



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

Teaching Succinct and Accurate Science Writing

**Writing Across the Curriculum+
February 22, 2017**



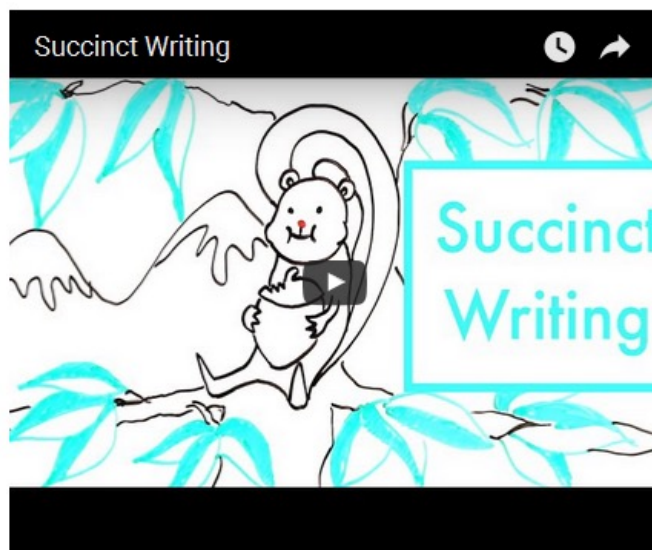
Workshop Objectives

By the end of today's workshop, you will be able to:

1. Define succinct and accurate science writing;
2. Introduce students to strategies for making writing succinct and accurate; and
3. Recognize unclear and wordy writing in student work and provide helpful feedback.

What is succinct and accurate writing?

- Science Writing Resources for Learning (ScWRL)



UBC Science Writing YouTube Channel:

<https://www.youtube.com/watch?v=rVx2Qtlwmg>

ScWRL Video Resource:

<http://scwrl.ubc.ca/guideline-for-effective-writing-writing-process/editing-succinctness-and-jargon/>



Strategies for clear sentence structure

- Gopen, G.D. and Swan, J.A. 1990. The science of scientific writing. *American Scientist*, 78(6): 550-558.
- Schimel, J. 2012. *Writing science: how to write papers that get cited and proposals that get funded*. New York: Oxford University Press.



Strategies for clear sentence structure

1. Put the subject and verb close together

Farmers that understand the differences between the soil requirements of plants when they are seedlings and their requirements when they are mature **are in high demand**.

Farmers are in high demand if they can understand the difference between the soil requirements of plants when they are seedlings and their requirements when they are mature.



Strategies for clear sentence structure

2. Put the subject at the start and the most important information at the end

“We do not start with strawberry shortcake and end up with broccoli.” (Gopen and Swan, 1990)

Strategies for clear sentence structure

2. Put the subject at the start and the most important information at the end

Peanuts, shrimp, almonds, milk or anything else with lactose, and wheat or anything with gluten all represent things that **people** are commonly allergic to.

People are commonly allergic to peanuts, shrimp, almonds, milk or anything else with lactose, and wheat or anything with gluten.

Example from Scientific Writing Resource, Graduate School, Duke University
<https://cgi.duke.edu/web/sciwriting/index.php?action=lesson1>

Strategies for concise sentences

3. Use simple subjects

The sequences that had passed our filtering, trimming, and alignment with ClustalX, were scanned for conserved elements across mammals.

The sequences were trimmed, filtered and aligned with ClustalX. The **resulting alignments** were scanned for conserved elements across mammals.

Example from Scientific Writing Resource, Graduate School, Duke University
<https://cgi.duke.edu/web/sciwriting/index.php?action=lesson3>



Strategies for clear sentence structure

4. Use specific action words

The **movement** in the liquid medium of the bacteria **was** accomplished by microflagella.

The bacteria **moved** in the liquid medium by microflagella.



Strategies for clear sentence structure

5. Use active voice

Passive voice: **Oxford University** was applied to by more than 50,000 students last year.

Active voice: **More than 50,000 students** applied to Oxford University last year.

Example from Science Writing Resources for Learning, UBC

<http://scwrl.ubc.ca/student-resources/grammar/active-and-passive-voice/>

Strategies for clear sentence structure

5. Use active voice...except when the passive voice is more appropriate

Active voice: **Mike** made an error, which compromised the study.

Passive voice: **The study** was compromised due to a methodological error.

Example from Science Writing Resources for Learning, UBC

<http://scwrl.ubc.ca/student-resources/grammar/active-and-passive-voice/>

Strategies for clear sentence structure

6. Put old material before new material

Until recently most people used **incandescent bulbs** in their lamps. Heating a tungsten filament until it glows, throwing off light, is how this **type of bulb** operates.

Until recently most people used incandescent **bulbs** in their lamps. This type of **bulb** operates by heating a tungsten filament until it glows, throwing off light.

Strategies for clear sentence structure: Example student activities

- Correct example sentences and practice identifying the subject, verb and object
 - <https://cgi.duke.edu/web/sciwriting/index.php?action=lesson1>
 - <https://cgi.duke.edu/web/sciwriting/index.php?action=lesson2>
- Dissect scientific papers in order to help students build their own sentence-level templates and build-up their action verbs
 - Dirrigr Jr, F.J., and Noe, M. 2014. The student writing toolkit: enhancing undergraduate teaching of scientific writing in the biological sciences. *Journal of Biological Education*, 48(3): 163-171.
- Ask students to review their own writing (or an example paper) and write out the verbs, trying to reduce the use of "to be"
 - Based on Gopen and Swan (1990)



Strategies for clear sentence structure - Example student activities

- ScWRL Quiz on identifying whether sentences are active or passive voice

<http://scwrl.ubc.ca/student-resources/quick-quizzes/>

<http://scwrl.ubc.ca/educator-resources/lesson-plans-activities-and-workshops/active-vs-passive-voice/>

- Identifying the use of passive and active voice in a journal article



Strategies for concise sentences

Ask yourself, can I say it in fewer words without changing the meaning of the sentence?

1. Remove wordy phrases

<https://cgi.duke.edu/web/sciwriting/index.php?action=lesson3>



Strategies for concise sentences

Wordy Phrase	Succinct Alternative
As a result of...	Because...
We are going to conduct an investigation into...	We will investigate...
At this point in time...	Currently...
Assuming that...	If...
Despite the fact that...	Despite...
In conjunction with...	With...
It would appear that...	Apparently...
We had a sufficient number of rats...	We had enough rats...
Mike was of the opinion that...	Mike thought that...
This phenomenon should be taken into consideration...	This should be considered...

Adapted from science writing resources created by Thomas Deane and the SCIE 300 teaching team through the UBC Teaching and Learning Enhancement Fund



Strategies for concise sentences

2. **Remove ineffectual phrases** (trying to make your sentence sound more important)

Note that...

It should be noted that...

Respectively...

It is important to realize...

So-called...

Strategies for concise sentences

3. Remove excessive hedging (limiting or qualifying words)

These results **may possibly suggest** that there is a **likelihood** that this species **could be vulnerable** to extinction.

These results suggest that this species is at risk of extinction.

Example from Matthews, R.W. 2000. Successful scientific writing: a step-by-step guide for the biological and medical sciences. Cambridge: Cambridge University Press. (pp. 112-113)



Strategies for concise sentences

4. Remove redundant words

entirely unique

might potentially

exactly identical

completely and utterly alone

completely devoid



Strategies for concise sentences

4. Remove redundant words

The engineer considered the second monitor an **unneeded** luxury.

Strategies for concise sentences

5. Remove obvious words

The greatest challenge in dealing with **the crisis** of a pandemic is that it is **global in scope** and so public health responses must operate across national borders.

The greatest challenge in dealing with a pandemic is that public health responses must operate across National borders.

Example from Schimel, J. 2012. The craft of scientific writing. New York: Oxford University Press. (p. 163)

Strategies for concise sentences

6. Limit adverbs/adjectives

The success of these advanced technologies depends **very heavily** on a **rather detailed** understanding of the **complex** velocities in the unburned gases.

The success of these advanced technologies depends on understanding the velocities in the unburned gases.

Example adapted from Alley, M. 1996. The craft of scientific writing. New York: Springer Science + Business Media. (p. 124)

Strategies for concise sentences

7. Choose simple words instead of fancy ones

Fancy Word	Simple Word
commence	start
construct	build
elucidate	explain
fabricate	make
frequently	often
optimal	best
indicate	show
possess	have
sufficient	enough
utilize	use

Example adapted from Shortland, M. and Gregory, J. 1991. Communicating science: a handbook. New York: John Wiley & Sons, Inc.

Strategies for concise sentences: Example student activities

- Write an assignment with a low word count, where it is a challenge to clearly express the concept or argument (e.g. a press release, an abstract, etc.)

Adapted from: Johnson, M.L. and Gonzalez, S.R. 2010. Creating a credit IL course for science students. In C.V. Hollister (Ed.) Best Practices for Credit-Bearing Information Literacy Courses (pp. 93-108). Chicago, IL: American Library Association.

- “Twitter essays”: practice writing 140 character statements about science concepts or summarizing topics for the public

http://learning.blogs.nytimes.com/2011/03/28/less-is-more-using-social-media-to-inspire-concise-writing/?_r=0

- Without losing facts, cross out as many words as possible from an example piece of writing

<http://www.ed.ac.uk/employability/staff-information/good-practice/cse/writing>



Strategies for concise sentences: Example student activities

- Students dissect a wordy paper from the discipline
- Provide a table of wordy phrases and have students fill out the table with alternatives
<https://cgi.duke.edu/web/sciwriting/index.php?action=lesson3>



Strategies for dealing with ambiguous words and technical jargon

1. Identify the audience

- Technical jargon and ambiguous words depend on the audience
- You can help students by identifying the audience in the assignment



Strategies for dealing with ambiguous words and technical jargon

2. Identify and replace ambiguous words

The male salmon grew **frighteningly** quickly.
These males grew **significantly** faster than females.

most

nearly

regularly

everyone knows that

about, approximately, almost

Example from Science Writing Resources for Learning, UBC

<http://scwrl.ubc.ca/student-resources/grammar/clarity-and-simple-language/>



Strategies for dealing with ambiguous words and technical jargon

2. Identify and replace ambiguous words

Development rate was fastest in the higher temperature treatment.

Development rate in the **30C temperature** treatment was **ten percent** faster than Development rate in the **20C temperature** treatment.

Strategies for dealing with ambiguous words and technical jargon

3. Technical jargon

**Cardiopulmonary
resuscitation**

**Canadian Pacific
Railway**



CPR

**Continuous Plankton
Recorder**

**Calibrated Peer
Review**



Strategies for dealing with ambiguous words and technical jargon

3. Technical jargon

- Use non-technical language instead
- Define technical jargon in the text
- Use analogies

Strategies for dealing with ambiguous words and technical jargon

3. Technical jargon

Why do I need more disk space and RAM? I explain that the cabinets hold the dishes you're not using at the moment (hard drive) and the countertop is used for items you are using (memory). This also helps to explain the concept of virtual memory (moving stuff from the countertop to a separate cabinet).

Example from Henriquez, J. 2009, December 27. 10 common user questions – and some analogies that help clear things up [Web log message]. Retrieved from <http://www.techrepublic.com/blog/10-things/10-common-user-questions-and-some-analogies-that-help-clear-things-up/>

Strategies for dealing with ambiguous words and technical jargon: Example student activities

- Provide a list of terms that have different meanings for the public and scientists and have students provide definitions and alternatives
 - Somerville, R.C.J. and Hassol, S.J. 2011. Communicating the science of climate change. *Physics Today*, 64(10): 48-53.
- Compare terminology between a media report and the original academic paper
- Suggest that students give their writing to someone outside the discipline (e.g. a roommate or friend)

Strategies for dealing with ambiguous words and technical jargon: Example student activities

- Rewrite sentences to remove the jargon
<http://scwrl.ubc.ca/educator-resources/lesson-plans-activities-and-workshops/succinct-writing-and-dealing-with-jargon/>
- ScWRL activity: Rewrite an abstract in their own words, making it less jargon-heavy (could also include making it concise and less ambiguous)
<http://scwrl.ubc.ca/educator-resources/lesson-plans-activities-and-workshops/succinct-writing-and-dealing-with-jargon/>
- Build a Lego structure and then write a description on how to build it. Switch with peers, try to build the structure and the peer review the written instructions. This activity reinforces repeatability and avoiding misinterpretation.
<http://www.ed.ac.uk/employability/staff-information/good-practice/cse/writing>



Online Tools

- Readability

<https://readability-score.com/>

- Proofreading – highlights common problems

<http://www.techtoolsforwriters.com/hemingway-app-a-proofreading-tool-for-writers/>

- Sentence-level grammatical features

http://writersdiet.com/?page_id=4



WAC+ Program Services

- Workshops
 - Strategies for Student Success with Writing
 - Writing Assignment and Assessment Design
 - Providing Effective Feedback on Writing Assignments
 - Teaching Oral Communication in Science
 - Non-traditional Communication Assignments
- One-on-one consultations
- TA Training
- Class visits to discuss writing assignments



Contact the WAC Program

Email: wac.coordinator@ubc.ca

Website: <http://scwrl.ubc.ca/wac>



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