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## Analytical Writing in the Content Areas

By: Amy Rukea Stempel (2010)

Because writing is thinking, the organization of students' writing reflects both the structure of their thinking and the depth of their understanding. Students should be writing in all their classes, explaining what they know and how they know it. Thus, it's essential for content-area teachers to give students meaningful analytical writing assignments. Read **An Introduction to Analytical Text Structures** for more information and graphic organizers to help with writing instruction.

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### Introduction

Non-language arts teachers often become nervous when they learn they are supposed to teach writing. This attitude is based on a misunderstanding of what "writing" is. Since writing is thinking made visible, educators in all subject areas teach thinking and all should also use and teach analytical writing. This is critically different than narrative, creative, or literary writing. It is not a science teacher's job to nurture the next James Joyce, but to develop students who can clearly read, think, and write "science."

What does this mean? Non-language arts teachers are NOT responsible for teaching the following:

- **Grammar, usage, mechanics, and spelling (except for subject-specific vocabulary):** It is only fair to students to circle any mistakes a teacher sees in their grammar, usage, mechanics, and spelling so they have some sense of how much work they have to do. However, non-language arts teachers do not have to read closely for those mistakes, do not have to factor it into their grading, and do not have to teach it in their classroom.

- **Style and voice:** Good expository writing exudes style and voice; however, subject-area teachers are not responsible for teaching these skills. The ability to write clearly with style comes with practice across the curriculum, combined with spiraled instruction in the language arts classroom.
- **"Literary" narrative writing:** Artistic, creative writing has no place in the other subject areas. Intellectual creativity is not "anything goes." Truly creative people do not ignore the realities in which they find themselves. What they do is interpret and make connections between and among facts and disciplines in ways that no one else has done before.

That said, what are non-language teachers responsible for when teaching thinking and writing? They are responsible for those elements of writing that reflect thinking in their subject areas:

- **Thesis statements:** Students need modeling and direct instruction in the kinds of thesis statements that are appropriate in each subject area. This is how students learn the "higher-order" thinking they will need to succeed in that subject area.
- **Structure and organization:** What supporting evidence is relevant to the thesis? How is it communicated in that subject area? How does one judge the appropriateness and relevance of supporting ideas and evidence in a particular subject area?
- **Transition words and phrases:** Transition language communicates to the reader how the ideas are related and how they connect to other knowledge and disciplines. Therefore, transitions need to be explicitly taught and then required in student writing throughout the disciplines.
- **Content and content-area vocabulary:** What are the knowledge and facts upon which students will base their thinking and writing? Of course, subject-area teachers are responsible for determining how best to teach this to students.

## The elements of analytic writing

The elements of an analytical essay are present in all non-fiction text structures, though they may be called by different names in different subject areas. The chart below identifies the structural elements — thesis statement, evidence/proof, conclusion, and common text structures — in each of the core subjects.

	Thesis Statement	Evidence/ Proof	Conclusion	Common Text Structures
<b>Lit &amp; Lang. Arts</b>	Thesis Statement	Quotations from text(s) Examples from and between text(s)	Conclusion	Compare-Contrast Concept Definition

		Analysis by literary critics		Proposition Support
				Cause-Effect
		Historical examples from primary sources		Cause-Effect
<b>History/ Social Studies</b>	Thesis Statement		Conclusion	Compare-Contrast
	OR	Interpretations from historians(secondary sources)	OR	Concept Definition
	Historical Argument	Examples of past events or predictions based on prior examples	Historical Interpretation	Proposition Support
<b>Science</b>				Goal-Action-Outcome (lab report)
	Hypothesis: What is being proved?	Experimental results of others	Results / Analysis Conclusion: Was the hypothesis proven or disproven? How and why?	Cause-Effect
		Students' own experimental results		Compare-Contrast
				Concept Definition
<b>Math</b>		Calculations	Outcome Statement (one sentence)	Goal-Action-Outcome
	Goal Statement: What is being solved	Logic proofs	What is the answer to the problem in context?	Cause-Effect
		Analysis linked using transitional phrases		Compare-Contrast
				Concept Definition

### **A note on writing in science classes: The lab report**

Science lab reports are a specialized goal-action-outcome text structure:

- **Goal:** To prove or disprove the hypothesis
- **Action:** The materials and procedures required
- **Outcome:** The analysis and conclusion

While other text structures can also be used in science, the lab report is the staple of science education. Whenever students do an experiment they should report their results in this format because this format remains the same from kindergarten through graduate school. The only elements of a lab report that change from year to year are the complexity of the experiments and equipment and whether it is original research or the repeat of a famous experiment. The following is a brief description of what must be included in an acceptable lab report:

1. **Identify yourself** and your partner(s)
2. **Title** of the lab/activity. This is not a creative title; it is descriptive.
3. **Purpose/Introduction** — Why study this problem?  
This gives the objective of the activity. What concept or skill was highlighted by this activity? Ask, "Why did we do this activity? What were we supposed to learn or practice?" The introduction states the objective of the experiment and provides the reader with background to the experiment. State the topic of your report clearly and concisely, in one or two sentences. Typically, the introduction states the problem to be solved or the experiment to be performed and explains its purpose and significance. The **hypothesis** sits at the end of the introduction.
4. **Materials** — Describe how and when you did your work, including experimental design (what you did), experimental apparatus (materials), methods of gathering and analyzing data, and types of control. This could also be in the form of a table.
5. **Procedure** — What did you do? How did you do it? Convey a mental picture of what you did. Ordinal phrases are not necessary (i.e., first, second, third, etc.) as the order of events is conveyed by the sentence order in the description. Remember that the audience should be able to repeat your procedure if they wish to do so. Write the description of what was done so that the reader can visualize the set-up. Be sure to include reference to any equipment that you used. A diagram or picture of the apparatus may be helpful but should not replace a good verbal description. Be very specific in your instructions.
6. **Observations & Data (Results)** — What did you find?  
Include only those things that you saw, heard, touched, or smelled. Present observations and data with no interpretations or conclusions about what they mean. A well-written and well-organized results section provides the framework for the discussion section. Include both quantitative (numerical) and qualitative (sensory, **not emotional**) observations. Quantitative observations are best presented in data tables. Qualitative observations may be organized in table form or paragraph form.  
The goal is to present the data that was collected in the activity in a clear and easily understood

format. Units are necessary for any measurement. If you are unsure about whether something should be included in the data section, ask yourself "How did I get this piece of information? What instrument did I use to collect this information?" If you are giving a value that you did not measure directly (such as density) it should not be included as data.

7. **Analysis of Data (Discussion)** — What does it mean? How does it relate to previous work in the field?

Show any calculations you made using the data collected. Give the formula used for each type of calculation. Show which measurements you are plugging into each calculation and then show the solution. Once you have shown a sample calculation, you may use a data table to show other calculated values of the same type. This is also the appropriate place to explain how the measurements relate to each other, as well as anything that happened during the activity that may have affected the measurements.

8. **Conclusion** — Discuss how the purpose of the activity relates to the analysis of the data and how the analysis can be applied to the real world. In other words, what did you learn? Stick to the facts. Do not comment on whether or not you enjoyed the activity. If the results of the activity were not satisfactory, suggest how the activity could be improved to result in better data. Did the activity raise questions that cannot be answered by the data collected? Describe them.

Conclusions are connections that are not obvious on the surface. Also, include any future direction for your results or changes you would make the next time to produce results that are more significant or noteworthy.

9. **Tables and Figures (if required)**

Tables and figures are often used in a report to present complicated data. Use the following guidelines to incorporate them effectively.

- Tables are referred to as tables, and all other items (graphs, photographs, drawings, diagrams, maps, etc.) are referred to as figures.
- Numbering: All tables and figures must be numbered. Tables and figures are assigned numbers in the order they are mentioned in the text. Tables and figures are numbered independently of each other (i.e., Table 1 and 2, and then Figure 1 and 2, as well).
- All tables and figures must have self-explanatory titles so that the reader can understand their content without the text.

## About the author

Ms. Stempel has been working in education and education reform for more than 20 years. Prior to founding **Lightbulb Learning Services**, which specializes in the alignment of curriculum to academic standards, literacy development, and classroom/school leadership, she led curriculum development projects for the Education Trust, Edison Schools, and the Council for Basic Education. In addition to experience in education policy, Ms. Stempel has taught literature in the International Baccalaureate program for many years.

## About the book

***Compose Yourself! A Guide to Critical Thinking & Analytical Writing in Secondary School*** supports teaching critical thinking and analytical writing at the secondary level, across content area. This resource includes step-by-step processes, many examples, writing checklists, helpful tips, and black-line masters. It is perfect for teachers, parents, and students who want to strengthen their thinking and writing skills, better learn and retain information, and improve overall academic performance. After using this guide, students will be able to write clear, concise, analytical texts.