

Conversation with Gemini

You said

Write a mad libs style fill in the blank document that mimics a short scientific biology paper that includes an introduction, methods, results and discussion section. It should leave blanks for things such as the type of organism, the specific research question, the specific hypothesis, specific methods, specific results and specific discussion. It should illustrate the general ordering of sentences within each of these sections.

Gemini said

Science writing can feel a bit like a rigid dance—everyone follows the same steps, just with different "partners" (or organisms). To help you visualize how a standard biology paper flows, I've put together a "Mad Libs" template.

This structure mimics the **IMRaD** format (Introduction, Methods, Results, and Discussion), which is the bread and butter of scientific publishing.

The Biology Paper Template

I. Introduction

The **[Broad Biological Context]** is a critical area of study due to its impact on **[Global Problem or Ecological System]**. Within this field, **[Organism Name]** is often used as a model because of its **[Unique Physical Characteristic]**. Despite extensive research, it remains unclear how **[Specific Research Question]**. This study aims to bridge that gap. We hypothesized that if **[Condition A]** is applied, then **[Predicted Outcome]** will occur because **[Biological Mechanism]**.

II. Methods

To test this hypothesis, we collected **[Number]** specimens of **[Organism Name]** from **[Location]**. The subjects were divided into two groups: a control group and an experimental group. The experimental group was subjected to **[Specific Treatment/Variable]** for a period of **[Time Frame]**. We measured the **[Dependent Variable]** using a **[Scientific Instrument or Software]**. Statistical significance was determined using a **[Type of Statistical Test]**, with an alpha level set at 0.05.

III. Results

Our data indicate a [**Significant/Non-significant**] difference between the two groups. Specifically, the experimental group showed a [**Percentage**] increase/decrease in [**Variable Measured**] compared to the control. The mean value for the treated group was [**Number + Units**], while the control group averaged [**Number + Units**]. Notably, we observed an unexpected trend where [**Secondary Observation**]. These results suggest that [**Specific Variable**] has a direct effect on [**Organism's Process**].

IV. Discussion

The findings of this study [**Support/Refute**] our original hypothesis. Our observation that [**Key Result**] aligns with previous work by [**Famous Scientist's Last Name**], who found similar patterns in [**Related Species**]. However, our results differ from the "Standard Model" because [**Reason for Difference**]. One potential limitation of this study was [**A Mistake or Constraint**], which may have influenced the [**Specific Data Point**]. Future research should investigate whether [**New Research Question**] to further clarify the role of [**Variable**] in biological systems.

Tips for "Playing"

- **The Intro:** Start big (The Ocean) and zoom in fast (The left nostril of a Blue Whale).
- **The Methods:** Be so specific that a stranger could recreate your "experiment" in their kitchen.
- **The Results:** Just the facts. No "I feel" or "I think"—save the soul-searching for the Discussion.

Would you like me to fill this out with a specific (or completely absurd) example to show you how it reads in practice?

You said

yes

Gemini said

Since you asked, let's go with a classic "urban legend" style experiment involving high-stakes caffeine consumption and one of the most resilient creatures on Earth.

Here is the template filled out with a (completely hypothetical) study on **Pigeon Navigation**.

The Effects of Espresso on Urban Navigation

By: Dr. Featherington et al.

I. Introduction

The **urban ecosystem** is a critical area of study due to its impact on **migratory bird navigation**. Within this field, the **Rock Pigeon (*Columba livia*)** is often used as a model because of its **internal magnetic compass**. Despite extensive research, it remains unclear how **high-dosage stimulants affect homing accuracy in dense traffic**. This study aims to bridge that gap. We hypothesized that if **double-shot espresso** is applied, then **pigeons will return home 30% faster** because **caffeine accelerates neural firing in the avian hippocampus**.

II. Methods

To test this hypothesis, we collected **50 specimens of Rock Pigeon from the steps of the New York Public Library**. The subjects were divided into two groups: a control group (water) and an experimental group. The experimental group was subjected to **0.5mL of dark roast Arabica** for a period of **fifteen minutes prior to release**. We measured the **time-to-roost** using a **miniature GPS backpack**. Statistical significance was determined using a **Student's t-test**, with an alpha level set at 0.05.

III. Results

Our data indicate a **significant** difference between the two groups. Specifically, the experimental group showed a **45% increase in flight velocity** compared to the control. The mean value for the treated group was **65 km/h**, while the control group averaged **42 km/h**. Notably, we observed an unexpected trend where **the caffeinated pigeons stopped to peck aggressively at shiny parked cars**. These results suggest that **caffeine** has a direct effect on **spatial urgency and aggression**.

IV. Discussion

The findings of this study **support** our original hypothesis. Our observation that **caffeine decreases travel time** aligns with previous work by **Starbuck (2024)**, who found similar patterns in **tired graduate students**. However, our results differ from the "Standard Model" because **our pigeons frequently flew in erratic zig-zags**. One potential limitation of this study was **a rogue hawk that chased the control group**, which may have influenced the **baseline flight speed**. Future research should investigate whether **decaf options** to further clarify the role of **the placebo effect** in biological systems.

Would you like me to generate a formal, serious version for a real biological topic (like photosynthesis or genetics) to use as a study guide?

You said

Add imaginary citations to the intro and discussion. In the results include some invented p values and statistical results.

Gemini said

Let's take our caffeinated pigeon study and dress it up with some formal academic "bling." I've added the standard citation format (Author, Year) and the kind of dense statistical notation that makes reviewers nod their heads in approval.

The Effects of Espresso on Urban Navigation

By: Dr. Featherington et al.

I. Introduction

The **urban ecosystem** is a critical area of study due to its impact on **migratory bird navigation** (Grackle & Sparrow, 2019). Within this field, the **Rock Pigeon (*Columba livia*)** is often used as a model because of its **complex internal magnetic compass** (Beakman, 2022). Despite extensive research, it remains unclear how **high-dosage stimulants affect homing accuracy in dense traffic** (Coop et al., 2020). This study aims to bridge that gap. We hypothesized that if **double-shot espresso** is applied, then **pigeons will return home 30% faster** because **caffeine accelerates neural firing in the avian hippocampus** (Macchiato, 2021).

II. Methods

(Section remains the same as previous)

III. Results

Our data indicate a **significant** difference between the two groups. Specifically, the experimental group showed a **45%** increase in **flight velocity** compared to the control ($t(48)=5.62, p<.001$). The mean value for the treated group was **65 km/h** ($SD=4.2$), while the control group averaged **42 km/h** ($SD=3.8$). Notably, we observed an unexpected trend where **the caffeinated pigeons stopped to peck aggressively at shiny parked cars** (Pearson's $r=0.85, p=.02$). These results suggest that **caffeine** has a direct effect on **spatial urgency and aggression**.

IV. Discussion

The findings of this study **support** our original hypothesis. Our observation that **caffeine decreases travel time** aligns with previous work by **Starbuck (2024)**, who found similar patterns in **tired graduate students**. However, our results differ from the "Standard Model" (Folger, 2015) because **our pigeons frequently flew in erratic zig-zags**. One potential limitation of this study was **a rogue hawk that chased the control group** (Talons & Beak,

2023), which may have influenced the **baseline flight speed**. Future research should investigate whether **decaf options** to further clarify the role of **the placebo effect** in biological systems (Brew-Ha-Ha, 2025).

A Note on the Stats

In a real paper, you'll see those little letters (t, p, r). Here's a quick cheat sheet:

- **p<.05**: The "Magic Number." It means there is less than a 5% chance the results happened by pure accident.
- **SD (Standard Deviation)**: How much the individuals differed from the average.
- **r (Correlation)**: How closely two things are linked (like caffeine levels and aggression).

Would you like me to show you how to format a "Literature Cited" section based on these imaginary authors?

You said

Yes and use APA style

Gemini said

To wrap up our "Caffeinated Pigeon" study, here is a formal **Literature Cited** section.

In **APA 7th Edition** style, sources are alphabetized by the first author's last name. For journals, the title of the article is in sentence case (only the first word and proper nouns capitalized), while the journal name and volume number are *italicized*.

References

Beakman, J. R. (2022). Magnetic navigation and the avian brain: A review of internal compasses in urban environments. *Journal of Avian Navigation*, 14(2), 112–125.

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Brew-Ha-Ha, L. (2025). *The placebo effect in non-human primates and urban birds*. Academic Press.

Coop, A. S., Loft, P. D., & Rooftop, B. (2020). High-speed collisions and stimulants: Why pigeons are moving faster in Manhattan. *Urban Biology Quarterly*, 33(4), 405–418.

Folger, J. M. (2015). The standard model of avian metabolic rates. In S. Maxwell (Ed.), *Fundamentals of Ornithology* (3rd ed., pp. 88–104). Science House.

Grackle, M., & Sparrow, T. (2019). Anthropogenic impacts on migratory patterns in the 21st century. *Ecological Trends*, *12*, 55–60. <https://doi.org/10.1111/et.2019.12.3>

Macchiato, E. (2021). Neural firing rates in the avian hippocampus under the influence of methylxanthines. *Neuro-Ornithology Today*, *7*(1), 19–24.

Starbuck, S. (2024). Caffeine-induced productivity: A comparative study of graduate students and common poultry. *The Journal of Over-Caffeinated Research*, *102*, Article 104562.

Talons, R., & Beak, F. (2023). Predator interference in controlled field experiments: A cautionary tale. *Field Methods in Biology*, *19*(3), 202–210.

A Quick APA Cheat Sheet

- **The "Who":** Last Name, First Initial.
- **The "When":** (Year).
- **The "What":** Article title in plain text, Journal Name in *Italics*.
- **The "Where":** Volume number in *Italics*, Issue number in (parentheses), and page range.

Would you like me to generate a different citation style, like MLA or Chicago, for comparison?