A three-step approach to pre-class reading and writing

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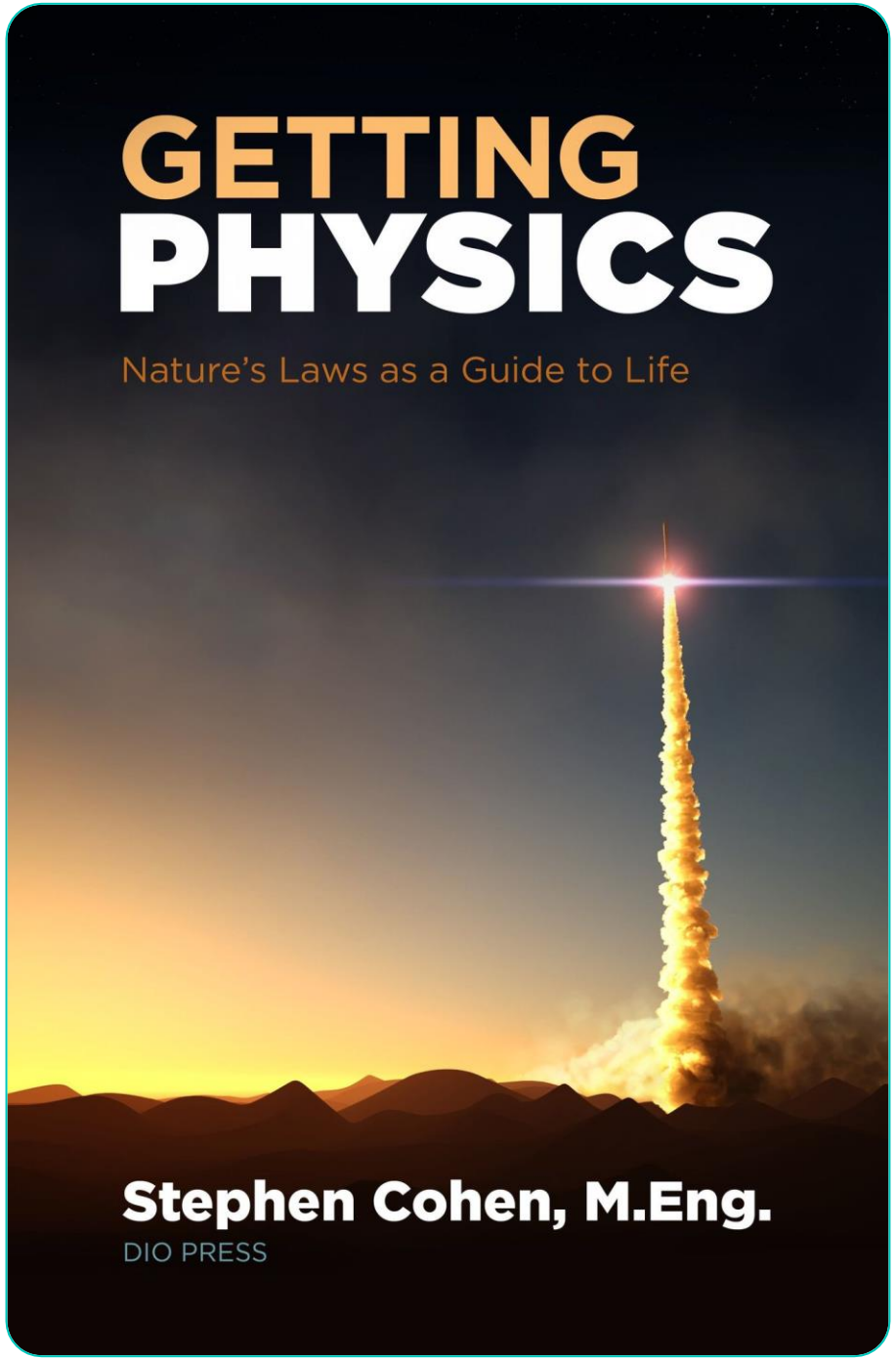
Backstory

- Started blog (www.engineerspulse.com) in 2010 for my own writing pleasure
- Began integrating it into class pedagogy almost immediately
- Refined reflective writing process
- Pre-class reading from my blog now an indispensable tool in my partially flipped classroom
- The blog content is being converted into a popular science book

Shameless plug

Coming in 2021



Outline

- Reflective writing process
- What should they read?
- Three components of writing
- Post-writing activity
- Practical considerations

Reflective writing process

- Students read article that covers concept about to be covered in class
- Students submit three-part reflective writing
- Teacher reads them and uses them to prepare for in-class activity

What should they read?

Conventional physics textbooks do **not** constitute suitable pre-class reading for most CEGEP-level students. Reading materials should:

- Be concept-based
- Contain little math
- Be reasonably short (3-4 pages)
- Be Relatable
- Dare I say, be fun

Physics is often viewed as intimidating – traditional textbooks make the problem worse

What should they write?

Three parts

1. Summarize
2. Elaborate
3. Ask

1. Summarize

Student Instructions	Purpose	Notes
Summarize the key physics ideas from the reading (100 – 200 words)	Forces students to identify key ideas and produce a mental map	I do not read this part of their writing (don't tell them…)

2. Elaborate

Student Instructions	Purpose	Notes
Write freely, personally (journal style) about the reading – make it meaningful to you (100 – 200 words)	Forces students to relate seemingly abstract physics ideas to their lives – creativity fosters long term retention	A personal student/teacher dialogue is formed here, which fosters trust and connection

3. Ask

Student Instructions	Purpose	Notes
Ask questions directly related to the reading, or, if all is clear, something more advanced	Forces students to confront misconceptions by expressing what they ‘don’t get’ in words	I make note of the key questions that come up most and a few that can lead to enriching discussions

Post-writing activity

- I write out roughly 10 questions directly from their writings (no names attached)
- In groups of 4-8, students attempt to answer these questions concisely (10-15 minutes)
- Altogether, we answer the questions with input from the various groups

Practical considerations

- Platform: Microsoft OneNote (Class Notebook)
  - Has teacher/individual student space for reflective writing
  - Has shared content library space for the Q&A
- Grades: Approximately 5% of final grade for 8-10 writings
  - A carrot is necessary for this to be taken seriously
- Rubric: ¼ for **each** of the three completed sections and ¼ for it done on time
- Teacher time cost
  - Reading/responding/grading: 2 minutes per student
  - In class activity: < 30 minutes

Student feedback

Forces students to come to class with a bit of an introduction to topics that will be taught during the week. Gets all the misconceptions out of the way because we discuss everyone's questions about the reading.

The reflective writings allow students to apply the concepts that will be seen via concrete examples. Additionally, because we have to reformulate the main ideas, this creates a small mental map.

Gives students an understanding of the topic before learning about it in class. This allows us to better absorb the information during the lectures.

The articles are conducive to relating content to real life, while writing also incites introspection and allows to build a personal connection with the content

The readings provided a more "human" way of looking at physics. I enjoyed the examples that were more relevant to real life which made the concepts a little bit easier to understand. The readings also allowed us to have a small understanding of what we were going to be learning before we learned it in class, making the in class learning a little easier and more interesting since we were able to compare it back to the reading.

I found the personal reflections to be quite therapeutic. I'm also glad there was an opportunity to ask questions since it's often difficult to think about them on the spot during class.

Synopsis

- Reflective writing gets the student thinking about the content before it is covered in class by summarizing the topic, elaborating on it creatively, and asking questions about it.

- It has become my single favourite thing that happens inside/outside my classroom.

- Though I do not have data to support it, I have a wealth of anecdotal evidence that it promotes deep learning, fosters connection, and contributes to a positive classroom dynamic.