

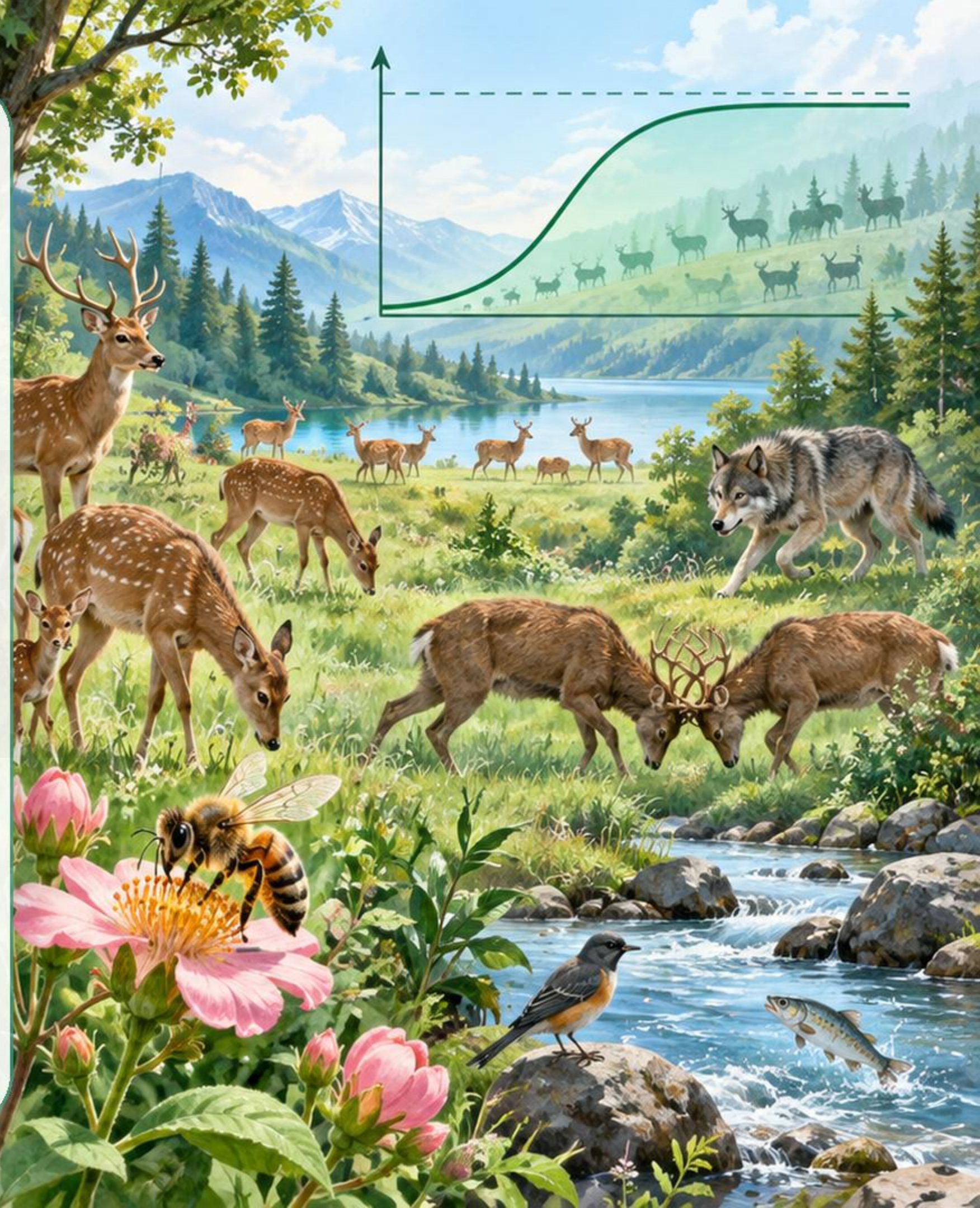
BIOLOGY • CLASS 12

11

CHAPTER

Organisms and Populations

CHAPTER NOTES

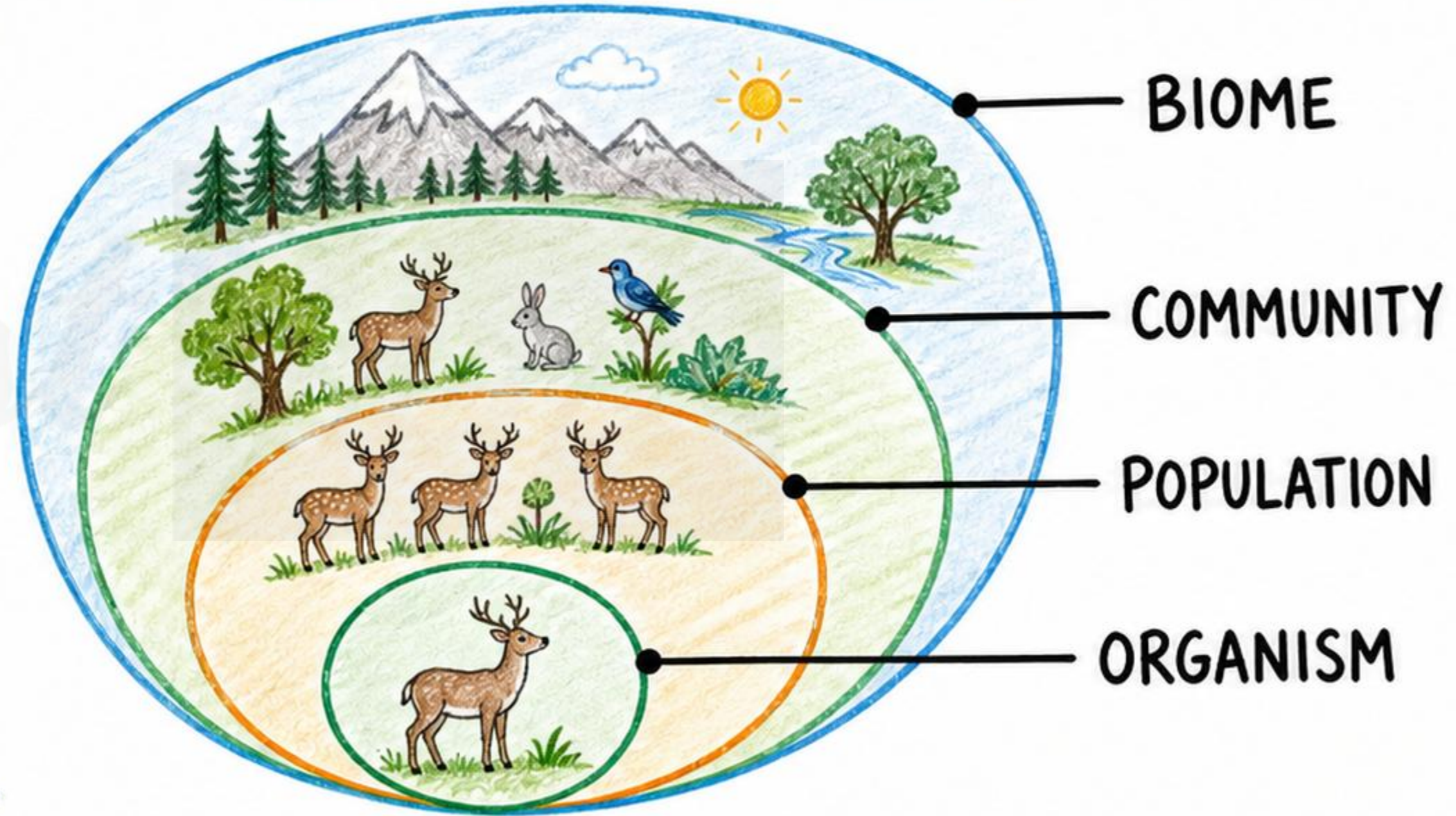


ECOLOGY: MEANING & LEVELS



- Ecology studies interactions among organisms and between organisms and their physical (abiotic) environment.

Four ecological levels:



HOW questions seek the mechanism behind a process.



WHY questions seek the biological significance of a process.

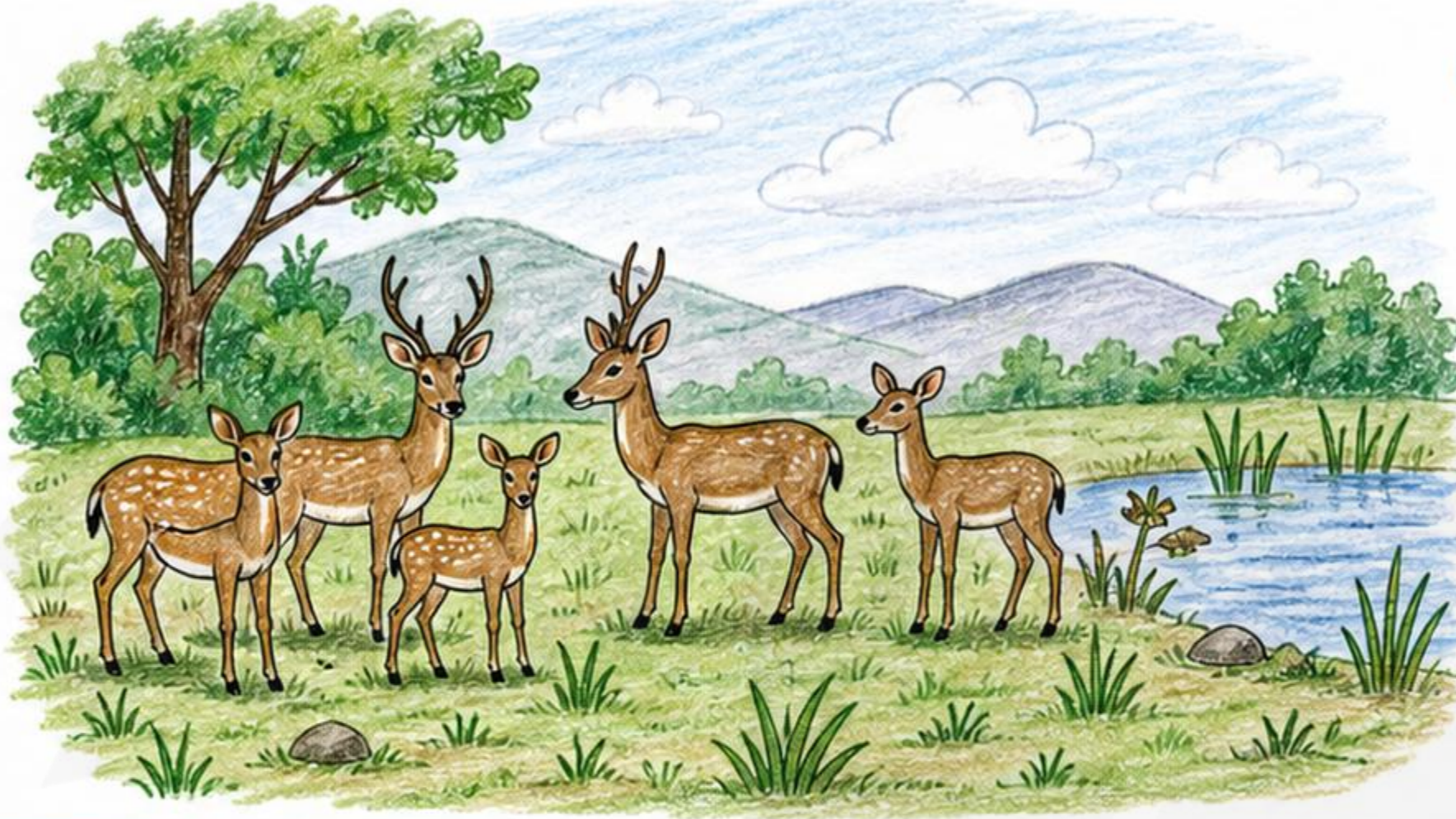


Ecology gives a holistic view of life.



POPULATION: MEANING & SIGNIFICANCE

- A population is a group of individuals of the same species in a defined geographical area.



- They share or compete for similar resources and can potentially interbreed.
- Groups produced asexually are also treated as populations in ecological studies.



cormorants
in a wetland



teak trees
in a forest



bacteria on
a culture plate



lotus plants
in a pond



Population ecology links ecology with population genetics and evolution.



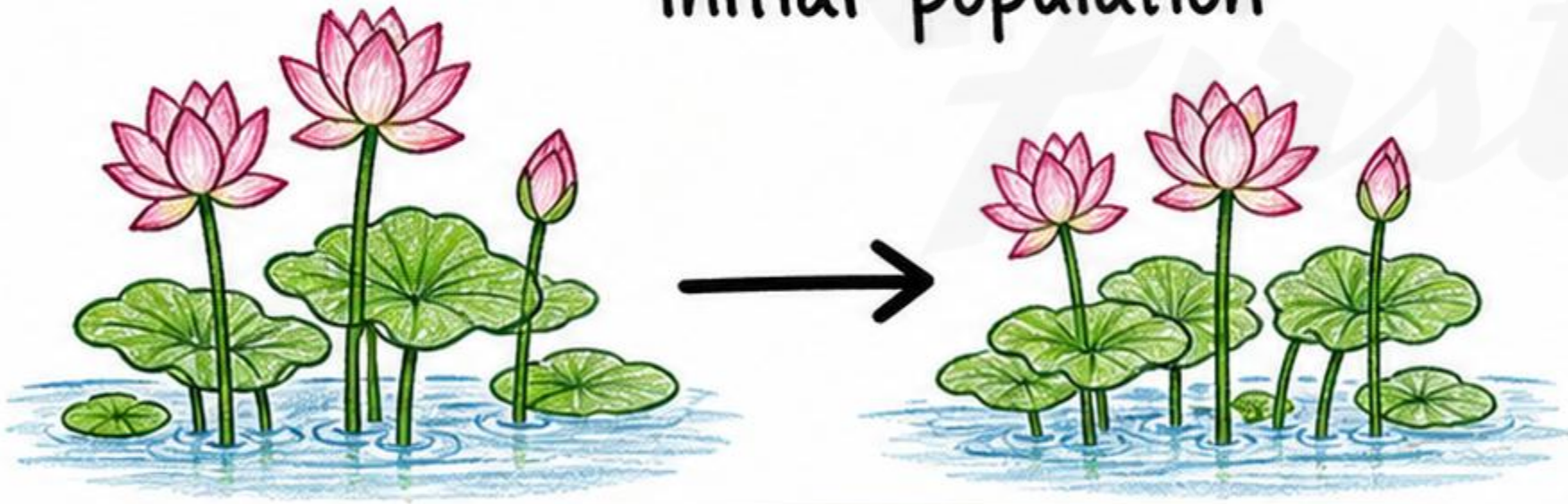
Natural selection acts at the population level.

BIRTH & DEATH RATES

NATALITY (birth rate)

- Per-capita births added during a given period.

$$\text{birth rate} = \frac{\text{new individuals}}{\text{initial population}} \div \text{time}$$

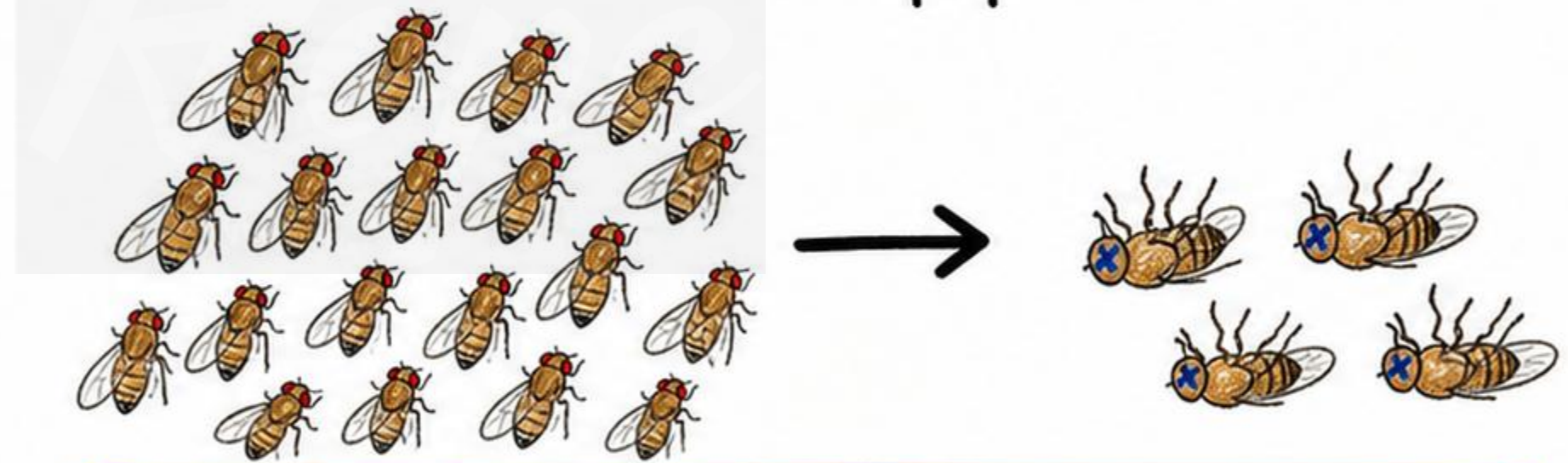


$$8 \text{ new lotus plants} \div 20 \text{ plants} = 0.4 \text{ offspring per lotus per year}$$

MORTALITY (death rate)

- Per-capita deaths during a given period.

$$\text{death rate} = \frac{\text{deaths}}{\text{initial population}} \div \text{time}$$



$$4 \text{ fruitflies died} \div 40 \text{ fruitflies} = 0.1 \text{ per fruitfly per week}$$

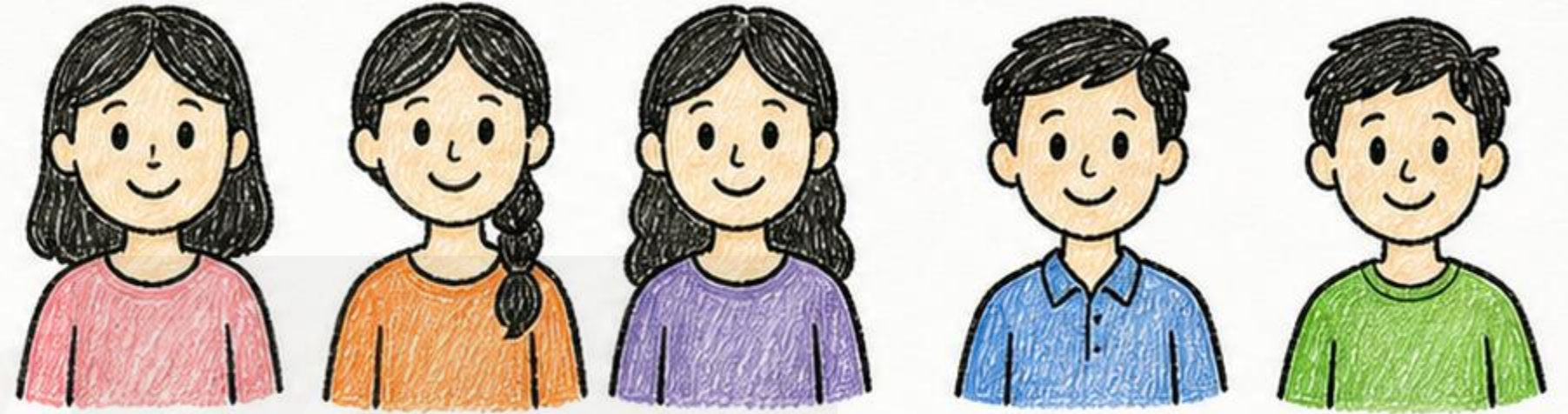
Rates describe change relative to population size.

SEX RATIO & AGE DISTRIBUTION

SEX RATIO

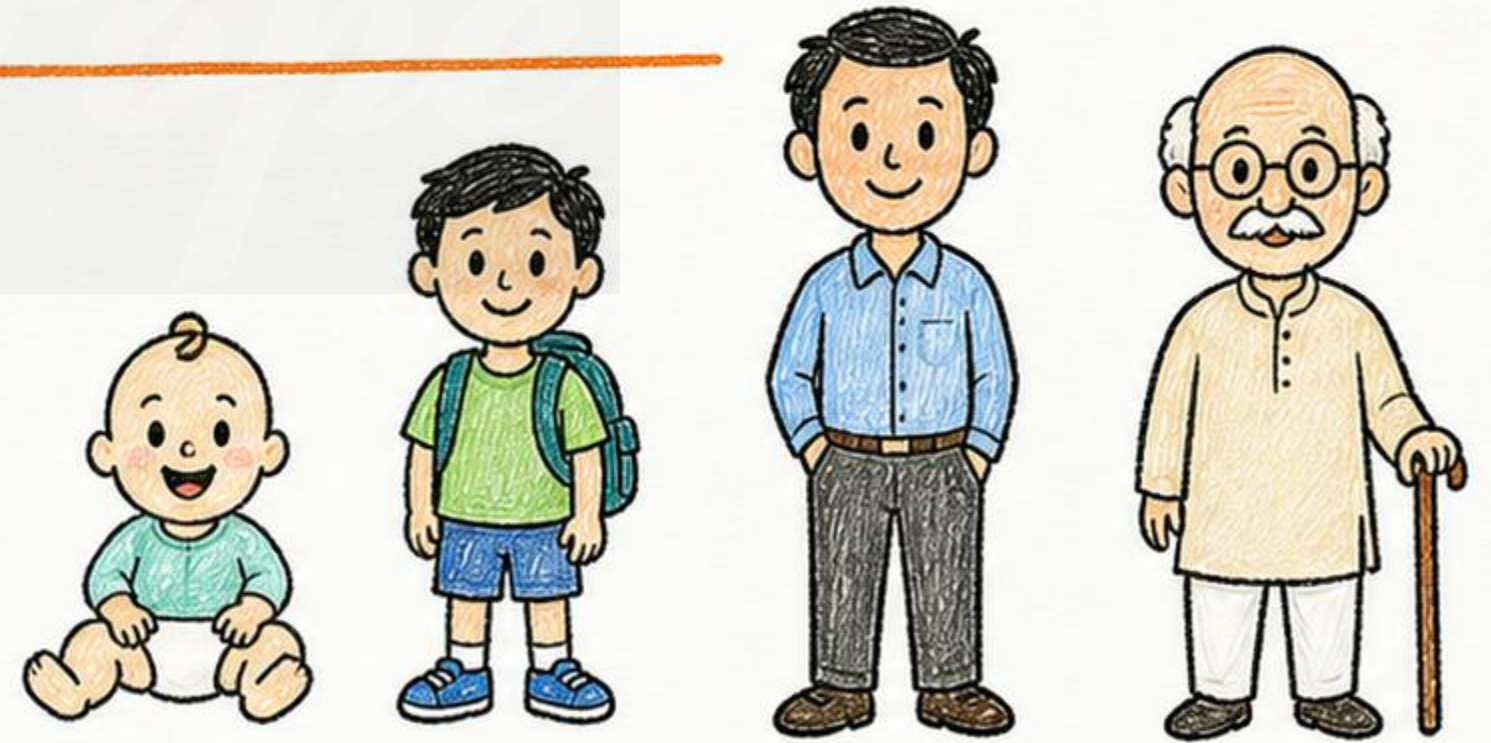
- An individual is male or female; a population has a sex ratio.

Example: 60% females : 40% males



AGE DISTRIBUTION

- A population contains individuals of different ages.
- Age distribution = percentage of individuals in each age or age group.
- When plotted, age distribution forms an AGE PYRAMID.



Population attributes describe the group, not one individual.

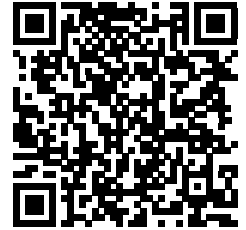


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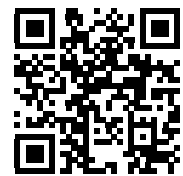


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