



S02-30min The Statistical Enquiry Cycle: 30-minute Pack

EDEXCEL 1ST0 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Write down the missing word: Plan, Collect, _____, Interpret.

(Total for Question 1 is 1 mark)

- 2** State whether this is True or False: A population, in statistics, always means every person living in a country.

(Total for Question 2 is 1 mark)

- 3** For each activity, write down whether it belongs to the plan stage or the collect stage of the statistical enquiry cycle.

- (a) Deciding how many people to survey.
(b) Handing out and gathering in the completed questionnaires.

(Total for Question 3 is 2 marks)

- 4** A student wants to investigate whether adults spend longer using their mobile phones each day than teenagers do.

Write a suitable hypothesis for this investigation.

(Total for Question 4 is 2 marks)

5 A student is investigating the fuel efficiency of cars. She writes the following as her hypothesis:

"Do bigger cars use more fuel than smaller cars?"

(a) Give a reason why this is not a suitable hypothesis. **(1)**

(b) Rewrite this as a suitable hypothesis. **(2)**

(Total for Question 5 is 3 marks)

6 A student writes the following as her hypothesis: 'Do older people watch more television than younger people?' Rewrite this as a suitable hypothesis.

(Total for Question 6 is 2 marks)

7 A student is planning to investigate how much time Year 11 students spend on homework each week.

(a) State the stage of the statistical enquiry cycle at which the student should decide whether to use a questionnaire, an observation, or an experiment to collect her data. **(1)**

(b) Give one factor, other than cost, that should influence which data collection method the student chooses. **(2)**

(Total for Question 7 is 3 marks)

8 A researcher is planning to send a postal questionnaire to a sample of 350 households. Printing and posting each questionnaire costs 90p. The researcher has a budget of £300 for this stage of her enquiry.

(a) Work out the total cost of printing and posting all 350 questionnaires. (2)

(b) State, giving a reason, one planning decision the researcher could make as a result of your answer to part (a). (1)

(Total for Question 8 is 3 marks)

9 A gym is investigating the hypothesis: 'Members who attend more than twice a week lose weight faster than members who attend once a week or less.'

(a) State which stage of the statistical enquiry cycle this hypothesis belongs to. (1)

(b) The gym decides to survey members only on a Monday morning. State one way this could bias the sample, and suggest one improvement. (2)

(Total for Question 9 is 3 marks)

10 A student wants to investigate how much time primary school children (aged 5 to 11) spend using screens each day, by interviewing children directly at their school.

(a) Identify one ethical issue with this plan. (1)

(b) Suggest how this ethical issue could be resolved without abandoning the investigation. (2)

(Total for Question 10 is 3 marks)

- 11** A national newspaper carries out an online poll on its website, asking readers: "Should the speed limit on motorways be raised?" Only people who visit the website and choose to respond take part. 2000 people respond, and 65% say yes. The newspaper concludes that most people in the country want the speed limit raised.

(Total for Question 11 is 3 marks)

- 12** A council wants to investigate how satisfied residents are with a new recycling scheme. It considers two methods:

Method 1: a postal questionnaire sent to a random sample of 500 households across the town.

Method 2: interviewing 50 people at the local recycling centre.

- (a) Give one advantage of Method 1 over Method 2. (1)
- (b) Give one advantage of Method 2 over Method 1. (1)
- (c) The council wants a conclusion that applies fairly to all residents of the town. (2)
State which method is more suitable, and explain why, referring to the plan and collect stages of the enquiry cycle.

(Total for Question 12 is 4 marks)

Mark scheme · S02-30min The Statistical Enquiry Cycle: 30-minute Pack

Question 1

- **B1** Process cao
- **Answer: Process**

Question 2

- **B1** False cao
- **Answer: False**

Question 3

- **B1** (a) Plan cao
- **B1** (b) Collect cao
- **Answer: (a) Plan (b) Collect**

Question 4

- **B1** a statement (not a question) that can be tested using data, oe
- **B1** clearly compares the two named groups (adults and teenagers) in terms of mobile phone use, oe
- **Answer: Adults spend longer using their mobile phones each day than teenagers do.**

Question 5

- (a) **B1** it is phrased as a question rather than a statement that can be tested, oe
- (a) **Answer: It is written as a question, not as a statement that can be tested using data.**
- (b) **B1** phrased as a testable statement, not a question
- (b) **B1** clearly compares fuel use between bigger and smaller cars, oe
- (b) **Answer: Bigger cars use more fuel than smaller cars.**

Question 6

- **B1** phrased as a statement, not a question
- **B1** clearly compares older people and younger people in terms of television watched, oe
- **Answer: Older people watch more television than younger people.**

Question 7

- (a) **B1** Plan cao
- (a) **Answer: The plan stage.**
- (b) **B1** identifies a valid factor, e.g. the type of data needed (self-reported time vs directly measured time), or how many students need to be reached, oe
- (b) **B1** links the factor to how it affects the choice of method, e.g. a questionnaire is quicker to distribute to many students than direct observation of each student's homework time
- (b) **Answer: How accurately the time needs to be measured: a questionnaire relies on students estimating their own time, whereas observing and timing students directly would give more accurate data but would take far longer to carry out for a large group.**

Question 8

- (a) **M1** 350×0.90 , oe
- (a) **A1** £315 cao
- (a) **Answer: £315**
- (b) **B1** a valid decision linked correctly to the cost exceeding the £300 budget, e.g. reduce the sample size, or find a cheaper method, oe
- (b) **Answer: She could reduce her sample size, since £315 is more than her £300 budget.**

Question 9

- (a) **B1** Plan cao
- (a) **Answer: Plan**
- (b) **B1** identifies bias, e.g. only members who can attend on Monday mornings are surveyed, so members with different weekly schedules are excluded, oe
- (b) **B1** suggests a valid improvement, e.g. survey members across several different days and times, oe
- (b) **Answer: Only members free on Monday mornings are surveyed, which could exclude members with different attendance patterns; the gym should survey members across several different days and times instead.**

Question 10

- (a) **B1** identifies that the children are minors, so consent must be obtained from a parent/guardian (and/or the school) before interviewing them, oe
- (a) **Answer: The children are under 16, so consent from a parent or guardian, and likely the school, would be needed before interviewing them.**
- (b) **B1** obtains informed consent from parents/guardians and the school before data collection begins
- (b) **B1** keeps responses anonymous/confidential so individual children cannot be identified, oe
- (b) **Answer: The student should get permission from parents or guardians and the school before interviewing any children, and should keep all answers anonymous so no individual child can be identified.**

Question 11

- **B1** the conclusion is judged not to be valid, oe
- **B1** identifies that the sample is self-selecting (only website visitors who choose to respond), so is unlikely to represent the whole country
- **B1** identifies that people with strong opinions on the topic are more likely to respond, which could bias the 65% figure, oe
- **Answer: The conclusion is not valid. Only people who visit the newspaper's website and choose to respond are included, so the sample is self-selecting and unlikely to represent the whole country; people with strong views on the issue are also more likely to respond, which could bias the 65% figure.**

Question 12

- (a) **B1** a random sample of households is more representative of all residents than only people who already visit the recycling centre, oe
- (a) **Answer: A random sample of households is more likely to represent all residents, since people at the recycling centre are more likely to already support recycling.**
- (b) **B1** a valid advantage of interviews, e.g. face-to-face interviews usually get a higher response rate, or answers can be collected/clarified immediately, oe
- (b) **Answer: Interviewing people face to face usually gets a higher response rate than a postal questionnaire, and any unclear questions can be explained immediately.**
- (c) **B1** identifies Method 1 (the postal questionnaire to a random sample) as more suitable
- (c) **B1** explains that choosing a random sample of households at the plan stage means the data collected represents all residents, whereas Method 2 only collects data from residents who already visit the recycling centre
- (c) **Answer: Method 1 is more suitable. Because the plan stage chooses a random sample of households across the whole town, the data collected at the collect stage represents all residents fairly, whereas Method 2 would only reach residents who already use the recycling centre.**