Textbook Evaluated

Wilbraham, A. C., Staley, D. D., Matta, M. S., & Waterman, E. L. (2012). *Pearson chemistry.* Boston, MA: Pearson.

Fry Readability Graph

Selection 1: As you already know, you can obtain mole ratios from a balanced chemical equation. From the mole ratios, you can calculate any measurement unit that is related to the mole. The given quantity can be expressed in numbers of representative particles, units of mass, or volumes of gases at STP. The problems can include mass-volume, particle-mass, and volume-volume calculations. For example, you can use stoichiometry to relate volumes of reactants and products in the reaction shown in Figure 12.5. In a typical stoichiometric problem the given quantity is first converted to moles. Then, the mole ratio from the balanced

Number of sentences: 6.3
Number of syllables: 171

Selection 2: Nitrogen monoxide and oxygen gas combine to form the brown gas nitrogen dioxide, which contributes to photochemical smog. How many liter of nitrogen dioxide are produced when 34 L of oxygen react with an excess of nitrogen monoxide? Assume conditions are at STP. List the knowns and the unknowns. The following calculations need to be performed. For gaseous reactants and produces at STP, 1 mole of a gas has a volume of 22.4 Liters. Solve for the unknowns. Start with the given quantity, and convert from volume to moles by using the mole-volume ratio. Then, convert from moles of

Number of sentences: 8.4
Number of syllables: 161

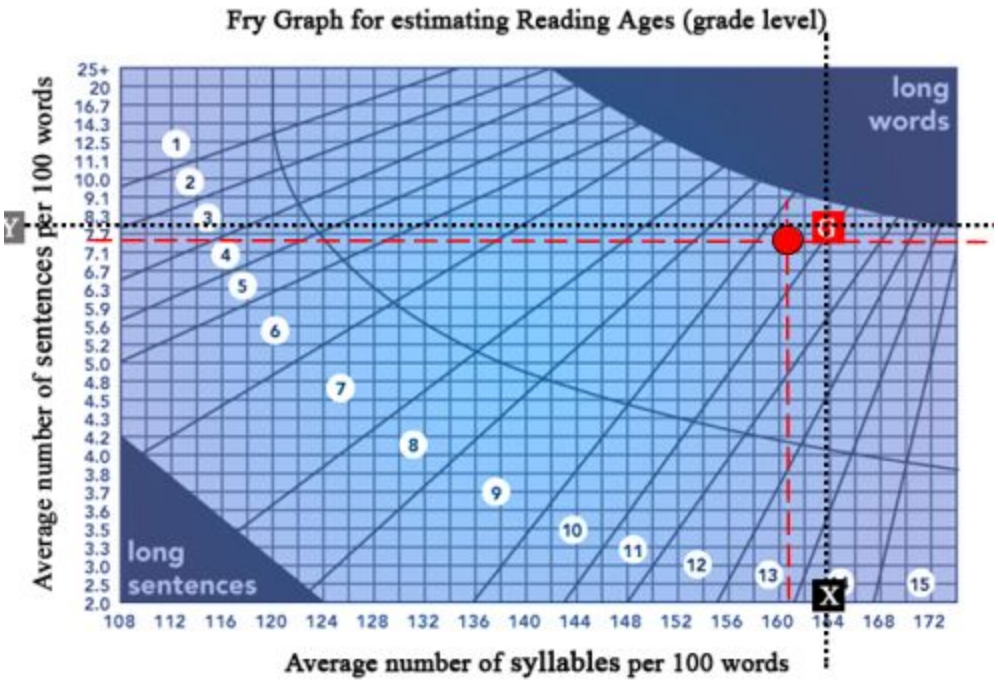
Selection 3: Many cooks follow a recipe when making a new dish. They know what sufficient quantities of all the ingredients must be available in order to follow the recipe. Suppose, for example, that you are preparing to make tacos like the ones in Figure 12.66. You would have more than enough meat, cheese, lettuce, tomatoes, sour cream, salsa and seasoning on hand. However, you have only two taco shells. The quantity of taco shells you have will limit the number of tacos you can make. Thus, the taco shells are the limiting ingredient in this cooking venture. A chemist often

Number of sentences: 7.5
Number of syllables: 149

Average number of sentences: 7.4
Average number of syllables: 160.3

Word count found using Google Docs word counter

Syllable count found with http://syllablecounter.net/count



To create this graph, I used http://www.readabilityformulas.com/freetests/fry-graph.php.
The black dotted lines are from entering the text directly into the tool.
Using my own data, I created the red dashed lines.

Interpretation of Fry Readability Graph

1. What grade level did you find for your textbook?

Between the two results, I can see that my textbook is appropriate for 10-11 grade readers.

2. Do you agree with these results? Why or why not?

I agree with these results. This textbook is selected by my district as appropriate for my 10-11 grade population.

3. Did anything surprise you about the Fry results?

I was not surprised by the Fry results; it is likely that the district used a Fry result (or similar evaluation) to determine if this text was appropriate for the population.

4. What implications can you draw from these results for ESOL learners? Exceptional education students? Explain.

From these results, I can see that this text will be challenging to any of my students who are not reading at grade level, especially ESOL students or those with IEPs. Many of my students, even without IEPs, are literacy-challenged and may not be able to interpret the textbook.

General Textbook Readability Checklist

Complete the General Textbook Readability Checklist found in this document, with a one-sentence rationale for each answer. Summarize the specific strengths and weaknesses of the textbook in terms of its understandability, usability, and appeal (visual and cognitive) to students.

In the blank before each item, indicate V for "yes," + for "to some extent," or x for "no" or 'does not apply." To get full credit, write your reasons for your assessment in the space below.

UNDERSTANDABILITY

+	1. Are the assumptions about students' vocabulary knowledge appropriate?
While some do, many students don't come into my class with the content-area vocabulary knowledge needed to interpret the text, and many don't come into class even with the general vocabulary knowledge, or the cultural background to connect with the analogies given.	
+	2. Are the assumptions about students' prior knowledge of this content area appropriate?
The text assumes that students have some prior knowledge from a middle-school "physical sciences" course. While this is true for about half my students, the other half do not have this foundation.	
V	3. Are the assumptions about students' general experiential background appropriate?
The text assumes that students have experience in things like cooking/preparing basic meals, riding a bike, playing sports, and seeing fireworks. I think these are fair assumptions, and are varied enough that students are likely to have done at least a few of these things.	
V	4. Does the teacher's manual provide the teacher with ways to develop and review the students' conceptual and experiential background?
The teacher's guide provides suggestions for demos and experiments that will provide students with a common experience on which to develop their understanding.	
x	5. Are new concepts explicitly linked to the students' prior knowledge or to their experiential background?
I agree that new concepts are consistently linked to concepts in previous chapters, but less so to previous demos. I do like that the text returns to similar real-world links, so that if a teacher has used an analogy that has worked for the students, s/he can return to it.	

V	6. Does the text introduce abstract concepts by accompanying them with many concrete examples?
The text does a good job of relating concepts to concrete examples, despite the fact that students may not all share the same life experiences, and does attempt to use a variety of real-life comparisons for this reason.	
V	7. Does the text introduce new concepts one at a time, with a sufficient number of examples for each one?
Each concept is introduced in its own section with a sample problem at the end of each section.	
x	8. Are definitions understandable and at a lower level of abstraction than the concept being defined?
I believe this is the case for the most part, and certainly if students are reading at grade level, this would be true. However, for students not reading at grade level, both the concept and the definitions may be at a higher level than they are prepared to process.	
X	9. Does the text avoid irrelevant details?
The text is full of extra details and comparisons that, in some cases, confuse the students. In the beginning of the year I relied heavily on the textbook, but over time have used it less and less because it takes too long to move through the whole unit chapter, when we actually test on far less content.	
+	10. Does the text explicitly state important complex relationships (e.g., causality and conditionality) rather than always expecting the reader to infer them from the context?
Sometimes the text explicit relationships and sometimes it does not; I think this is a good thing though, because it prevents the sections from becoming too dense.	
V	11. Does the teacher's manual provide lists of accessible resources containing alternative readings for the very poor or very advanced readers?
The teachers manual is full of differentiation suggestions for lower-level and higher-level students. That being said, I haven't been able to put most of these into use, though I would like to do so next year.	
x	12. Is the readability level appropriate (according to a readability formula)?
The readability level is technically appropriate for 10-11 grade readers, though many of my students are reading significantly below grade level.	

USABILITY

EXTERNAL ORGANIZATIONAL AIDS

V	1. Does the table of contents provide a clear overview of the contents of the textbook?
Yes, the table of contents is clear, complete and descriptive.	
V	2. Do the chapter headings clearly define the content of the chapter?
Yes, in most cases the chapter headings are very descriptive of the chapter contents.	
V	3. Do the chapter subheadings clearly break out the important concepts in the chapter?
Yes, the subheadings are clear, such as "Naming Ions" and "Naming and Writing Formulas for Ionic Compounds"	
V	4. Do the topic headings provide assistance in breaking the chapter into relevant parts?
I have often used the topic headings to plan my instruction, it is clear.	
V	5. Does the glossary contain all the technical terms in the textbook?
The glossary is very complete, including terms as simple as "battery" and as complex as "brownian motion".	
+	6. Are the graphs and charts clear and supportive of the textual material?
While I originally thought the graphs and charts were clear, some students have had trouble reading and interpreting them. This may be an extension of my students' literacy challenges.	
+	7. Are the illustrations well done and appropriate to the level of the students?
The illustrations are reasonable, but the text is sprinkled with digital-style cartoons of human figures that I don't believe contribute to the text, and make it look lower-level.	
x	8. Is the print size of the text appropriate to the level of student readers?
Though the print text is reasonable, the students access the text digitally and find it difficult to have the zoom at an appropriate level to both read and to view an entire sentence.	
V	9. Are the lines of text an appropriate length for the level of the students who will use the textbook?
I have no complaints about the length of the sentences.	

V	10. Is a teacher's manual available and adequate for guidance to the teachers?
I am actually using the teacher's manual right now, and it is quite helpful. I have a print copy as of about a week ago, which is why I rate this so highly; previously, I had only a digital copy, and the teacher's manual is so packed with content that it is nearly impossible to read digitally. However, the print version is much more useful, and now I can access the guidance it contains, which I believe is adequate from my brief interaction with it.	
+	11. Are the important terms in italics or boldfaced type for easy identification by readers?
Important terms are sometimes boldfaced but not in all cases. I would choose to emphasize words more; there are large blocks of continuous text that don't have emphasized words.	
V	12. Are the end-of-chapter questions on literal, interpretive, and applied levels of comprehension?
The end-of-chapter questions are very varied. There is a lesson-by-lesson multiple choice section, a conceptual section, a critical thinking section, an enrichment section, and an essay section. There's also an inquiry question at the very end.	

INTERNAL ORGANIZATIONAL AIDS

V	1. Are the concepts spaced appropriate throughout the text, rather than being too many in too short a space or too few words?
There is absolutely appropriate conceptual spacing. The text covers relatively few topics (basic first semester chemistry topics) but the length of the text is about the same (or larger) than a two-semester text.	
V	2. Is an adequate context provided to allow students to determine the meaning of technical terms?
Technical terms are first introduced in terms of an analogy to real life; for example, mole ratios are introduced with an entire section referring to bicycle manufacturing and cookie making.	
V	3. Are the sentence lengths appropriate to the level of students who will be using the text?
I have no issues with the sentence lengths.	
+	4. Is the authors' style (word length, sentence length, sentence complexity, paragraph length, numbers of examples) appropriate to the level of students who will be using the text?
The authors' style is appropriate to normal 10-11 grade students, but is above the reading level of many of my students.	
+	5. Does the author use a predominant structure or pattern of organization (compare-contrast, cause- effect, time order, problem-solution) within the writing to assist students in interpreting the text?
These strategies are all present, but it does not always help students interpret the text. These strategies are all higher-order thinking strategies that are lost on some of my students.	

INTERESTABILITY

x	1. Does the teacher's manual provide introductory activities that will capture students' interests?
If used appropriately (that is, as inspiration rather than to-the-word replications), I do believe the teachers manual provides some interesting demos and guiding questions. However, it does not provide inquiry-based or project-based introductions, which I prefer.	
+	2. Are the chapter titles and subheadings concrete, meaningful, or interesting?
The chapter titles and subheadings are indeed concrete and meaningful, but I would not consider them "interesting" to the students.	
+	3. Is the writing style of the text appealing to the students?
While the textbook is certainly not as dry as many college-level texts I've read, I feel that the scholastic writing style does not appeal to most of my students. Those who do like to read probably prefer more narrative-style text. This is difficult to achieve in a textbook, so I don't fault the authors for this. They certainly did their best!	
+	4. Are the activities motivating? Will they make the student want to pursue the topic further?
If a student has any prior interest in physical science or mathematics, then yes, I do believe the activities would be motivation. However, they are not necessarily motivating for the general public.	
+	5. Does the book clearly show how what is being learned might be used by the learner in the future?
The book makes connections to manufacturing, pharmaceuticals, medical applications, cooking, and sports, among others. However, students do not necessarily understand how these topics will matter to them in their adult lives.	
X	6. Are the cover, format, print size, and pictures appealing to the students?
It is possible that the print version would appeal to students, but they only have access to the digital version, which is difficult to navigate. It is difficult to read a continuous sentence with the zoom set at a reasonable print size, and images are often off the screen. A higher rating would be given for the print version.	
X	7. Does the text provide positive and motivating models for both sexes as well as for other racial, ethnic, and socioeconomic groups?
No special effort is made to link to non-Western European chemists or to women in science.	

That is a link that I attempt to make in my instruction when possible.	
X	8. Does the text help students generate interest as they relate experiences and develop visual and sensory images?
The answer is no, partly because so few students access the text. For the print version, I would probably rate this as "somewhat", because for some students I do believe the text would generate interest, while for others it would still seem too abstract.	

SUMMARY RATING

Select one choice for each item.

The text rates highest in:	Understandability	**Usability**	Interest
The text rates lowest in:	Understandability	Usability	**Interest**
My teaching can best supplement:	**Understandability**	Usability	Interest
I would still need assistance with:	Understandability	Usability	**Interest**

STATEMENT OF STRENGTHS

"The strengths of this textbook are…." Please use three headings, "Understandability," "Usability," and "Appeal." Within these headings discuss how you can take advantage of the textbook's strengths.

UNDERSTANDABILITY

The strengths of this textbook in the area of understandability include good pacing, plenty of analogies and a good teacher's edition with plenty of suggestions for differentiation. The book also makes many attempts to connect with students' prior life experiences, using common experiences that are familiar to people of diverse cultural background.

USABILITY

The print version of the text is quite usable. The chapter heading and subheadings are clear and descriptive, the sentence length and structure is appropriate, the glossary is complete and the teacher's manual is quite good. The images and illustrations are appealing and also relatively useful.

INTEREST / APPEAL

The authors certainly make an attempt at building interest and appeal through their real-world connections and through providing plenty of activities. They also provide guiding questions and illustrations throughout in an attempt to connect to the students.

STATEMENT OF WEAKNESSES

"The weaknesses of this textbook are…" Please use three headings, "Understandability," "Usability," and "Appeal." Within these headings discuss how you can compensate for its weaknesses.

UNDERSTANDABILITY

The weaknesses of this textbook in the area of understandability lies mainly in the area of reading level. Despite the attempts at boosting understandability, the text is still written for a 10-11th grade reading level, and since many of my students read below grade level, the text falls short in that regard. As a result, students may still have trouble with the definitions and explanations of higher-level concepts, if they don't have the prior knowledge required for even that level of vocabulary.

USABILITY

Though the text on its own is quite usable, the students have access only to the digital textbook, which makes the text nearly unusable for the majority of students. I myself was unable to navigate the textbook regularly before acquiring a paper copy of the student and teacher editions; this is because it's difficult to access, to navigate, and to read the digital textbook in a continuous manner. Furthermore, the graphs and tables seem appropriate to grade level, but many of the students have difficulty understanding them nonetheless.

INTEREST / APPEAL

Though the authors make a valiant attempt at building appeal, I've found that students don't easily connect with these illustrations, and I am unable to use many of the activities in my classroom due to lack of supplies. There is also a noticeable lack of reference to non-Western European scientists and figures. Furthermore, the students don't appear to appreciate the explanation of the ways in which the content will become relevant in their adult lives.