Technique to Order Information to Increase Flow

1. Put Old Information before New Information ***(Old before New)***

Poor: The H2020 research plan does not indicate a clearly defined commitment to fundamental climate research. For instance, studying socioeconomic impacts, adaptation, and mitigation rather than their critical prerequisite, fundamental science understanding, is the focus of the plan when it does mention climate research.

Better: The H2020 research plan does not indicate a clearly defined commitment to fundamental climate research. For instance, where the plan does mention climate research, it focuses on studying socioeconomic impacts, adaptation, and mitigation rather than on their critical prerequisite, fundamental science understanding.

2. Put Short Noun Phrases before Long Ones ***(Short before Long)***

Poor: I sent my undergraduate advisor, a Heidelberg University professor that leads a team of ten researchers, my first paper.

Better: I sent my first paper to my undergraduate advisor, a Heidelberg University professor that leads a team of ten researchers.

Poor: Global warming could raise sea levels to a point where much of the world's low-lying coastal areas would disappear, according to climate scientists.

Better: According to climate scientists, global warming could raise sea levels to a point where much of the world's low-lying coastal areas would disappear.

S_____ V____ **Not Preferred**

S_____V_____ **OK If Subject Not Too Long**

S____ V_____ **Preferred**

3. Put Topical Information in Subject Position ***(Topical Subjects)***

Poor: There is another reason historians have concentrated on Darwin rather than Mendel. Hundreds of letters, both personal and scientific, to scores of different recipients, including leading scientific figures, illuminate Darwin's genius. Only ten letters to the botanist Karl Nageli, and a handful to his mother, sister, brother-in-law, and nephew, represent Mendel.

Better: Historians of science have concentrated on Darwin rather than Mendel for another reason. Darwin's genius is illuminated by hundreds of letters, both personal and scientific, to scores of different recipients, including leading scientific figures. Mendel is represented by only ten letters to the botanist Karl Nageli, and a handful to his mother, sister, brother-in-law, and nephew.

Ways of Satisfying these Criteria

1. *Passive-Active* Alternation

Poor: A CTD is an oceanographic instrument that measures depth, temperature, and salinity, the latter by conductivity. Neil Brown invented it.

Better: A CTD is an oceanographic instrument that measures depth, temperature, and salinity, the latter by conductivity. It was invented by Neil Brown.

Poor: Neil Brown was a 20th century engineer whose invention was so critical to ocean science that it doubled the number of available measurements of temperature and salinity within just its first decade of use. The CTD was invented by him.

Better: Neil Brown was a 20th century engineer whose invention was so critical to ocean science that it doubled the number of available measurements of temperature and salinity within just its first decade of use. He invented the CTD.

2. *Equative* Shift

Poor: There are numerous threats from rising atmospheric CO_2 concentrations that are of concern. Ocean acidification, caused by the reaction of CO_2 with seawater, is one of these threats.

Better: There are numerous threats from rising atmospheric CO_2 concentrations that are of concern. One threat is ocean acidification, caused by the reaction of CO_2 with seawater.

3. *Indirect Object* Shift

Poor: I sent the *Nature* editor who I met at the EGU meeting last week my new manuscript.

Better: I sent my new manuscript to the *Nature* editor who I met at the EGU meeting last week.

Applying the Procedure to Paragraphs

1. Read the Paragraph

2. Is there and adequate topic statement and clear pattern of organization?
   - no → Rewrite the topic sentence or paragraph.
   - yes

3. Consider the 1st sentence

4. Does it have *old* information before *new*?
   - no → Rewrite the sentence*
   - yes

5. Is the *subject topical*?
   - no
   - yes

6. Do *short* noun phrases come before *long* ones?
   - no
   - yes

7. Go to next sentence and repeat steps 4-7

* It may not always be possible to rewrite the sentence to meet all three criteria. Sometimes two out of three is the best you can hope for.

Note: Material in this handout is generally based on Leslie A. Olsen and Thomas N. Huckin's *Principles of Communication for Science and Technology* (New York: McGraw-Hill, 1983), p. 303-319.

REFERENCES

[1] W. Strunk Jr. and E. B. White, *The Elements of Style*, Longman Publishers for the 4th edition, 1999 (the 1st edition was published in 1959!)

[2] **J. M. Williams, *Style: The Basics of Clarity and Grace*, 1st edition, ISBN 00-321-11252-0 Addison Wesley Longman, Inc.., 2003, 150 pp.** [it is now in its 2nd edition]
✉ This short-and-sweet version is handier than the longer versions known as "Style: Lessons in Clarity and Grace", but the longer version has many exercises that would be valuable to students who take the time to go through them.

[3] **R. A. Day and B. Gastel, *How to Write and Publish a Scientific Paper*, 6th edition, ISBN 0-313-33040-9 Greenwood Press, 2006, 320 pp.**

[4] W. C. Booth, G. C. Colomb, and J. M. Williams, *The Craft of Research*, 2nd edition, University of Chicago Press, ISBN 0-226-06568-05, 325 pp.

Note: Books in bold should be read by all scientists.