Capture-recapture

Grade 5 | Foundation and Higher | 5 questions, 20 marks

GCSE Statistics topic practice

Name: _____ **Date:** _____ **Score:** _____ **/ 20**

1 Grace wants to estimate the number of snails in her garden. She catches 30 snails, marks each shell with a dot of paint and lets them go. Three days later she catches 50 snails. 6 of these 50 snails have a dot of paint.

Work out an estimate for the number of snails in the garden.

(3 marks)

2 Ecologists want to estimate the number of fish in a lake. They catch 40 fish, tag each one and release them back into the lake. One week later they catch 60 fish. 8 of these 60 fish have a tag.

a. Work out an estimate for the number of fish in the lake. (3)

b. Write down one assumption you made in part (a). (1)

(4 marks)

3 A marine biologist wants to estimate the number of crabs on a beach. She catches 48 crabs, marks each one with a spot of paint and releases them. The next day she catches 60 crabs. 9 of these 60 crabs are marked.

a. Work out an estimate for the number of crabs on the beach. (2)

b. The paint had washed off some of the crabs before the second sample was taken. Explain how this affects the estimate in part (a). (2)

(4 marks)

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4 A ranger estimates that there are 450 voles in a meadow. She used the capture-recapture method. She first caught 36 voles, tagged them and released them. A week later she caught a second sample of 50 voles.

a. Work out how many of the 50 voles in the second sample had a tag. (3)

b. Write down one thing the ranger could do to make her estimate more reliable. (1)

(4 marks)

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5 A fishing club wants to estimate the number of trout in a reservoir. Members catch 25 trout from the north bank, tag them and release them. One hour later they catch 40 trout from the same place on the north bank. 2 of these 40 trout have a tag.

a. Work out an estimate for the number of trout in the reservoir. (3)

b. Use the numbers in the question to give one reason why this estimate may not be reliable. (1)

c. The second sample was taken after only one hour and from the same place. Explain why this could make the estimate too low. (1)

(5 marks)

End of questions | Total 20 marks

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