Topic 1 • Science Literacy Book Report (100,000 points)

Purpose

Science Classes

As a student, you have received science and science related information from your teachers. Whether you believe it or not is up to you. But a professional has taken the time to determine what sorts of things are important to know and with how much detail, both for the purposes of the courses you are taking and for the more general purpose of "Science Literacy", to help make you a better citizen and better able to function in our science & technology driven 21st Century.

How Will I Get Science Information in the Future?

For some of you, your courses at Western Michigan University may be the last time you will have the benefit of someone directing what science you are exposed to. So, what happens when you get to the "real world"? Well, you may be bombarded with information from all sorts of sources: your job, newspapers, magazines, books, television, radio, movies, the Internet, friends, conversations overheard while standing in line somewhere – you name it. What these methods may lack, though, is the control and expertise of your teachers. You can find all sorts of amazing information on the Internet, but you would have to be very naïve to believe 100% of ***everything*** you read there. Much of our news is dominated by politics, but how much science do our politicians know? At the moment, we have exactly one professional engineer and one physicist in the House of Representatives (both of these men are from Michigan – you ***should*** know who they are, but probably don't), none in the Senate. Most of Congress is made up of lawyers. While there is nothing wrong with studying the Law ***per se***, legal arguments do not follow the same rules and purposes of scientific arguments. Therefore there is nothing that requires an environmental cleanup bill, for example, to have anything to do with either the environment or cleaning it up. Likewise, the talking heads we get our news from on TV are not trained in science and technology for the most part. I don't know what Ellen Ratner or Connie Chung majored in at college, but I can probably bet it wasn't Physics. They may have, unlike you, been able to graduate from college without ever having had a Physics course. Even on the cable channels, one of the hosts of a computer show I used to watch is now doing a cable show on gardening – go figure.

So how will you evaluate information on your own? This is possibly something that you have never thought about, but Dr. Phil and other professionals have. Dr. Phil's approach is to have you read a book and examine what you read and how it affects you, as well as whether you believe it. (You don't have to.)

Learning to "Parse" Information

Evaluating what you read in this context is very much in line with definition 3 of the verb ***parse***:

> **parse** (pärs) *verb*
> **parsed**, **parsing**, **parses** *verb, transitive*
> 1. To break (a sentence) down into its component parts of speech with an explanation of the form, function, and syntactical relationship of each part.
> 2. To describe (a word) by stating its part of speech, form, and syntactical relationships in a sentence.
> 3. To examine closely or subject to detailed analysis, especially by breaking up into components: *"What are we missing by parsing the behavior of chimpanzees into the conventional categories recognized largely from our own behavior?"* (Stephen Jay Gould).
> 4. **Computer Science.** To analyze or separate (input, for example) into more easily processed components. Used of software.
>
> *verb, intransitive*
> To admit of being parsed: ***sentences that do not parse easily***.
> [Probably from Middle English ***pars*** *part of speech*, from Latin ***pars*** (*orātiōnis*) *part (of speech)*.]
>
> Source: Microsoft Bookshelf '95 [American Heritage Dictionary of the English Language (Third Edition)]

Dr. Phil's Definition of Science Literacy

1. Pick a book from the booklist. If you don't want to use a book from the booklist, you **must** get approval from Dr. Phil ***and*** turn in a Draft Paper at least a week before the due date. If you had Dr. Phil before, you can't use the same book and you can't read a second best-seller, if you read a best-seller the first time.

2. Read the book. This is a Science Literacy assignment, not just Physics. So read the book with an eye toward what you finding about all the sciences, engineering, technology, computers, medicine, and the morality and ethics of using them. Is the author believable? Understandable?

3. Think about what you brought to the table before you read the book – what you know, your experiences.

4. Consider what you learned from the book. Is it new to you? Or is it something you already knew? This is an opinion paper, so what you know and what you think does matter. You do not have to like your book.

5. Write the paper. Do not just retell the plot or story. Dr. Phil has read the book and so have you. Start from there. You might begin by telling why you selected this book. Then pick 2 or 3 things and talk about them in the context of (3) and (4) above.

6. Be careful to make sure you are talking about the book your paper is on. Many of these books have movie versions – Dr. Phil has seen them and knows the differences. He has also read all the books. (You may choose to write a paper about both book and movie, adding in a section about the differences between the two, as well as the assignment, but the page count goes up to 7 to 8 pages.)

7. The paper should be written in English with correct spelling and reasonable grammar. Because it is an opinion paper, you may use the word "I" – as in "I think that…." (first-person is acceptable).

8. The paper should be 4 to 5 pages typed (probably on a PC or Mac using a word processor in Spring 2010), double-spaced, with 1" margins all around, single-sided, a single simple cover sheet, and numbered pages. The cover sheet cannot be page 1, and 4 to 5 pages means that there are at least 4 complete pages of text without extra blank lines at the beginning or end. You may write the page numbers by hand if you wish.

9. Most computer printers and word processors allow you to control the font (lettering) size and style. Acceptable fonts are: `Courier/Courier New (12 point).` If you have printer problems, contact Dr. Phil. If you typing on a real typewriter, see Dr. Phil.

10. You may, if you want to, turn in a Draft Paper at least one week before it is due, for a free evaluation by Dr. Phil. If you are reading a book not on the booklist and Dr. Phil approved it, you must submit a Draft Paper. In either case, if you turned in a Draft Paper and Dr. Phil marked it up, you must turn in that marked up Draft with your Final Paper, or your Final Paper will not be graded. The number of days that Dr. Phil has your Draft are added to your Due Date, so there is no penalty for writing a Draft.

11. Papers are due on Thursday 13 April 2010 by 5pm. You have a Grace Period that extends until Monday 19 April 2010 at 2pm – that means you can turn in your paper on that Thursday, Friday, or Monday with no penalty. After that, there is a 10,000 point/day penalty.

12. Major penalties: Writing about the movie and not the book—90,000 points. Writing about a book that was not approved or on the booklist—100,000 points. Previous Dr. Phil students reading the wrong book—80,000 or same book—100,000 points. Writing only about the Physics in a book that isn't about Physics—or—Writing only about the plot of a book with no analysis—the fraction of 100,000 points that the offending section covers. Other minor penalties assessed based on severity/frequency (2000 pts ea.)

13. Papers that meet the minimum qualifications are worth at least a "B". Exceptional papers will be rewarded; problems will be deducted.

Dr. Phil likes most of the papers he gets, but it takes some effort to get everyone to take this assignment seriously.

Full Book Descriptions at: http://homepages.wmich.edu/~kaldon/classes/ph207-14-15-Bl.htm

So what does a paper for Dr. Phil look like? I've avoided simply copying what an "A" paper looks like, because then I'll just get 25 to 100 papers just like that. But to some extent, it looks a lot like what this young movie reviewer has done regarding the Spring 2000 movie U-571. Now obviously this is a lot shorter than your assignment and Mr. Molnar's agenda was very different than yours – he was a kid reviewing a movie for a newspaper. But in a little over half a page, Mr. Molnar has given a *brief* description of the plot of the story, identified that he doesn't know a lot about submarines but that he felt that what was presented was believable, and that the characters, while not well-rounded, behaved in a believable manner. Now explain how you picked this particular book to read, add a few pages talking about what you know or don't know about the science, engineering or computer technology (or the morality and ethics of using same) in the book you are reading, and then you'll have a Dr. Phil book report. More or less.

THIS IS WHAT THE BOOKLIST (PAGES 12-26) LOOKS LIKE:

First Up

------ Frankenstein: A Modern Prometheus / Mary Shelley e. I,III,VI

When I first started thinking about a booklist, it was because I had heard of an engineering school that required all of its freshmen to read Frankenstein. Not the 1930s movies, but the original early 19th century ghost story. Although there are other contenders, I personally date Science Fiction from the writing of this book. This is a story in ethics, of taking responsibility for your science and your creative genius. So even though I don't have a good citation for this, surely you can find a copy of this work somewhere. If you've only ever seen the old black & white movies, you'll be very much surprised.

- Science People----------

IIWKLV - Surely You're Joking, Mr. Feynman e. I,II,IV,V

and IIWKL-- What Do You Care What Other People Think? both by Richard Feynman e.

Two very funny accounts of The Manhattan Project, a life as a physicist, being on the California school textbook board, the space shuttle Challenger commission, painting and playing the bongo drums. These are short books - you must read them both for this assignment. For those of you who might get caught up in the fun, there is another (non-science and therefore not eligible) book, Tuva or Bust! by Richard Leighton, that documents Feynman's last great adventure to try to visit legendary Tannu Tuva in the heart of Central Asia, having once seen only a postage stamp from the place and being amazed that the country absorbed by the USSR had a capital with no vowels. One just has to want to visit a place like that, if you're Dick Feynman. (There is also a movie, Infinity, about the Los Alamos years, with Matthew Broderick and Patricia Arquette as Mr. & Mrs. Feynman, but no one has ever seen it – it showed up in Holland at the Knickerbocker Theatre in the summer of 1997.)

IIWKL-- Genius: The Life and Science of Richard Feynman / James S. Gleick e. II,IV,V,IX

Feynman's own books at the beginning of the list are a lot of fun, but they are his stories, the way he remembers them. This is a very complex, and often poignant, story of a very complex and unconventional scientist (who never seems to do ordinary science) and professor (who never seems to do ordinary teaching). Well written, but I warn you that physicists seem to like it!

IIWKLVR The Double Helix / James D. Watson e. I,II,IV,V

-or- IIWKLV- What Mad Pursuit / Francis Crick e. I,II,IV,V

Both books are about the race to figure out the structure of DNA. Watson's is the classic that surprised many with its frank portrayal of how scientists really do science. On the other hand, the original title for The Double Helix was supposed to be Honest Jim, which most people who knew Jim Watson felt was a little overboard. Crick finally decided that he had had enough of that serious version and finally wrote his own, less reverent, but probably more accurate tale. (There is a BBC TV movie called Race for The Double Helix starring Jeff Goldblum as the geeky American Watson, that captures the spirit of the whole adventure of searching for the DNA structure very nicely.)

-WKLV- Rosalind Franklin and DNA / Anne Sayre e. II,IV,IX

Watson's Double Helix has been the classic of a generation; Crick's What Mad Pursuit puts a lid on some of Jim's exuberant self-aggrandizement. One of Watson's creations is a character named Rosie, the personification of the embittered old maid of science – who just happened to do the X-ray diffraction work crucial to Wilk's Nobel Prize winning theory without her knowledge. The problem is that "Rosie" didn't exist, and it's author seems to try to set the facts straight. (The Nobel Prize committee does not award prizes posthumously, which is why you didn't know.)

Don't bother asking to read other Tom Clancy's or Michael Crichton's Disclosure, Spheres, Jurassic Park or Lost World (Jurassic Park 2). Dr. Phil will say "No".

This Version of the List Contains 110 (or so) Titles, Many of Which Are Listed in The Computer Catalogs in Area College and University Libraries (The Library Codes are Out-of-Date).
Maybe, Just Maybe, You Might Want to Keep This Handy Book List for Future Reference?

All Books Have Been Carefully Chosen So If You Don't See Any Science in A Particular Book Rather Than Saying "I Don't See Any Science" Why Not Ask Yourself: "Why Do You Think That Dr. Phil Put the Book On The List?" Be Sure You Read The Assignment Sheet Carefully Before You Write Your Paper
See the Following Pages for More Information About the Format for Papers!

PLEASE! I Know That This Takes Time – I Know That Fitting In A Paper Is Hard Work
I Know That Printers Don't and Word Processors Mangle,
So Store Your Work on TWO Floppy Disks or a USB Memory Device If You Use a Computer.
If You Use A "Real Typewriter" Rather Than a Computer, I Understand Your Problems.

So Don't Use Your Paper As An Excuse To Cut Class.
That's What the Grace Period Is For – To Have Time to Fix The Glitch

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We Want You HERE To Participate (And Get Your Work Done On Time, Too.)

NEW – An attempt to code the titles as an aid to keep you from making a bad mistake.

I, – Best-Seller

Many books are popular in their field, but a best-seller is defined as ones that appeals to a much wider audience. Should be readable.

II, – Fact

This book is based on Fact.

III, – Fiction

Fiction is made-up. All Novels are fiction. Occasionally a book is based so much on a real incident, that I've coded at least one book as both Fact & Fiction.

IV, – History/Biography/Reminisce

The material in this book is based on actual events, which you could look up elsewhere, or use as a reference to some extent.

V, – Technology

The technology of 1999 is the technology of the 20th Century. This includes more than just the latest Intel Pentium III, chips at 650 MHz, but all sorts of stuff invented since the 20's and 30's. Understanding our technology is a major cornerstone in what Dr. Phil calls Science Literacy.

VI, – Non-1999 Technology

Most of us would not survive very well outside the 20th Century technological base. Studying the technologies of the Victorian or Edwardian engineers (19th & earliest 20th Century), or of metal work in the year 1000, or how one gets food to the table in a world without Saran Wrap™, microwaves or McNuggets™ is one window on today. A few books that study possible future technologies are also labeled with this code.

VII, – Fantasy/Alternate Worlds

Some people argue that all Science Fiction is just somebody's fantasy, but technically Fantasy applies to stories that exist outside the realm of science – nearly anything with Magic, for example. Magic is often written in such a way that it **becomes** a science or a technology to its users in fantasy, and this is a good way to learn to study how and why we know science.

I've also included in this code, some books which have chosen to rewrite what history we know, again as a way to evaluate where we are today. These are *What if…?* books.

VIII, – Difficult to Evaluate

These books are minefields in some way. You can write a really lousy paper by *not getting* the point of the book and many people have. Most book reports on The Diamond Throne, a fantasy book, or Dune, an SF book, concentrate on the *politics*. Now if you are going to talk about the *politics* in relation to Science Literacy, you're going to have to be really good. Otherwise, its best to stick the mantra for this paper: **Science, Engineering, Technology, Computers, Math and the Morality and Ethics of Using Same.**

IX, – "Nutrient Dense"

Fancy way of saying long, hard book.

X, – Advisory for the Faint of Heart

Contains one or more of the following: adult situations, controversial materials or descriptions that are hard to handle. You have been warned!