Stages in learning the number system.

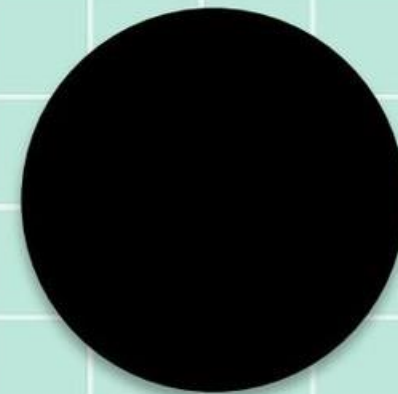
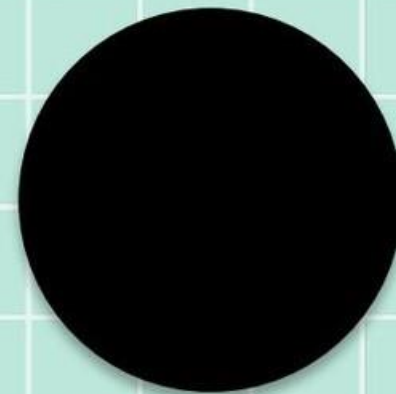
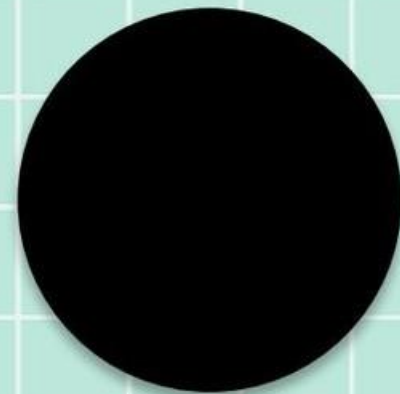
A baby already distinguishes between 1 and 3 objects in the first months of life



## Phase 2

### Development of the verbal number system

Quantities are associated with a specific word

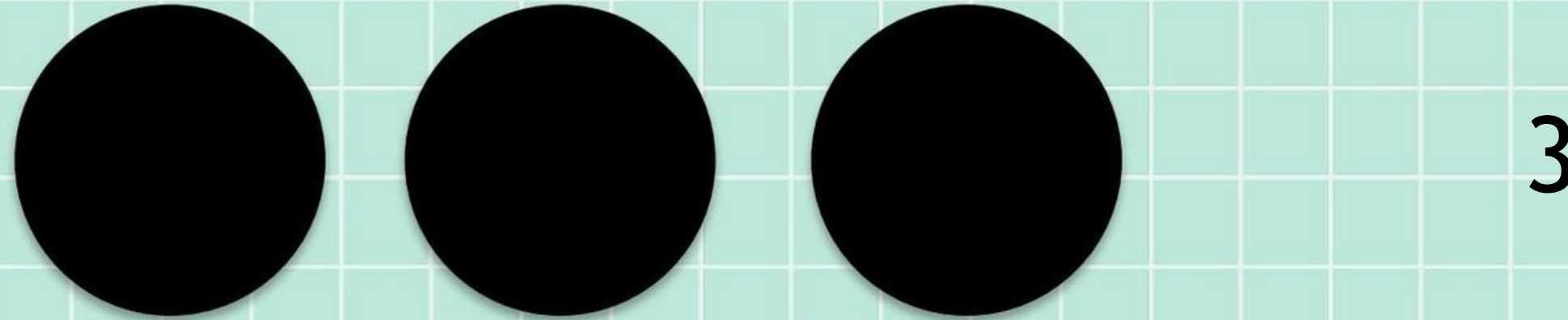


Three

# Phase 3

## Development of the Arabic numeral system

Quantities are associated with a specific number





## Phase 4

### Development of the mental number line

- The numbers are ordered sequentially, progressively incorporating tens, hundreds, thousands, etc.

- This mental number line is flexible and allows for approximate calculation operations.

1, 2, 3, 4,.....12,13,..... 56.....147.... ..... 1004

- Learning to add, subtract and perform other operations complex is built on an innate capacity; It also depends on the teaching



# Number sense in the EI stage

1. Understanding numbers

2. Representation of numbers.

3. Arithmetic operations







# 1. Understanding numbers

- Recognize the number of objects in a collection (Cardinal)
- The number line (Ordinal)
- Compare quantities of elements by quantitative criteria
- Comparing collections of perceptually different objects helps to overcome the weight of perception

• Classify, order, associate or serialize quantities of elements by criteria  
quantitative, compare “more... than”, “less ..than”, “as much... as” or “equal ...that”

- Progressive acquisition of number acquisition from 2 to 7a.
- With the acquisition of counting many people can reason about specific quantities.

in a meaningful context, e.g. one head, two hands, hair, 10 fingers,  
specific and vary depending on the language

- The words to designate the numerals require cultural knowledge

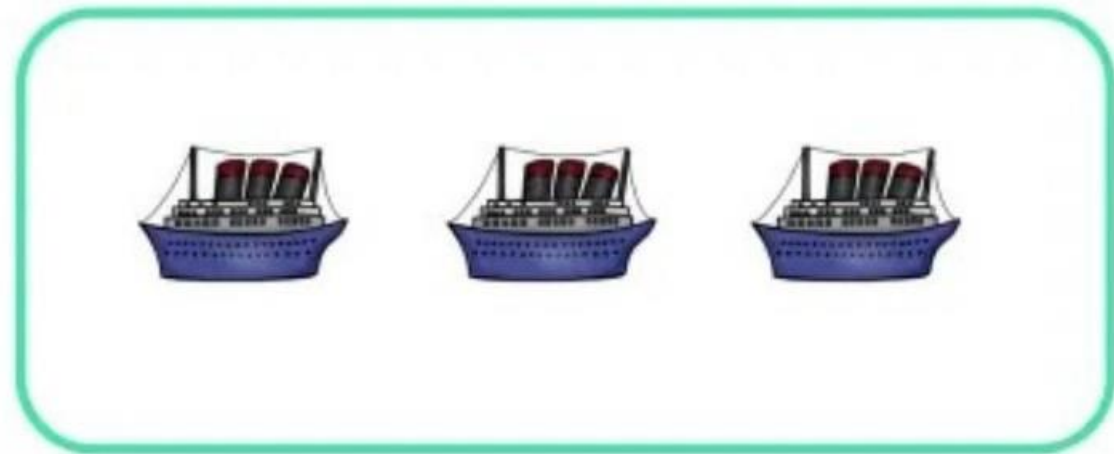






## 2. Representation of numbers

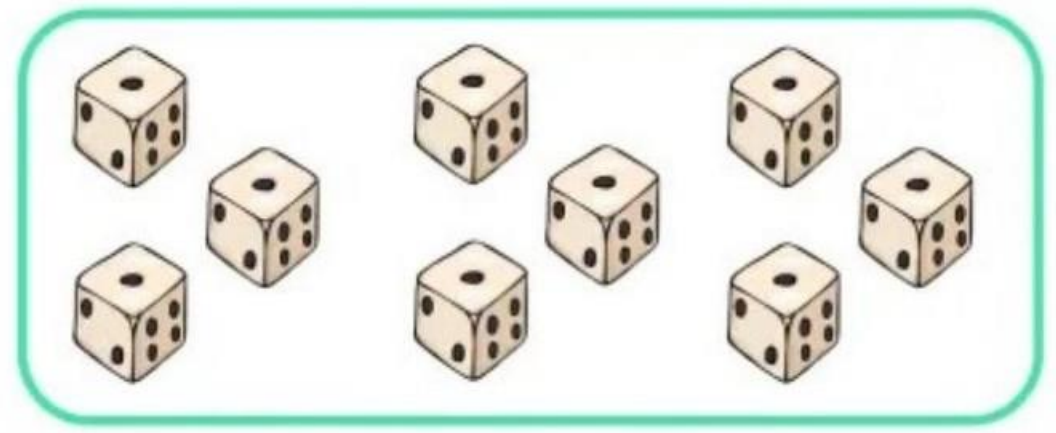
- First link: term-to-term correspondence
- Representation of numbers in different ways
- Montessori Materials



**Representación pictórica**

**Representación simbólica**

**3** Y se lee : tres



**Representación pictórica**

**Representación simbólica**

Y se lee : \_\_\_\_\_

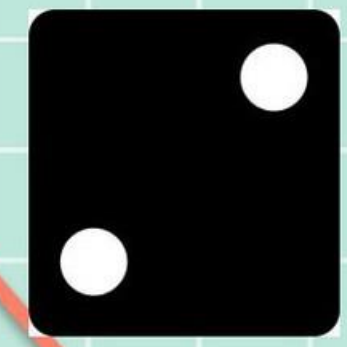


# Triple code model



## Analog magnitude code

Representation of the quantity or numerical magnitudes that give meaning to the verbal and visual code  
Processes estimation tasks, approximate calculations, comparison, number line, numerical reasoning



## Arabic visual code

It is responsible for recognizing and representing Arabic numerals (digits).  
For example, the digit "2".



## verbal-auditory code

Number word processing.  
Numbers are represented by words: one, two, three...  
Processes simple mathematical operations with few digits and is automatable

