AP Research
Summer Assignment
Dear Researcher,  1 May 2017

We must first and foremost congratulate you on your interest in challenging yourself with the AP Capstone program. The skills that you have and will continue to acquire due to the Capstone program are paramount in your post-high school success. So, to your dedication, we salute you!

Now, down to business. The following summer work has been created after much consideration and discussion with other AP Research colleagues as well as input from this year’s AP Research students who all wished they had started the year with this work already completed. I realize this looks like a lot for the summer, but we know that if you frontload before the year starts you will alleviate some stress later when you also have other classes to contend with. I am NOT about busy work, but there are some concepts and items that you need to establish for yourself prior to starting AP Research. One such concept is that this course is more self-directed than your other high school classes; this should make you realize then that this course is not about your grade but about learning. Consequently, when we recommend you complete work—instead of require it for a grade—you need to be motivated enough to actually do it because it will help you be successful.

These concepts, and others, should be considered while taking long walks on the beach, while sitting in the back of the car on a road trip, while trying to fall asleep at camp, while playing video games, or whatever summer activity enhances your life. Know that you will be asked to dig deep, so please start now. You are NOT required to have written response to the following questions; however, we recommend you to spend some time thinking about them before you start the actual assignment: What is “research”? Who is the audience for published research articles? Who is the audience for your research project? Why did I choose to take AP Research? How do I think AP Research will be different than AP Seminar? How intrinsically motivated am I to be successful in a self-directed course?

Our second recommendation for the summer is that you read Part I and II of The Craft of Research by Booth, Colomb, and Williams. Simply do a Google search for the title to find a free pdf file for either the 2nd or 3rd edition. If you prefer reading a hard copy book, see if you can check it out of the library. Reading these 100 pages will give you a considerable advantage when you go to complete the required written assignment. It would be even better to read the whole book.

Here is the URL: http://course.sdu.edu.cn/G2S/eWebEditor/uploadfile/20140306165625006.pdf

**Required Summer Research Question Work PART I:**

Similar to AP Seminar, the College Board wants you to start your AP Research project with a leading question. The following concepts are things to consider when attempting to build an AP Research leading question. As resources you have been given a separate handout about research questions and the list of research questions from this year’s research projects. However, it is essential that you realize not all research questions are created equal (hint: some of the ones from this year are better than others).

Remember, the discipline, specific topic, and research question you decide to work with must hold your interest for the entire year. Sit and reflect about your true interests for this course prior to settling on a discipline, specific topic, and research question; you must be passionate about your choice. Also, please realize that this is just an initial research question; by the time you actually start the methods-driven study portion of your project, you may have revised your question numerous times, and no one will be able to proceed past this basic assignment without teacher approval for your research question.

The following elements are critical when attempting to build your research question. As you proceed it is essential that you consider these four major concepts in connection to your research project: focus, scope, value, and feasibility. Use the table below as a guide to help you develop a solid initial research question. You are not required to have written answers for the reflection questions, but it is highly recommended that you be able to articulate an answer for each one. If you cannot, perhaps there is a problem with your chosen topic and research question.

By the end of the process for PART I you should be ready to start putting your ideas down in black and white. Create a document that includes the following information:

<table>
<thead>
<tr>
<th>Example</th>
<th>Jane Doe</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 August 2017</td>
<td>AP Research Summer Assignment</td>
</tr>
</tbody>
</table>

**PART I**

Your Discipline
Your Specific Topic
Your Research Question
<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
<th>Reflection Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td><strong>Research Discipline &amp; Topic</strong>&lt;br&gt;&lt;br&gt;<strong>Discipline:</strong> Lens or section of focus&lt;br&gt;- Art&lt;br&gt;- History&lt;br&gt;- Humanities&lt;br&gt;- Hard Sciences&lt;br&gt;- Social Sciences&lt;br&gt;- Mathematics&lt;br&gt;&lt;br&gt;<strong>Topic:</strong> Specific interest within a discipline that creates the basics of your research question</td>
<td>1. What discipline would you enjoy working in during your research?&lt;br&gt;2. What specific topic are you interested in examining?&lt;br&gt;3. Why are you interested in this particular topic?&lt;br&gt;4. What can you add to the body of knowledge that already exist on the topic?</td>
</tr>
<tr>
<td>Scope:</td>
<td><strong>Depth:</strong> The level of detail&lt;br&gt;<strong>Breadth:</strong> The number of topics discussed (i.e., all people, teenagers, infants, etc.)&lt;br&gt;<strong>Context:</strong> The specific setting of your research (i.e., a lab, a classroom, a sound booth, etc.)&lt;br&gt;<strong>Variables:</strong> The items/people/situations/issues/concepts being studied and/or manipulated (i.e., blood pressure &amp; music selection, IQ, personality type, &amp; instructional method)</td>
<td>1. What specific things will you study? People? Animals? Concepts? Theories?&lt;br&gt;2. How can you limit the scope of your research question to make your project more feasible?&lt;br&gt;3. How and/or where will you work with these variables?</td>
</tr>
<tr>
<td>Value:</td>
<td><strong>Contribution to the Body of Knowledge</strong>&lt;br&gt;&lt;br&gt;The value or significance of your research is determined by how your contribution enhances what is already known about the topic. You are required to fill a gap in the body of knowledge (BoK) by either adding to the current conversation of the discipline or using multiple discipline conversations to create a new understanding. You are not merely compiling or rehashing information; you are bringing something new to the table.</td>
<td>1. How will your research change the way we currently see the topic? How will it fill a gap?&lt;br&gt;2. What can you add to the body of knowledge that already exists on the topic?&lt;br&gt;3. How will your research benefit society or your discipline?&lt;br&gt;4. Will you create a new piece of art, music, dance, or theatre as part of your project?&lt;br&gt;5. Will you design and create a new device or product as part of your project?</td>
</tr>
<tr>
<td>Feasibility:</td>
<td><strong>Possibility of Research</strong>&lt;br&gt;&lt;br&gt;Time, money, and resources will play a major role in determining your ability to complete your research project. This may include a research lab, special software, access to secondary data, art supplies, special equipment, etc.&lt;br&gt;&lt;br&gt;You will be required to design a research method to answer your question. Once you have developed a research methods, you will actually only have about 2 to 3 months to complete the methods-driven research study portion of your research project.&lt;br&gt;&lt;br&gt;The time leading up to it will be filled with learning the basics of scholarly research, conducting a review of the literature to become an expert on your topic, and designing your research methods (i.e., quantitative vs. qualitative, mixed methods, correlational, action research, phenomenological, experimental, etc.).</td>
<td>1. What method will you need to use to answer your research question? How will you generate new data with your method?&lt;br&gt;How will you analyze that data?&lt;br&gt;2. What will you need, physically and/or monetarily, to complete your research project?&lt;br&gt;3. How long will the methods-driven research study portion of your research project take?&lt;br&gt;4. Do you have access to the things you need for your research? (Refer back to scope as you address this.)&lt;br&gt;5. Who can help you with your research? Who might be potential experts/advisors?</td>
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</table>
Required Summer Research Question Work PART II:
After you have completed the initial reflection and thinking required in PART I and created the brief written portion for PART I, you are ready to complete the written work for PART II on the same document.

Explain the focus, scope, value, and feasibility of your research question. Write a detailed paragraph for each (for a total of 4 paragraphs) and include a subheading above each paragraph that identifies which element you are addressing (i.e., focus, scope, value, feasibility). The reflection questions included in the above table should help you with each explanation. In a 5th detailed paragraph under the subheading “Potential Challenges & Problems,” address this question: What challenges or problems do you anticipate as you proceed with this project?

Required Summer Research Question Work PART III:
Now it is time to start gathering sources and building an understanding of the body of knowledge and how scholarly research works. Use the research skills you gained in AP Seminar to gather 10 sources that will help support you in this process. Use the table below to help you understand the 2 types of sources you will be using this year: Anchor Sources and Mentor Sources. You are required to find 7 to 8 Anchor Sources and 2 to 3 Mentor Sources for a total of 10 sources.

<table>
<thead>
<tr>
<th>Type Of Source</th>
<th>Explanation</th>
<th># Required</th>
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<tbody>
<tr>
<td>Anchor Sources</td>
<td>These are sources:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• in your discipline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• about your specific topic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• that are most often scholarly, peer-reviewed articles</td>
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<td></td>
<td>• that address differing perspectives on your topic</td>
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<td></td>
<td>• that include contrasting views about your topic</td>
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<tr>
<td></td>
<td>• that include information you may include in your literature review</td>
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<tr>
<td></td>
<td>• that teach you about your specific topic</td>
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<td></td>
<td>• that help you become an expert on your specific topic</td>
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<td></td>
<td>• that help you improve your ethos</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• that help you identify the gap in the research</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• that help you understand the significance of your research question</td>
<td></td>
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<tr>
<td></td>
<td>• that ANCHOR your understanding of the body of knowledge in your discipline</td>
<td>6 to 7</td>
</tr>
<tr>
<td>Mentor Sources</td>
<td>These sources:</td>
<td>2 to 3</td>
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<tr>
<td></td>
<td>• may or may not be in your discipline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• may or may not be about your specific topic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• are most often scholarly, peer-reviewed articles</td>
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<tr>
<td></td>
<td>• may include similar variables as your research project</td>
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<tr>
<td></td>
<td>• include a research design or method similar to what you might use to answer your question</td>
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<td></td>
<td>• include similar data analysis methods</td>
<td></td>
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<tr>
<td></td>
<td>• teach you how to conduct a research study</td>
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<td></td>
<td>• teach you about a particular element of the research process</td>
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<td></td>
<td>• help you improve your ethos</td>
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<tr>
<td></td>
<td>• do NOT necessarily help you identify the gap in the research</td>
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<td></td>
<td>• do NOT necessarily help you learn about your specific topic</td>
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<td></td>
<td>• act as a MENTOR to you as a researcher</td>
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Required for each of the 10 sources:
- Bibliographic information in either MLA or APA documentation style (use the one most common in your discipline)
- A detailed paragraph that summarizes the sources in your own words
- Identify what type of source it is (i.e. Anchor or Mentor) and address why the source is valuable to your success; this should be completed in one or three sentences at the end of the paragraph that complete the appropriate statement for the source:
  - “This ANCHOR SOURCE is valuable to my research project because…”
  - “This MENTOR SOURCE is valuable to my research project because…”
NOTE FOR STUDENTS COMPLETING SCIENCE FAIR PROJECTS:
If you are continuing a project from a previous year, the College Board requires that your project—and ultimately, your paper and presentation—for AP Research be new; in other words, there must be a new research question and research method/design to generate new data. You are NOT allowed to merely rehash what you have already done or use the same data you have already generated or use the same paper you have already written. Additionally, any project that complies by ISEF rules is allowed as long as it can get IRB/IACUC approval. The College Board is not going to restrict your research as long as you follow the rules established by the university & ISEF; this includes projects involving working in a lab at UL, cell cultures, recombinant DNA, or any sort of chemical.

NOTE ABOUT EXPERT ADVISERS AND MENTORS:
We highly recommend that every student in AP Research locate an expert adviser or mentor, even if you are not working in a lab at U of L. This can be a difficult process, so we have included some resource materials about the do’s and don’ts of contacting professors and other potential mentors. We will eventually address this in class, but some of you may want to get a head start. We do NOT recommend that you actually contact them over the summer before school starts unless you have a contact that will make the introduction for you. However, compiling a list of potential mentors and drafting email communications over the summer would help you feel more confident about asking professors for assistance. If you have the messages written when we start school, you can set up a conference with your AP Research teacher to read over your messages and give you some feedback before you actually send them.

If anyone wants to work in a lab at U of L, the optimal time to search for one is August; this is when the graduate student rotation opens up lab spots. Sometimes professors are willing to take on students in their labs only if the student has some pre-existing connection to the university. Lucky for you we have a current AP research student who has such a connection: Madison Sneve. She directs a STEM lecture series with U of L professors, and as a result she knows some faculty members in most science departments, especially neuroscience. She is willing to correspond with you over the summer: madison.sneve@gmail.com. Please be respectful of her time and realize she is not going to do all of the work for you; she is merely willing to help you.

You may email me during the summer if you have questions, but I do not check my school email regularly.

alesia.williams@jefferson.kyschools.us

Other resources you may find helpful:
1. Practical Research: Planning and Design by P.D. Leedy and J.E. Ormrod
3. The Bedford Researcher by Mike Palmquist
4. USC’s Library Guides at http://libguides.usc.edu/

DUE ON THE 1ST DAY OF CLASS

Remember:
Research is a recursive process.
This is only one small step in that quest.

Adapted from an assignment originally created by Emily Lott.
AP Capstone Program:

from the AP Research Course and Exam Description Book

Components

The following components are formally assessed:

<table>
<thead>
<tr>
<th>Component</th>
<th>Scoring Method</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Paper (AP) 4,000-5,000 words</td>
<td>Teacher scored, College Board validated</td>
<td>75%</td>
</tr>
<tr>
<td>Presentation and Oral Defense (POD) (15-20 minutes total for presentation followed by three or four questions from a panel of three evaluators)</td>
<td>Teacher scored</td>
<td>25%</td>
</tr>
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</table>

Task Guidelines

Students develop a research question/project goal on a topic of their own choosing in an area of personal interest. They submit an inquiry proposal (see Inquiry Proposal Form, p. 55) for the teacher's approval, and teachers provide feedback that helps students refine their research questions/project goals. Once the inquiry proposal is approved, students begin their background research (i.e., review of previous scholarship) on their topic.

With assistance from the teacher, students may identify one or more expert adviser(s) — internal or external to the school — to serve as an additional resource. The expert advisers should be experts in the chosen discipline or field that the student is investigating or in the research method that the student chooses to employ.

Under the teacher's guidance — and using the expert advisers' expertise as needed — students design or choose a method to collect data and information and then analyze, evaluate, and select relevant and credible evidence to develop a logical, well-reasoned argument or aesthetic rationale that results in an academic paper of 4,000-5,000 words. The argument or aesthetic rationale must directly address the research question/project goal. If the academic paper is accompanied by an additional piece of scholarly work (e.g., performance, exhibit, product), this work is not formally assessed but is viewed by the teacher and panelists to contextualize the student's research.

Academic Paper (AP)

The academic paper must contain the elements listed in the following table. These elements should be presented in a style and structure appropriate to the discipline in which the topic resides (e.g., psychology, science, music).
The nature of students' inquiries is open-ended in that students' approaches to their investigations and the type of research they conduct may vary widely. However, every student is expected to produce a paper that addresses his or her inquiry, and all papers will be subject to the same standards of college-level work that demand research conducted at a deep, rigorous level.

Students must avoid plagiarism by acknowledging, attributing, and/or citing sources throughout the paper and by including a bibliography. Students must also observe ethical practices when gathering information through such vehicles as interviews or discussions, and be prepared to sign agreements with individuals, institutions, or organizations that provide primary and private data. Students should also be prepared to obtain institutional review board (IRB) approval prior to engaging in research involving human subjects. Graphs, data tables, images, appendices, abstract, and the bibliography are not part of the total word count for the academic paper.

Presentation and Oral Defense (POD)
All students will develop a 15-20 minute presentation (using appropriate media) and deliver it to an oral defense panel of three evaluators.
What is a Research Question?

A research question guides and centers your research. It should be clear and focused, as well as synthesize multiple sources to present your unique argument. Even if your instructor has given you a specific assignment, the research question should ideally be something that you are interested in or care about. Be careful to avoid the “all-about” paper and questions that can be answered in a few factual statements.

Examples:

1. For instance, the following question is too broad and does not define the segments of the analysis:

   Why did the chicken cross the road?
   (The question does not address which chicken or which road.)

2. Similarly, the following question could be answered by a hypothetical Internet search:

   How many chickens crossed Broad Street in Durham, NC, on February 6, 2014?
   (Ostensibly, this question could be answered in one sentence and does not leave room for analysis. It could, however, become data for a larger argument.)

3. A more precise question might be the following:

   What are some of the environmental factors that occurred in Durham, NC between January and February 2014 that would cause chickens to cross Broad Street?
   (This question can lead to the author taking a stand on which factors are significant, and allows the writer to argue to what degree the results are beneficial or detrimental.)

How Do You Formulate A Good Research Question?

Choose a general topic of interest, and conduct preliminary research on this topic in current periodicals and journals to see what research has already been done. This will help determine what kinds of questions the topic generates.

Once you have conducted preliminary research, consider: Who is the audience? Is it an academic essay, or will it be read by a more general public? Once you have conducted preliminary research, start asking open-ended “How?” “What?” and “Why?” questions. Then evaluate possible responses to those questions.
Examples:

Say, for instance, you want to focus on social networking sites. After reading current research, you want to examine to what degree social networking sites are harmful. The Writing Center at George Mason University provides the following examples and explanations:

Possible Question: Why are social networking sites harmful?
An evaluation of this question reveals that the question is unclear: it does not specify which social networking sites or state what harm is being caused. Moreover, this question takes as a given that this “harm” exists. A clearer question would be the following:

Revised Question: How are online users experiencing or addressing privacy issues on such social networking sites as Facebook and Twitter?
This version not only specifies the sites (Facebook and Twitter), but also the type of harm (privacy issues) and who is harmed (online users).

While a good research question allows the writer to take an arguable position, it DOES NOT leave room for ambiguity.

Checklist of Potential Research Questions in the Humanities (from the Vanderbilt University Writing Center):

1) Is the research question something I/others care about? Is it arguable?
2) Is the research question a new spin on an old idea, or does it solve a problem?
3) Is it too broad or too narrow?
4) Is the research question researchable within the given time frame and location?
5) What information is needed?

Research Question in the Sciences and Social Sciences

While all research questions need to take a stand, there are additional requirements for research questions in the sciences and social sciences. That is, they need to have repeatable data. Unreliable data in the original research does not allow for a strong or arguable research question.

In addition, you need to consider what kind of problem you want to address. Is your research trying to accomplish one of these four goals?¹

1) Define or measure a specific fact or gather facts about a specific phenomenon.
2) Match facts and theory.
3) Evaluate and compare two theories, models, or hypotheses.
4) Prove that a certain method is more effective than other methods.

Moreover, the research question should address what the variables of the experiment are, their relationship, and state something about the testing of those relationships. The Psychology department at California State University, Fresno, provides the following examples and explanations:

Examples:

Possible research question: *Are females smarter than males?*
This question delineates the variables to be measured: gender and intelligence. Yet, it is unclear how they will be evaluated: What method will be used to define and measure intelligence?

Revised question: *Do females age 18-35 score higher than adult males age 18-35 on the WAIS-III?* (The WAIS-III is a standardized intelligence test.)
This research question produces data that can be replicated. From there, the author can devise a question that takes a stand.

In essence, the research question that guides the sciences and social sciences should do the following three things:  

1) Post a problem.
2) Shape the problem into a testable hypothesis.
3) Report the results of the tested hypothesis.

There are two types of data that can help shape research questions in the sciences and social sciences: quantitative and qualitative data. While quantitative data focuses on the numerical measurement and analysis between variables, qualitative data examines the social processes that give rise to the relationships, interactions, and constraints of the inquiry.

**Writing After the Research Question**

The answer to your research question should be your thesis statement. Keep in mind that you will most likely continue to refine your thesis statement as you conduct and write about your research. A good research question, however, puts you well on your way to writing a strong research paper.

**Helpful Links**

- [http://www.csc.edu/online-writing-center/resources/research/research-paper-steps/developing-questions/](http://www.csc.edu/online-writing-center/resources/research/research-paper-steps/developing-questions/)
- [http://psych.csufresno.edu/psy144/Content/Science/researchquestion.html](http://psych.csufresno.edu/psy144/Content/Science/researchquestion.html)

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Narrowing a Topic
You may not know right away what your research question is. Gather information on the broader topic to explore new possibilities and to help narrow your topic.

- **Choose an interesting topic.** If you're interested in your topic, chances are that others will be, too. Plus researching will be a lot more fun!

- **Gather background information.**
  - For a general overview, reference sources may be useful.
  - The database OneSearch@IU is also a good place to start narrowing your focus and finding resources (libraries.iub.edu/oneseach).
  - Ask yourself:
    - What subtopics relate to the broader topic?
    - What questions do these sources raise?
    - What do you find interesting about the topic?
  - **Consider your audience.** Who would be interested in the issue?

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Reference Sources
Reference sources are a great place to begin your research. They provide:

- a way to identify potential research topics.
- a starting point to gather information on your topic.
- an introduction to major works and key issues related to your topic.
- key authors in your area of research.

General Reference Sources
Dictionaries and encyclopedias provide general information about a variety of subjects. They also include definitions that may help you break down and better understand your topic. They are generally not cited, since they mainly give an overview of a topic.

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From Topic to Research Question
After choosing a topic and gathering background information, add focus with a research question.

- **Explore questions.**
  - Ask open-ended "how" and "why" questions about your general topic.
  - Consider the "so what" of your topic. Why does this topic matter to you? Why should it matter to others?
  - Reflect on the questions you have considered. Identify one or two questions you find engaging and which could be explored further through research.

- **Determine and evaluate your research question.**
  - What aspect of the more general topic you will explore?
  - Is your research question clear?
  - Is your research question focused?
  - (Research questions must be specific enough to be well covered in the space available.)
  - Is your research question complex?
  - (Questions shouldn't have a simple yes/no answer and should require research and analysis.)

- **Hypothetize.** After you've come up with a question, consider the path your answer might take.
  - If you are making an argument, what will you say?
  - Why does your argument matter?
  - How might others challenge your argument?
  - What kind of sources will you need to support your argument?

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Sample Research Questions

<table>
<thead>
<tr>
<th>Clarity</th>
<th>Focused</th>
<th>Simple vs. Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unclear:</strong> Why are social networking sites harmful?</td>
<td><strong>Unfocused:</strong> What is the effect on the environment from global warming?</td>
<td><strong>Too simple:</strong> How are doctors addressing diabetes in the U.S.?</td>
</tr>
<tr>
<td><strong>Clear:</strong> How are online users experiencing or addressing privacy issues on social networking sites like MySpace and Facebook?</td>
<td><strong>Focused:</strong> How is glacial melting affecting penguins in Antarctica?</td>
<td>** Appropriately complex:** What are common traits of those suffering from diabetes in America, and how can these commonalities be used to aid the medical community in prevention of the disease?</td>
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</tbody>
</table>

Research Questions for 2016-2017

Astronomy

Aaron Gallahue "Which of the proposed methods for defending against asteroid impacts would be in the best choice in each scenario for the United Nations in respect to its costs, preparation time activation, effectiveness, and viability?"

Biology

Sarah Crowley "What is the relationship between music and blood pressure in subjects ages 13-18 and how can the relationship be applied to the creation of more effective blood pressure management technologies?"

Mahathi Gavuji "Which method of differentiation of mouse induced pluripotent stem cells produces the most cardiomyocytes in the least amount of time and is not costly?"

Anh Phan "How does the expression of the cytokine TGF-β protect the transplantation of pancreatic islets in a mouse model of type 1 diabetes?"

Jacob Schagene "The correlation between environmental health effects and myopia"

Madison Sneve "What neuron populations are responsible for mechanosensation (touch sensation) on the tongue?"

Chemistry

Sowmya Gangyshetty "How much energy can Nitrogen-doped Carbon, Nitrogen-doped Carbon plus Caffeine, and Nitrogen doped Carbon with Molybdenum Sulfide, catalysts, produce through the process of electrolysis in comparison to the most effective catalyst, Platinum?"

Meena Pattabiraman "Testing the Catalytic Properties of Ammonium Tetrathiomolybdate and Ammonium Tetrathiotungstate using the Hydrogen Evolution Reaction"

Current Issues

Fons Cervera "Is there a higher incidence of sex trafficking in the city of Louisville, Kentucky during Derby time?"

Economics

Tanner Bielefeld Pruitt "How has the North American Free Trade Agreement (NAFTA) impacted the wages of workers employed in the American auto industry and the production of the American auto industry?"

Alice Deters "Why are modern Americans less prone to economic risk-taking than their European predecessors were during the Age of Discovery and what information could such a phenomenon yield regarding the economic well-being of the current United States?"
Education

Kristin Adams “What effect does listening to the musical "Hamilton" have on the interest and test scores of 11th grade students taking AP U.S. history at duPont Manual High School?”

Emma Boggess “How do current methods used for instruction in the high school classroom favor extroverted or introverted traits in a high-performing magnet high school?”

J.P. Gahwyler “Does the Zeigarnik effect have the potential to be beneficially applied towards education?”

Lauryn Johnson “Is there a relationship between correctional educational programs and recidivism in the United States’s State Prisons? Should correctional education be implemented in the United States’s State Prisons?”

Saralee Renick “Do teachers’ expectations for student achievement at an all-magnet high school correlate to students’ socioeconomic status?”

Gender Studies

Madhulika Garmella “In Kentucky with a focus on communities that have an economic basis in coal, does the physical environment (the immense use of coal) affect the role of women, and if so how?”

Lynn Jackson “How has the frequency of articles focusing on women’s health (between 1990-2005) evolved, and how does the variation over the years demonstrate the progress in women’s health representation in journalism in developing countries?”

Savanna Vest “In what ways do high-school-aged young adults’ perspectives toward feminist topics and feminism as a movement align with aspects of modern feminist theory, and how can these attitudes be adequately gauged in an attitudinal survey and account for the complexity of feminism and feminist research?”

Health

Meghan Sharma “To what degree does economic and educational status have on general health literacy?”

Humanities

Caroline Burzynski “To what extent has expanding the audience of the Appalachian Jack Tales to include the wider American public in 1943 impacted the subsequent versions of the Appalachian folktale, ‘Jack and the Old Fire Dragaman’?”

Linguistics

Sri Bhamidipati “How effective are the various Native American language preservation methods implemented in California?”

Political Science

Evan Farmer “What was the nature of the Progressive Movement?”
Caroline Foshee “To what extent, if any, is there a correlation between social media use and the political views of Midwestern, high achieving, urban magnet high school students and their parents? How do the correlations, if existent, indicate any influence that social media has had on the tendencies for children to have more liberal political leanings than their parents?”

Cassie Froedge “What policies can the Kentucky Foster care system implement that states with more effective foster care systems have already implemented?”

Ria Jain “How effective were the carbon taxes in Finland, Norway, the Netherlands, Sweden, and Denmark at reducing carbon emissions?”

Gabe Weber “Which of the three forms of sustainable forest management identified as REDD+, FSC, and CFM will fit best within the Brazilian Amazon region to facilitate the Brazilian economy while also sustaining the natural resources the Amazon Rainforest Provides?”

**Psychology**

Aliza Brown “Can lucid dreaming be used as an effective depression treatment among teens by internalizing the LOC?”

Mikayla Curtis “How does external mental health stigma in adolescents aged 13-14 differ between anorexia nervosa, bulimia nervosa, binge-eating disorder, major depressive disorder, and substance abuse?”

Alexis Embry “How does postpartum depression affect the mother-infant relationship of women bloggers on the most predominantly used online postpartum depression forums and to what extent do those effects last?”

Sarah Korssa “To what extent does breastfeeding duration in an infant’s life influence their cognitive abilities in their adolescent years?”

Bennet Melaku “How does the exposure to Third Culture Kids’ first culture influence their success based on their personality and cognition?”

Maggie Michael “How does the use of social media in a high performing magnet high school affect the emotions of female high school students? How do the emotions change based on time spent on social media in a typical day?”

Will Morgan “Stereotypes at duPont Manual High School”

Maha Pattabiraman “How do the emotions generated by termination of a fetus due to prenatal diagnosis impact communication in a marriage?”

Johanna Murray “How Do the Post-Divorce Relationships of Middle/Upper-Class White Adolescents Compare to Those of Middle/Upper-Class African American Adolescents in a High Performing Educational Environment?”

Angel Payne “How Does Male Bullying Affect Female Body Image Dissatisfaction and Self-Esteem?”

Calla Reed “How and in what ways are implicit racial stereotyping and colorism correlated in a multicultural society such as the United States?”
Meredith Wickenheiser “How does the representation of high school clique stereotypes, as depicted in The Breakfast Club, act as an indicator for adolescent social stereotyping in U.S. magnet high school students today, more specifically in the eleventh grade at a high-performing Mid-Western high school?”

Madeline Wainwright “What genetic correlation does Monoamine oxidase A Gene have on Cluster B personality disorders?

Zach Young “How does daily job stress affect short-term memory performance after 5+ years of exposure?”
duPont Manual Website

http://manuallibrary.weebly.com/

How to Cite Sources

www.citationmachine.net
www.bibme.org
www.easybib.com

http://owl.english.purdue.edu/owl  (use search box to find templates etc.)

http://library.duke.edu/research/citing/within/mla.html

Louisville Free Public Library  www.lfpl.org

Databases, books, journals, research tools
- Use the tab on the side bar and select: Research Tools  search by subject
- Use the tab on the top tool bar and select: Education & Teaching  search by database
- The best databases for academic research are
  o Academic Search Premier (EBSCO)
  o JSTOR
- You will need an LFPL library card to access the databases.

Kentucky Virtual Library  www.kyvl.org

Top tool bar: KYVL Resources

The above tab will link you into a search page that will access EBSCO Host and other databases

For remote access the ID and Password follows:

Username/ID: jeffersonsd2  Password: cutegopher16
eBook Reference Library

The search command will automatically cross reference all books on the database.
or
http://tinyurl.com/3o6yhf5
Password: dupont     Remote Access Secondary Password: remote

Literature Resource Center

All entries are full text.
or
http://tinyurl.com/4y5elh9
Password: dupont     Remote Access Secondary Password: remote

Opposing Viewpoints Database

Current events from news sources, journals, and book excerpts.
or
http://tinyurl.com/43q9gcy
Password: dupont     Remote Access Secondary Password: remote

Gale World History in Context

Articles, book excerpts, videos, etc.
or
http://tinyurl.com/a6h3njt
Password: dupont     Remote Access Secondary Password: remote

Access the school OPAC (online public access catalog) homepage: www.libraryworld.com/opac
ID: dupont manual high (no password required)
Tips for Reading Journal Articles

A quick & efficient way to review an article is to read:

1. Title
2. Abstract
3. Last paragraph in the Background/Introduction/Literature section (i.e. the purpose statement)
4. Scan the Methods section for data source and design
5. Review tables and charts in Results section. If these are unclear, go to 6.
6. Read first few paragraphs of the Discussion section, often summarizing the results and providing implications of the research.
7. Then, go back and check the Methods and Results section (if unclear), or re-read the entire article.

Ultimately, be an active reader. Identify the “what”, “who”, “when”, “where”, “how”, and “why” as you read. Take notes in the margins (if possible) and look up what you don’t know or understand to fill in gaps.

More Tips
- Go from the general to the particular:
  Articles that report experiments were not necessarily intended to be read straight through. Don’t waste time struggling with minute details if you do not first understand the big picture. Before you dive into the article, you should already know roughly what it is going to say! Get that information by reading the title, abstract, and headings and by skimming the introduction, the conclusion (or discussion), and any tables or figures.

- Look for definitions:
  Jargon is usually defined somewhere in the article, at least by subtle context if not explicitly. If you do not understand a concept that is being discussed at length, look around for the definition. It may be helpful to consult a textbook or even a dictionary. Do not just pass over the terms you do not understand.

- Examine the tables and figures:
  Briefly review the tables and figures presented by the authors to obtain a sense of the data presented in the article. Read the title legends to provide a context for the data presented. Note the important patterns that emerge from your review of the data presentation represented in the tables and figures. This review should provide a useful context when reading the methods, results, and discussion sections of the article.

- Selectively read the method and results:
  Read these sections with certain questions in mind. How were the variables measured? Do those measures really capture the conceptual variable, or might they be measuring something else? What did the participants have to do? What were the actual numerical results? Where are the findings that the authors discuss? Are there anomalies that they don’t address? What was the main hypothesis? What were the findings regarding those variables?

- A second reading may be necessary:
  It is not unusual to have to read an article twice to understand its message. Often there is so much information presented that it cannot all be absorbed in one pass. Even experienced scientists need to read articles slowly, carefully, and repeatedly so do not expect yourself to breeze through them! After you have a good feel for the article’s results, go back and re-read the introduction, and finally, go back and read the general discussion to see how the author interprets his or her data.
duPont Manual High School AP Research Expert Advisor Form

This form must be completed and submitted for each expert adviser a student uses.

Student Researcher’s Name (printed):
________________________________________

Title of Project:
________________________________________

ROLE OF EXPERT ADVISERS

Expert advisers represent a resource for teachers and students in a variety of areas (i.e., expertise in specific disciplines, fields, or methods).

Expert Advisers

➢ when asked, should ask questions and provide feedback and guidance to students regarding their choice of research questions, project goals, data- or information-collection methods, and analysis strategies

➢ may hold individual work-in-progress interviews with students to discuss the progress of their papers or presentations, explore issues and/or discuss topics and perspectives, and question students as necessary

➢ may provide necessary background for a topic—including suggesting possible resources—so that students are not disadvantaged in their exploration

➢ may help students with the mechanics of the research process (e.g., strategizing to find answers to questions or helping them understand how to access resources)

➢ may provide general feedback to students about elements of their papers or presentations that need improvement

➢ may vary in number, according to the needs of the paper or presentation

Expert Advisers MAY NOT

➢ generate research questions or project goals for students

➢ conduct or provide research, articles, or evidence for students
➢ write, revise, amend, or correct student work

➢ provide or identify the exact questions a student will be asked prior to his or her defense (i.e., students should be prepared to answer every one of the oral defense questions)

➢ provide unsolicited help (i.e., students must initiate conversations that call for expert adviser feedback, such as asking a question to which the expert adviser can respond)

**Expert Advisers may be drawn from**

➢ the faculty

➢ the community

➢ local or nonlocal businesses and industries

➢ higher education institutions

I agree to act as an Expert Adviser for the above named student. I agree to follow the procedures and guidelines described above.

**Expert Adviser’s Name (printed):**

__________________________

**Signature:**

__________________________

**Date:**

__________________________

**Expert Adviser Institution & Address:**

__________________________

__________________________

__________________________

**Phone:**

__________________________

**Email:**

__________________________
How to Approach a Faculty Member

We’ve all heard it a million times: “It’s not about what you said, it’s about how you said it!” When it comes to contacting faculty members about your desire to get started on a research project, this statement couldn’t be truer. Sometimes, the “etiquette” for contacting an expert in your field can be mystifying... and sometimes, the whole prospect is downright intimidating. Here are some tips from the URO to ease the pressure and increase the chances that you get the kind of response you’re hoping for.

The Do’s and Don’ts of Contacting Professors About Research

DO...

Identify yourself! Don’t write a generic message and then sign it with a first name only. Tell them who you are! Include your major and year in school. If you took a class with this person, mention that. If you were referred to this person by someone else, mention that, too.

Address the individual you’re emailing. Don’t just say “Hi” or “Dear Professor;” this can appear as if you sent out a mass email message, which in turn indicates that you haven’t thought carefully about what kind of research you want to do and who would be an appropriate faculty mentor for your project. It’s also a little casual in tone: addressing the recipient by name instantly sounds more serious.

Sell yourself! You are, in a sense, trying to advertise yourself a little bit in the initial email to a faculty member you might like to work with. Without going overboard or writing an excessively long message, identifying what sparked your interest in doing research is a good way to personalize your message and give them a reason from the outset to believe that your interest is genuine.

...Your homework! This is probably the most important piece of advice we can offer to students who are sending out that first email to a professor. We really encourage students who seek our advice on getting started in research to spend some time looking over what a faculty member’s current research interests are. You may know what field he or she is working in, but knowing whether he or she is specifically focusing on “X” instead of “Y” says that you are already committed enough to the idea of beginning research do some reading on your own. It also suggests that you have a better sense yourself of what kind of research would keep you genuinely interested, and that you aren’t necessarily willing to do anything that comes along. You can find a list of what a professor has recently published by accessing his or her curriculum vitae (basically, an academic resume), which should be accessible the faculty member’s profile on any departmental webpage. Find out what this person focuses on, how long he or she has been investigating that subject, or even what classes he or she has recently taught that relate to the research. Then, go to the library and find one of the recent listed publications, and check it out!

But... the research that faculty members publish is difficult to understand, right? Sure it is! Do you have to understand everything you read? Definitely not! But you CAN look for some of the key terms of the study that would catch someone’s attention in that initial email. Make a list of questions as you read... professors will be impressed by your curiosity and the time you’ve taken to investigate their work, as much as they would be impressed by your comprehension.
Make it easy to set up a meeting. We suggest that you close your email by saying “I am available on such-and-such days of the week at such-and-such times.” Then, this professor has to do is check his or her own schedule and say, “Ok, meet me at THIS time.” It reduces the number of email exchanges that are required to get to that face-to-face conversation.

DON’T...

Send generic emails. You may be reaching out to more than one professor at one time, as you begin searching for a faculty mentor... and, if there are lots of faculty members doing research in the field that interests you, or if your interests are diverse, that’s a perfectly appropriate strategy to help you find the ideal opportunity! It can become a problem, though, when your email messages look like form letters. Here’s a great rule of thumb, or litmus test of sorts, that you can use as you begin this process of making contact with professors. Ask yourself this question: “Could I change the name of the addressee in the salutation of my message and just as easily send it to several people?” If the answer is “Yes,” then you haven’t done it right! You want to personalize your emails (especially using the suggestion above about doing your homework!) and raise questions around which you can build a more in-depth conversation. These initial conversations should all be uniquely framed for the person to whom you are writing.

Neglect proofreading. Silly grammar errors? Just don’t make them.

Give up! Finding the right faculty mentor for your undergraduate research project may take some time. Professors are busy... but they also have enough experience to know when they are perhaps not the best person to sponsor and direct your work. Sometimes, it’s not about you or your credentials — it may just be about the “fit.” You may not get a positive response the first or second or fifth time you send an email. Keep trying! Also, don’t be afraid to get back in touch with professors who turned you down and ask them if they have suggestions about other people you should contact; even if they aren’t able to help you with a research project personally, they might be willing to help you do some networking. Read the bios on our “Research Spotlights” page to find about the some students have taken to find research projects and positions... we guarantee that those paths have not always been straight.

Written by Ashley Owens, Graduate Administrative Assistant 2012
UNDERGRADUATE RESEARCH OPPORTUNITIES

How to Email a Research Professor

Your email should:

- have an informative subject line
- be concise
- be formal: Dear Dr. Smith; Sincerely, Your Name
- not use Mrs. or Ms.
- NOT have slang, abbreviations, or emoticons
- if applying for an opening:
  - address any qualifications the professor is looking for
  - demonstrate your experience
- if asking for a research opportunity:
  - state specifically your interest in that research group (you need to read the professor's website)
  - explain why research is important for your goals
  - ask to schedule a meeting or say that you will be coming to office hours

DO NOT SEND THIS EMAIL

Generalized from an email to a UCSC Professor

Hi Joe,

My name is Name and I am a major in Major. Is there space in your lab for an undergraduate? If so, what is the pay rate?

Thanks,

Name

DO SEND AN EMAIL LIKE THESE

General email to a STEM professor

Subject: Meeting to discuss undergraduate research opportunities in topic

Dear Dr. Professor,

I am a year student at university majoring in major. How you found out about the professor's research. Expression of interest in specific paper or topic. I would appreciate the chance to talk with you about your research in topic of interest and about possible undergraduate opportunities in your lab.

My experience in research experience or class, confirmed my intention to develop my research skills and goal. I know you are very busy. We could schedule an appointment or I can drop by your office hours on day and time.

I have attached my resume and unofficial transcript. Please let me know if there is any other information I can provide. I look forward to talking to you soon.

Best,

Name

---

Generalized from an email to a UCSC professor

Subject: Possible undergraduate research opportunities
Dear Dr. Professor,

I am a [year, major] at [university] and I am writing to ask about opportunities for undergraduate research in your lab beginning [time period]. I have conducted undergraduate research on [topic] with [names] in [program or class]. (Expression of interest in the topic). I would like to continue a path of research on [topic] and would ultimately allow me to [career goal]. I am especially interested in your previous work on [describe a paper or talk].

I have attached my CV and unofficial transcript to this e-mail, but if there is additional information that I have not included that you would like, I would be happy to provide it to you. Thank you for your consideration.

Sincerely,

Ambitious Student
Email address

From University of Virginia, "How to Successfully E-mail Professors"

Dear Dr. Smith,

My name is David Wu and I'm a second year biology major at UVa. In my introductory and upper-level coursework, I've developed a passion for science and am extremely interested in pursuing independent research as an undergraduate. An extensive research experience will greatly help me consolidate my future career choice.

I am personally greatly interested in the molecular biology of stem cells. Recently I read your 2011 paper on the role of microRNAs in the differentiation of muscle stem cells and became fascinated by your work. In particular, I found it amazing that microRNAs can alter the fate of a cell in such a profound way. If possible, I would love to start working on a long-term project in your lab beginning this summer.

Would you be available to meet sometime this week to discuss your research? I would also be happy to volunteer in your lab for a few weeks before we commit to anything to see if this is a good match. My transcript and resume are attached in case you are interested. I look forward to hearing from you!

Thank you,

David Wu

Template from UC Irvine Undergraduate Research Opportunities Program

Dear Professor X:

My name is [Peter Anteater], and I am very interested in becoming involved in research in [Subject Area]. I am a [X year] student with a GPA of [X]. I have taken [Courses] and [Additional Experiences]. My goal is to [Goal].

I have reviewed your faculty profile and am interested in the work that you have done. I was intrigued by your journal article, "[Article Title]." It [Additional Information about Topic]. I would like to get involved in research in this area because it will help me to better prepare for [Goals].

Would it be possible to meet with you to further discuss [Topic] and my possible involvement in research? I am available [Days and Times]. I look forward to hearing from you.

Sincerely,

[Peter Anteater]
Student ID
Address
Finding a Faculty Mentor

The Aresty RA and Summer Science programs are designed to help students find mentors who are actively seeking new researchers. At the same time, we recognize that many students may want to join research projects outside Aresty's programs and will seek mentors on their own. Here are some guidelines for finding a faculty mentor. (The Rutgers department of Molecular Biology and Biochemistry also offers good tips on finding a lab).

Step 1: Identify Potential Mentors

List faculty members with whom you have taken courses and whose work has inspired or influenced your Intellectual interests.

Attend lectures on campus to familiarize yourself with other faculty members outside your courses.

Consider the interdisciplinary implications of your interests and identify all relevant departments - including professional schools - that may house potential mentors. Don't be limited to the department of your major.

Check departmental websites for up-to-date information on faculty research interests and publications. This is a great way to learn about your discipline. Recent course listings can also give you an idea of the research interests of particular faculty members.

Explore the Undergraduate Research System to view both past and current projects, and who the associated faculty are. Make a list of the projects that interest you most.

Talk to fellow students, especially seniors, TAs, and graduate students involved in research, to find out which faculty members specialize in areas relevant to your proposed research project.

Step 2: Approach Potential Mentors

Narrow down your list to 3-4 faculty members and do your homework before you approach them. Browse their most recent publications through the RU Library databases or on their websites and write down questions that you have about the work. Be able to state why you are seeking out this particular person.

Write a professional, personalized email to prospective mentors. Remember: many faculty receive dozens of unsolicited requests to join their research each year. A generic email will be immediately deleted. Explain your interests and ask professors if they would be willing to discuss their research with you. Demonstrate Intellectual curiosity and a thoughtful approach to your academic goals.

Have an agenda for the meeting. Do you need: feedback on a research or creative project idea? Help defining the purpose or scope of a project? Suggestions for further background reading? Advice about designing a research instrument or plan? Information about laboratory facilities or equipment?

When you contact the faculty member, say that you have read the person's work, ask one or two questions that you have written down, and say that you would like to meet in person to discuss their current work and your own interests.

Don't go in empty handed: have with you a paragraph summarizing your research interests, your transcript, your resume, and a list of specific questions/requests for guidance.
Before leaving the meeting, think about what kind of follow-up you would like to have with the faculty member. If you have established a good rapport and would like to develop an ongoing working relationship, ask if he/she would be willing to meet with you again. If there isn’t a good match between your interests and those of the faculty member, ask him/her to suggest other colleagues you might approach.

Be confident and assertive about asking for help, but keep the length of your meeting within the established time limit (e.g., 15 minute or 40 minute “slots”).

Step 3: Select a Mentor

Once you have identified a faculty member with whom you wish to work on your research or creative project, clearly communicate what kind of time commitment you are expecting and make sure you understand the professor’s expectations as well.

If you are doing an independent project, give your mentor a copy of your research proposal, as well as any forms she/he will need to fill out to establish a formal advising relationship. Be sure to allow plenty of lead time before deadlines and make sure your mentor knows when forms are due. Arrange an agreed upon date to check back with the faculty member to verify that forms have been submitted.

If a faculty member declines to serve as your mentor, don’t be discouraged! A negative response likely says more about the professor’s prior commitments than it does about the merits of your project. If you’ve done your homework and have carefully reflected on your interests, return to Step 1 and begin the process again.