Technical Writing

[and where to find help]

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No one “right way” ...

styles differ for books, papers, reports, briefing docs, manuals

... But common principles guide “good” technical writing.

Level 1: Spelling, punctuation and grammar:
necessary but not sufficient

Level 2: Reader-centred writing:
purpose, structure & navigation

Level 3: Storytelling

What's all the fuss?

Why is technical writing hard?

Like maths: not an innate "gift" – must be learned
skill developed via practice – it gets easier
cerebral – need to think it through (plan and do)
creative – starts with a blank page
rarely mastered – always more to learn

Uncertainty: based more on conventions than rules
... helpful most of the time, but not always
... so opinions and practice vary

"He said do X, but she said do Y. What do I do?"

Rules you may have learnt ...
Which are robust rules (not merely convention)?

1. Don’t split infinitives
2. Don’t begin a sentence with a conjunction
3. Do begin a sentence with a capital letter
4. Don’t end a sentence with a preposition
5. A paragraph must contain more than one sentence
6. Sentences require a verb
7. Research papers should be written in the third person

Level 1: Spelling, punctuation and grammar

Get a good **dictionary** – and **use it.**

Re-read what you write – carefully.

Use a spell checker ...

but don't rely on the spell chequer too get it write.

Read slowly and carefully:

Brain is too clever for its own good; auto error correction

Yu cn rd pgs of wrds evn if thy r bdly msplt ...

Hard to spot your errors ... but they're still **your** errors.

Level 1: Spelling, punctuation and grammar

Spelling – some conventions

Integers: **spell out small integers** from zero to ten or twelve, use digits for larger numbers (11 onwards or 13 onwards)

Avoid contractions: "was not" instead of "wasn't"

Know when to use **apostrophes** ... (these ARE rules)

possession: e.g. "Jo's laser is broken."
... but not for "its/ones" e.g. "Its switch is off."
e.g. "Keep ones head."

contraction: e.g. "It's off." = "It is off."

it's and its: e.g. "It's blown its fuse." = "It has blown its fuse"

Level 1: Spelling, punctuation and grammar

Punctuation – use separators to clarify meaning

Commas (,) – **underused**

– separates **timeframe** from event

e.g. “After 30 minutes, the laser blew its fuse.”

– **link** ideas within a longer sentence

e.g. “The lab was hot, and the laser blew its fuse.”

Colon (:) - before a **list** E.g. “... three bands: J, H and K.”

Semicolon(;)- **underused**

links two related sentences that you want joined

e.g. “The lab was hot; after 30 min, the laser blew its fuse.”

Dash (—) - cites the case in point

E.g. “ ... the first star — HD140283 — was faint.”

Grammar: Spot the verb!
"A verb is a doing word."

1. "A"
2. "verb"
3. "is"
4. "a"
5. "doing"
6. "word"
7. None of the above

Grammar: Spot the preposition!
"Some people say you should never end a sentence with a preposition."

1. "Some"
2. "people"
3. "say"
4. "you"
5. "should"
6. "never"
7. "end"
8. "sentence"
9. "with"

Level 1: Spelling, punctuation and grammar

Grammar– clarifies meaning in your sentences

If your grammar is weak, **learn** it ... along with your discipline.

Verbs – every sentence needs one ...
... so make sure you can recognise one!

Word order: be careful where you put your adjectives, adverbs and prepositions, especially “only”.

e.g. “Only I observed the star in J, H and K.”
“I only observed the star in J, H and K.” (poor)
“I observed only the star in J, H and K.”
“I observed the star only in J, H and K.”

Level 1: Spelling, punctuation and grammar

The Latin Mafia

e.g. "exempli gratia" = for example – a specific case

etc. "et cetera" = and the rest, there are more like this

... so e.g. and etc. **don't go together**

et al. "et alia" = and other things/people

... "al." is an abbreviation and needs a **full stop**

inter alia = amongst other things

cf. = confer/compare, not just "see" (and not actually Latin)

viz. "videlicet" = namely

in situ = in its original/proper place

Use where standard and helpful, but don't be pretentious.

Level 1: Spelling, punctuation and grammar

Writing and formatting variables and units - conventions

variables: italic e.g. x, y, c, T, m

subscripts: non-italic for labels e.g. T_{eff}, m_{p}, ν_{e}

units: non-italic
lowercase in word form
uppercase in abbreviated form if derived from a name
e.g. 3.5 joules or 3.5 J, but not 3.5 Joules or 3.5 *J*
always singular in abbreviated form, e.g. not 3.5 Js

negative powers in units: $c = 3\times10^{8}\ \mathrm{ms}^{-1}$, not $c = 3\times10^{8}\ \mathrm{m/s}$

multiplication symbol: $\times$ not x or x

[see *NIST Guide*]

Level 1: Spelling, punctuation and grammar

Where to get help (all online)

"Fowler's Modern English Usage" (UK) (<£15)
http://www.bartleby.com/116/

"Elements of Style" Strunk and White (USA) (<£15)
http://www.bartleby.com/141/

"The Mayfield Handbook of Scientific and Technical Writing"
http://www.mhhe.com/mayfieldpub/tsw/toc.htm

"The NIST Guide for the use of The International System of Units"
- especially Chapter 10 "More on Printing and Using Symbols and Numbers in Scientific and Technical Documents" (USA)

http://www.nist.gov/pml/pubs/sp811/index.cfm

Level 2: Reader-centred writing

Questions to ask yourself:

Why am I writing this?

What is my **purpose** in writing the document?

What **ideas** do I need to get across?

... But this is the wrong starting point;

it's not about you the writer, it's about the **reader**

Reader-centred writing – know your audience

Who will want to read it?

Why will they want to read it?

How will they know they want to read it?

What **information** do they want/need?

What is the right level of **detail**?

What do they **know already**/ how quickly will they **learn**?

How will they **use** the document? Read once? ... often?

Level 2: Reader-centred writing

What structure is required?

A **logical structure** is as **important** as spelling & grammar! Otherwise the document won't **make sense** to the reader; order may seem **illogical** or parts **disjointed**.

E.g. **Research papers**

evolved structure suits development of new knowledge: Abstract, introduction (including current knowledge), aims, methods, results, interpretation, conclusions, references

Must explain **why**, not just **what** you have done

Others: **Technical reports / Planning documents / Reviews**

Develop **logical structure** from the **perspective of reader**.

Executive Summary?

Recommendations?

Processes/Procedures?

Level 2: Reader-centred writing

Quantum of ideas: paragraphs!

One and only **one substantive idea**.

Designing a paper/report:

Lay out **Section headings**

Lay out key **ideas** in as few words as possible
(each idea will become one paragraph)

Reorganise ideas until paper makes sense from perspective of reader, and has no redundant ideas/paragraphs.

Write each paragraph with three-part structure:
topic sentence (general),
supporting sentences (details)
concluding sentence (wrap up)
http://learn.lexiconic.net/para2.htm

Level 2: Reader-centred writing

Navigation:

How does the reader know where he/she is on the journey?

Section headings?

Surprisingly ineffective:
reader goes too fast to notice them;
too brief to tell the reader much

Text – use to highlight structure

Tell reader explicitly in the text (again if necessary):
what comes **now** and how it **relates** to what came before;
the **main concepts/arguments** that will be used;

what has been covered and **why**;
relate it **forward** to what comes next.

Level 3: Storytelling

What has storytelling to do with technical writing?

Stories **tell** the listener/reader **something** ...

... in an **engaging** way

... **provides information** needed to understand the story

... **resolves** at least some of the mysteries

... **completes** the main story (even if part of a trilogy)

... and leaves the listener/reader

understanding the key elements of the story and **understanding the sequence** of the elements.

Having sorted out the spelling, punctuation, grammar, purpose, structure, sequence and navigation, ask yourself:

What was the story I set out to tell?

Is that the story I **told?** Was it **complete?** Will the reader have **understood** the story? If not ... **refine it again**!