

Human populations and urban systems · supported focus

International Baccalaureate · IB Diploma · Environmental Systems and Societies · HL

Scope and prerequisites

Supported HL focus. First assessment 2026; current SL/HL brief acquired. Remaining guide, assessment and practical requirements retain their recorded holds.

Prerequisites: read the stated quantities and units, use arithmetic and the model conditions below. Each lesson develops its own method before independent transfer.

These are original or explicitly fictional teaching examples, not actual measurements or completed assessed learner investigations.

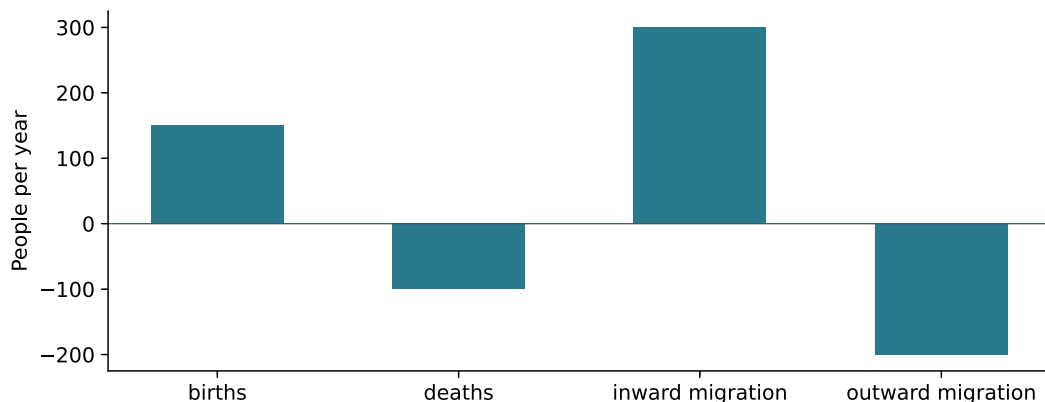
Population, urban systems and indicators

■ What would explain this observation?

- A city can grow because people move into it even when births equal deaths. Population change has several flows.
- Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

■ Build the model

- Population change depends on births, deaths, **immigration** and emigration. Urban systems exchange energy, materials and waste with a wider region. A sustainability **indicator** measures a specified feature rather than total wellbeing.
- immigration: Movement into a population; indicator: A measure of a specified condition.



■ Choose evidence that can test it

- Compare rates with a common denominator and interval. An average can hide unequal access to services. At HL, evaluate how economic incentives, legal responsibilities and ethical priorities change an urban management proposal.
- Use published demographic and city-service data with dates and definitions. Protect privacy when collecting local opinions. Compare the same geographical boundary rather than mixing an urban core with a whole metropolitan region.

■ Work from known quantities

- State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution.
- Known: a city has 10,000 people; births 150, deaths 100, immigration 300 and emigration 200 in one year. $\text{Change} = 150 - 100 + 300 - 200 = 150$. $\text{Growth percentage} = 150 / 10,000 \times 100 = 1.5\%$.

Example:

A population of 2,000 grows by 40 in a year. Find percentage growth. Use the same sequence: known quantities → model → relation → substitution → unit and interpretation.

■ Check the conclusion and its limits

- A projected population is conditional on assumptions. Urban growth does not automatically mean improved health, income or environmental quality for every resident.
- Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Warn:

Population growth depends only on births and deaths. This claim is false: A projected population is conditional on assumptions. Urban growth does not automatically mean improved health, income or environmental quality for every resident.

Key:

Population, urban systems and indicators: Compare rates with a common denominator and interval. An average can hide unequal access to services. At HL, evaluate how economic incentives, legal responsibilities and ethical priorities change an urban management proposal.