These brief “lessons” are designed to address common mistakes in English usage and to administer instruction in small doses.

Today we’ll look at “in order,” which is often used superfluously to introduce dependent clauses.

“In order” can usually be removed from every sentence in which it occurs, much to the credit of the writer, the comprehension of the reader, and the benefit of the sentence.
“In order” followed by a clause is usually a sign of a wordy sentence

“In order” used to introduce an infinitive clause

In order to reconstruct the density profiles of the dressed states from experimental data, we analyze the Rabi oscillations at $t = 190$ ms spatially resolved.

Specifically, it was shown that certain two-qubit mixed states exist which require at least two rounds of local measurement and classical communication in order to distill pure EPR entanglement.

Delete the “in order” and leave the infinitive to make the sentence more concise and direct

The phrase “in order to” is often used in place of the simple infinitive (the “to” form of a verb), which results in a wordy, indirect sentence. Get rid of the “in order” and let the verb be a verb.

The “it was shown that” and the “which” instead of a “that” in the second example will be dealt with separately.
“In order for” and “in order that” should also be removed for conciseness

Replace “in order for” with “for”
Replace “in order that” with “so”

“In order for” and “in order that” are often used to introduce dependent clauses. Replace these wordy constructions with a simple “for” or “so.”
A particularly infelicitous example:

In order to achieve ferromagnetic ordering, it is necessary to dope to concentrations $x \geq 1\%$, an order of magnitude larger than the equilibrium solubility, necessitating an off-equilibrium growth technique such as low-temperature molecular beam epitaxy.

Merely deleting the “in order” will not help this sentence much, but it’s a step in the right direction

The use of “order” three times, each with a different meaning, is an abuse of readers, as is a 36-word sentence. The repetition of “necessary” and “necessitating” is also painful.

Here’s how Ms. Particular would revise this unruly sentence:

To achieve ferromagnetic ordering, samples must be doped to concentrations $x \geq 1\%$—ten times greater than the equilibrium solubility. Consequently, an off-equilibrium growth technique, such as low-temperature molecular beam epitaxy, is required.

Result: two sentences of fewer than 20 words each, “order” used only once, and neediness eliminated entirely.

The em dash after the $x \geq 1\%$ ties the two concepts together more strongly than the original comma and focuses the reader’s attention on the problem—the difficulty of achieving those concentration levels.
“In order” can stay if there’s another infinitive lurking nearby*

Since this constraint is satisfied for every realization $ζ_k$, we do not actually need to do the ideal experiment in order to conclude that the inequality $τ_{NL} ≥ –800$ applies.

*But look long and hard at revising that sentence

Ms. Particular thinks that deleting the “in order” before “to conclude” would improve the sentence, but your taste may differ.