

Commentary on candidate 1 evidence

Assessors awarded the candidate evidence the following marks for each section of the project.

Abstract

Section 1 A brief abstract stating the main aim(s) and overall findings/conclusions

The candidate was awarded **0 out of 1 mark** because the aim does not match the main investigation. The abstract states 'colour preference on the feeding habits of garden birds' versus the main aim, which relates to the colour preference of garden birds while visiting feeders.

Introduction

The candidate was awarded **3 out of 5 marks** for this section.

Section 2(a) A clear statement of the aim(s) together with relevant hypotheses

The candidate was awarded **1 out of 1 mark** because the hypothesis ranks feeder colour:

- Independent variable = colour of feeder
- Dependent variable = count of birds as a measure of colour preference

Section 2(b) An account of the underlying biology, with justification of the biological importance of the project

The candidate was awarded **2 out of 4 marks**. The purpose of the underlying biology is to address the questions raised by the aim. The candidate does not address the preferences of birds and the importance of this to birds.

There is some relevant information on pages 6, paragraph 2 and 7, paragraphs 1 to 3. However, the focus on the human eye is not helpful to the aim.

The information is clear and accurate in the areas that are relevant but are not at an appropriate depth to allow levels of analysis, interpretation, and discussion of results.

The candidate made multiple attempts to justify the importance but to a varying degree of success.

Holistically, the candidate was awarded **2 marks**.

Procedures

The candidate was awarded **8 out of 9 marks** for this section.

Section 3(a) Procedure(s) are appropriate to the aim(s)

The candidate was awarded **1 out of 1 mark** because the procedure allows a colour preference to be established.

Section 3(b) Procedure(s) described in sufficient detail to allow the investigation to be repeated

The candidate was awarded **2 out of 2 marks**.

- **1 mark** for identification of independent variable (different colours of feeder) and identification of measurement of dependent variable (number of visits per feeder).
- **1 mark** for the procedure described in adequate detail for it to be repeated.

Section 3(c) Appropriate controls are identified

The candidate was awarded **1 out of 1 mark** because they justified why no control was possible.

Section 3(d) Control of confounding variables is described

The candidate was awarded **1 out of 1 mark** because they have controlled many variables:

- food type
- feeder height
- fixed positions of feeders
- same recording time for point count

- distance between feeders
- randomised feeder order

The position of the feeder was randomised to minimise the effect of other environmental confounding variables.

The temperature would affect the total number of birds, and not the preferences of those birds, so doesn't need to be considered.

Section 3(e) Sample size is appropriate

The candidate was awarded **1 out of 1 mark** because they took recordings across seven days per replicate.

Section 3(f) Independent replication is described

The candidate was awarded **0 out of 1 mark** because they did not describe how the independent replicate was achieved.

Section 3(g) Description of how the pilot study informed the development of the final procedure(s)

The candidate was awarded **1 out of 1 mark** because they recorded details of how the pilot study provided results that would then inform the final procedure.

Section 3(h) Procedures show complexity, creativity or accuracy

The candidate was awarded **1 out of 1 mark** because the procedures showed complexity:

- creativity – made the feeders
- complexity – randomised positions
- accuracy – use of video footage for re-watching

Any one of these would have accessed the mark.

Results

The candidate was awarded **5 out of 6 marks** for this section.

Section 4(a) Data is relevant to the aim(s)

The candidate was awarded **1 out of 1 mark** because the data is relevant to the aim.

Section 4(b) Raw data is recorded and within the limits of accuracy of measurement

The candidate was awarded **1 out of 1 mark** because the raw data is present in the report.

Section 4(c) Results presented appropriately

The candidate was awarded **1 out of 1 mark** because the results were presented in appropriate tables and bar graphs. The graph of combined results (graph 9) was the appropriate graph to use to award the mark. Other graphs are surplus at this point.

Section 4(d) Overall results calculated and presented

The candidate was awarded **1 out of 1 mark** because both an overall table and a graph was presented.

Section 4(e) Presentation of tables and graphs is correct and accurate

The candidate was awarded **1 out of 2 marks**.

- **1 mark** was awarded for the table as the means are correct and rounded to whole numbers. The headings are appropriate.
- **0 mark** was awarded for the graph, as although the plots are accurate, the Y-axis label is incorrect.

Discussion (conclusion(s) and evaluation)

The candidate was awarded **6 out of 7 marks** for this section.

Section 5(a) Conclusion(s) relevant to the aim(s) and supported by data in the report

The candidate was awarded **1 out of 1 mark** because the first conclusion is supported by data in the overall combined results.

The supplementary conclusion is supported by data in the report, but does not answer the aim, and is therefore ignored.

Section 5(b) Conclusion(s) is valid

The candidate was awarded **0 out of 1 mark** because the conclusion is not valid. In replicate 1, silver is the least preferred, and in replicate 2, yellow is the least preferred. This suggests insufficient replication has taken place.

Section 5(c) Evaluation of procedures with justification

The candidate was awarded **2 out of 2 marks**.

This section was marked holistically as follows:

- Page 22, paragraphs 1 and 2 together are sufficiently **detailed** to meet point 10.
- Page 22, paragraph 3 meets point 9 as it includes a **detailed** discussion on the suitability for an organism. Point 1 was awarded later.
- Page 22, paragraph 4 meets point 3 as it includes a **detailed** discussion around how a representative sample was achieved.
- Page 22, paragraph 5, point 7 is a **weak** discussion around a negative control not being possible/appropriate.
- Page 23, paragraph 1 did not meet any points.
- Page 23, paragraph 2, point 10 is a **weak discussion**.
- Pages 23, paragraph 3, 4, and 5 meet point 10 as they are **detailed**. All three paragraphs are individually weak, but summatively are strong.
- Page 23, paragraph 6 meets point 1 as it includes a **detailed** discussion around a pilot study and subsequent modifications.
- Page 23, paragraph 7 does not meet any points.
- Overall, five areas show detailed evaluative discussion which meet points 1, 3, 7, 9 and 10 which meet the criteria for both marks to be awarded.

Section 5(d) Results analysed and interpreted, and findings discussed critically and scientifically

The candidate was awarded **3 out of 3 marks**.

Analysis of results

Page 23, paragraph 8 to page 24, paragraph 4 includes a **good** critical discussion across these paragraphs, including percentage changes and comparisons between replicates.

Interpretation of results

Page 24, paragraphs 2, 3 and 6 include a **good** critical discussion around the meaning of trends, and suggested biological explanations as to why these trends were observed.

Critical and scientific discussion of the findings

Page 24, paragraph 7 is a **weak** critical discussion around other studies with a similar aim.

Page 24, paragraphs 5 and 6 include a **good** critical discussion and evaluation of a second conclusion/trend spotted, with robust and biological explanations for an alternative hypothesis.

A better introduction would have provided more opportunities for further critical and scientific discussion.

Presentation

The candidate was awarded **1 out of 2 marks** for this section.

Section 6(a) Appropriate structure, with informative title, contents page and page numbers

The candidate was awarded **1 out of 1 mark** because the title and structure are appropriate and page numbers are present.

Section 6(b) References cited in the text and listed using Harvard or Vancouver referencing systems

The candidate was awarded **0 out of 1 mark** because only two references (8 and 9) were correctly listed.

Overall, the candidate was awarded **23 out of 30 marks**.