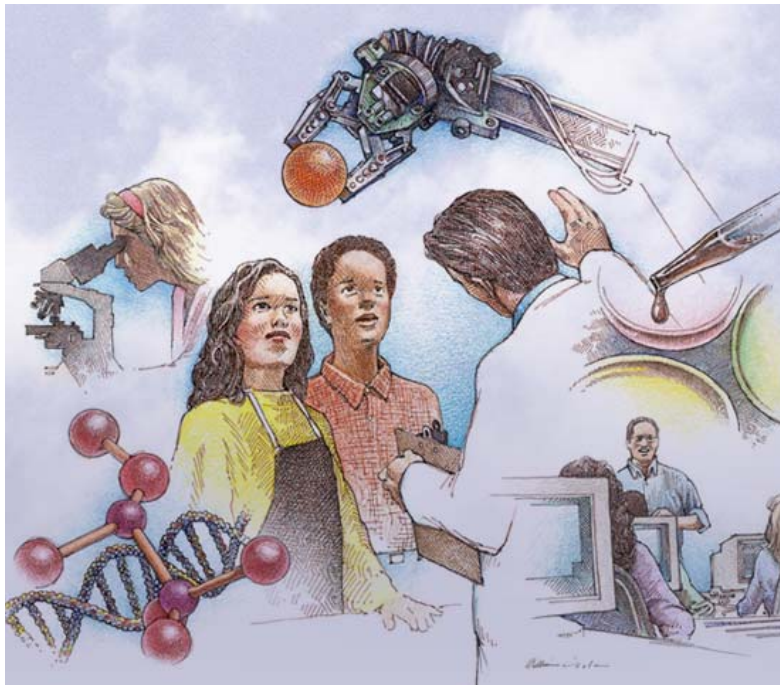


SMA at Aberdeen

SRT 12 Handbook



Science and Mathematics Academy
at Aberdeen High School
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From the beginning of our concept for a magnet school in Science and Mathematics, the idea of providing opportunities for students to research and explore was seen as critical to the purpose and design of the Academy. The Senior Capstone Project is intended to accomplish three major purposes for our students:

Thomas Szerensits, Principal
Donna Clem, Coordinator

- Integrate science, mathematics, and technology in an authentic way.
- Provide for interaction with the professional science community.
- Allow for individual inquiry and discovery using the tools, techniques, and valid protocol inherent in real research.

We are fortunate to live in an area where science, technology, engineering, and mathematics are significantly represented in the workforce. The facilities at Aberdeen Proving Ground, various defense contractors (large and small), universities and colleges, medical institutions, and Harford's outdoor environment all offer superior study sites and resources for the student investigator. Combined with the many volunteer mentors who have stepped forward to give their time and talents on behalf of the Academy, we look forward to an exciting opportunity for our senior students!

As our world becomes more dependent on the applications of science and technology, we believe the senior capstone experience will be a valuable component in building a bright future for our students. The inherent need to work independently, organize effectively, persist in the presence of obstacles, and seek and act on advice from teachers and mentors will enhance their comprehension, motivation, and achievement.

We ask all participants to remember that they represent themselves, their families, and the Academy as they conduct their research activities. The mentors and the many scientists with whom they interact are potential references for college and employment. Establishing a reputation as a competent, motivated, and ethical student researcher will pay benefits far beyond the Academy and course requirements.

The Academy staff is ready to facilitate your efforts toward a successful research experience. We understand this is a learning process and no research ever goes exactly as planned. It is the journey and not the ending point that will provide the growth as a learner and we look forward to learning with you. We expect you to be equally proud of your accomplishments and the process taken to produce the results. We will share that pride and know that your progress as a student is our greatest reward. We extend sincere best wishes for an exciting adventure!

Sincerely,

Dr. Dennis L. Kirkwood
Supervisor of Science

SRT 4 – Important Dates and Deadlines

Below are significant deadlines that you should prepare for; write them in your calendar. In addition, each quarter you will be graded several times on writing about research, meeting benchmarks, scientific notebooks, and reflections. Dates are subject to change.

1st Quarter

- 8/29: update sheet due
- 9/7: first performance evaluation
- 10/1: hypothesis, methods, materials due
- 10/22: research seminar (show off what your are doing in front of peers)
- 10/29: 1st draft literature review due

2nd Quarter

- 11/6: research seminar
- 12/18: research seminar
- 1/7: final literature review due

3rd Quarter

- 1/21: finish ALL data collection and experimentation
- 1/28: stat plan due
- 2/11: stats display due
- 2/18: written results due
- 2/25: final draft results due; research seminar
- 3/3: conclusion and discussion due
- 3/17: scientific poster (1st draft due); in house poster symposium

4th Quarter

- 4/8: power point presentation of research
- 5/2: final posters DUE for printing
- 5/8: research power point presentations (to peers and for final grading)
- 5/12: poster symposium - - - BIG event; lots of people
- 5/28: graduation

Requisition Forms



Requisition Form

SMA Senior Capstone Project
2007 – 2008 School Year

Directions: Fill out all sections of this form. Forms that are not complete will not be processed. This form must be typed, printed, signed, and returned to Mrs. Clem. *You may scan a completed copy and email it to Mrs. Clem (300 dpi grayscale, saved as a jpeg).*

Requested by (student name): _____ Date: _____

Vendor: _____ Vendor's Address: _____ City: _____ State: _____ Zipcode: _____ Vendor's Phone: _____	Vendor's Fax: _____ Vendor's Email (sales): _____ Vendor's Website: _____ Purchase can be made by (<i>Check all that apply</i>) <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> Website
--	---

Item	Qty.	Model or Catalog #	Description	Price Per Unit	Total
1					
2					
3					
4					
5					

Method of preferred shipping (UPS ground, UPS overnight, etc.):
Cost of shipping:
Total cost to be taken from my \$200 budget:

Explain how the item(s) will contribute to the Senior Capstone Project.

Faculty Advisor Signature: _____ Date: _____

Mentor Signature: _____ Date: _____

All materials, software, books, etc. purchased with Science and Mathematics Academy funds will remain property of the SMA. It may take up to two weeks to process this form and place the order.

Official Use Only:

Date ordered: _____ Total Cost: _____ Order #: _____

Scientific Posters

A scientific poster is a way to communicate and show off your research. Scientists may create posters, after completing a report, to introduce peers or other interested parties to new methods or tools of science, new conclusions, or just to summarize and synthesize reviews of other research. Often, scientists attend research symposiums and display posters at symposiums to show off their work or to network with other researchers. You will be presenting your research at a poster symposium as well. Your poster needs to sell your work. It needs to be interesting, eye catching, easy to read and understand, educational for ALL readers, and evoke conversation from bypassers. The tips, tricks, and procedures below should help you get there. If you need more information, just type “scientific posters” in any keyword search box on the internet.

1. Microsoft Power Point and Publisher are recommended for poster design.
2. First go to Page Set Up and make the slide fit the specs for your poster assignment
3. Next, set up your basic format by placing subtitles (consider how much room you will need for each section): Title, Name, Research Location, Introduction, Methods and Materials, Results (tables, graphs, statistical analyses, written analysis), Conclusion, Discussion, Acknowledgements, References, Pictures.
4. Choose your color scheme to best match your graphs and pictures.
5. Choose your font colors and sizes (no more than two).
6. Begin by placing your data displays, then the rest of your results.
7. Next, complete the methods and materials section (add a picture if necessary; don’t get into nitty-gritty details). This does not have to be numbered, but could be bulleted.
8. Finish writing your results, conclusions, and discussion. Then write your introduction. Finally, work on acknowledgements, references, pictures, and title.
9. The template below should give you a general idea of what goes where. Remember that you can be brief, but not skimpy. Remember that people should be able to read your poster in just a few minutes.

<i>Title</i> <i>Name and location</i>		
<u>Introduction:</u> introduce the project purpose. Provide a little background information if needed or to interest readers. Lead into your hypothesis and findings. Summarize the highlights of your study.	<u>Results:</u> include appropriately labeled graphs, tables, statistical analyses, keys, etc. Don’t display data unless it is interesting.	<u>Conclusion:</u> state what you think your research supported, or didn’t support. Without repeating results, indicate how you know you supported or not. Mention the relevance of your findings (but don’t just rewrite your introduction).
<u>Methods and materials:</u> do not write the step by step details; summarize the stuff needed to understand what you did and how you did it. Provide a diagram or picture if needed for clarification or to cut down on words.	Summarize the data (displayed and not displayed). Don’t just write sentences about what we can obviously read. Do write sentences explaining relationships. Summarize the statistical analysis you performed on your data and EXPLAIN what it means. Don’t write your conclusions here; just the facts.	<u>Discussion:</u> what went well? What didn’t? what should others consider if interested in replicating your study? What other research would support your study? What other research ideas do you suggest related to your study? Emphasize your dedication and excitement about your study.
<u>References:</u> use a modified APA format (don’t skip lines) to cite anything you referred to in your poster.		<u>Acknowledgements:</u> have fun but be professional in thanking people.

Scientific Notebooks

When properly kept, a scientific laboratory notebook permanently records, for future proof, what was done on a project or research experiment. The intent of all entries is for proof in court of work completed, and as such becomes a legal document. The following criteria need to be considered when setting up and maintaining a scientific notebook;

- Notebook must have permanently bound pages
- First page should have name of principal investigator and project/research
- All pages should be numbered consecutively in upper right hand corner
- All entries are made in ink
- Entries should include hypotheses, scientific method, data, conclusions and reflections about projects/research
- Communication with advisors/scientists
- Letters, sketches, photos, charts pertinent to the research/project should be permanently placed in the notebook
- All pages should be dated and signed
- Any correction should have a line through mistakes and initialed.

There should be no blank areas on a page. A person that is competent to understand the work should regularly examine and witness the entries by signing and dating each page examined.

Quick Facts – Hypothesis Writing

What is a hypothesis? It is an assumption written in a clear, concise manner about what you think will happen in your investigation. The hypothesis is the heart of a well-designed investigation. A hypothesis is critical for your investigation and **MUST** be testable and measurable. It sets the stage and outlines the parameters of the experimentation. The “if.....then....” format is the expectation for hypothesis writing, although scientists may or may not use this format. The “if” requires an understanding of the independent variables and the need for controls and the “then” identifies the dependent variable. Hypotheses may be written as statements or as questions.

There are two types of hypotheses that can be written – the research hypothesis and the null hypothesis.

The research hypothesis matches the research question in the problem. When you write a research hypothesis, be sure to include three elements;

- Explicitly state the populations you wish to compare
- State the dependent variable
- State the type or direction of the effect

When you write a null hypothesis, you will be writing a competing hypothesis – it’s basically the opposite of the research hypothesis. When considering a null hypothesis, we would like to directly test the research hypothesis, but we actually test the null. If we disprove the null, then we indirectly support the research hypothesis since it competes directly with the null. It states that there is no effect for the treatment or no differences in the populations. If the research hypothesis has been supported, then there should be evidence to reject the null hypothesis.

Consider the following “if....then....” statement: “If I play the lottery, then I will get rich.” This is merely a simple prediction, not a formal hypothesis. However, when rewritten, “If the frequency of winning is related to the frequency of buying lottery tickets, then

 (whatever prediction of what will happen if there is an increase or decrease in the frequency of buying lottery tickets) is a testable statement. “Ultraviolet light may cause skin cancer” can be considered to only be a prediction, but when written “If skin cancer is related to ultraviolet light, then people with a high exposure to uv light will have a higher frequency of skin cancer” turns this into a testable investigation.

Quick Facts – Literature Review

A literature review analyzes a number of published documents in a particular subject area and possibly within a certain time period. It should combine summary and synthesis; it may evaluate sources and advise the reader regarding pertinence or relevance.

- Planning
 - Clarify requirements
 - Find models
 - Narrow topic
 - Verify currency of sources
- Strategies
 - Identify focal point
 - Develop working thesis statement
 - Determine organization of body
 - chronological
 - by publication
 - by trend
 - thematic
 - methodological
 - Consider additional sections if needed
 - current situation
 - history
 - methods and/or standards
 - questions for further research
- Composition
 - Provide evidence that supports your interpretation.
 - Select only the most important points from each source.
 - Use direct quotation only when necessary.
 - Summarize the information and synthesize showing that you understand how the sources apply to you.
 - Maintain your voice by including your ideas and words.
 - Avoid plagiarizing.
- Revision
 - Verify conformity to guidelines.
 - Eliminate unnecessary information and/or words.
 - Eliminate jargon and slang.
 - Verify source documentation.

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Quick Facts – Displaying Data

The main goal for displaying data is to do so clearly and accurately.

- Display as much information as possible without confusing the message.
- Avoid frills – 3D and unreasonable use of color
- Maximize data-ink and minimize non-data ink
 - Avoid heavy grids
 - Erase non-data ink
 - Avoid overly busy grids and excess ticks
 - Avoid redundant legends, boxes, shadows, pointers
 - Replace enclosing box with an x/y grid
- Keep appropriate significant figures, when displaying numbers
- Avoid using pie charts
- Select an appropriate scale, Excel does not always select an appropriate scale.
- Do not always be content with Excel's default setting.

Below are quick facts about commonly used graphs.

- Histograms
 - Single variable data collected into groups (bins)
 - Good for large amounts of data
 - Shows general patterns
 - 5-15 bins
 - Excel is very poor at histograms and is not a standard graph (histograms are not bar graphs)
- Scatter plots – shows possible relationships between two variables
- Box and Whisker Plot (boxplot)
 - Used to summarize a set of data
 - Show minimum, maximum, median, lower quartile, and upper quartile
 - Can be used to compare more than one data set

Quick Facts – Data Analysis/Statistics

Methods of Displaying Data – choose the appropriate ones

1. Box Plot
2. Stem Plot
3. Table (how organized)
4. Circle graph
5. 2-dimensional coordinate graph
6. 3-dimensional coordinate graph
7. Histogram
8. Bar Graph
9. Line Graph

Descriptive Statistics

Used to describe the basic features of the data in a study.

They provide simple summaries about the sample and the measures.

Distribution - summary of the frequency of individual values or ranges of values for a variable. The simplest distribution would list every value of a variable and the number of persons who had each value. Most commonly displayed with a frequency distribution.

Central Tendency - estimate of the "center" of a distribution of values

Mean

Median

Mode

Dispersion - refers to the spread of the values around the central tendency

Other terms to keep in mind when doing your statistical analysis

Range, Interquartile range, Variance, Standard Deviation

$$\sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$$

where:

x = each score

\bar{x} = the mean or average

n = the number of values

\sum means we sum across the values

Inferential Statistics - to reach conclusions that extend beyond the immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think. Or, we use inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study.

Linear Model or Regression analysis/error analysis

- If data is bivariate
Use the following link to answer further questions
<http://www.socialresearchmethods.net/kb/genlin.php>

t-test

- has two groups (usually a treatment group and a control group)
- uses a post-only measure
- has two distributions (measures), each with an average and variation
- Assesses probability that any differences between the two groups found were not by chance.

Use this link to review how to use a t-test:
http://www.socialresearchmethods.net/kb/stat_t.php

ANOVA

- Differences between three or more groups.
- One-tailed vs. two-tailed

Link with an example and the opportunity to calculate a result:
<http://www.physics.csbsju.edu/stats/anova.html>

Chi-square statistic

Used to test differences in categorical variables between two or more groups.

Link: <http://www.physics.csbsju.edu/stats/chi-square.html>

Remember your statistical analysis is not limited to the things listed on this page. There are many other valid methods of completing the statistical analysis depending on your project and data. These are simply suggestions about commonly used methods. If you have other questions please ask Mr. Blythe (he is our stats expert).

Quick Facts – Results

- Summarize your findings in text and illustrate them, if appropriate, with figures and tables.
- In text, describe each of your results, pointing the reader to observations that are most relevant.
- Describe results of control experiments and include observations that are not presented in a formal figure or table, if appropriate.
- Analyze your data (statistical analysis), then prepare the analyzed (converted) data in the form of a figure (graph), table, or in text form.
- Do not discuss or interpret your results, report background information, or attempt to explain anything.
- Never include raw data or intermediate calculations in a research paper.
- Do not present the same data more than once.
- Text should complement any figures or tables, not repeat the same information.
- Use past tense when you refer to your results, and put everything in a logical order.
- Complete and well designed visuals are imperative.
- Make sure visuals are titled and clearly labeled; figure 1, figure 2, table 1, table 2 etc.
- Nothing your readers **can dispute** should appear in the Results section.

Quick Facts – Conclusions/Discussion

- State what you think your research supported, or didn't support (do not use the word proven etc.).
- Without repeating results, indicate how you know you supported or not.
- Mention the relevance of your findings (but don't just rewrite your introduction).
- What went well?
- What didn't?
- What should others consider if interested in replicating your study?
- What other research would support your study?
- What other research ideas do you suggest related to your study?
- Emphasize your dedication and excitement about your study.

Quick Facts – Methods and Procedures

The procedure is the set of steps that you will follow to conduct your experiment. This should be detailed so that another person would be able to do the research following your directions. Leave out obvious instructions like "Gather all the materials." The steps of the procedure should be in numbered or bulleted form, not in a paragraph. You should also identify the independent variable, the dependent variables, and the control.

Some important things to keep in mind when designing your experiment are:

1. Imagine yourself doing it --from beginning to end.
2. State a hypothesis. This will give you a starting point for your procedure.
3. List all materials needed, including amounts and/or measurements.
4. Include significant diagrams and sketches.
5. Try to test only one independent variable in the experiment. Sometimes this is not possible, depending on the experiment.
6. Include a control--a test or condition to compare your experiment to.
7. Do several trials to check results.
8. Review plan for accuracy (correctness), completeness (all details explained), and safety (eye goggles, glasses, apron, etc.).
9. Share your procedures with someone who will try to imagine doing it and who will give suggestions to you.
10. Revise steps or add new ones based on ideas your partner suggested.
11. As you complete the experiment, make any necessary changes to your procedure. If you don't complete a step, do not leave it in the procedure!

Quick Facts – Etiquette

Everyday Etiquette

- RSVP for an invite event declining or accepting the invitation
- All Harford County Public School dress code policies are expected to be followed in addition to any dress codes established by the mentor or employer
- Do not bring uninvited guests to work functions
- Turn cell phone off or to silent mode
- Use thank you notes when appropriate
- Use names of superiors and colleagues when appropriate
- Use Mr., Mrs., Dr., or other appropriate name prefix when addressing anyone, unless otherwise told to use another name.

Phone Etiquette

- Place your call in a quiet place free of distractions and background noise
- Do not chew gum or use a computer while talking
- Have a pen or pencil and paper ready before making the phone call
- When calling greet the person on the other end with an appropriate greeting and be sure to include your name
- Keep a smile on your face, it shows even on the phone
- Speak clearly and into the phone so you may be heard clearly the first time you speak
- Know what you want to say when you make the call. Avoid using “ah” and “um” they are time wasters
- Be sure to take notes on anything you feel may be important
- Get more direct contact information for the person in case you need to get in touch with them in the future
- When ending the call be sure to thank the person for their time. Be short and straight to the point
- Avoid using cell phone to place the call since cell phone coverage may be an issue

Conversation Etiquette

- Use eye contact when speaking to someone
- When first meeting a person shake hands with a firm but not crushing grasp
- Use a proper volume when speaking to someone
- Speak clearly and avoid using big words to seem smart
- Keep your laugh under control. Not too loud or long
- Avoid talking with your hands
- Avoid talking about other people’s personal lives

Netiquette

- Always include a subject for all e-mail
- Do not use peculiar fonts, or fonts that are too small or too large
- Times New Roman, Arial, or Courier New are all acceptable fonts and 12 point is appropriate size
- When including the salutation be sure to be as specific as you can. If you know the name use it
- At the end be sure to use sincerely, or some other form of ending salutation

- Mind your P's and Q's (Please and Thank You)
- Use a white background and black font. No colored fonts or backgrounds
- Do not use any abbreviations in the body of the letter
- Check and Double Check your grammar
- Make the body of the letter short and to the point.
- Remember everything written in a letter is in permanent form and could be held against you. Be careful what you say

Quick Facts – Technical Writing

The purpose of a research report is to share your research with others. Consequently, you will have completed most of your research before you begin your report.

- Data collection and interpretation
- Literature search
 - Consult journals important in your field.
 - Conduct a key word search of library databases.
- Prewriting – Answer the following questions.
 - What is the purpose of your research?
 - What is the most important feature of your research?
 - Who contributed to your research? Who could be involved in writing the report?
 - Which works by other researchers did you use in your own research?
 - How does your research prove or disprove other researchers' work?
 - What is the background of this subject?
 - What did you expect to find before you started your research? Explain if and how your project changed over time. Explain if and how your results differed from your expectations.
 - What were your results and how did you check them? Can you best represent them with text, in a table, with a figure, etc.?
 - What are the consequences of your research? What is the importance to the subject and how will it affect future research?
 - Who comprises the ideal audience? Who would be most impacted and best understand the consequences of your research?
 - In which journals would you like to publish your report? Analyze language used in journals that interest you.
 - What are the specific guidelines? What sections are you required to include?
- Drafting – There are eight sections you might include.
 - Title page – Use format directed by instructor and choose title which accurately reflects the content of your report.
 - Abstract – Provide readers with a highly condensed (150 words) version of your report. See page 22 for more details.
 - Table of contents – List each major section and include descriptive headings if necessary.
 - Introduction – Prepare the reader for your report by introducing the purpose, scope, and background of your research. See page 24 for more details.
 - Body – Include all evidence (details, data, results of tests, facts, and conclusions) readers need in order to understand the subject. Some typical sections follow:
 - theories, models, and your own hypothesis
 - materials and methods
 - presentation and interpretation of results
 - Recommendations – Include this section if your results and conclusions indicate a need for further work or you have a solution for a problem.

- References – List sources you used so that other researchers can expand or duplicate your research. This section helps establish the credibility of your information. Include references that you cited directly and those which provided significant information for your report. When listing sources, use only the style outlined by the American Psychological Association (APA).
- Appendices – Use an appendix only to avoid interrupting the flow of information in the body of your report. The data included in each appendix must be relevant and separated from other sets of data.
- Revising – Continue to streamline your report. Aim for concise but thorough reporting, and pay attention to the following areas to improve your writing.
 - sentence clarity
 - making subjects and verbs agree
 - active and passive voice
 - sentence fragments
 - transitional devices
 - independent and dependent clauses
 - using pronouns clearly
 - non-sexist language
 - proofreading for commas

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Quick Facts – Abstract

An abstract is a highly condensed version of your research report. It should meet the following requirements within a 150-word paragraph.

- Introduce subject matter
- Tell what was done
- Present selected results

Your abstract should expedite others' research by communicating the scope of a research report and the topics discussed. Scientists should be able to read your abstract and determine whether the information in your full report is pertinent to them. Knowing your audience is essential to writing an effective abstract. Answer the following questions to determine what you will include.

- What makes my research interesting to another researcher?
- Which aspects of my research are most important?
- What additional information will the reader need in order to understand my most important aspects?
- What are the main points in each section of my report?

You will write an informative abstract which summarizes the key information from every major section in the body while providing the key facts and conclusions. Provide a 1-2 sentence summary for each of the major parts (e.g. introduction, research problem, body, results, and conclusion), and include important numerical data.

http://www.unc.edu/depts.wcweb/handouts/literature_review.html

Quick Facts – Power Points and Oral Presentations

- Principles of professional Power Points
 - Consistency
 - One background
 - One font and size for titles
 - One font and size for body text
 - Consistent colors
 - Consistent transitions/animations
 - Make sure that the presentation does not distract from the presenter or content
 - Color
 - High contrast
 - Color is not for decoration, but emphasis and separation of information
 - Titles
 - Titles should be slightly larger than the body text
 - Maximum of 2 lines for a title
 - Titles should be in the same spot for all slides
 - Tables – Do not pack too much content into a table
 - Fonts and Text
 - Avoid all caps
 - There needs to be “white space” or empty spaces
 - Remember: If you are just going to read the slide, give the audience a handout
- Oral presentations
 - Planning
 - Plan for the audience you will be talking to.
 - Plan for the time allotted
 - Make sure you are experienced with all aspects of the topic
 - Organize your presentation in a logical order
 - Practice
 - Practice timing
 - Practice in front of someone
 - Practice with your visuals
 - During the presentation
 - Be positive
 - Avoid reading
 - Use visual aids when relevant
 - Maintain eye contact

Quick Facts – Writing an Introduction

Capture your reader's attention and introduce your report with an explanation of purpose, scope, and background information. Tailor your introduction to your audience by including the amount of detail appropriate to someone knowledgeable in your field. For each part of the introduction, consider some of the following questions.

- Purpose – Why? This part explains the reason for your research and report.
 - What did you prove or discover with your research?
 - What problem did you explore?
 - Why did you choose this problem?
 - Why are you writing this report?
 - What do you want the reader to know or understand after reading your report?
- Scope –How much? This part explains the area covered by your report and outlines your method of investigation.
 - What method did you use on the research problem?
 - Why did you choose that method?
 - Where there other approaches you could have taken? If so, why didn't you?
 - What circumstances/elements contributed to the method you chose for researching this problem? Which was the most important determinant?
- Background information – What else? This part provides information essential for the reader to understand the report. This might include events leading to the authorization of the project, details of previous work on the problem, or reviews of theories related to the problem.
 - What does the reader need to know to understand your report?
 - Why did your instructor authorize the project?
 - Who has done previous work on the problem?
 - Which a theory or model helped shape your project?
 - What are some facts that support or refute the theory?
 - What will be the reader's prior knowledge related to your report?

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Performance Evaluation by Mentor/Faculty Advisor

Subject to change
 SRT 12 – Performance Evaluation by Mentor/Faculty Advisor
 The Science and Mathematics Academy

Name: _____ Advisor: _____

Research Topic: _____ Mentor: _____

Dates for Evaluation: _____

Work Log (10 points): If you are unable to attend, call AND email your mentor AND advisor in advance. All 10 points will be lost if you miss SRT on or off campus. Complete the page in pen.

Day / Date	Time In / On Time	Time Out	Comments
Mentor Signature:	Date:	Advisor Signature:	
Total Days Student Worked:			

Appraisal (35 points): Mentors: please complete the checklist pertaining to the workdays listed above in pen.

Criteria Description	No	Yes / n/a	Results / Comments:
Exhibits professional behavior			
Is on task ALL the time			
Demonstrates independent thinking and asks questions as needed			
Does NOT disrupt others			
Cleans up materials, chairs, field equipment, lab area, etc.			
Demonstrates excellent workplace and social etiquette and courtesy at all times.			
Positive Attitude			

Contract: Student Agreement

The Student agrees to:

1. Receive no pay for any work done in this placement.
2. Be on time and attend any scheduled meetings with the mentor.
3. Notify the mentor and school coordinator in case of absence or lateness in advance when possible.
4. Exercise honesty, courtesy and have a cooperative attitude while respecting and obeying rules of the mentor and his/her worksite.
5. Dress appropriately in accordance with business requirements.
6. Notify the school coordinator of any problems, issues or questions.
7. Not accept transportation from another student or offer transportation to another student.
8. Adhere to all policies of Harford County Public Schools and understand that school policies also apply to the work site.
9. Ensure that he/she has a valid driver's license if he/she drives to work site.
10. Accept responsibility for their own negligent actions.

Contract: Mentor Agreement

The Mentor and their sponsoring organization agree to:

1. Not pay the student any wages for work performed during this placement.
2. Not require a student to be present when school is not in session.
3. Ensure that commercial general liability insurance for business (including liability arising from student activities at the work site) is in effect.
4. Provide a certificate of insurance from the place of employment showing evidence of current coverage for General Liability.
5. Permit the school coordinator to make regular visits to the work site.
6. Provide a positive and safe learning environment and experience.
7. Be available to the student for questions, help and to provide guidance, etc.
8. Clearly define the company's expectations and the student's responsibilities, as applicable.
9. Notify the school coordinator of any problems with the student.
10. Provide the student with adequate supervision.
11. Ensure that the student works with or along side several people. Situations where the student works alone or with just one other person in non-open areas should occur only when required by project necessity and with the concurrence of the school coordinator.
12. Indemnify and hold harmless the Board of Education of Harford County, its officers, agents, and employees from any and all claims, loss actions, liability, demands, suits, or costs including attorney's fees and other costs connected therewith, arising out of or in any way related to this experience and/or placement.

Contract: Parent/Guardian Agreement

The Parent/Guardian agrees to:

1. Support the senior capstone project as a learning experience program for their child.
2. Give permission for the student to participate fully in the mentorship program.
3. Give permission for the student to leave school campus for the work-based learning placement, if required in the project proposal.
4. Arrange for transportation to and from the project work site.
5. Ensure and provide automobile insurance which covers the student's vehicle, and a valid driver's license, if the student drives that vehicle to the project work site.
6. Immediately notify the school coordinator if the insurance or driver's license status changes and to cease allowing the student to drive to the project work site, if the student may no longer legally drive.
7. Accept liability and responsibility for the student's travel to and from the project work site.
8. Accept responsibility for any negligent actions on the part of the student, if allowed by law.

Resources: Contact Information

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