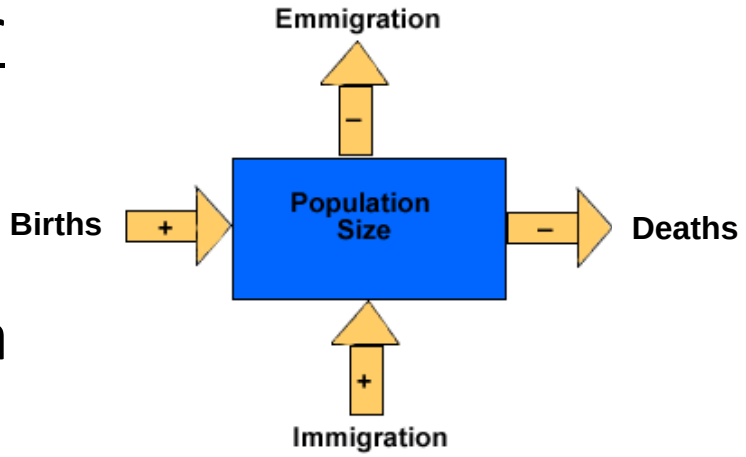
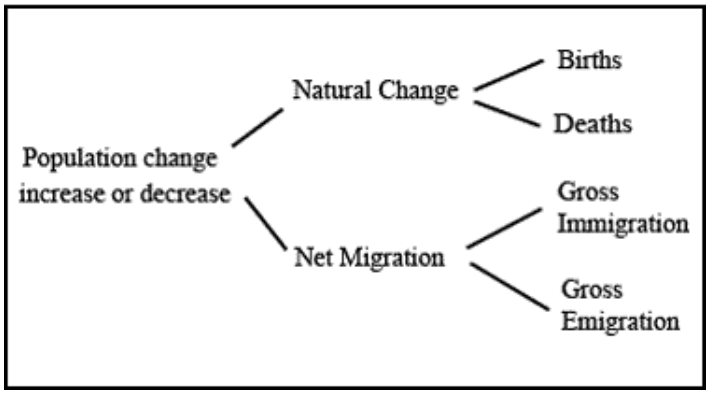
Population Ecology

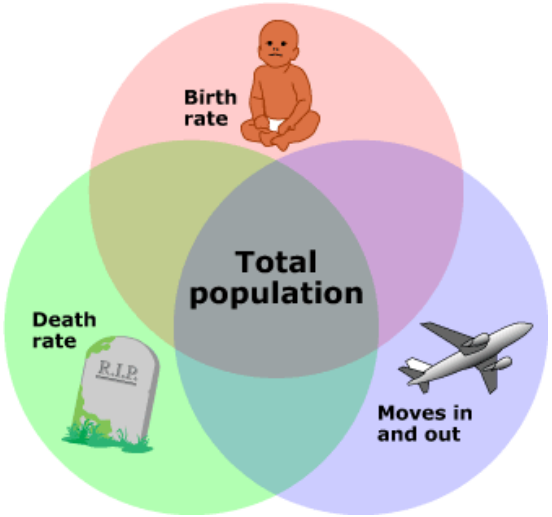
Factors that Affect Population Size

Increasing vs. Decreasing Population Size

- **Births:** increase population size
- **Deaths:** decrease population size
- **Immigration**: individuals that enter population.
  - Increases population size.
- **Emigration**: individuals that leave a population.
  - Decreases population size.

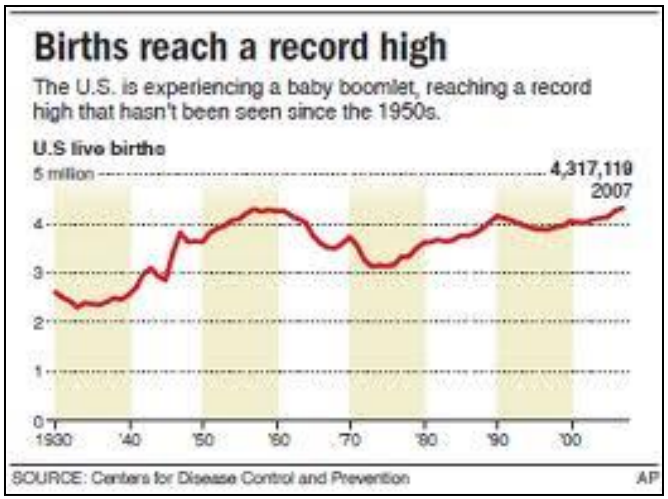






Birth Rate

- **Birth Rate** : the number of births that occur in a population
- Factors that affect the birth rate of a population:
  - **Less competition** among organisms means that there are **more resources**, like food and land, to help organisms survive and reproduce
  - If there are **more healthy individuals** that can reproduce, there will be more births
  - **Fewer predators** mean that more organisms will survive and reproduce

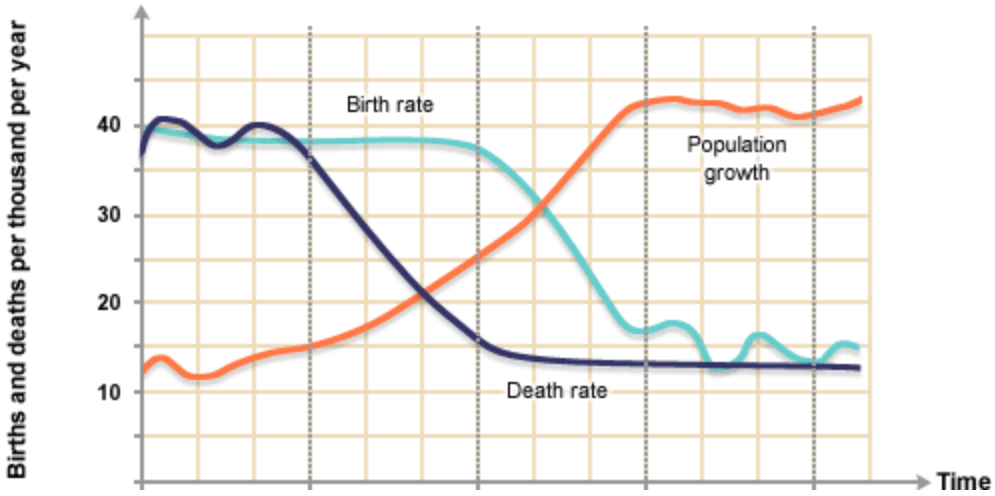


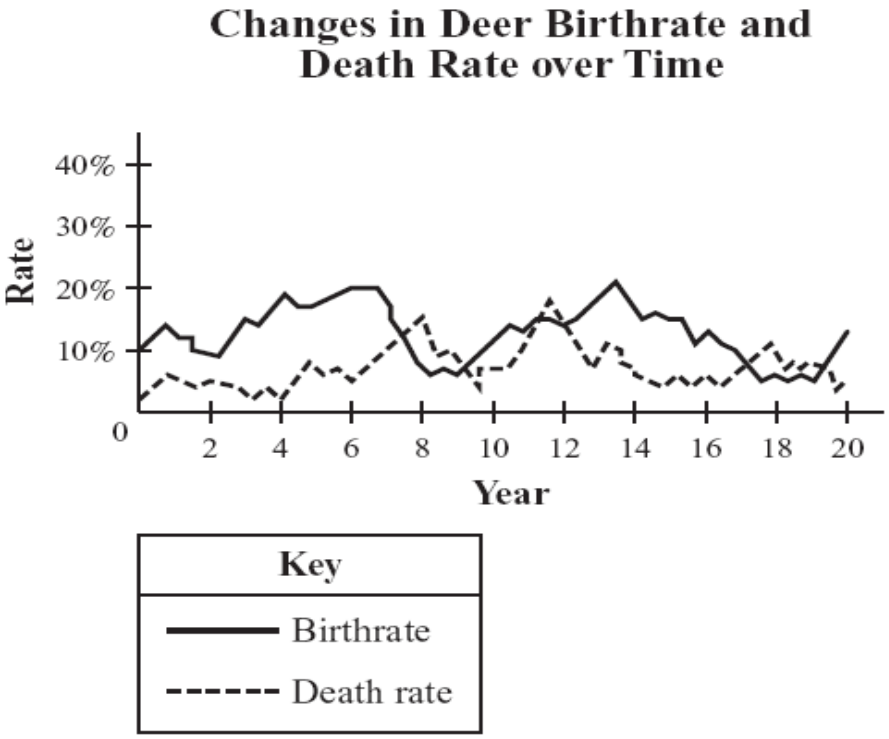
Death Rate

- Death Rate: the number of deaths in a population
- Factors that affect the death rate of a population:
  - **More competition** among organisms → **fewer resources** available → organisms **die**
  - **More predators:** organisms will have a harder time surviving
  - **Diseases**
  - **Natural disasters** (hurricanes, tornados)
  - **Unusual climate** (severe winter, droughts, extreme cold or hot weather)
  - **Human activity**, such as damming rivers and cutting down forests, destroy the habitat of organisms, causing them to die.

Birth Rate vs. Death Rate

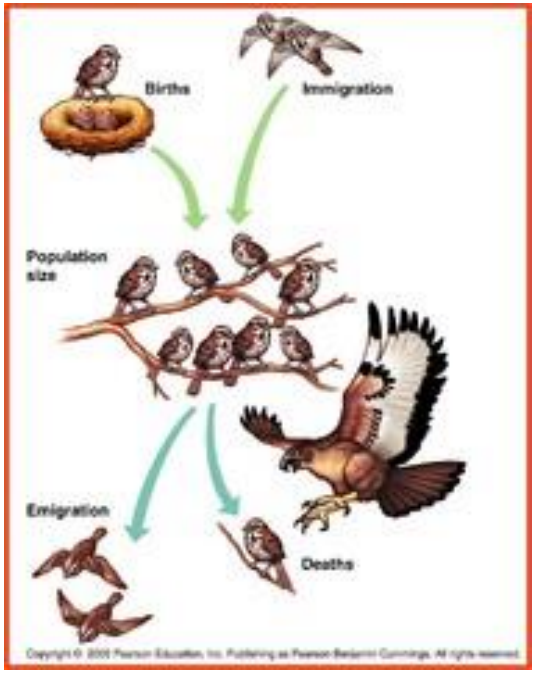
- More births than deaths: population will **increase**
- More deaths than births: population will **decrease**
- If the birth rate equals the death rate, then the population stays about the same





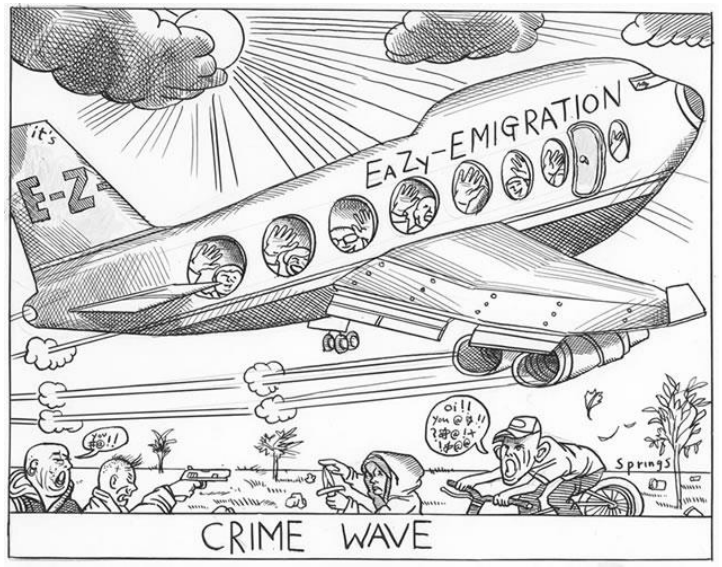
Immigration

- Immigration is when individuals <u>move into an area</u>, causing a population to **increase** in size
- Populations can increase by immigration as animals in search of mates or food arrive from the outside



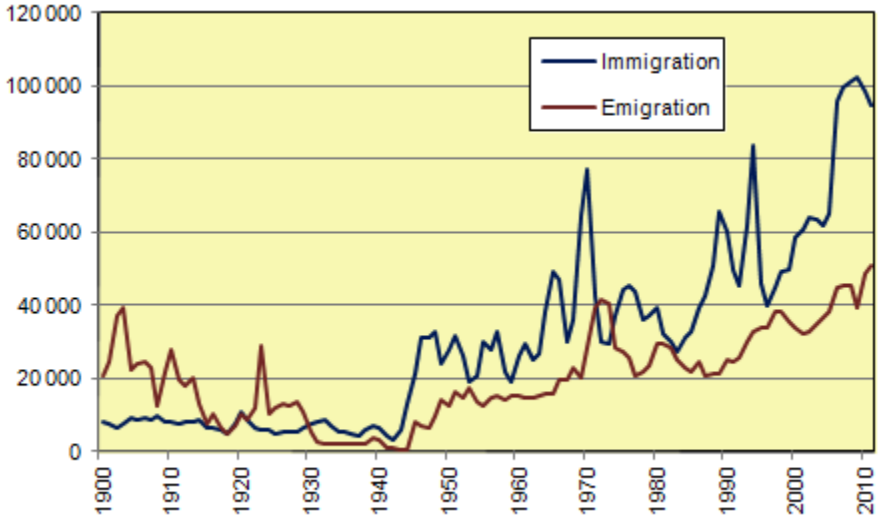
Emigration

- Emigration is when individuals <u>move out of an area</u>, causing the population to **decrease** in size
- Emigration can occur when young animals approaching maturity leave the area where they were born, find mates, and establish new territories
- A shortage of food in an area may also lead to emigration



Immigration vs. Emigration

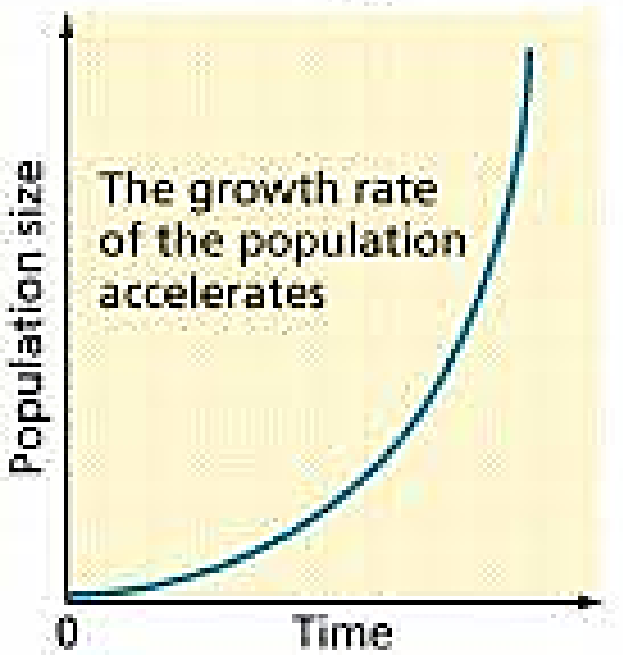
- Higher immigration than emigration: population will **increase**
- Higher emigration than immigration: population will **decrease**
- If the immigration and emigration rate is equal, the population will stay the same.



Exponential vs. Logistic Growth

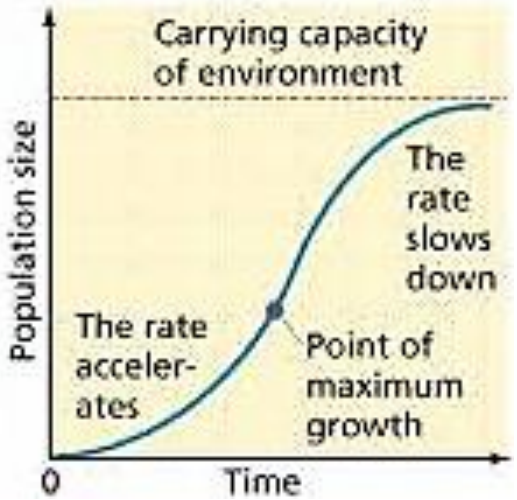
Exponential Growth

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



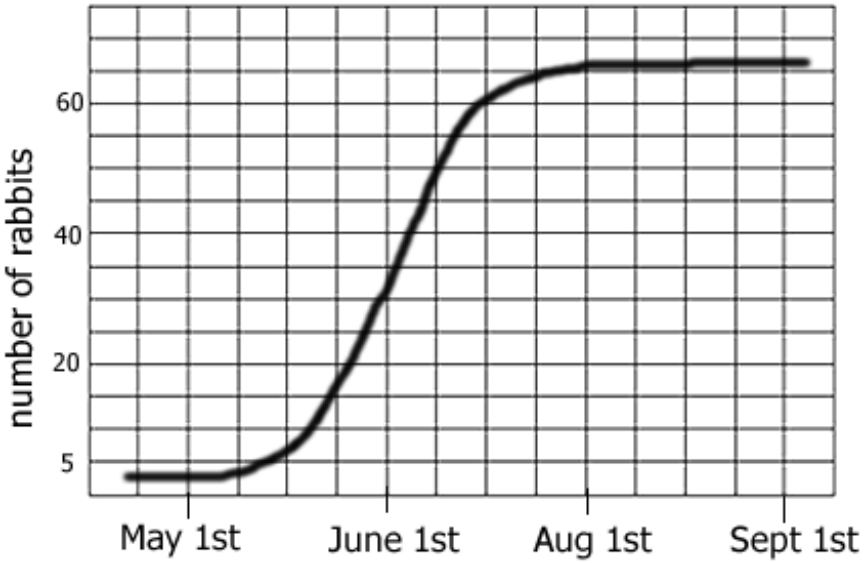
Logistic Growth

- Having fewer resources available slows down or stops the growth of a population slows or stops
- Population growth begins to slow down and grow at a much slower rate (**logistic growth**)



Carrying Capacity

- When the population growth slows down or stops, the population has reached its carrying capacity
- The carrying capacity of the environment of a species is the highest number of individuals that an environment can support.



What is the carrying capacity of rabbits for this environment? _____

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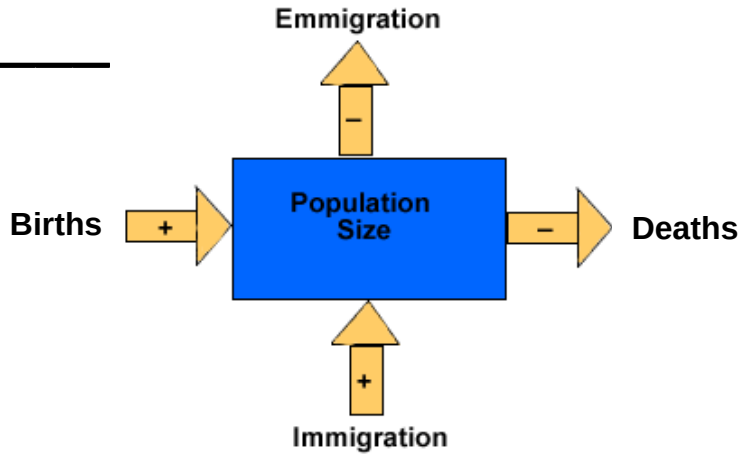
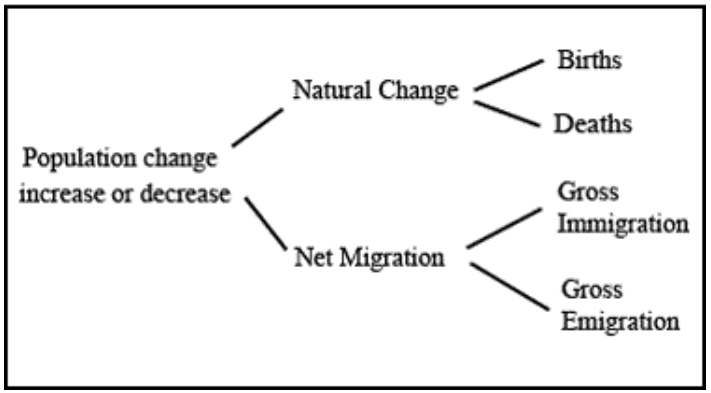
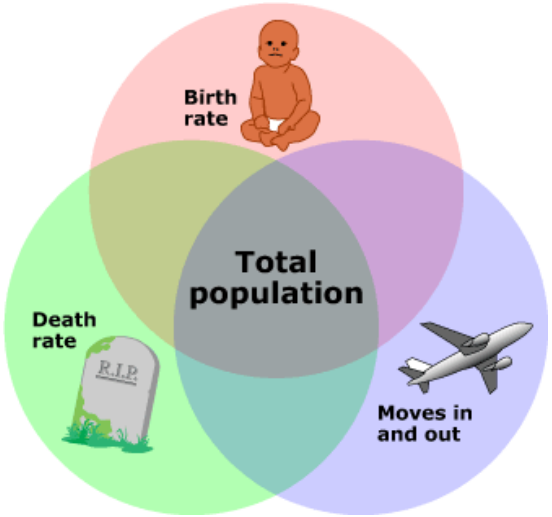
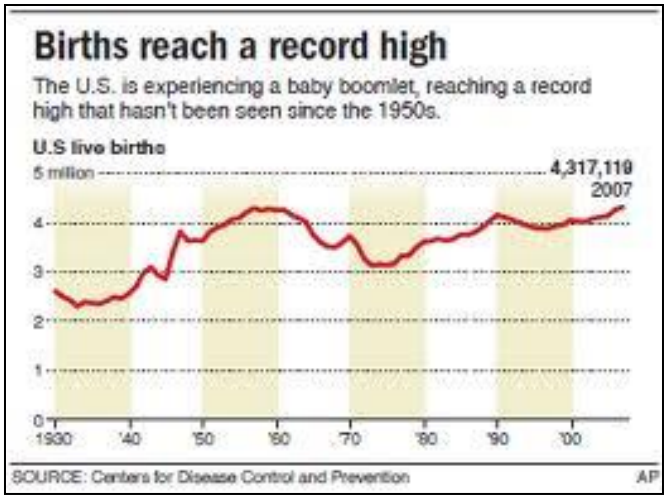






Birth Rate

- **Birth Rate** : the _____ in a population
- Factors that affect the birth rate of a population:
  - _____ among organisms means that there are **more resources**, like food and land, to help organisms survive and reproduce
  - If there are _____ , there will be more births
  - **Fewer predators** mean that more organisms will survive and reproduce

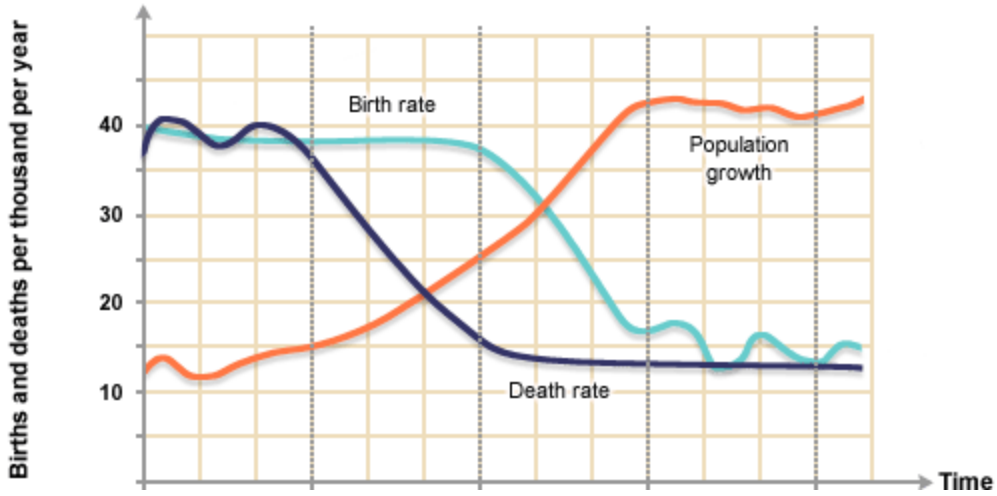


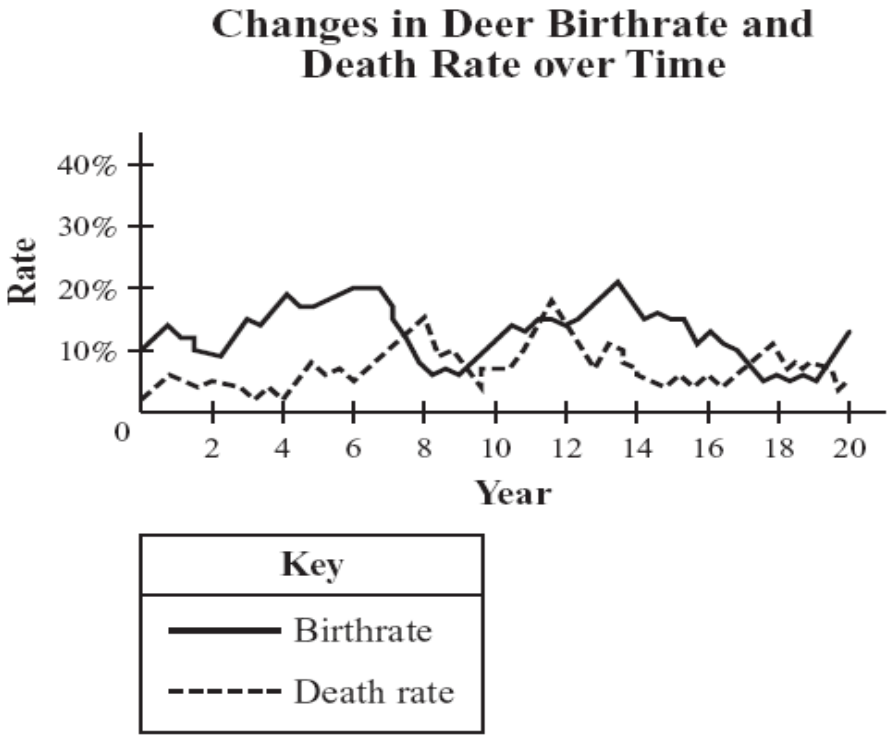
Death Rate

- Death Rate: the _____ in a population
- Factors that affect the death rate of a population:
  - _____ among organisms → **fewer resources** available → organisms **die**
  - _____ **:** organisms will have a harder time surviving
  - **Diseases**
  - _____ (hurricanes, tornados)
  - **Unusual climate** (severe winter, droughts, extreme cold or hot weather)
  - _____ , such as damming rivers and cutting down forests, destroy the habitat of organisms, causing them to die.

Birth Rate vs. Death Rate

- _____: population will **increase**
- More deaths than births: _____
- If the birth rate equals the death rate, then the population _____.





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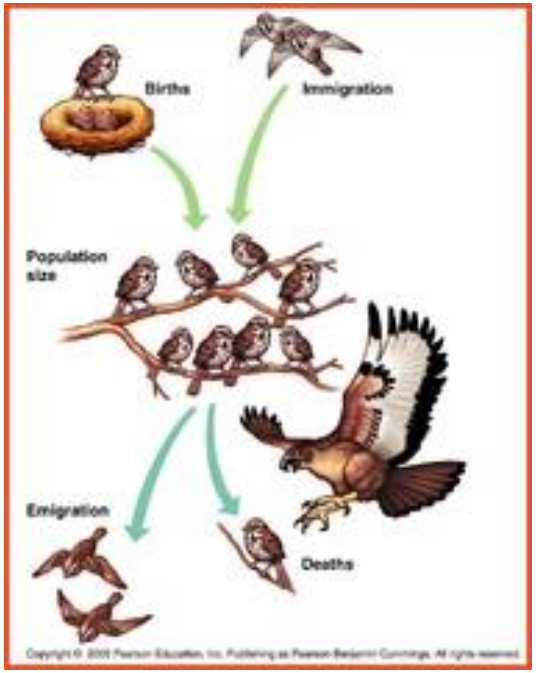

Emigration

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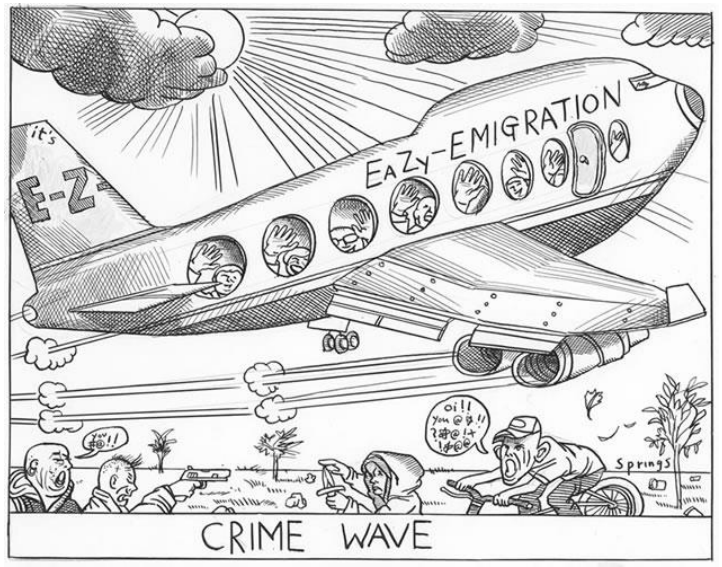
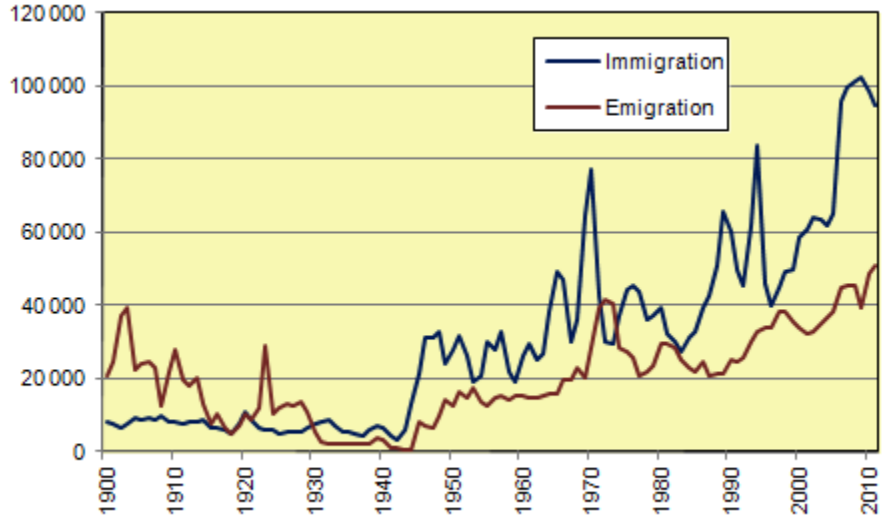


Immigration vs. Emigration

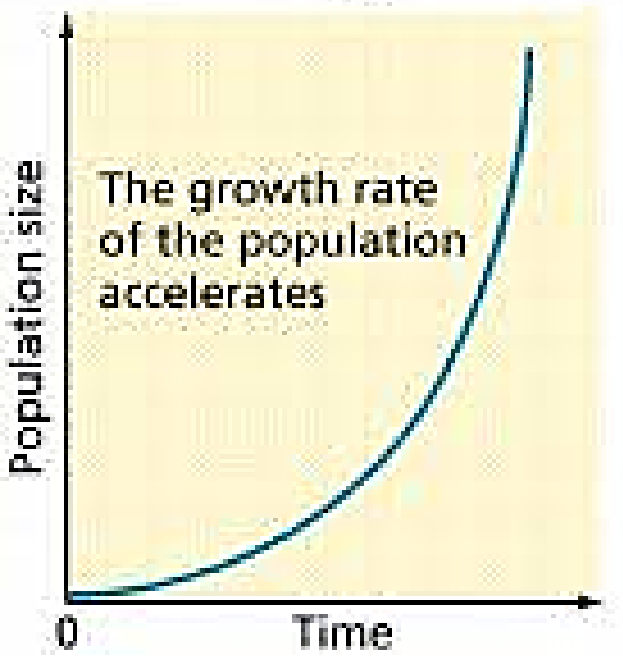
- _____:
  population will **increase**
- Higher emigration than immigration: _____
  _____
- If the immigration and emigration rate is equal, the population _____.



Exponential vs. Logistic Growth

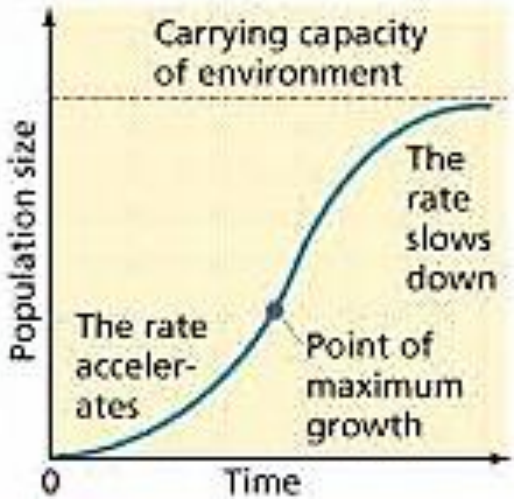
Exponential Growth

- Under _____ _____ with unlimited resources, a population will grow **exponentially**



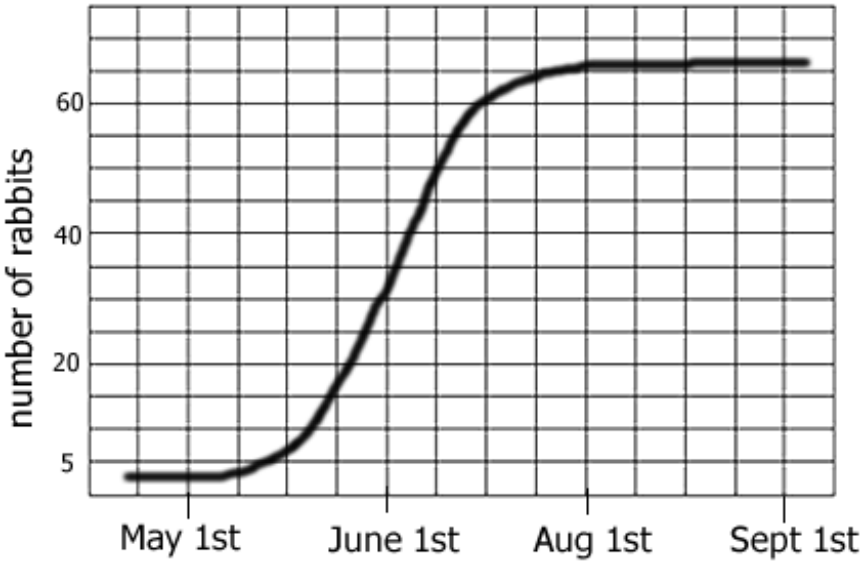
Logistic Growth

- Having _____ _____ available slows down or stops the growth of a population slows or stops
- Population growth begins to slow down and grow at a much slower rate (_____ _____)



Carrying Capacity

- When the population growth slows down or stops, the population has _____
- The carrying capacity of the environment of a species is _____ _____.



What is the carrying capacity of rabbits for this environment? _____