# Explaining research to the public:

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Where am I coming from?

- PhD in rhetoric and writing
- Taught over 90 courses since 1992
- Consultant for business writers since 2001
- Co-author of *The Brief Penguin Handbook* and *A Strategic Approach to Technical Communication*
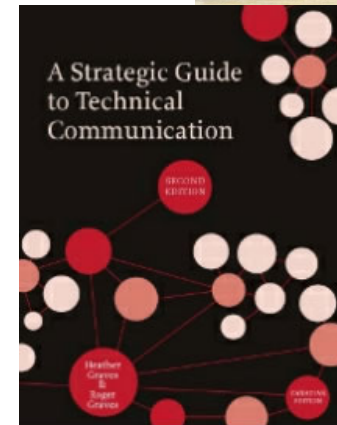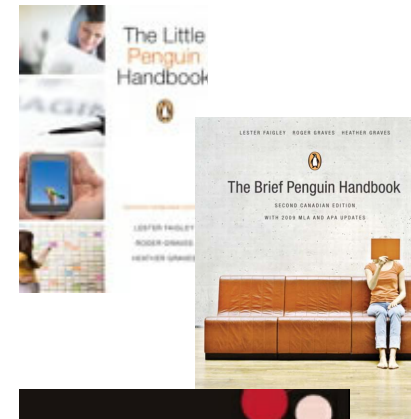
What is plain language?

- A worldwide effort to improve the clarity and accessibility of how legal contracts, government documents, and other important information is written

- Write short sentences, using specific, uncomplicated terms that most readers can understand

- A good basis for writing lay summaries

Plain language guidelines

- Plain language involves an ethical relationship between reader and writer
- Writers want to communicate clearly with readers
- Take your readers' point of view
- Organize ideas around what your reader needs to know

Know your readers

- What level of knowledge do they have?
- What is their cultural background?
- What is their income level?
- What do they want to know?
- What information will they use most frequently?
- What questions are they asking about the topic you are writing about?

Application: Asbestos QRCard

- What level of knowledge do they have?
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Quick Reference Cards genre

QRCards offer multiple ways to access information

- Short paragraphs

- Headings

- Lists

Ways to organize information

- A series of questions and answers

- Put the most important information first

- Include everything readers need to know to understand and/or to act

- Use bullet points to emphasize main ideas or points

- **"2.4 Why work on climate and energy issues at the municipal level?"**

- Figure #: Amount of money an Edmonton resident would spend on energy in 2044 if energy prices rise significantly [p. 44]

- "we will refer to these materials, though not necessarily in sequence"

You will also receive a second binder of additional materials including:

- Resources for working together on the Citizens' Panel (suggested ground rules, the difference between dialogue and debate, participant profiles, overviews of each session, and a call for volunteers to author the final report).
- How we will plan to record the work of the Panel as new ideas and information are introduced, and instructions for how to raise your own questions as they come up.
- Detailed materials for each of the six Panel sessions (we'll add to these as we go).
- The original Energy Transition Discussion Paper, upon which this Handbook is based.
- Advice on how to decide which scientific and technical claims to trust, and a discussion of how the energy models used in this Handbook were developed.

Words/images

Timelines: which is better for your audience?

History of international climate negotiations:

- June 1988—At the World Conference on the Changing Atmosphere in Toronto, politicians and scientists together recommend that global CO_2 emissions be reduced 20% by 2005.
- August 1990—The IPCC publishes its First Assessment Report, which concludes that the increasing accumulation of human-made GHGs in the atmosphere would "enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface" unless measures are adopted to limit the emissions of these gases.
- June 1992—At the Rio Earth Summit, 154 signatories to the UNFCCC agree to the principle of "common but differentiated responsibilities" and to stabilize GHG concentrations "at a level that would prevent dangerous interference with the climate system." Developed countries agree to "aim to stabilize" their emissions at 1990 levels by 2000.
- March 1995—The first COP acknowledges and agrees that the UNFCCC needs country-specific commitments and agrees to negotiate GHG reduction targets for developed countries.
- December 1995—The IPCC releases its Second Assessment Report, which concludes: "The balance of evidence suggests a discernible human influence on global climate."
- December 1997—More than 150 countries sign the Kyoto Protocol, which binds 38 developed countries (called Annex I countries) to reduce their emissions by an average of 5.2% below 1990 levels between 2008 and 2012. In order to become law, at least 55 countries representing 55% of Annex I emissions must ratify the agreement. Incidentally, the Kyoto Protocol includes a number of "flexibility mechanisms" that allow developed countries to receive credit for reducing GHG emissions in other countries.
- November 2000—The talks at the sixth COP collapse over disagreements regarding how the Kyoto Protocol should be ratified and implemented.
- January 2001—The Third Assessment Report of the IPCC is released and concludes "There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities."
- March 2001—US President George W. Bush announces his country's withdrawal from the Kyoto Protocol.
- December 2002—Following a three-month national debate, Canada ratifies the Kyoto Protocol.
- February 15, 2005—The Kyoto Protocol becomes international law after Russia signs the agreement.
- February-November 2007: The IPCC's Fourth Assessment Report is released calling anthropogenic climate change "unequivocal" and concluding that "most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."
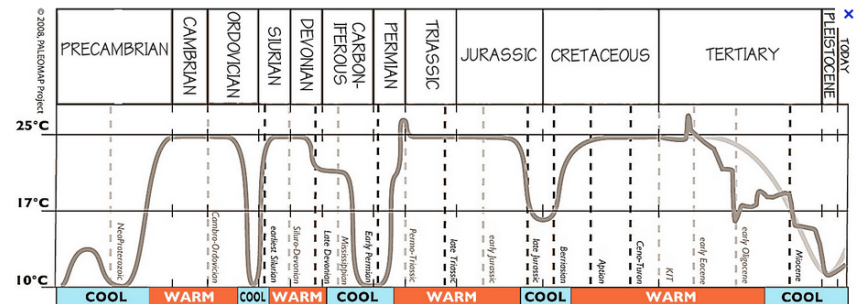
Justin Bell, "Convenient Misinformation. Blog post April 26, 2012. 2012 ISP203B: Natural Hazards and Disaster Class. Michigan State University.

Word-level plain language

- Use words that are accurate, appropriate, and familiar.
- Use technical jargon sparingly; do not use business jargon at all.
- Use active verbs most of the time.
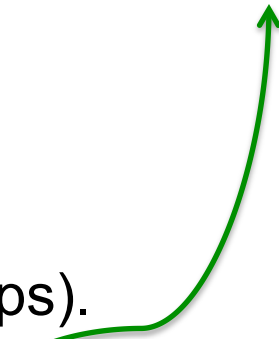- Use strong verbs (not nouns) to carry the weight of your sentences.

Linguistic registers

- Levels of formality
- Level of difficulty of vocabulary
- Number of words in English: roughly 1 million
- Number of words in all of Shakespeare: 24,000
- Technical writing varieties of limited English: 1,000

Word choices

- Use words that are accurate, appropriate, and familiar.
- Use technical jargon sparingly; do not use business jargon at all (Stakeholders, roadmaps).
- Use active verbs most of the time.
- Use strong verbs (not nouns) to carry the weight of your sentences.

- "Asbestos poses health risks when fibres are present in the air."

Sentence-level plain language

- Be concise
- Vary sentence length and sentence structure
- Use parallel structure (especially in lists)
- Put your readers in your sentences
- Begin most paragraphs with topic sentences
- Use transitions to link ideas

Keep sentences short

- Working memory can only process about 25 words in a chunk.
- Use 25 words as your limit for sentences.
- Aim for 15 to 22 words (or 2 ½ to 3 lines of type in a document).
- Keep paragraphs short.
  - What is short? 6 to 8 lines of text.

11 lines in original: Break it up

- Asbestos is the generic name for a variety of fibrous minerals found naturally in rock formations. The three most common varieties are chrysotile, amosite, and crocidolite. It has been widely used in home construction materials, such as floor and ceiling tiles, insulating boards, roofing shingles, water supply lines, plastic fillers, and pipe covers. Asbestos is rarely used alone, and it is generally safe when combined with other materials with strong bonding agents. As long as the material remains bonded it poses no health risk. Asbestos fibers can become loose and airborne, most often when contained in soft, easily crumbled materials or when such well-bonded materials as floor tiles and painted surfaces are cut, scraped, filed, sanded, or removed. Remodeling or demolitions can lead to the release of asbestos fibers.

What's wrong with long?

- Readers miss important points due to overextending memory
- They may not reread long sentences
- They may stop reading your document altogether.
- Exceptions?

  When an idea makes more sense in one long sentence than in several short sentences, use a longer sentence.

How do I shorten sentences?

- Include only one or two ideas in a sentence.

- Explain qualifiers or modifiers to an idea in separate sentences.

- Explain any conditions attached to the main idea in separate sentences.

- Avoid using "and" to connect ideas that can be rewritten in separate sentences

53 words: shorten it

- Conversely, Smith and Wright (1996) looked at the 25 cohort studies followed for more than 20 years having the highest ratios of pleural mesotheliomas per 1,000 deaths and concluded that crocidolite may be only 2-4 times more potent, and that no valid evidence supports the conclusion that amosite is more potent than chysotile.

What to avoid in shortening sentences?

- Don't sacrifice clarity to keep a sentence short.

- Link related ideas by using *that*, *which*, or *who*.

- Don't shorten sentences by leaving transitions out.

Use simple sentence structures

- Simple sentence structures ensure that your writing is direct, positive, and active

- Use simple, declarative sentences (subject + verb + object)

- Example

"Your refund arrived today."

"Climate change also will have significant national and international impacts.

Three tips

1. Connect modifiers to the words they modify:

Not "Please let me know whether you can meet the newest deadline as soon as possible."

Instead "As soon as possible, please let me know whether you can meet the newest deadline."

Tip #2

- If the paragraph exceeds 6 to 8 lines of text, change the format or use bullets to list information.

Not "The manual is divided into three section that are tailored to the background knowledge of various users such as the first time user who doesn't know how to turn the program on to the novice user who is ready to learn more advanced functions to the expert user who want to adapt the source code of the program."

Instead "The manual is divided into three sections tailored to the user's background knowledge:
  - First-time users who can't turn on the program
  - Novice users ready to learn more advanced functions
  - Expert users who want to adapt the source code of the program."

14 lines

Little research has been conducted to identify an actual no-observed adverse effect level (NOAEL) for chrysotile-related lung cancer and mesothelioma. Meta-analyses of epidemiological cohort studies examining the risk of chrysotile asbestos exposure (Hodgson & Darnton, 2000; Berman & Crump, 2003) estimate that a worker exposed to 1 fibre per cubic centimetre per year (i.e. 0.1 f/cc-yr for 10 years) has an estimated probability in the order of 1 in 10 000 of dying of cancer due to exposure (Ogden, 2009). Pierce et al. (2008) summarize the cumulative exposure-response data reported for predominantly chrysotile-exposed cohorts in the published literature and report that the preponderance of the cumulative "no-effects" exposure levels for lung cancer and mesothelioma fall within a wide range of approximately 25–1000 f/cc-yr and 15–500 f/cc-yr, respectively. However, the authors identified numerous potential biases that could contribute to either over- or under-estimation of the risk and noted that many of the studies lack sufficient power to assess whether there could have been a significant increase in risk at the reported NOAEL. Furthermore, the analysis by Berman & Crump (2008) rejected the hypotheses that uncontaminated chrysotile asbestos caused no lung cancer or mesothelioma.

Tip #3

- If you use bullet points, use parallel structure for parallel ideas

Not "To access the font formatting instructions follow these steps: 1) click on the help icon on the main toolbar, 2) next you need to scroll through the options until you find formatting, 3) next users would want to click on the "font" choice."

Instead "To access the font formatting instructions follow these steps:
   1. Click on the help icon on the main toolbar
   2. Find the formatting option
   3. Click on the "font" choice"

Lists

(1) That the mining and use of chrysotile asbestos in Canada be banned.

(2) That chrysotile asbestos be included in Annex III of the Rotterdam Convention.

(3) That the international sale and export of chrysotile asbestos and asbestos-containing products for use or disposal be banned.

(4) That Canadian diplomatic influence be used with other exporting nations to support efforts for a legally binding treaty to ban asbestos mining and manufacturing around the world.

(5) That workers and communities that are impacted by changed policies be supported through the transition to a ban.

(6) That active reporting be encouraged for asbestos-related diseases in the general population.

(7) That the public be educated about health issues related to asbestos exposure using current scientific knowledge about exposure risks and adverse effects.

(8) That victims of asbestos-related diseases be appropriately compensated.

It's all about the verbs

Citizen Deliberation:

- **Creates** opportunities for deep learning and framing of issues, rather than just sharing perspectives, views, and opinions

- **Enables** a structured deliberative dialogue

- **Involves** a process to work through difficult choices

- **Organizes** discussion around values and assumptions

- **Determines** mutually acceptable compromises and areas of disagreement

- **Facilitates** group decision making

- **Identifies** a common ground for shared agreements

Readability and document design

- Add white space: paragraph breaks
- Use bolding to highlight and enable skimming
- Use bulleted lists
- Use headings

8. Consider your conclusion. Restating your claim usually isn't the best way to finish; conclusions that offer only a summary tend to bore readers. The worst endings say something like "In my paper

Target:?

- Our first task is to define the genre as clearly and as specifically as possible

- Our goal is to understand what we're aiming for, who our readers are

- Only then can we make good choices about how to revise our own writing
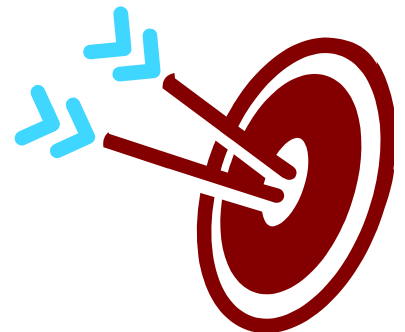
Readability in other genres

TABLE 1. Brochure Readability, Atrial Fibrillation (n=8)

Brochure Name	Source (See Appendix)	SMOG Grade Level	Flesch-Kincaid Grade Level
Atrial Fibrillation*	Mosby, Inc.	8	8.3
What is Arrhythmia?	American Heart Association	9	7.2
Detecting Atrial Fibrillation for Stroke Prevention	National Stroke Association	9	6.5
Atrial Fibriwhat?	DuPont Pharma	10	6.9
Atrial Fibrillation, Coumadin® and You	DuPont Pharma	11	7.8
Atrial Fibrillation: Management of This Irregular Heartbeat†	Mayo Clinic	12	10.2
Atrial Fibrillation†	3M Pharmaceuticals	13	10.7
Anticoagulant Information†	American Heart Association	13	11

*Brochure contains <30 sentences.
†Brochure posted on the Internet.

Anticoagulant Patient Information Material Is Written at High Readability Levels. Carlos A. Estrada, MD, MS; Mary Martin Hryniewicz, RN, MSN; Vetta Barnes Higgs, MD; Cathy Collins James C. Byrd, MD, MPH

Reability factors

- Readability studies of printed materials about cancer have shown them to be written at a Grade 10 level or higher, which leads to the following problems for seniors:

- information overload
- unclear messages
- difficult vocabulary
- incomprehensible technical language
- uninviting tones
- content that does not specifically target their cohort
- little organization

Friedman, D. B., & Hoffman-Goetz, L. (2003). Cancer coverage in North American publications targeting seniors. Journal of Cancer Education, 18(1), 43-47.

Exercise

In groups, pick a section of the draft and count these items:

- Number of paragraphs:

- Number of sentences in each paragraph:

- Number of words in each sentence:

Divide the work up within your group—each person takes one paragraph, for example.

Totals

	Paragraphs	Sentences	Words/sent.

Fry's readability score

- Randomly select three sample passages and count exactly 100 words beginning with the beginning of a sentence. Don't count numbers. Do count proper nouns.

- Count the number of sentences in the hundred words, estimating length of the fraction of the last sentence to the nearest 1/10th.

- Count the total number of syllables in the 100-word passage. If you don't have a hand counter available, an easy way is to simply put a mark above every syllable over one in each word, then, when you get to the end of the passage, count the number of marks and add 100.

- Enter graph with average sentence length and number of syllables; plot dot where the two lines intersect. Area where dot is plotted will give you the approximate grade level.

Plot your scores

http://www.on.literacy.ca/pubs/clear/20.htm
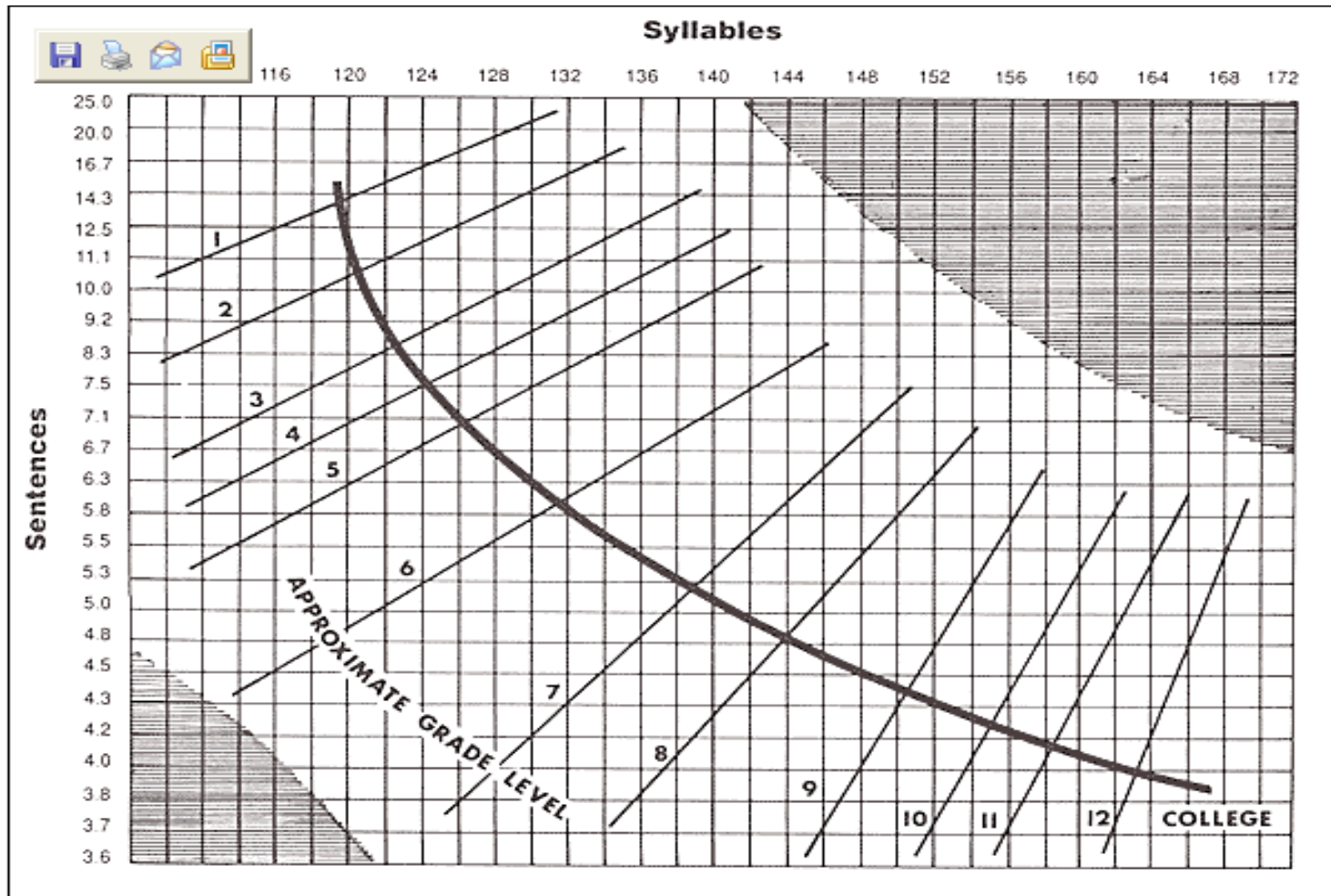
Beyond formulas: sentence types

- Identify the sentence styles used:
- Simple (subject + verb + other)
- Compound (simple sent. + [and/but/;] simple sent.)
- Complex (dependent phrase/clause + main clause [simple sentence]
- Compound-complex [simple + simple + dependent phrase/clause]

Guidelines for revising your own drafts

- Break the text into paragraphs
- Vary your sentence length
- Vary your sentence types
- Search for simpler words/vocabulary
- Spell out acronyms
- Define technical terms in your sentences

Guidelines for revising your own drafts

- Put actors (you, the reader) into your sentences

- Make your organizational patterns clear (narrative, analysis)

- Use transitional words and phrases