Population Growth

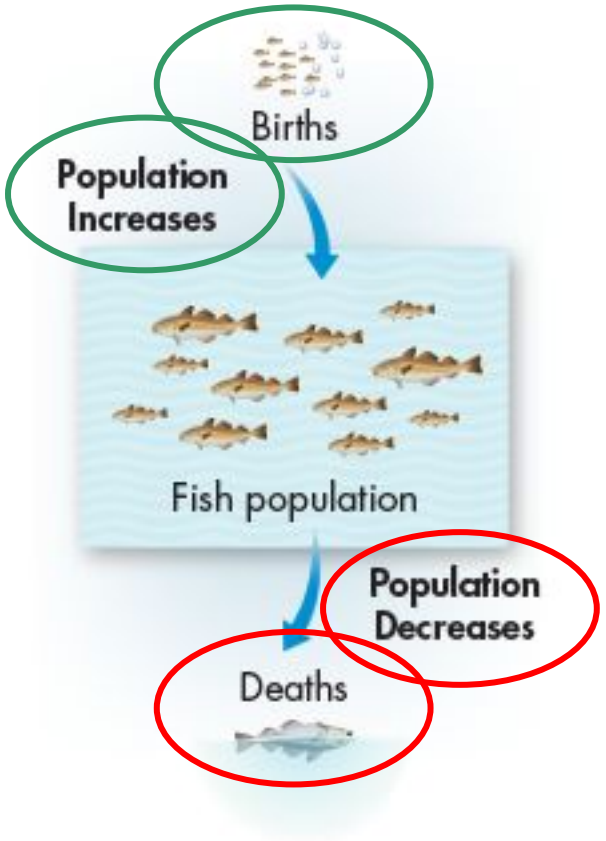
Population Growth

- A population will increase or decrease in size depending on **how many individuals are added to it or removed from it**.

- The factors that can affect population size are the **birth rate**, **death rate**, and the **rate at which individuals enter or leave** the population.

Birth Rate and Death Rate

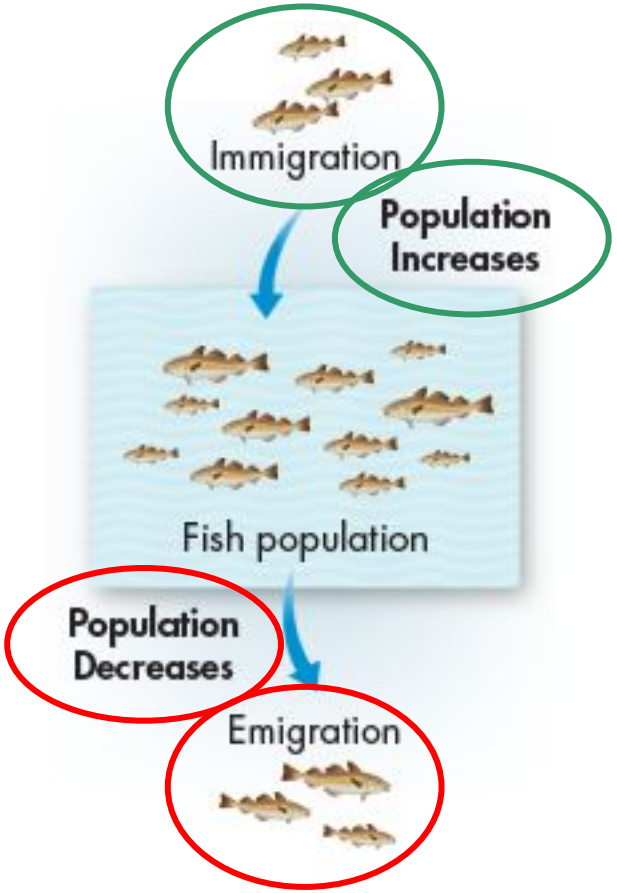
- A population **increases** if its birth rate is higher than its death rate.
- A population **decreases** if its birth rate is less than its death rate.
- A population will stay the same if the birth rate **equals** the death rate.

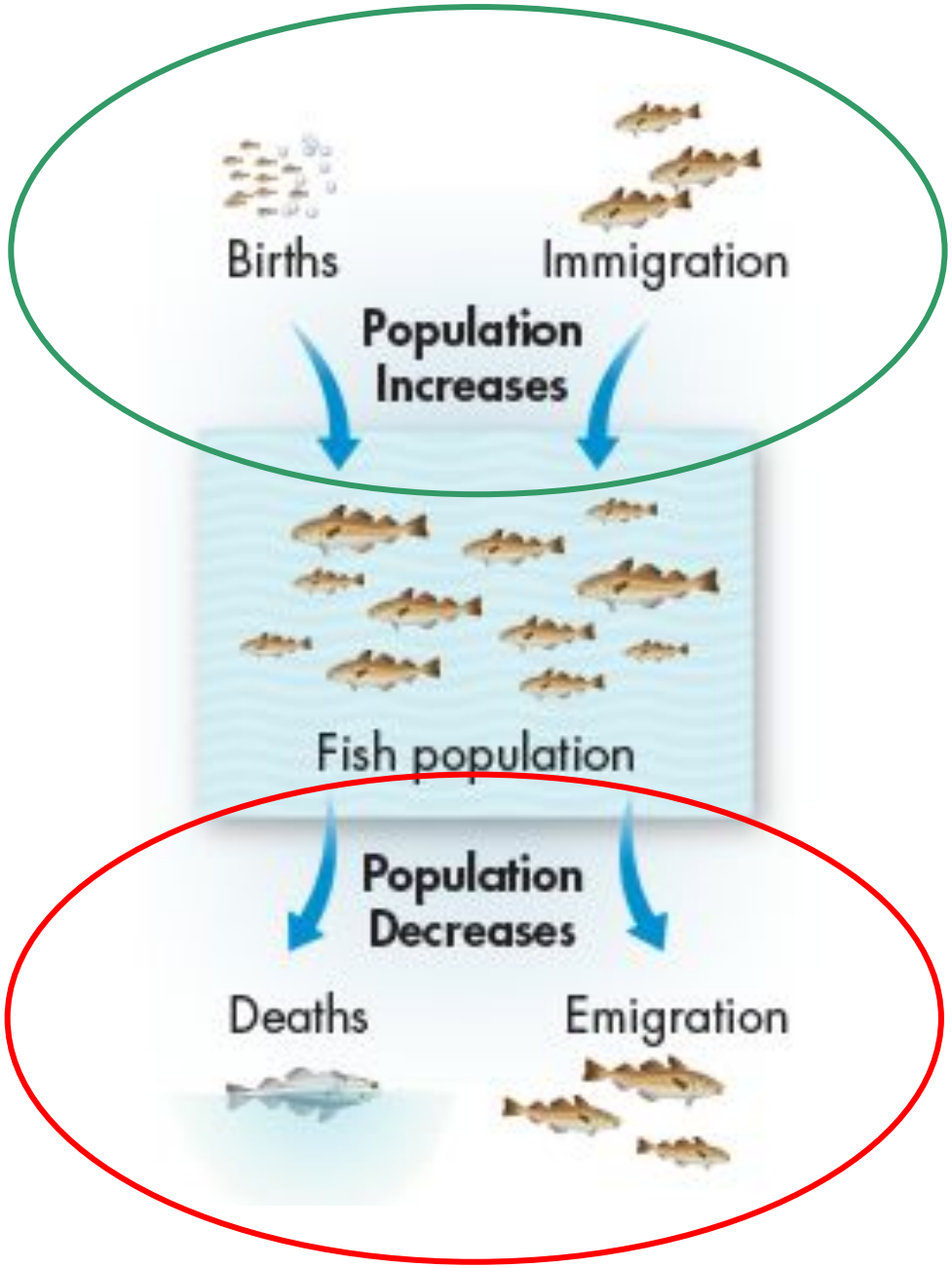


Immigration and Emigration

- A population may **increase** in size if individuals move into its range from elsewhere, a process called **immigration**.

- A population may **decrease** in size if individuals move out of the population's range, a process called **emigration**.




Births
Immigration
Population Increases
Fish population
Population Decreases
Deaths
Emigration

Exponential Growth

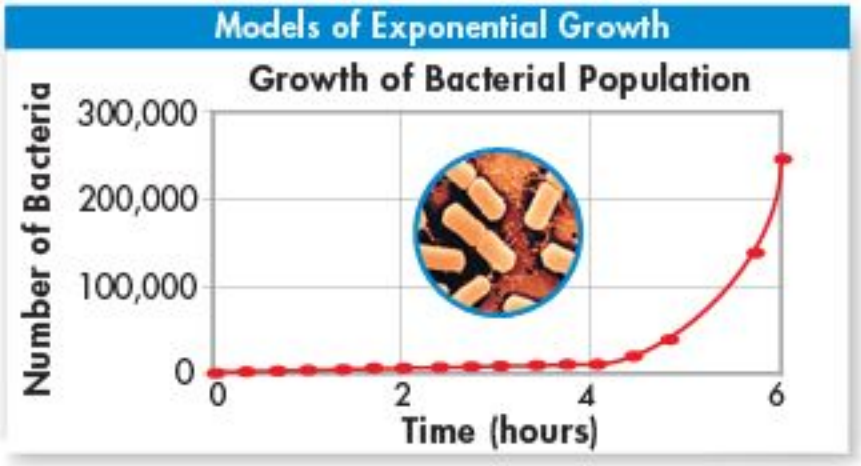
- Under ideal conditions with **unlimited resources**, a population will grow **exponentially**.

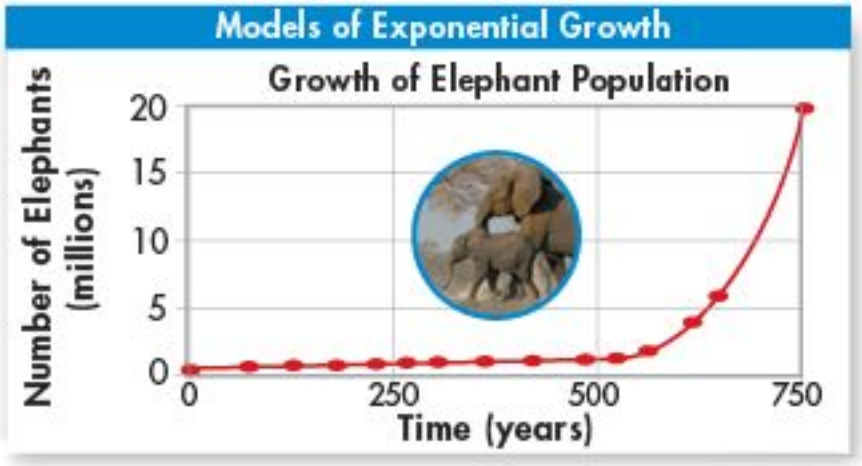
- In exponential growth, the larger a population gets**, the faster it grows**.

- Ideal conditions include:
  - ✓ **unlimited resources**
  - ✓ **absence of predation**
  - ✓ **absence of disease**

Exponential Growth

- Exponential growth is characterized by a **J-shaped curve**.





Phases of Growth

- Natural populations do **NOT** grow exponentially for long.

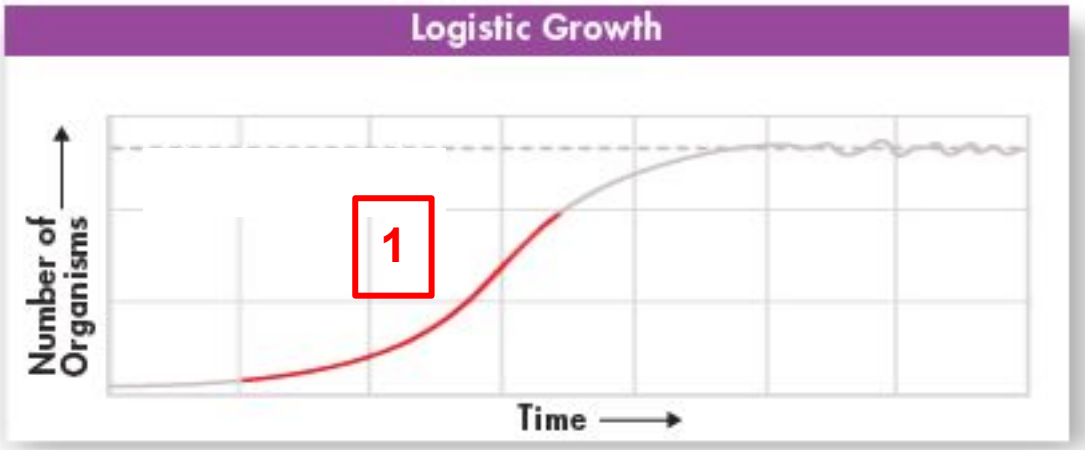
- Sooner or later, something stops exponential growth.

- Growth of natural populations goes through 3 stages:

Phases of Growth

Phase 1: **Exponential Growth**

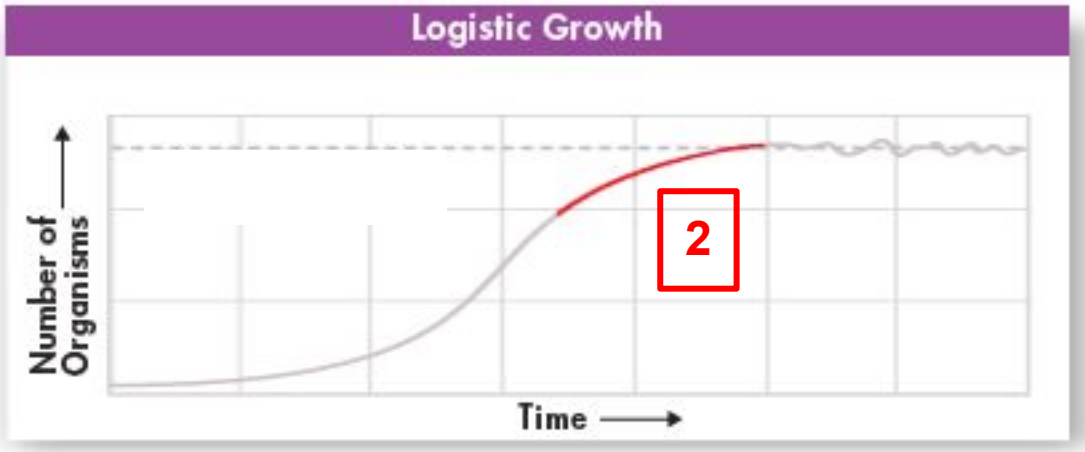
- At first a newly introduced population will grow exponentially **if resources are unlimited**.



Phases of Growth

Phase 2: **Growth Slows Down**

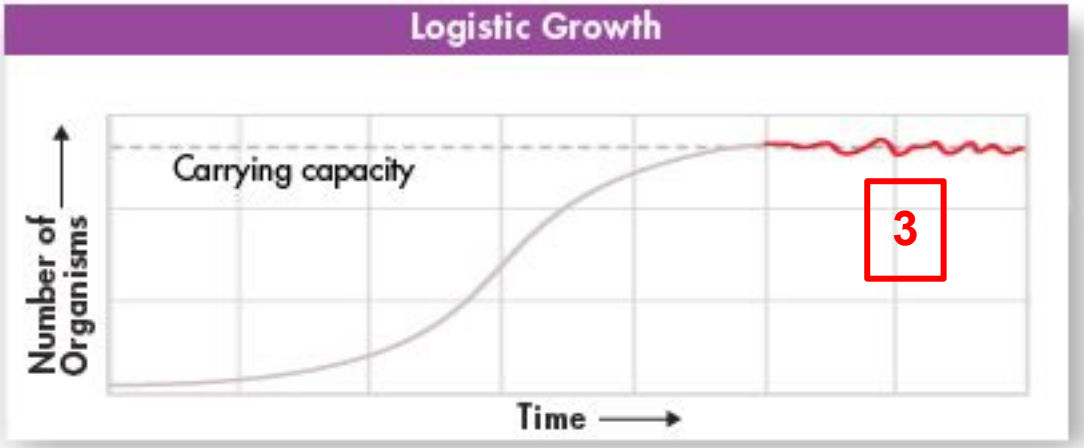
- The population still grows, but the **rate of growth slows down**.



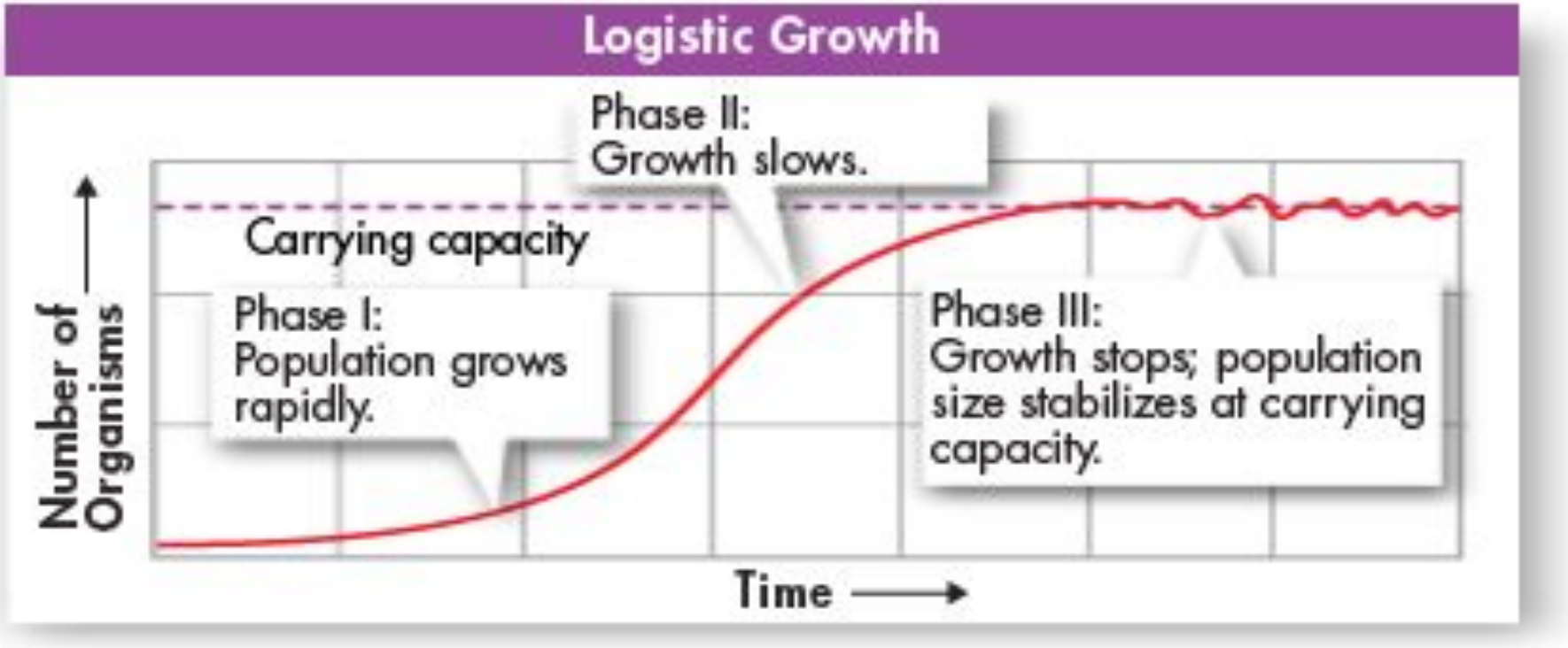
Phases of Growth

Phase 3: **Growth Stops**

- As growth stops, **the size of the population levels off**.

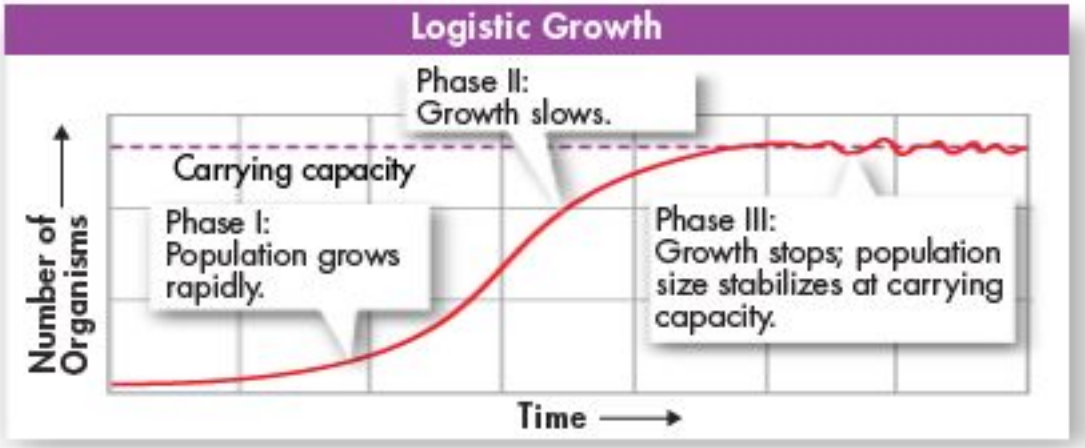


Phases of Growth



The Logistic Growth Curve

- **Logistic growth** occurs when a population's growth slows and then stops, following a period of exponential growth.
- Logistic growth is characterized by a **S-shaped curve**.
- Most populations go through **logistic growth**.



Carrying Capacity

- The maximum number of individuals of a particular species that a particular environment can support is called the **carrying capacity**.

✓ **Results from limited resources.**
✓ **Birth rate = Death rate**
✓ **Immigration = Emigration**