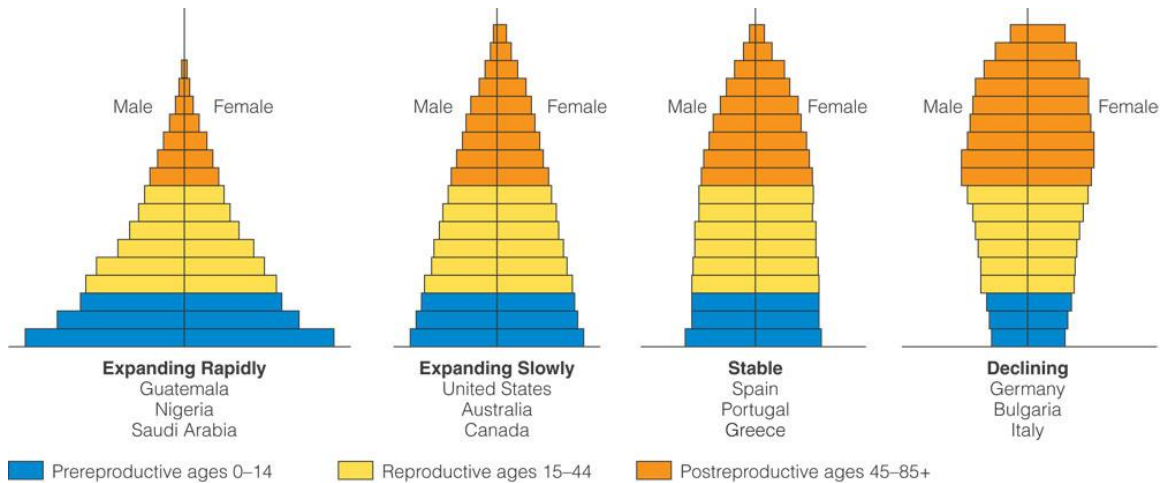**Section III: Population**

- Population Dynamics
  - Distribution
    - Uniform (ex penguins)
    - Random (ex. plants – dandelions)
    - Clumped (ex. herding species – antelope)
  - Density independent (abiotic)
    - Weather/climate, natural disasters affect species population
  - Density dependent (biotic)
    - Food, predation, disease, migration, parasitism affect species population
  - Population Growth
    - J shaped curve = exponential growth
      - **r**-selected species ("**r**eproduce **r**apidly like **r**abbits")
    - S shaped curve = logistic growth
      - K-selected species
  - Survivorship Curve
    - Type I- Death greatest at old age; ex. humans
    - Type II- Death spread evenly throughout life; ex. squirrels
    - Type III- Death greatest among the young; ex. fish, oysters,
  - Community Ecology
    - Competition (ex. paramecium experiment [Fig 6.14])
    - Resource partitioning (when 2 species divide the resource)
    - Predator – Prey relationships – how one species affects the other
    - *Lab: Species Diversity*
      - Species richness = number of species
      - Species evenness = abundance of individual species
      - → can measure/calculate with a "diversity index" → candy lab
- Human Population
  - Worldwide population = 7 Billion
  - Population Change = (B + I) – (D + E)
  - Doubling time – Rule of 70
    - DT = 70/%
  - Replacement level fertility- # of kids a couple must have to "replace" themselves; 2.1 in developed countries, higher in developing countries
  - Total Fertility Rate (TRF)- actual # of kids a couple has
  - Factors affecting birth/fertility rates
    - Importance of children in labor force
    - Cost of raising kids (economics)
    - Pension systems
    - Urbanization

- Women in school (education)/workforce
- Infant mortality rate
- Age at marriage
- Birth control
- Religious/cultural beliefs

  o 2 main factors that best indicate quality of life in a country:
  - infant mortality rate
  - life expectancy

  o Greatest impact on worldwide environment: stabilize/reduce population
  o Age Structure

Expanding Rapidly	Expanding Slowly	Stable	Declining
Guatemala	United States	Spain	Germany
Nigeria	Australia	Portugal	Bulgaria
Saudi Arabia	Canada	Greece	Italy

Prereproductive ages 0–14   Reproductive ages 15–44   Postreproductive ages 45–85+

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  o Demographic Transition
  - Death rates drop before the birth rates
  - Zero population growth at stage 1 & 4
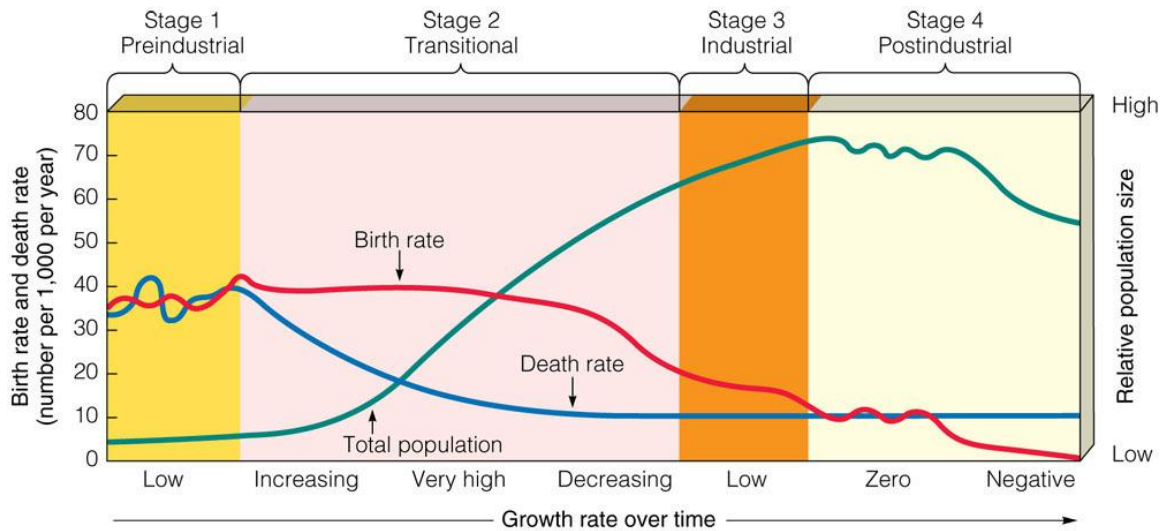
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  o Case Studies
  - China: most populous country; 1 child act

- India
- USA (population increase due to immigration)
  - *Review population math study guide