8.2 Urban systems and urban planning

Name: _____ Class: _____ Date: _____ **Total: 17 marks**

KEY WORDS urbanization • push factor • pull factor • urban sprawl • urban heat island • green roof

Objective

Build the skills to answer exam questions on **urban systems** : urbanization, the city as a system, **urban sprawl** , the **urban heat island** , and planning for sustainable cities.

You must be able to:

- describe trends in urbanization and explain push and pull factors
- describe a city as a system with inputs and outputs
- explain the urban heat island and the impacts of urban sprawl
- evaluate strategies for more sustainable cities

1 Key knowledge and worked examples

■ Urban systems

Urbanization is the growth in the **share** of people living in towns and cities. About 30% of people lived in urban areas in 1950, 55% in 2018, and the UN projects about 68% by 2050. Most urban growth is now in Asia and Africa.

Push factors (rural): few jobs, poor services, drought or conflict. **Pull factors** (urban): jobs, higher wages, schools, hospitals, opportunities.

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A city is a **system**: inputs of food, water, energy, materials and people; outputs of waste, wastewater, heat, polluted air and products. Most inputs come from far away, so a city's **ecological footprint** is far larger than its area.

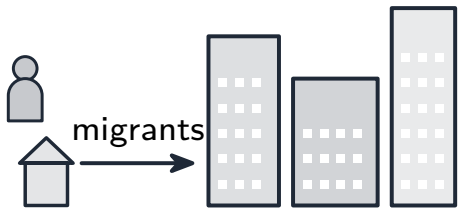
issue	cause	effect
urban sprawl	low-density building spreads into the countryside	loss of farmland and habitat; more car use and emissions
urban heat island	dark surfaces absorb heat; little vegetation; waste heat from cars and air conditioners	city warmer than surroundings, especially at night
surface runoff	concrete and tarmac are impermeable	flash floods

Sustainable city strategies: compact, mixed-use neighbourhoods; good public transport, walking and cycling; green roofs, parks and street trees; renewable energy; water recycling; waste reduction.

Answer shapes: name the strategy, explain how it changes an input or output of the city system, and give one limitation.

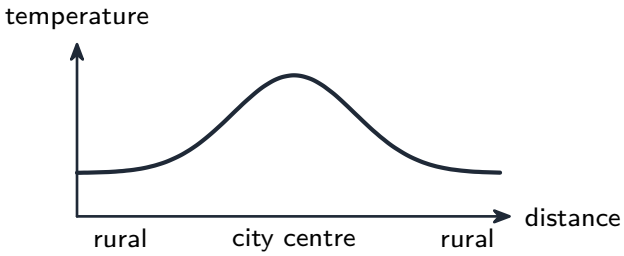
2 Practice

2.1 Define urbanization, and state the approximate share of the world's population living in urban areas today. [2]



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

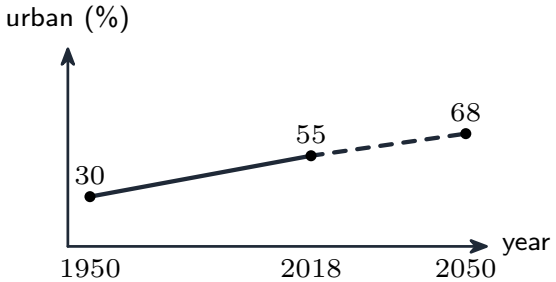


2.3 Explain how urban sprawl affects the natural environment. [3]



3 Exam-style questions

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.

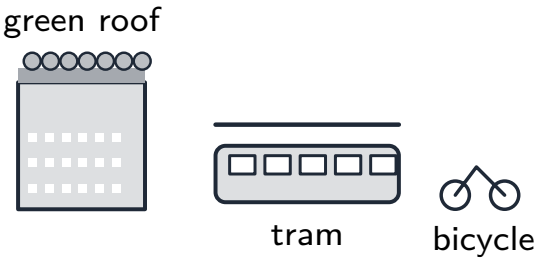


(a) Calculate the projected increase in percentage points from 2018 to 2050. [1]

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(b) Explain **one** push factor and **one** pull factor that cause rural–urban migration. [3]

3.2 A city plans to become more sustainable.



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

(b) Evaluate the use of green roofs in cities. [3]

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Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

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

2.2

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

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

3.1

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

(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

3.2

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

(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

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