

Technical Writing and Speaking in English

Class 5: Beginning with the Familiar.¹

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¹This course is based on the book The Craft of Scientific Writing, Michael Alley.

Case study

What is the goal of the paragraph below?



In most earthquakes, the earth's crust cracks like porcelain. Stress builds until a fracture forms at a depth of few kilometers and slip relieves the stress. Some earthquakes, however, take place where the earth cannot fracture. Such earthquakes, called deep earthquakes, occur hundreds of kilometers in the earth's mantle. At this depth, high pressure is thought to prevent the rock from cracking, even though stresses might be high enough to deform the rock like putty.

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The paragraph introduces the idea of **deep earthquakes**.
But the paragraph starts with **surface earthquakes**!

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The paragraph introduces the idea of **deep earthquakes**.
But the paragraph starts with **surface earthquakes**!

The “beginning with the familiar” strategy: Orient the audience by beginning with what was familiar (surface earthquakes) before introducing what was new (deep earthquakes).

Write the sections **from the audience's perspective**, and not yours.

What good writers do

- Use this strategy of beginning with the familiar in the first sentences.
- Use mapping sentences to prepare readers for what is ahead.
- Show sensitivity to what the readers know by defining new terms and by relating new concepts to what is familiar.
- Carry this sensitivity into their illustrations.

Select a first sentence that not only orients, but also takes a significant step

- Two scenarios: when the audience **is familiar** with the subject and when the audience is not familiar

When the audience is Familiar 😊

Combatting Malaria with Mosquito Netting. This section introduces a new type of mosquito bed netting, coated with insect repellent, to reduce the spread of malaria among African children.

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- The author assumed that the audience was already familiar with malaria and how mosquitoes contribute to the problem.
- The first sentence **confirms the focus** of the section.
- Details were added but knowing that the audience could readily comprehend.

Select a first sentence that not only orients, but also takes a significant step

When the audience is not Familiar 😊

Design of Downhole Steam Generator. More than half of the oil in a reservoir is too viscous to pump out with conventional methods. By heating these oils with steam and decreasing their viscosity, we can recover billions of gallons. For oils below 800 meters, though, the steam produced on the surface loses too much energy in transit to heat the oil. One way to overcome this problem is to use a downhole steam generator that applies hot steam directly.

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- The writer chose to begin with details that made the audience more comfortable with the “downhole steam generator” term.
- The section engaged the audience by appealing to the “recovering gallons of oil”.
- The background moved efficiently to the subject of the section. It was not too long.

Select a first sentence that not only orients, but also takes a significant step

What you should avoid: empty beginning 😞

The cooling of turbine blades in jet engines is important. This paper focuses on a cooling scheme that uses small internal channels to cool the inner portions of blades. . . .

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The first sentence is **too vague**, it **adds nothing**. A solution to this is to say **why** is important.

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The cooling of turbine blades in jet engines is important because the combustion gases that flow over the blades are more than 500 °C hotter than the blades' melting temperature [7]. This paper focuses on a cooling scheme that uses small internal channels to cool the inner portions of blades. . .

Quantitative evidence (500 °C hotter), and reference ([7]) provides **grounding** to the sentence.

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What you should avoid: the “Genesis” beginning 😞

Man has since the beginning of time attempted to acquire a greater and greater control over his environment. Gaining control over a situation serves not only a survival-related need, but also a psychological need. Man's need for better control of his environment has increased greatly during and following any time of major conflict, such as World War II. This need and desire for control is evident in all technological settings, including the welding field.

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- The document was about welding. The document will not say anything about prehistoric man or the Second World War.

Map sections in which readers could become lost



Dangers of Breathing Compressed Air

Recreational scuba divers breathe compressed air at depths down to 190 feet. Breathing compressed air at these great depths and even at more moderate depths poses many dangers for scuba divers. The three most important dangers are nitrogen narcosis, decompression sickness, and arterial gas embolism.

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- The section will discuss three dangers: nitrogen narcosis, decompression sickness, and arterial gas embolism.
- The author mapped these dangers at the beginning, preparing the reader for what is up ahead.

If you cannot avoid an unfamiliar term, then define it

- **The author** (not the reader) bears the responsibility of bridging the language gap to the audience.
- If your terms are not familiar, then you should either **avoid them** or **define them**.

If you cannot avoid an unfamiliar term, then define it

Avoiding Unfamiliar Terms.

- Especially **jargon**, which is a vocabulary particular to a place of work.
 - Jargon can be useful if the purpose of the text is for communication within a place of work.
 - But otherwise, jargon alienates readers



For the first year, the links with SDPC and the HAC were not connected, and all required OCS input data were artificially loaded. Thus, CATCH22 and MERWIN were not available.

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For the first year, the links with SDPC and the HAC were not connected, and all required OCS input data were artificially loaded. Thus, CATCH22 and MERWIN were not available.

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Because some links in the computer system were not connected the first year, we could not run all the software codes.

Now we understand a bit more.

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Defining Unfamiliar Terms.

- It concerns both unfamiliar words, or familiar words with unusual meanings.



Retina is light-sensitive tissue that is found at the back of the eye and that converts light impulses into nerve impulses.

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Strategy used to define retina:

- 1 Start with a noun that identifies the class to which the term belonged.
 - “light-sensitive tissue” establishes the class.
- 2 Follow by enough information to separate that term from other terms in the class.
 - The rest of the information was to separate retina from other types of light-sensitive tissues.

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- If a term appears several times in the text, you should consider creating an **abbreviation**.



In a central receiver system (CRS), a field of solar mirrors focuses sunlight onto a central boiler or receiver. An example of a CRS is the Solar One Power Plant located near Barstow, California. Another example of a CRS is . . .

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- Place the abbreviation in parentheses after the first full expression of the term in the document.
- If the term appears only once or twice in the text, you should simply avoid the abbreviation and use the full term.

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Anchoring Unfamiliar Concepts with **examples** and **analogies**.



Since the design of the Solar One Power Plant, significant advances have occurred in solar energy technology.

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- “significant advances” is **too vague** and **generic**. You can solve this problem by giving an **example**

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Since the design of the Solar One Power Plant, significant advances have occurred in solar energy technology. For example, experimental tests have shown that using molten salt, rather than water, as the heat transfer fluid could increase overall system efficiency from 17 percent to 25 percent.

- Much **more grounded**, with **qualitative** (increase overall system efficiency) and **quantitative** (from 17 percent to 25 percent) evidence.

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Numerical analogies: show the significance of numerical findings



In the brightness tests, the maximum retinal irradiance was less than 0.064 w/cm^2 , a brightness about that of a household light bulb. Kruger National Park in South Africa contains about 19,500 square kilometers, which is larger than the states of Connecticut and Rhode Island combined.