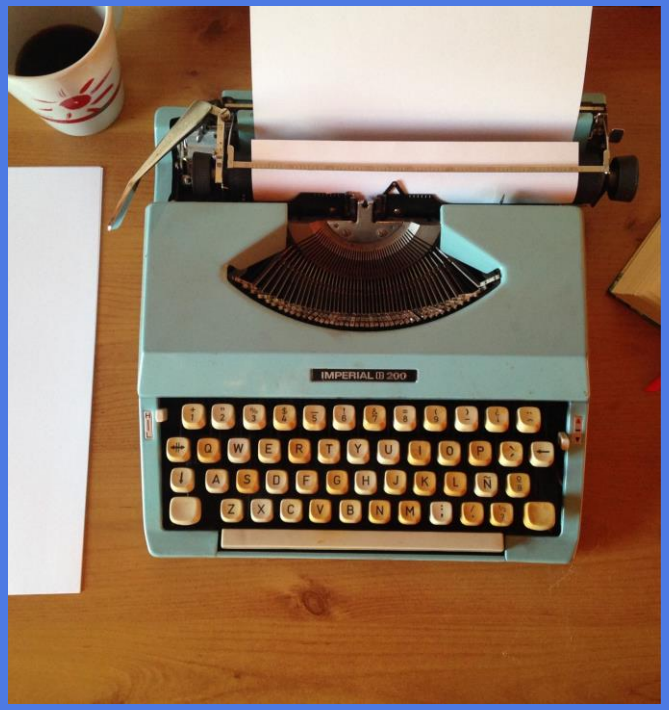


SKILLS 4 SCIENCE

WRITTEN COMMUNICATION - On Scientific Paper writing

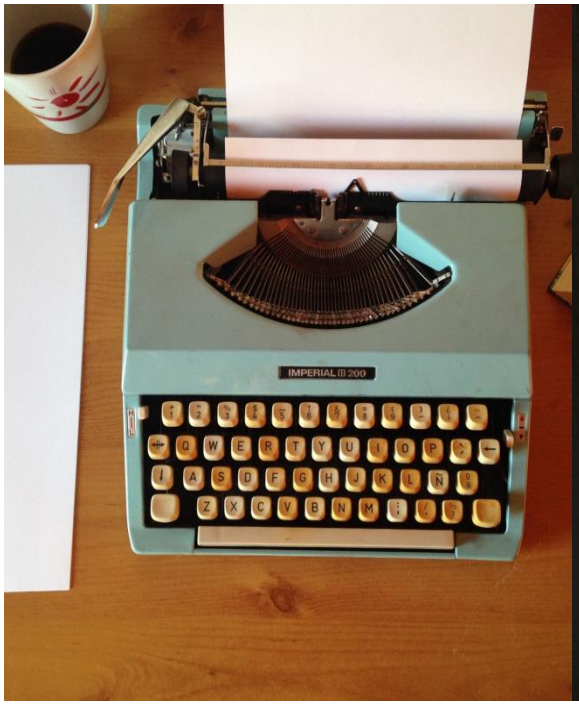
WHO WE ARE

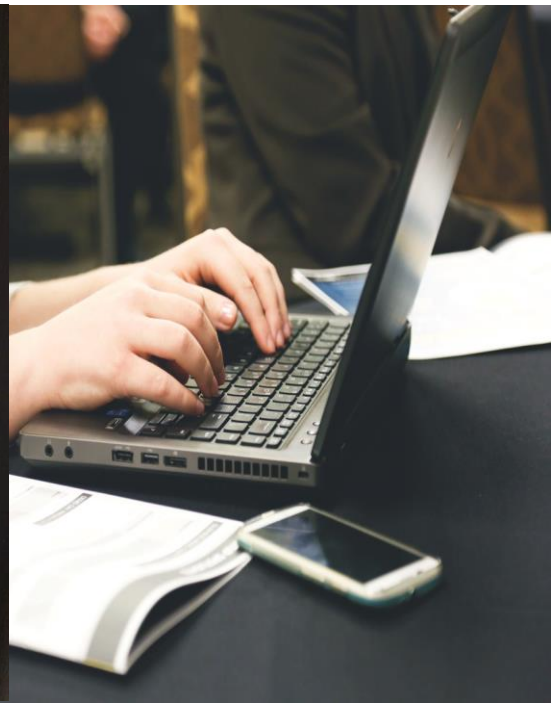
SKILLS 4 SCIENCE

Manuela
Diploma-Engineer
Biotechnology
Corporate Trainer

Sofi
Degree in Psychology
Master Degree in Gender Studies
Executive & Life Coach

SHOW OF HANDS





COMMON CHALLENGES

Time & Project Management

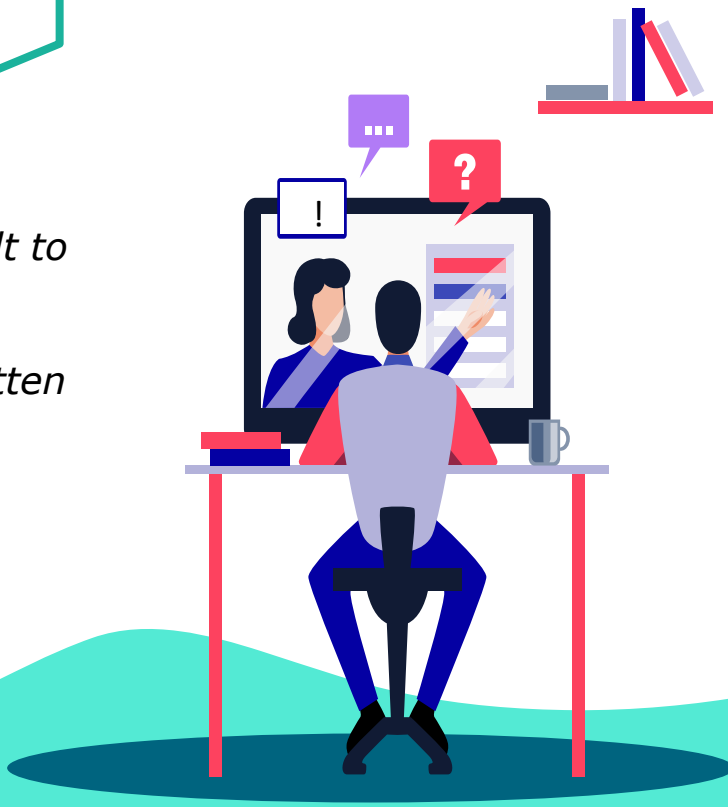
"I never have time to sit down and write."

Collaborative Writing Challenges

"I am waiting for someone else to finish their part of the paper."

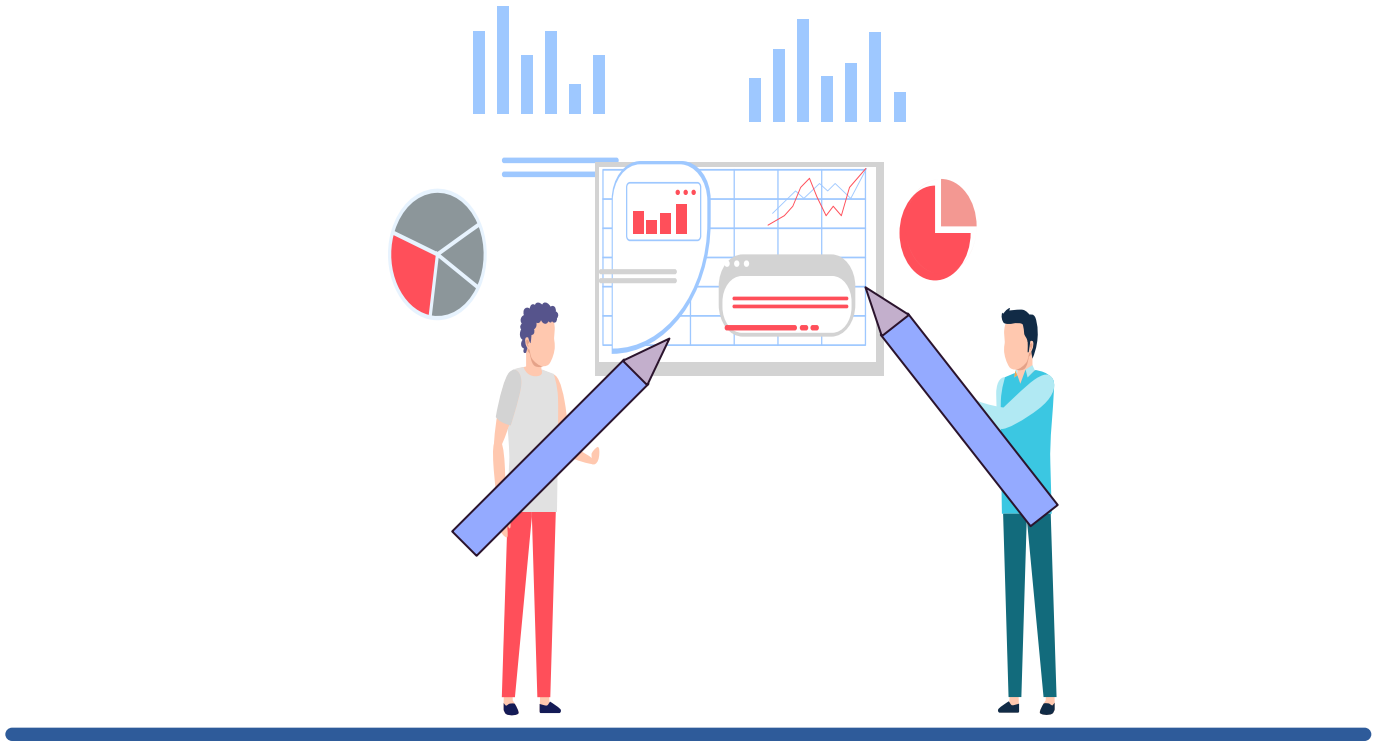
Scientific Writing Challenges

"I find it difficult to organize and express my research in written English."



BEST PRACTICE SHARING

Time Management and collaborative writing



TIME MANAGEMENT FOR WRITING

Include writing time in your project planning

Start early

Schedule fixed writing times
Pay attention to your maximum focus times

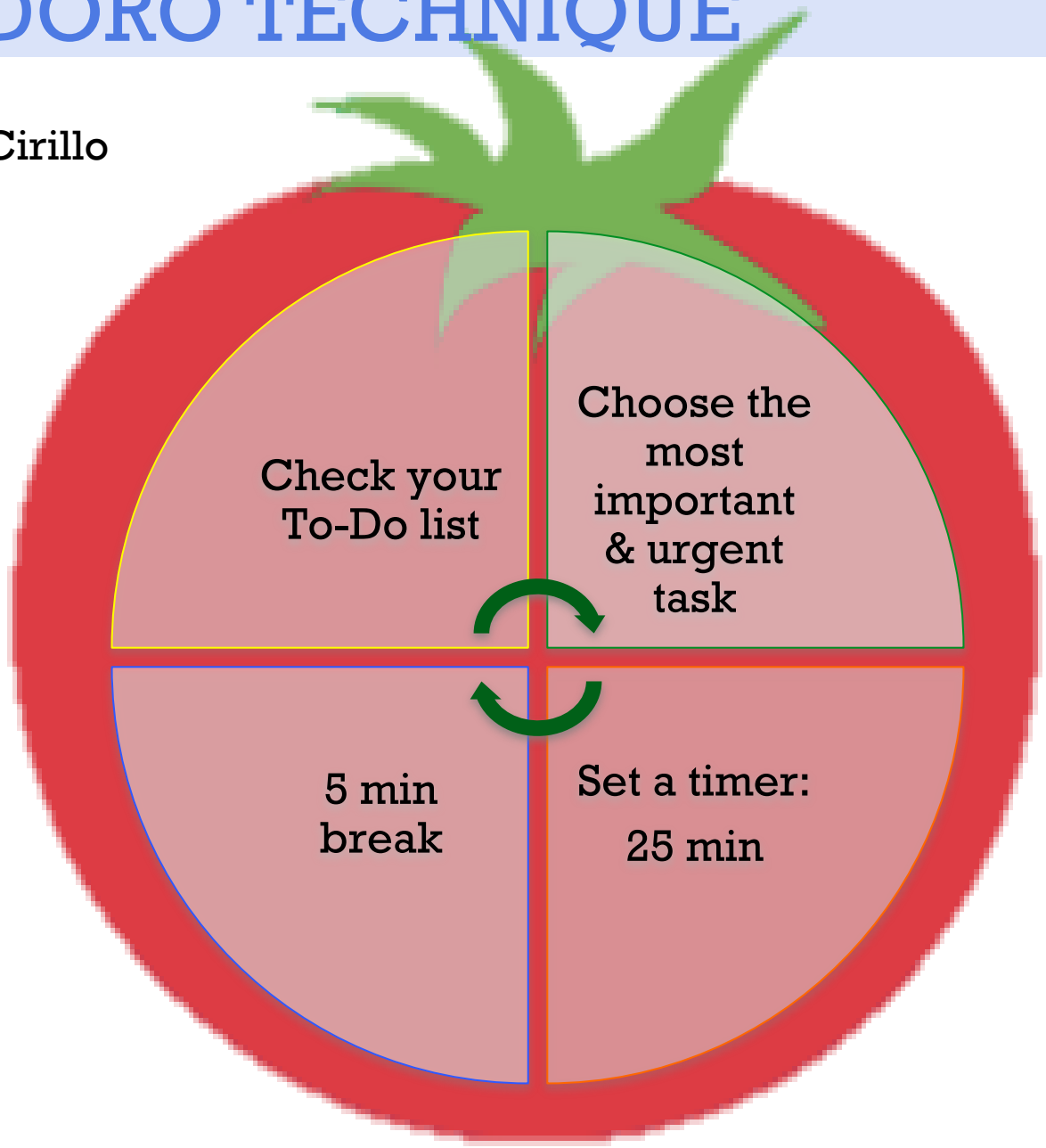
Increase productivity by avoiding ALL distractions (e.g. pomodoro technique)

Cirillo, F. (2009). *The pomodoro technique*. San Francisco, Calif: Creative Commons.

Chase,et al (2012). Time Management Strategies for Research Productivity. Western journal of nursing research. 35. 10.1177/0193945912451163.

POMODORO TECHNIQUE

By Francesco Cirillo



COLLABORATIVE PAPER WRITING TIPS

1. Choose the writing team and it's leader
2. Jointly decide on authorship guidelines
3. Create data management plan
4. Decide on writing strategy
5. Choose fitting digital tools
6. Set clear timelines and adhere to them
7. Be transparent
8. Keep the spirit up

Frassl, et a. (2018). Ten simple rules for collaboratively writing a multi-authored paper. PLOS Computational Biology. 14. e1006508. 10.1371/journal.pcbi.1006508.

COLLABORATIVE WRITING STRATEGIES

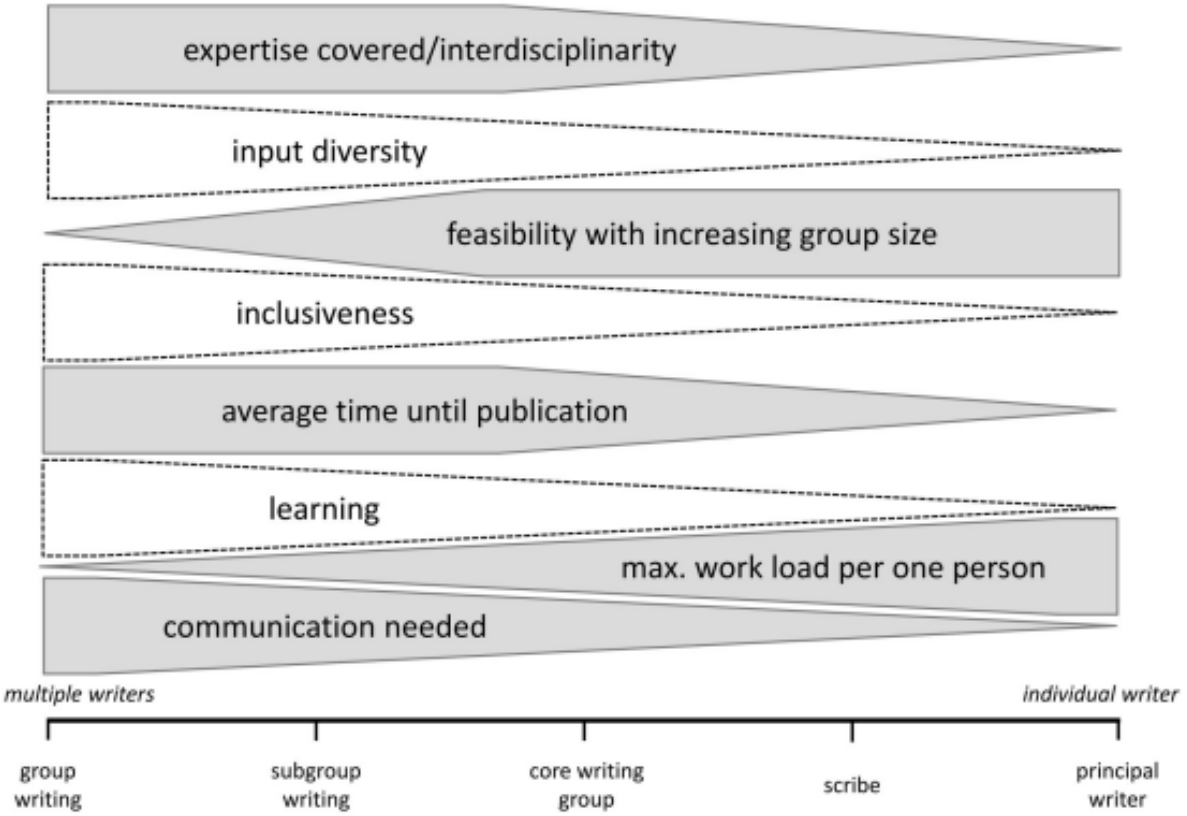


Fig 1. Decision chart for writing strategy. Different writing strategies ranging from very inclusive to minimally inclusive: group writing = everyone writes on everything; subgroup writing = document is split up into expertise areas, each individual contributes to a subsection; core writing group = a subgroup of a few coauthors writes the paper; scribe writing = one person writes based on previous group discussions; principal writer = one person drafts and writes the paper (writing styles adapted from [20]). Which writing strategy you choose depends on external factors (filled, gray shapes), such as the interdisciplinarity of the study or the time pressure of the paper to be published, and affects the payback (dashed, white shapes). An increasing height of the shape indicates an increasing quantity of the decision criteria, such as the interdisciplinarity, diversity, feasibility, etc.

https://doi.org/10.1371/journal.pcbi.1006508.g001

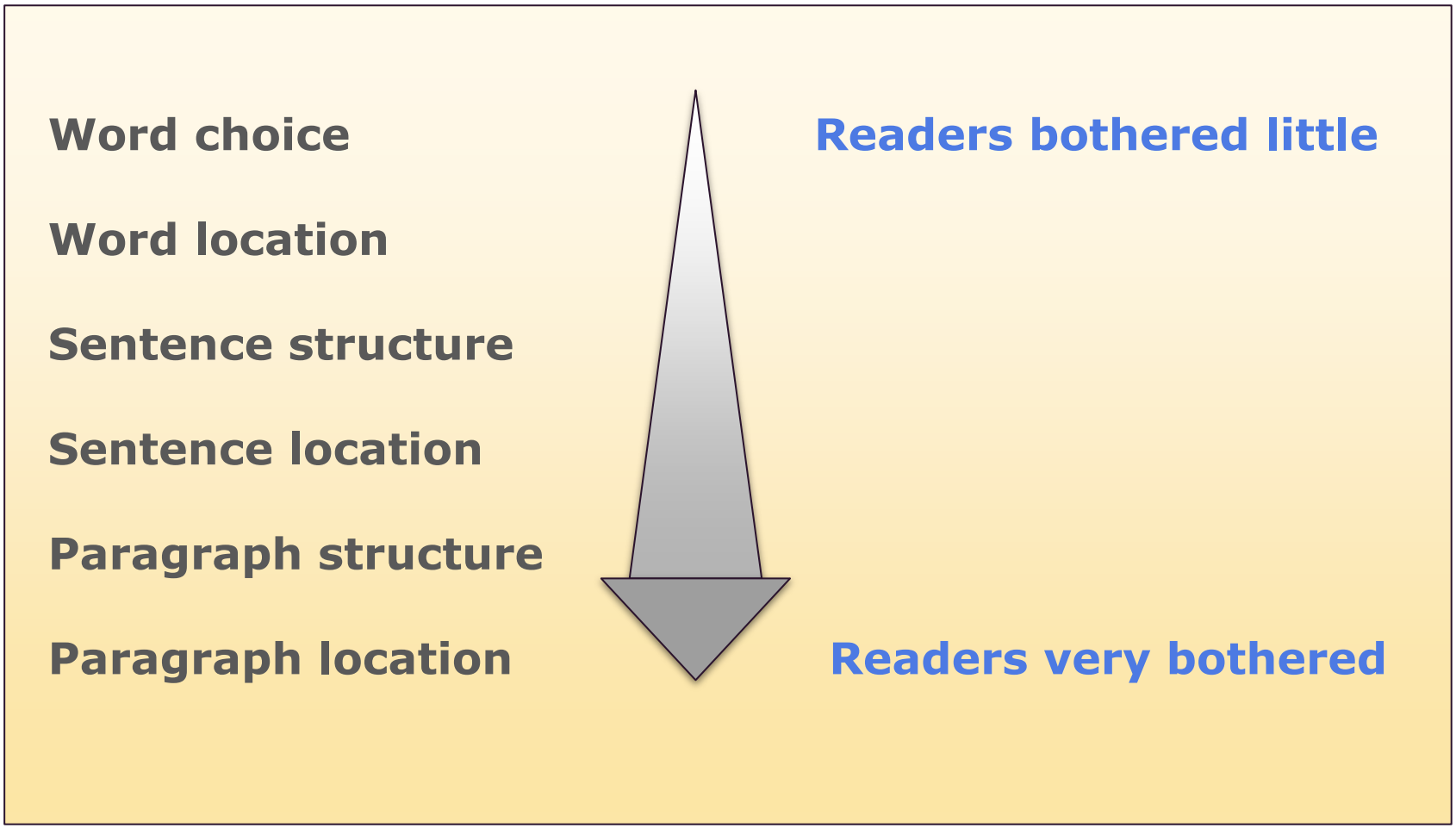
Frassl et al. (2018). Ten simple rules for collaboratively writing a multi-authored paper. PLOS Computational Biology. 14. e1006508. 10.1371/journal.pcbi.1006508.

GOOD SCIENTIFIC WRITING

WRITING STYLE ACBC

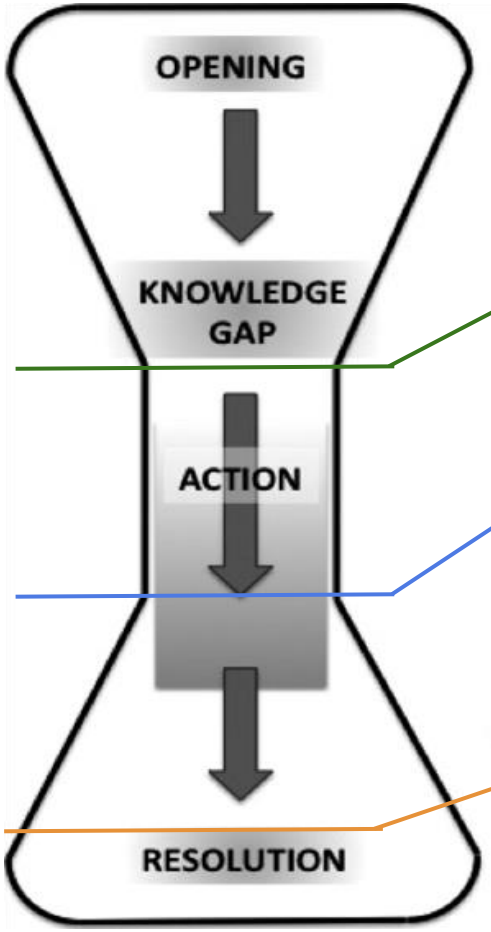
- ACCURATE: exact & correct in all details
- COMPLETE: including all relevant information
- BRIEF: short, using few word
- CLEAR: easy to understand, leaving no doubts

WHAT BOTHERS READERS?



Hofman,A. (2020) Scientific writing and communication, papers, proposals and presentations. 4th ed. Oxford University Press, United States of America

SCIENTIFIC PAPER STRUCTURE



INTRODUCTION

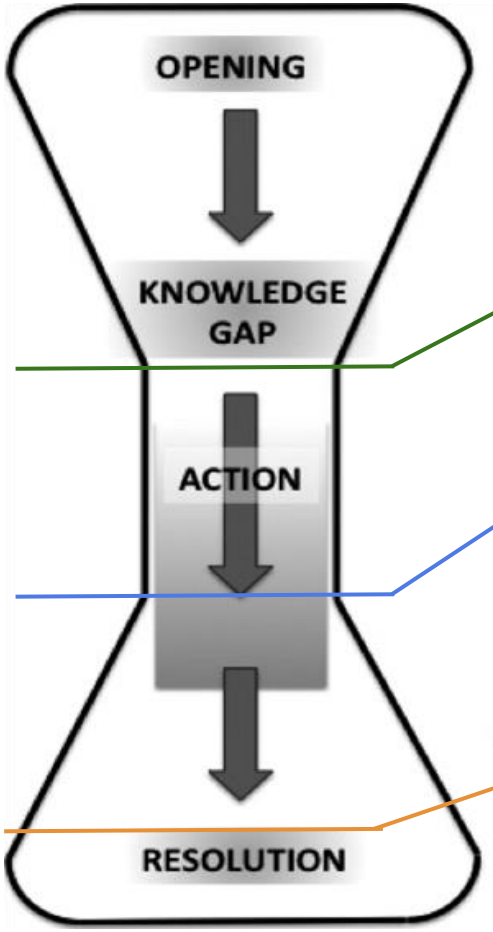
MATERIALS & METHODS

RESULT

DISCUSSION

Turbek, S.P. et al, , (2016), Scientific Writing Made Easy: A Step-by-Step Guide to Undergraduate Writing in the Biological Sciences. Bull Ecol Soc Am, 97: 417-426. https://doi.org/10.1002/bes2.1258

SCIENTIFIC PAPER STRUCTURE



INTRODUCTION

- ❏ Background
- ❏ Unknown/ Problem
- ❏ **Question/ Purpose of the research**
- ❏ Experimental approach
- ❏ Optional: Results / Conclusion/ Significance

MATERIALS & METHODS

- ❏ Experimental approach
- ❏ Enough detail to enable others to repeat and evaluate

RESULT

Main results & all other results organized in segments:

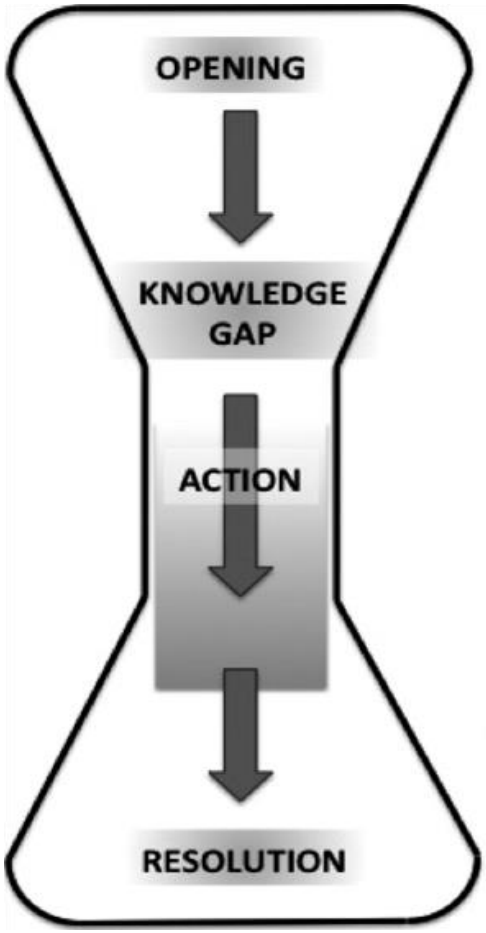
- ❏ Purpose or background of experiment
- ❏ Experimental approach
- ❏ Results & Interpretation

DISCUSSION

- ❏ State key findings & answer research question
- ❏ Conclusion: Significance, Implication, Future direction

Turbek, S.P. et al, , (2016), Scientific Writing Made Easy: A Step-by-Step Guide to Undergraduate Writing in the Biological Sciences. Bull Ecol Soc Am, 97: 417-426. https://doi.org/10.1002/bes2.1258

SCIENTIFIC PAPER STRUCTURE



TITLE

- ❏ Short: 10-12 words
- ❏ Specific, informative and include keywords
- ❏ Do not use abbreviations or questions

KEYWORDS

- ❏ Different from title keywords

ABSTRACT

- ❏ Questions / Purpose
- ❏ Experimental Approach
- ❏ Results & Conclusion
- ❏ Optional: Background/ Significance

SUPPLEMENTAL MATERIAL

- ❏ Raw Data
- ❏ Additional Figures
- ❏ ...

Turbek, S.P., Chock, T.M., Donahue, K., Havrilla, C.A., Oliverio, A.M., Polutchko, S.K., Shoemaker, L.G. and Vimercati, L. (2016), Scientific Writing Made Easy: A Step-by-Step Guide to Undergraduate Writing in the Biological Sciences. Bull Ecol Soc Am, 97: 417-426. https://doi.org/10.1002/bes2.1258

CREATE A FLOW

message

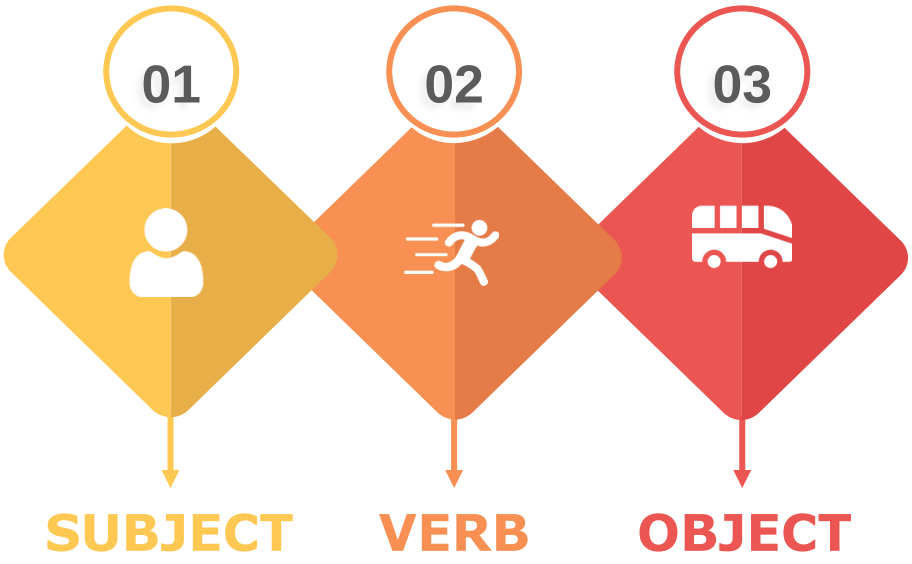
message

message

message

THE SENTENCE STRUCTURE

One sentence = One message



We incubated the samples.

CLEAR MESSAGES -CORRECT & COMPLETE

A. Although the samples were incubated at 37°C for 24h we did not observe any change in the growth pattern.

A. For strong adhesion, the epoxy was dried at room temperature for several hours.

A. We prepared the silicon layer with sodium carbonate.

CLEAR MESSAGES -CORRECT & COMPLETE

A. Although the samples were incubated at 37°C for 24h we did not observe any change in the growth pattern.

1. Although the samples were incubated at **37°C,** for 24 h we did not observe any change in growth pattern.
2. Although the samples were incubated at 37°C for **24h,** we did not observe any change in growth pattern.

A. For strong adhesion, the epoxy was dried at room temperature for several hours.

A. We prepared the silicon layer with sodium carbonate.

CLEAR MESSAGES -CORRECT & COMPLETE

A. Although the samples were incubated at 37°C for 24h we did not observe any change in the growth pattern.

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1. For strong adhesion, the epoxy was dried at room temperature for 24h.

A. We prepared the silicon layer with sodium carbonate.

CLEAR MESSAGES -CORRECT & COMPLETE

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1. Although the samples were incubated at **37°C,** for 24 h we did not observe any change in growth pattern.
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A. For strong adhesion, the epoxy was dried at room temperature for several hours.

1. For strong adhesion, the epoxy was dried at room temperature for 24h.

A. We prepared the silicon layer with sodium carbonate.

1. We prepared the silicon layer using sodium carbonate.
2. We prepared the silicon layer in presence of sodium carbonate.

CLEAR MESSAGES - SHORT AND SIMPLE

A. Blood and saliva, collected from the patient upon admission to the ward and stored at -20°C till their testing time, were analysed by our clinical assistant.

A. The scientists, including members of the Argentinian team as well as a group of volunteer students, discovered bigger dinosaur skeletons during the excavation.

CLEAR MESSAGES - SHORT AND SIMPLE

A. Blood and saliva, collected from the patient upon admission to the ward and stored at -20°C till their testing time, were analysed by our clinical assistant.

1. To many messages

A. The scientists, including members of the Argentinian team as well as a group of volunteer students, discovered bigger dinosaur skeletons during the excavation.

CLEAR MESSAGES - SHORT AND SIMPLE

A. Blood and saliva, collected from the patient upon admission to the ward and stored at -20°C till their testing time, were analysed by our clinical assistant.

1. To many messages

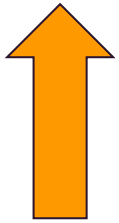
A. The scientists, including members of the Argentinian team as well as a group of volunteer students, discovered bigger dinosaur skeletons during the excavation.

1. Subject and verb are far apart

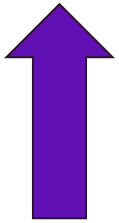
EMPHASIZE CORRECTLY

Mosquitoes often carry parasites.

Parasites are often carried by mosquitoes.



TOPIC
Old, known information



STRESS
New information

ACTIVE, PASSIVE & NOMINALIZATION

ACTIVE

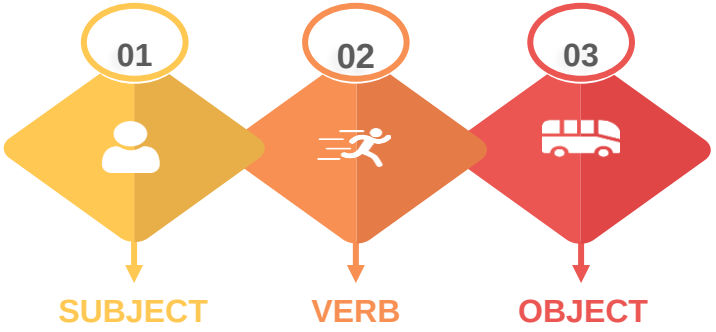
We coated the samples with gold particles.

PASSIVE

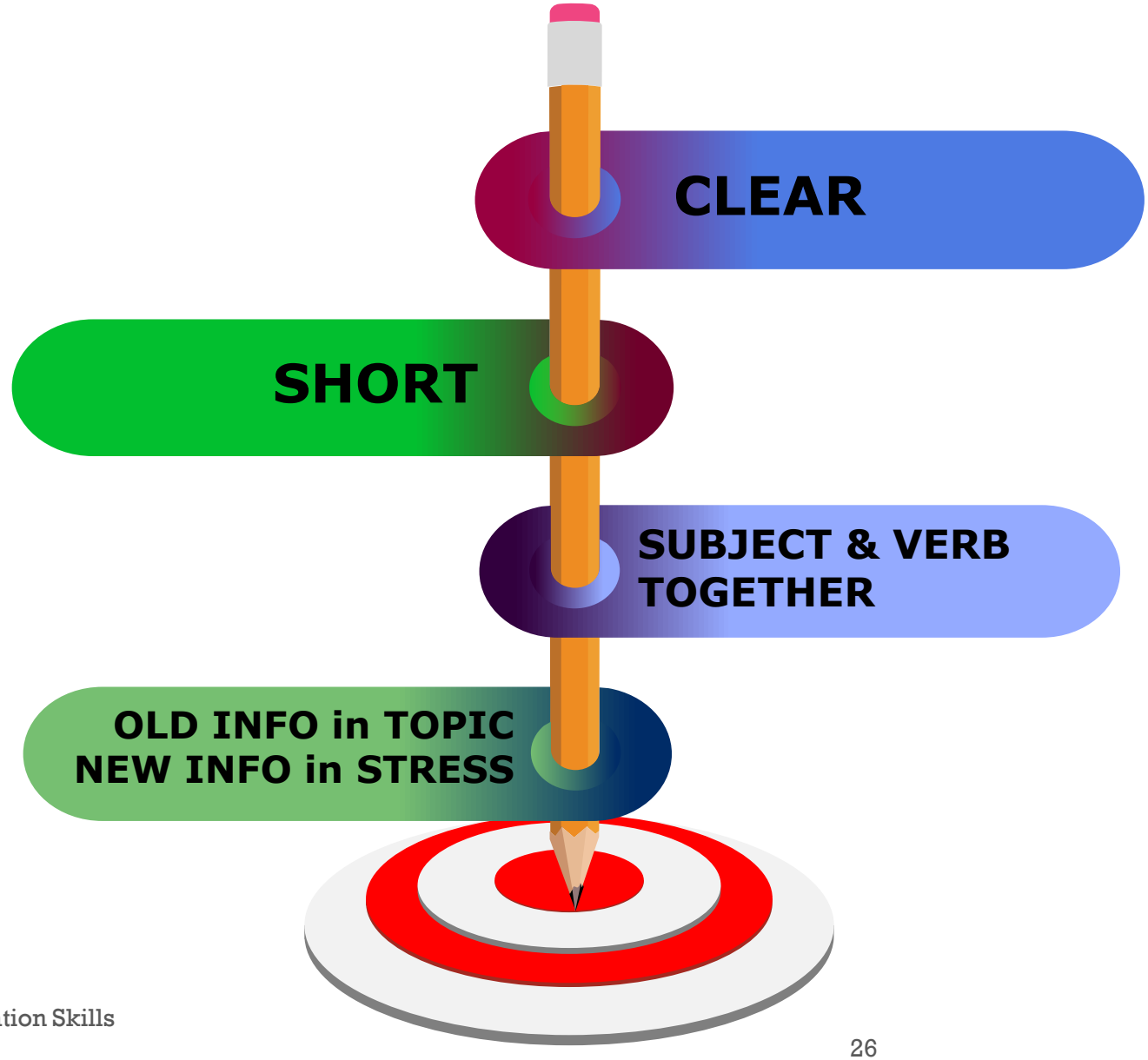
The samples were coated with gold particles.

NOMINALIZATION

Coating of the samples was done with gold particles.



OVERVIEW SENTENCES



CREATE A FLOW

message

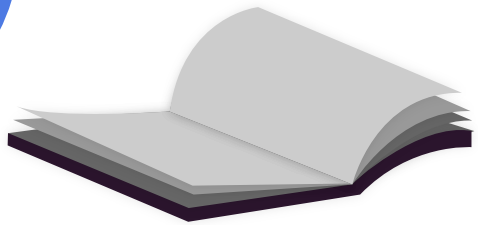
message

message

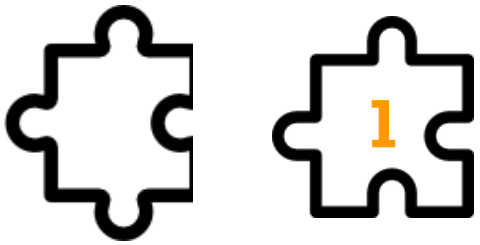
message

COHESION

COHERENCE



COHESION - THE SENTENCE GLUE



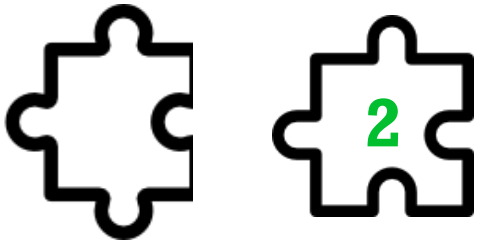
Repeat Key Words

Parasites are often carried by mosquitoes.

Bites from those mosquitoes can cause severe infections.

Mosquito-borne infections include yellow fever and malaria.

COHESION - THE SENTENCE GLUE

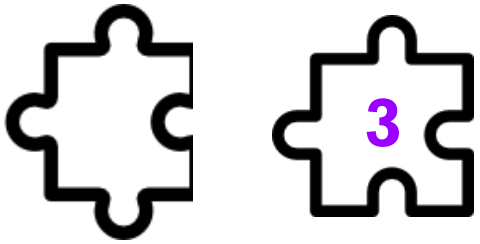


Reference Words:
This, that, those, these
It,who, which, what, whose, whom

The Australian prime minister has called an early election. **The date** was selected to coincide with the start of the Olympic Games. **This decision** was based on the views of **his** ministerial advisors, who predicted that voter confidence in the government's policies would be strong **at this time**.

https://students.unimelb.edu.au/academic-skills/explore-our-resources/essay-writing/improving-cohesion

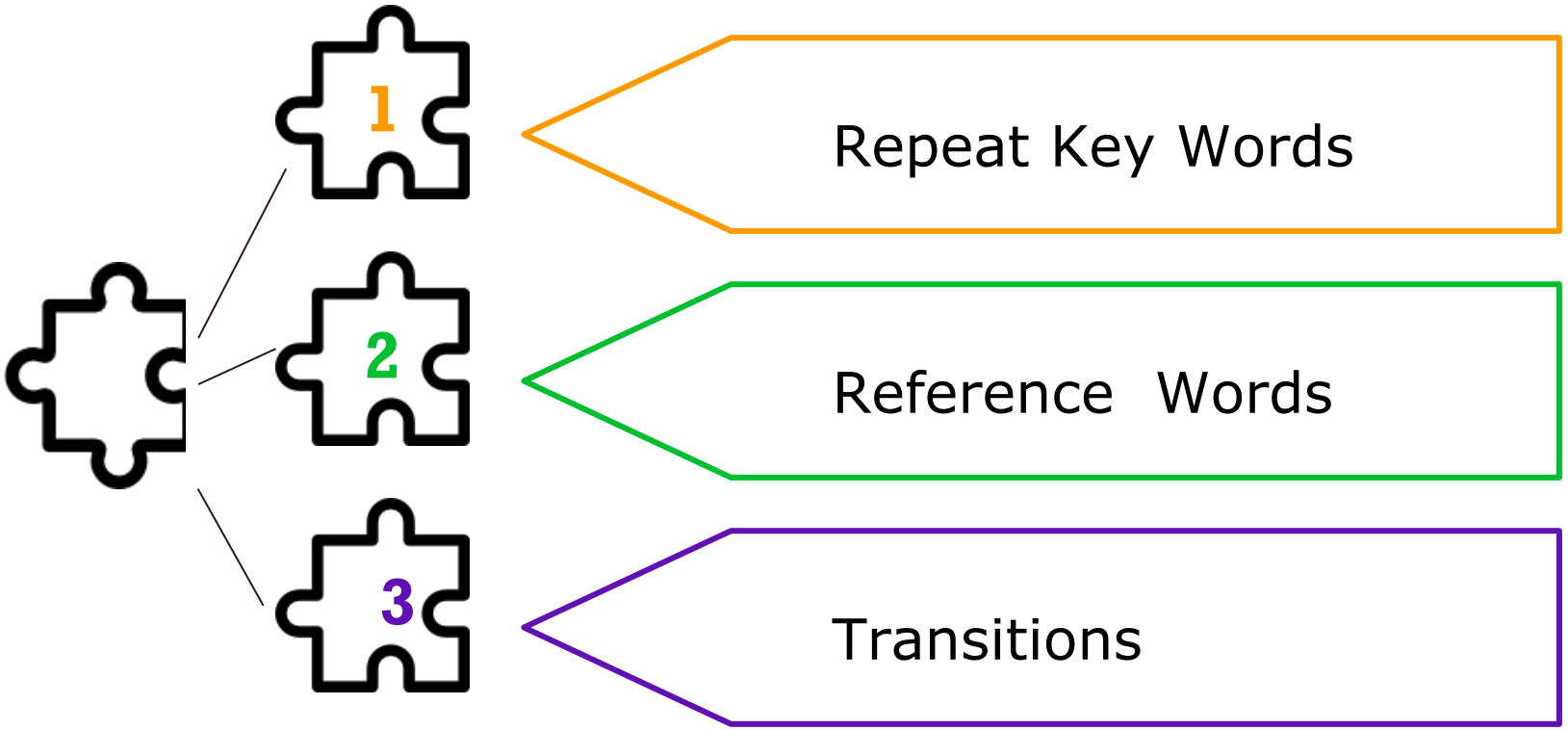
COHESION - THE SENTENCE GLUE



Transitions

Addition	Again, also, furthermore, moreover	In addition to X, we.. Besides X,..	Further experiments showed...
Contrast	But, however, nevertheless	In contrast to A, On one hand, on the other hand, Despite X	Although X differed.. One difference is that...
Result	Consequently, hence, therefore	As a results of...	Analysis fo ABC showed that
Summary	In brief, in conclusion, in short	To summarize...	As a summary of our results shows..

COHESION - THE SENTENCE GLUE



PARAGRAPH COHERENCE

Unity of topic

The most common pet in the European Union is the cat.

Cats have been first domesticated around 7500 BC, most likely in Ancient Egypt.

Ancient Egypt was a civilization of ancient North Africa, concentrated along the lower reaches of the Nile River.

The Nile River is the longest river in Africa.

PARAGRAPH COHERENCE

Unity of topic:
1 paragraph = 1 topic

Virtually all bacterial pathogens require **iron** to successfully infect their human hosts.

TOPIC

This presents a problem to invading bacteria, because the majority of **iron** in humans is tightly bound by **iron**- binding proteins.

To counteract this host defense, bacterial pathogens have developed elaborate mechanisms to acquire nutrient **iron** during infection.

To gain insight into how the amount of available **iron** impacts the human pathogen Staphylococcus aureus, the authors identified proteins that increase or decrease abundance upon alterations in **iron** status.

SUMMARIZE
CONCLUDE
CONNECT

Friedman et al. (2006). Staphylococcus aureus Redirects Central Metabolism to Increase Iron Availability. PLoS pathogens. 2. e87. 10.1371/journal.ppat.0020087.

THE CORRECT ORDER

A) This carries the necessity of using words in a manner that clearly impart the intended meaning of the author and not getting off the subject as reflected in the title.

B) I discuss appropriate formation of titles such that the intended audience can find the title through bibliographic sources.

C) The purpose of scientific writing is to impart thoughts or ideas and their bases and implications in such a manner that a reading audience, with at least a moderate knowledge of science, can understand the material presented within a paper.

D) Also, the goal of scientific writing is to produce a manuscript written from the perspective of strength, rather than weakness.

Carraway, Leslie. (2009). Improve Scientific Writing and Avoid Perishing. The American Midland Naturalist. 161. 383-394. 10.1674/0003-0031(2006)155[383:ISWAAP]2.0.CO;2.

THE CORRECT ORDER

C) The purpose of scientific writing is to impart thoughts or ideas and their bases and implications in such a manner that a reading audience, with at least a moderate knowledge of science, can understand the material presented within a paper.

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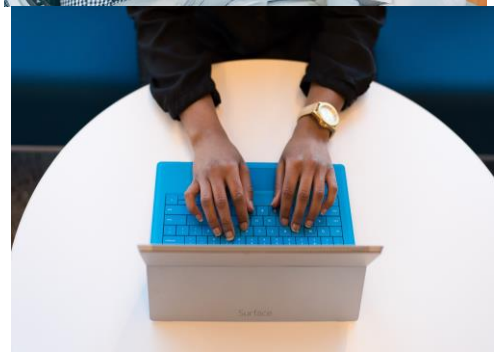
OVERVIEW

TIME

TEAM

TEXT



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SKILLS 4 SCIENCE

SOFT SKILLS FOR SCIENTISTS

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