Fake News, Real Science Writing 101
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Tips for Writing Sentences

rules before you start

A. Understand the material before writing.
B. Have something to say.
C. Know who your target audience is.
D. The value of science writing is based on its usefulness.

modes of writing

- register: continuum from informal to formal
    - informal = family and friends, conversational and emotional
    - popular = common in popular science magazines, broad audience, telling a story
    - conventional = scientific journals, science audience, tells story, technical terms
    - abstract = unclear, wordy, pompous and dull (very common in science)

- tone: author's attitude towards self, subject and audience
    - timid to confident scale
    - arrogant to dismissive scale
    - energetic to dull scale
    - cynical to optimistic scale

tell a story with characters and actions

- characters are subjects and should be tangible, concrete <u>nouns</u> (cells, people, chemicals; first person is good)
- characters should not be abstract nouns such as ideas, emotions or qualities (understanding, observation, assumption, prediction, hypothesis, interpretation, accuracy, efficiency, etc.)
- actions should be strong **verbs** that grip reader
    - two weak verbs be and have (in all forms)

    bad
    <u>Understanding seasonal habitat ranges and their distribution</u> **is** critical for Greater Prairie Chicken conservation and management. (16 words)
    good
    Before <u>we</u> **can conserve and manage** Greater Prairie Chickens, <u>we</u> **must understand** their seasonal habitats. (15 words)

- **place subject and verb close together**
  bad
  Part of our evidence establishing that the p65 product was derived from uncleaved FAT1 and not from the further proteolytic processing of the cleaved FAT1 heterodimer **was obtained** by the use of the furin-defective LoVo cells. (36 words).
  good
  We **established** that the p65 product was not derived from the further proteolytic processing of cleaved FAT1 heterodimer. Instead, by using furin-defective LoVo cells, we **discovered** that p65 was derived from uncleaved FAT1. (33 words)

use active voice, not passive voice

- active voice has the subject *doing* some action
  - The biologist **counted** the caribou. (5 words)
  - character, action, goal sequence
- passive voice has the subject *receive* the action
  - The caribou **were counted** by the biologist. (7 words)
  - includes to be form, verb ends in -ed and subsequent "by ____" phrase
  - however, methods section suits passive voice

  bad
  Dramatic improvements in policy and technology **are needed** to reconfigure agriculture and land use to gracefully meet global demand for both food and biofuel feedstocks (25 words)
  good
  The Department of Agriculture **must help** farmers with new legislation and technology to meet global demand for biofuels without jeopardizing our food supply or environment. (25 words)

word choice

- short words are better (use > utilize; make > develop; next > subsequent; etc.)
- stick with correct words (don't look for synonyms, they produce confusion)
- refrain from using technical terms
- avoid *noun strings*

  bad
  As the *labor market time commitment* of mothers has increased in western societies in the recent decades, questions about the provisions of care for children, especially in relation to maintaining and generating time for care, **have attracted** significant international social and policy attention. (43 words)

good
As mothers in western societies commit more time to work, they **spend** less time with their children. This phenomenon **has attracted** widespread attention from social scientists and policy makers. (29 words)

omit needless words

- concise is good

  bad
  Inhalation of *vapor phase particulate matter chemical contaminants* from biomass combustion in domestic settings **is** a significant contributor to local disease burden. (22 words)
  good
  Domestic wood smoke **causes** local health problems. (7 words)

- avoid repetition
- avoid excess detail
- use a word instead of a phrase (we assessed > in this study, we assessed; study > undertake an examination of; caused > were responsible for; now > at the present time; etc.)
- eliminate excess "the" use
- use positive terms instead of negative (rejected > did not accept; different > not the same; few > not many; lacks > does not have; etc.)

effective transition words, rarely

- comment on ideas (to summarize, in conclusion, etc.)
- provide structure (first, second, more importantly, however, additionally, etc.)
- guiding readers (note that, in order to understand, consider now, therefore, etc.)

old before new

- put (old information) first
- put [new information] at the end

bad
(In areas of the arid west), riparian forests **constitute** [less than 1% of the landscape, and yet well over 50% of the species of breeding birds depend on] (those habitats). <30 words>
good
(In the arid west), riparian forests **constitute** [under 1% of the landscape, yet they support well over 50% of the breeding bird species]. <23 words>

Tips for Writing Paragraphs

rules before you start

A. Understand the material before writing.
B. Have something to say.
C. Know who your target audience is.
D. The value of science writing is based on its usefulness.

structure of a paragraph

- target size <200 words, 150 words is good average
- parts of a every paragraph
    - issue is topic sentence/s = focus of paragraph; end with characters and their actions within paragraph; 1 – 2 sentences
    - development = steps that lead to conclusion; give examples or expert opinions; if issue is a question, development is the answer; multiple sentences
    - conclusion = take home message; speculation to ponder; 1 sentence
        - point (for multi-paragraph introductions only) = 1 conclusion sentence that leads to remaining document
- organize each paragraph around one idea or character
- old before new (issue might include old and new information)
- make lists parallel in structure (an early sensitive phase…. a filtering phase… a babbling phase… a social phase.)
- vary the length of your sentences

References

1. Greene, Anne E. 2013. Writing Science in Plain English. 124 pages. The University of Chicago Press. Chicago, IL. ISBN: 978-0-226-02637-4 (this is a fantastic book)
2. Elliot, Leslie Atkins, Kim Jaxon and Irene Salter. 2017. Composing Science: A facilitator's guide to writing in the science classroom. 163 pages. Teacher's College Press. NY, NY. ISBN: 978-0-8077-5806-9.