If you’re the next Isaac Newton, you could probably get by with “reading to the walls.” If you’re not, you must learn how to communicate effectively in science if you’re going to be successful.
This semester, I’ll do my best to disabuse you of these “reasons.”
1) I’m a physicist; I do math, not prose...

Increasingly, physicists work in collaborations; good communications skills are essential

Getting hired and getting promoted often depend on good communications skills

Funding depends on good communications skills

“Success” depends on good communications skills

Executives and professors spend most of their time communicating—analyzing, supervising, delegating, evaluating, clarifying, leading—all of which require clear, precise writing and speaking
2) I’m too busy...

Good communication skills save time and increase efficiency by eliminating mistakes and misunderstandings

Good communication skills cut down on revising and editing time
3) My word processor will correct my missteaks

Electronic checkers do not “read” your work; they look for suspect patterns based on algorithms

The best grammar checkers cannot help you with organization, emphasis, or tone

The best spell checkers cannot save you if you write “asses” for “assess”
4) Copy editors will correct my papers

Copy editors are a nearly extinct species at most journals nowadays; authors submit text that is usually published “as is,” mistakes and all.

Copy editors won’t see the slides for your talks, your proposals, your reports to funders or your bosses, your email to collaborators or customers...

Your reputation is in your hands and dependent on your communication skills.
5) I’m just not a good writer or speaker

Writing and speaking well is a *craft*, not a talent

The same aptitudes that make you a good scientist (logic, rigor, carefulness, attention to detail) are *exactly* what you need to be a good scientific communicator

Like everything else in physics, it requires instruction and practice
Communication is a two-way process

Broadcasting, not communication

Communication is an exchange of meaning between a person and an audience

Communication is not broadcasting—it is successful only when the receiver understands the content of a message as the sender intended it.
Communication occurs in eight steps

1. You have an idea and an audience that you want to convey it to
2. You select a medium to transmit the idea
3. You encode the idea in a message
4. You transmit the message
5. Your audience receives the message
6. The audience decodes it (assigns meaning)
7. The audience transmits a message back to you about how they interpreted the message (feedback)
8. You confirm that the message has been understood as you intended
Some scientific communications (particularly written communications), have no mechanism for Steps 7 and 8. Consequently, writers must be particularly careful that the meaning they seek to convey is encoded precisely and unambiguously and in words that the receiver can understand.
An enormous gulf divides “talking” or “writing” and effective communication. On the left is NASA’s explanation for the Challenger accident. On the right is Richard Feynman’s admittedly flawed experiment that galvanized the American public.

“I took this stuff I got out of your [O-ring] seal and I put it in ice water, and I discovered that when you put some pressure on it for a while and then undo it, it doesn’t stretch back. It stays the same dimension. In other words, for a few seconds at least, and more seconds than that, there is no resilience in this particular material when it is at a temperature of 32 degrees. I believe that has some significance for our problem.”


You must provide explanations that are understandable and meaningful to your audience if you’re going to succeed as a science communicator.
They require having an adequate vocabulary and a sensitivity to words’ nuances.
They require practice and iteration.
They require constructive criticism from experts and peers.
Train yourself to recognize excellence and emulate it.
Seize every opportunity that presents itself to improve your skills.
Your investment in improving them will affect your future success.

Practice may not make “perfect,” but it definitely makes “better.”
For good advice and further reading:


