Exercise walk-through

8.2
Urban systems and urban planning

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

A country that started to shrink

> Birth totals can rise in a year when the population still falls.

- China's population fell in 2022, 2023 and 2024.
- NBS 2024: 9.54 million births, 10.93 million deaths; births rose from 2023 while population fell.
- This unit: populations $\rightarrow$ cities $\rightarrow$ urban air.

Ecological planning connects functions

Land and living systems

Green roofs and wetlands can link habitat, cooling and water storage.

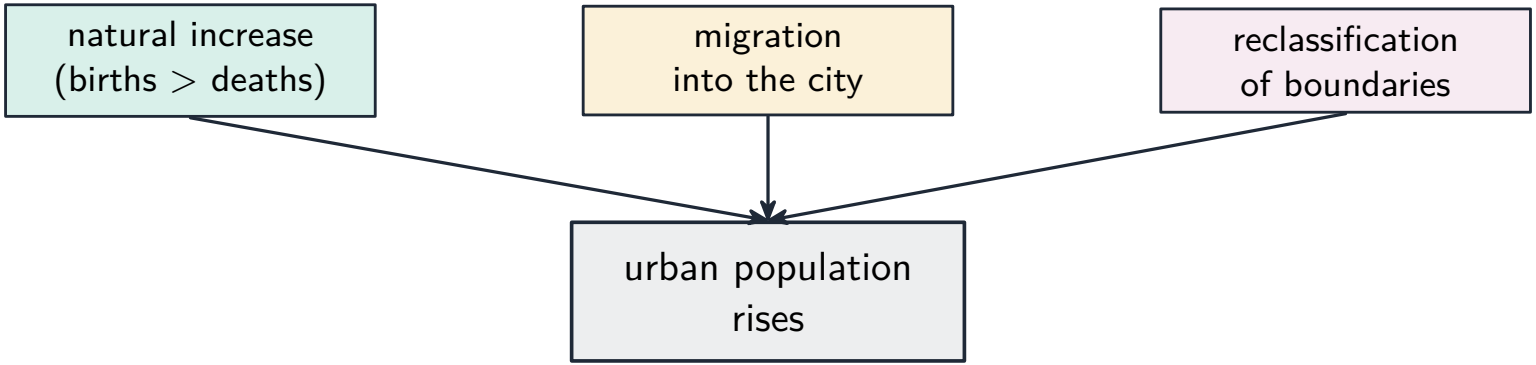
Map connectivity and permeable ground, not just green colour.

People and services

Include affordable housing, work, finance, health and safe transport.

Maintain systems and measure access and actual outcomes.

Why the urban population grows

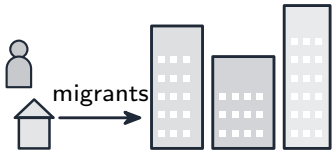


compare maps at the same scale and boundary before blaming migration alone

> Three routes raise the urban count

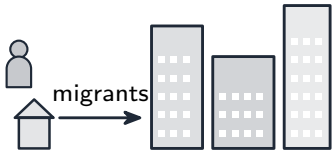
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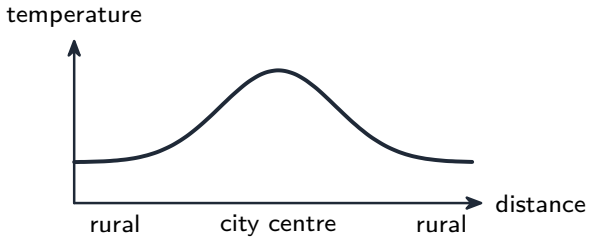


2.1

urbanization: an increase in the proportion of people living in urban areas; more than half / about 55–58%

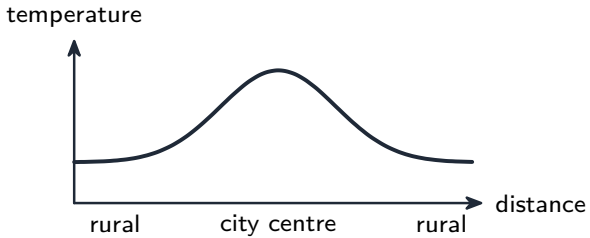
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2.2 Explain **three** causes of the urban heat island. [3]



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dark surfaces such as tarmac and roofs absorb sunlight and release heat at night (low albedo); fewer plants and less water, so less cooling by evapotranspiration; waste heat from vehicles, factories and air conditioners; tall buildings trap heat and block wind

Exercise 2.3

2.3 Explain how urban sprawl affects the natural environment. [3]



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2.3

farmland and natural habitats are built over, so biodiversity is lost and habitats are fragmented; more impermeable surfaces increase runoff and flood risk; low density means longer journeys by car, so more fuel use, air pollution and CO_2

Exercise 3.1 (a)

3.1 The share of the world's population living in urban areas was 30% in 1950 and 55% in 2018, and is projected to be 68% in 2050.

(a) Calculate the projected increase in percentage points from 2018 to 2050. [1]

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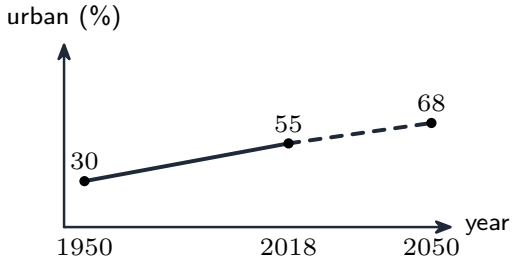
(a) Calculate the projected increase in percentage points from 2018 to 2050. [1]

(a) $68 - 55 = \mathbf{13}$ percentage points

Exercise 3.1 (b)

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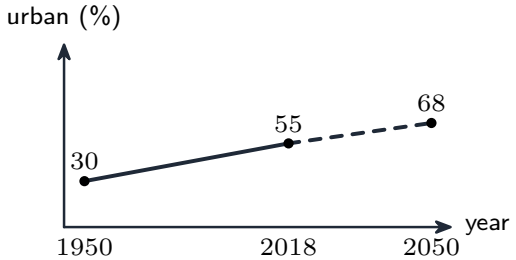
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(b) push: e.g. few jobs and low farm incomes in rural areas, made worse by drought or mechanization; pull: e.g. more jobs and higher wages, better schools and hospitals in cities; people move to improve income and quality of life

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Exercise 3.2 (a)

3.2 A city plans to become more sustainable.

(a) Outline **two** features of a sustainable city. [2]

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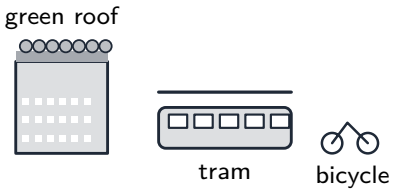
(a) Outline **two** features of a sustainable city. [2]

(a) any two: good public transport, walking and cycling; renewable energy; green spaces; compact mixed-use areas; recycling of waste and water

Exercise 3.2 (b)

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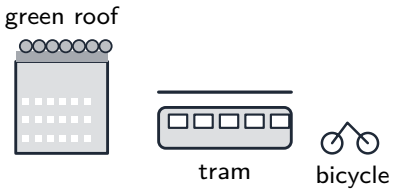
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(b) strength: plants cool buildings and reduce the heat island; they hold rainwater, reducing runoff; habitat for insects and birds; limitation: high cost and roofs must be strong enough; need maintenance and water; judgement: most useful in dense cities when combined with other green infrastructure