4.4 Urban Sustainability and Reducing Cities' Environmental Impact: 30-minute Pack

AQA 8035 · Calculators not allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer the short questions with brief answers. Full-sentence responses are required for the 6-mark and 12-mark questions. Suggested time: 30 minutes.

1 State TWO ways a city council could encourage household recycling participation in a suburb similar to Vauban.

(Total for Question 1 is 2 marks)

2 'Urban sustainability strategies such as energy retrofits, water conservation and sustainable transport are highly effective at reducing a city's environmental impact.' Assess the extent to which you agree with this statement. Use named examples such as Vauban, Freiburg, and at least two distinct strategies in your answer.

(Total for Question 2 is 12 marks)

© Revision Library | revisionlibrary.co.uk

3 Give two examples of sustainable urban transport strategies, apart from cycle infrastructure.

(Total for Question 3 is 2 marks)

---

4 The table below shows a fictional mode share for journeys to work in a mid-sized city before and after a sustainable transport programme that introduced park and ride, improved buses, congestion charging and new cycle corridors. Use these figures to answer parts a to c. Mode | Before programme (%) | After programme (%) Private car | 62 | 45 Bus | 15 | 25 Cycle | 6 | 15 Walk | 10 | 10 Other | 7 | 5

(a) Using the table, state which single transport mode had the largest percentage point increase after the programme. **(1)**

(b) Calculate the reduction in private car mode share in percentage points. Show your working. **(2)**

(c) Explain TWO likely reasons, using the table data, why the cycle share increased so much compared with walking remaining the same. **(3)**

(Total for Question 4 is 6 marks)

© Revision Library | revisionlibrary.co.uk

5 Explain ONE advantage and ONE disadvantage of using water butts and grey water recycling together in a residential area for garden watering and toilet flushing.

(Total for Question 5 is 2 marks)

6 A small neighbourhood records that before a waste reduction campaign, 400 kg of household waste per month went to landfill. After introducing separate food waste collection and a textiles reuse scheme, landfill output fell to 260 kg per month. Calculate the percentage reduction in landfill waste. Show your working and give your answer to one decimal place.

(Total for Question 6 is 2 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 4.4 Urban Sustainability and Reducing Cities' Environmental Impact: 30-minute Pack

Question 1

providing easy curbside separate collections for recyclables, oe **B1**

running public education campaigns and providing free or subsidised recycling bins, oe **B1**

Answer: Provide easy curbside separate collections for recyclables, and run public education campaigns with free or subsidised recycling bins.

Question 2

Level 4 A thorough, well-balanced assessment that uses detailed, accurate reference to named examples such as Vauban and other studied strategies; weighs evidence of effectiveness, scalability and limitations, and reaches a clear, justified conclusion about the extent of effectiveness. **10-12**

Level 3 A clear assessment that considers effectiveness with reference to at least one named example and several strategies; provides reasoned judgement though some points may be less developed. **7-9**

Level 2 Some relevant points about how strategies reduce environmental impact are made, with limited evidence or named detail; a simple conclusion is given with limited justification. **4-6**

Level 1 One or two isolated points about sustainability strategies are made with little or no development or examples. **1-3**

Level 0 No relevant content. **0**

Indicative content:

- Evidence that strategies are effective: energy retrofits and insulation reduce energy demand and emissions; solar retrofits produce renewable electricity and lower grid dependence; Vauban demonstrates integrated design with low car ownership, renewable energy and energy-efficient buildings delivering lower per-capita emissions.
- Water conservation such as grey water recycling and water butts reduces mains water demand and pressure on treatment works, improving resilience and lowering energy used in water supply.
- Sustainable transport measures such as congestion charging, park and ride and improved public transport can significantly reduce car use and emissions, as shown in cities that introduced them, and cycle infrastructure can increase active travel.
- Limits to effectiveness: high upfront costs and the need for subsidies can limit rollout, and retrofit coverage may be incomplete in an existing city so benefits are uneven; social and behavioural barriers affect uptake, for example reluctance to change travel habits.
- Potential unintended consequences: congestion charging can push traffic to inner residential streets unless combined with wider measures; renewable energy needs storage or grid integration to manage intermittency; recycling schemes require public participation to work effectively.
- Scalability and equity: Vauban is a relatively small, planned district with favourable conditions; scaling similar approaches to whole cities with mixed housing and income levels is more challenging and may need additional policy, funding and community engagement.
- A high-quality conclusion should weigh the strong potential effectiveness of these strategies against practical limitations and argue whether they are sufficient on their own or need to be part of an integrated, well-funded package to achieve major environmental impact reductions.

© Revision Library | revisionlibrary.co.uk

Question 3

one valid sustainable urban transport strategy, other than cycle infrastructure, e.g. park and ride, congestion charging, pedestrianisation, or improved public transport such as tram or bus priority, oe **B1**

a second, different valid sustainable urban transport strategy, other than cycle infrastructure, oe **B1**

Answer: Park and ride, and congestion charging.

Question 4

(a) bus **B1**

(a) Answer: Bus.

(b) 62 - 45 seen, oe **M1**

(b) 17 percentage points cao **A1**

(b) Answer: 17 percentage points.

(c) reason 1, e.g. the introduction of cycle corridors made cycling safer and faster, encouraging people who used cars or buses to switch to cycling, supported by the large increase in cycle share, oe **B1**

(c) reason 2, e.g. park and ride and improved buses reduced car journeys but did not affect short walking trips, so walking stayed the same while those able to cycle from slightly further away switched to bikes, oe **B1**

(c) linked point, e.g. cycling can replace medium-distance trips more easily than walking, so cycle mode share could grow at the expense of car and bus trips rather than walking, oe **B1**

(c) Answer: Because cycle corridors made cycling safer and faster, people who previously drove or used buses were encouraged to switch to bikes; and park and ride plus improved buses reduced long car trips but did not affect short walking trips, so walking stayed the same while cycling grew, replacing medium-distance car or bus journeys.

Question 5

advantage, e.g. reduces mains water demand and saves household water bills, oe **B1**

disadvantage, e.g. initial installation costs and need for maintenance or potential hygiene concerns if not managed correctly, oe **B1**

Answer: Advantage: using water butts and grey water recycling reduces mains water demand and can lower household water bills. Disadvantage: there are initial installation costs and ongoing maintenance, and potential hygiene concerns if systems are not properly managed.

Question 6

(400 - 260) / 400 x 100 seen, oe **M1**

35.0% cao **A1**

Answer: 35.0%.

© Revision Library | revisionlibrary.co.uk