

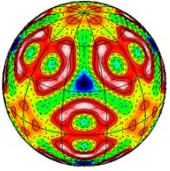
Why is Persuasive Writing Important?



It's not just all about good data/calculations: **you will be judged as much for the quality of your thinking and presentation as for the quality of your results**

Scientists in general, *but physicists in particular*, are naturally skeptical \Rightarrow **your results and ideas will not often be received without resistance**

Persuasive writing is logically structured and thoroughly supported with evidence: **you should present your results and ideas so that it seems logically inconsistent to disregard them!**



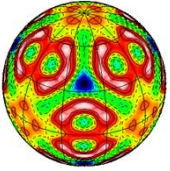
In Praise of “Outlining”



Get in the habit of making outlines for your scientific talks and scientific writing!!

Don't just start writing, stream of consciousness: Generate a detailed outline of your presentation/paper

- (1). First, write down the key idea(s) you want to convey.
- (2). Next, write down the broad – logically structured – organization of your presentation/paper that you plan to use to “demonstrate/support” this idea(s)
- (3). Next, provide more details to each category in your broad outline by listing the supporting pieces of evidence you'll use to justify your arguments, e.g., your own results, references to other results in the literature, figures you'll use, arguments you'll make, etc.
- (4). Avoid extraneous statements and information that don't contribute to this logical flow!



In Praise of “Outlining”



Example of basic (Level 1) structure of scientific outline:

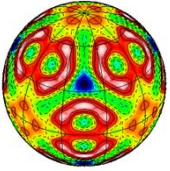
I. Introduction (Get the reader's/viewers attention; states key idea(s) or thesis; provides essential background)

II. Procedures (Provides background on key experimental/theoretical methods)

III. Results (Presents key results that support ideas discussed in Introduction)

IV. Discussion (Interprets results; Discusses results in the context of prevailing models)

V. Summary and Conclusions (Reemphasizes key results and how they support thesis; Discusses new directions)



In Praise of “Outlining”



Example of a more detailed (Level 2) structure of scientific outline:

I. Introduction

- A. Attention-grabbing, “big picture” statement of issue
- B. Key previous results leading to state of the field
- C. Unaddressed problems
- D. Preview of key points of talk/paper

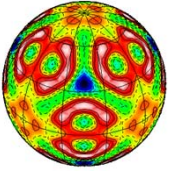
II. Procedures

- A. Experimental methods
- B. Theoretical methods
- C. Data processing
- D. Error analysis

III. Results

- A. Key results 1
- B. Key results 2
- C. Key results 3

Provides more details of internal organization of each section



In Praise of “Outlining”



Example of a more detailed (Level 2) structure of scientific outline (cont):

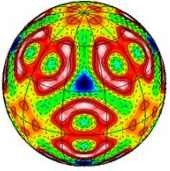
IV. Discussion

- A. Interpretation of results**
- B. Comparison with key models/previous results**
- C. Possible sources of errors**

V. Summary and Conclusions

- A. Reemphasis of key results**
- B. Summary of key conclusions**
- C. Possible future directions**
- D. Exciting closing statement**

Provides more details of internal organization of each section



In Praise of “Outlining”



Example of an even more detailed (Level 3) structure of scientific outline:

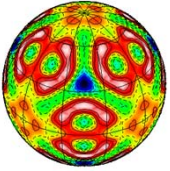
I. Introduction

- A. Attention-grabbing, “big picture” statement of issue
 - i. **Interesting diagram to show**
 - ii. **Interesting quote to give**
- B. Key previous results leading to state of the field
 - i. **Specific papers that will be referenced**
 - ii. **Previous ideas that will be emphasized**
- C. Unaddressed problems
- D. Preview of key points of talk/paper

II. Procedures

- A. Experimental methods
 - i. **Experimental diagram to show**
 - ii. **Procedural flow chart #1**
- B. Theoretical methods
- C. Data processing
 - i. **Flow chart describing data analysis**
- D. Error analysis

Provides specific details figures, quotes, references, sentences, etc. to support section



In Praise of “Outlining”



Benefits of outlining:

(1). Your papers and presentations will be logically organized from the beginning

(2). It is less likely that there will be unnecessary information that will take time and detract from the points you’re trying to make

(3). Outlines allow you to break up large projects into more manageable chunks that you can tackle

(4). Outlines allow you to easily expand or contract material to different length presentations or papers

Everything should be made as simple as possible, but not simpler

