

Popular Science Essay Assignment, Andres Carlstein, Writing in Health and Human Physiology

For this assignment you will partner up and write about a scientific topic of your choice. The paper must include both human and informative elements, and it **MUST** be about very new or recent scientific work. You must also write it in such a way that it will appear to have quotes from the human relevant to the material. This means that if you want to write about SpaceX, you should probably get some good quotes from Elon Musk or someone else who is in charge there. What if you don't know these people and cannot interview them? You can look up interviews where they have made relevant quotes and reference those quotes. How? Consider the following sample from an essay about SpaceX's reusable rocket design.

SpaceX is wasting no time in taking advantage of their reusable rocket technology. In a 2018 article in Business Insider, Musk claimed that their missions will be expanding in scope, and that they plan to send passengers on a trip to orbit the Moon by 2020. "I hope this gets people really excited about sending people into deep space again," Musk said. "There's a market for at least one or two of these per year." Relying on two wealthy private investors to make this journey, Musk added that such missions could eventually make up 10-20% of SpaceX's annual revenue.

Because I have listed the year and the publication, I have effectively cited the quote. Even though there is a separation of stating "Musk said," this all counts as one quote.

Alternatively, it can be even better to use a local scientist as your human subject, and to work with their research as your informative thread. This way you can interview them to provide direct information about their work, as well as personal details of their life. Finally, you can also combine these two ideas. For example, you could write about SpaceX and quote Musk, but then also interview a physicist at the University to provide feedback and insight into the technology and travel plans. Bear in mind, this last method is by far the most difficult, and least effective way to write this paper. I strongly encourage you avoid doing so. Better to pick a live subject to interview or stick to finding a bunch of quotes from your subject online. Whatever you decide, you must include the necessary background history to understand the scientific topic, and any relevant personal details about your human subject to understand them.

Here are the rules:

1. Three pages minimum, four pages, maximum. (Moderate margins, 11pt font, double spaced, class header.) It can take four pages to do this well. It can be done in three, but it's harder. Woe to anyone turning in a 2.5 page paper.
2. It must be new science (within the last six months). You will probably end up using a primary research article from a well-known journal. When trying to find these, I recommend getting help from a librarian. Use Infohawk and other library resources—you should never have to pay to access a scientific journal while you are a student. You are granted access to research materials through the University libraries as a student. Ask if you have questions.
3. This is a news article. You need to act like an investigative journalist and address all the facts, or the "Six Ws" Who, What, When, Where, Why, and How. In other words, **YOU MUST EXPRESSLY STATE WHAT THE TOPIC IS ALMOST IMMEDIATELY**, whether it be an invention, new discovery, or a scientific study. For example, list a new study by name, if that is the news, right away. We need get the **WHO** and **WHAT**

in the first paragraph. Ideally, the WHERE AND WHEN should be there too. If not, be sure to include them by the end of the second paragraph.

4. You must interview an expert in the science, or (if the expert is unavailable) you must present quotes from other published sources to convincingly give the impression of a personally researched human subject.

5. Write your essay in Third Person only! (“Dr. Parks believes this.” She says that....” etc.) This means no First Person—you cannot tell me what you (the author) thinks about the topic. YOUR GOAL IS TO REMOVE YOURSELF FROM THE WRITING. Do not say, “I sat down with Dr. Parks to discuss amoebae.” This also means no Second Person. In other words, you may not address the reader directly. For example, you can’t say, “Have you ever wondered what happens to all the coffee grounds we throw away?” Instead you could say, “The average consumer might be surprised to learn what happens to their old coffee grounds.” In class we will be going over how to create these documents. The reading examples presented can guide you. Almost all of them are in the Third Person and you can model your writing on those examples.

6. You will not use citations. This means you provide neither footnotes nor a bibliography. How then to reference work? Notice the ways that the articles we read refer to the work of others. To avoid plagiarizing they either quote and name the sources like so:

In a study published in 2017 in the *New England Journal of Medicine*, researchers found that “90% of all diabetics will experience stress on their kidneys at some point in their lives.”

Alternatively, you can paraphrase the same quote:

The vast majority of people who suffer from diabetes (90%) will experience kidney stress during their lifetime, according to a 2017 study in the *New England Journal of Medicine*.

Notice that the titles of print publications are italicized. If you are referring to the website of a print publication (or an organization mainly known through its print publication) treat it as the print publication. For instance, if you found an online version of an article that also appeared in the print publication, just refer to it simply the same as the print version:

...in the December 2013 issue of *Nature*, Ron Cowen reports that...

Alternately, you can refer to the website, with the title of the print publication italicized:

...as reported by the website of the *New York Times*

However, if the website doesn’t have a print publication, then you capitalize its name like a headline, or otherwise as given on the website:

According to *ScienceDaily*...

Michelle Starr of *ScienceAlert* reports that...

7. Your essay will have three main components: a) The Intro. b) The Body. c) The End.

a) **Introduction** (first paragraph). Sometimes called a “hook.” This is what catches a reader’s attention and makes them want to keep reading. Some intriguing detail or fact is a good choice. Maybe a moment

of action or surprise from your human subject's life. Almost anything is fair game. Get us excited about the story. Look to the examples of the readings given in class. Compelling images, strange ideas, or weird facts can make a reader pay attention. It needn't be anything special at all. The science itself is usually enough to get people interested.

The first paragraph must clearly state the who and the what. It can also have the when and where, but if not, those two must be included before the end of the second paragraph:

- 1) Who has done the research or made the discovery, and What has been discovered, invented, or investigated.
- 2) Where the research or discovery has been done—meaning the organization that the subject works for, and When.

Example: "But Andrew Forbes [who], from the University of Iowa [where], thinks that this factoid cannot possibly be right. In a new paper, published in May of 2019 [when] online as a pre-print, Forbes and his colleagues argue that nature's apparent beetlemania is more a reflection of historical bias than biological reality [what]."

b) Body. This is the relevant Human and Informative elements that tell us everything we need to know.

- 1) The rest of the body gives the how [the methods of the study or research] and the why [the significance or importance of the discovery or investigation—why anyone should care].
- 2) Give us the necessary details to understand the topic. That and no more. Don't share the history of all naval submersibles if writing about a new submarine. Just the bare minimum we need to "get it." Don't tell us everything there is to know about your human subject, just enough to make us care a little bit about who they are and their story.

c) End. This is exactly what it sounds like. Just stop. Trail off. Cut it short. Quit writing. I do not want a conclusion. I want no "summary" of thoughts or ideas presented. I understand that this contradicts everything you've ever learned about writing a paper. I get it. But it's much better to simply state the facts of the story and stop. The paper is short; everything you would say in the conclusion we have just read. We don't need to hear it again. Assume that your reader is smart enough to recall what passed before their eyes literally two minutes beforehand. Okay? So now that you are convinced that you WILL NOT WRITE A CONCLUSION, practically, how does this work? Well, the best way to end an essay is with a really great quote from your human subject, or with a really beautiful image of some kind. Examples abound in class.

FAQ

1. What can I write about?

You have been discussing new science every week in class. There is no shortage of potential topics. As long as it is topical and well researched, it will be fine. Anything that can be analyzed scientifically is fair game. You can write about some new science behind baking, some new development in exo-planets, or a recent study about how to beat an AI at board games. Anything is on the table as long as you can get into the details of what is happening, and you can find good quotes and information to use about your human subject. It's often easiest if the new science is based on a study you can source, and not just a

new invention. I also recommend writing about something outside your particular area of study. You will have more fun learning about something new, and it will give your brain a break from constantly thinking about your coursework.

2. My Mom/Dad/Uncle/Neighbor/Roommate is working in X field. Can they be my human subject?

No. This isn't a good idea. It's best to choose a subject you are really interested in and write about that, instead of finding a scientist who is accessible because they are a friend or family member. It is difficult to be objective with someone you are very close to. Getting the human elements for your essay really isn't that hard. Finding a subject that you are most excited about is what matters. Let's say your topic of interest also happens to be something your favorite professor is researching at the University. If this person is willing, great. That serendipity, and you're free to write about them and their work.

3. Can I write about someone who isn't a professor, like a grad student? What about a local expert in the science topic who isn't a teacher? What about an undergraduate researcher?

Graduate students are fine if they are on their way to a PhD. If the local expert you know is really qualified and the science is indeed new and "deep" enough, this option could work too. But you may not interview another undergrad. With some very rare exceptions, they simply don't have enough authority and expertise yet.

4. What if I go over four pages? Or if I am under three pages?

You lose points. We are attempting to learn concision and accuracy in writing. It can often be much harder to write succinctly than to ramble on. Also, the more words you write, the greater the chance that you will make errors that can cost you. Keep it simple and short. However, if it's too short it won't have enough information.

5. There's so much out there—how on Earth do I choose?

Well, what do you care about? What are you interested in? I have a ton of interests. From arts to home improvement to reading and the sciences. You tell me what you like, and I'll tell you to start there. If I were to pick a topic, I would think about the things I am most interested in and then look for recent scientific studies about them.

6. Do I write this like other school papers I have written? Opening, body paragraphs, conclusion?

NO! Absolutely not. As with other assignments, the structure I've provided must be used. YOU WILL NOT WRITE A CONCLUSION. End with a strong image or a quote from your human subject. Consider the course readings.

7. Should I include a bibliography?

No. If you need to paraphrase from a source, you will cite "inline" in the text. This means that you will say something like: According to a recent article in The Washington Post, Dr. Matthews arrives at his lab every morning at 7am. For citing quotes, see the various examples given above.

8. What is an attribution?

An attribution is how a writer cites a quote. The verbs chosen to describe how people speak in an attribution can vary, but I don't want you to vary them. Simply say: "he said," "she said," or "Dr. X said." Don't say, "he replied, she stated, Dr. X explained." As we say in writing, "said says it."

9. How many quotes do I need from my human subject?

You need 4-6 quotes. They must all be from different sources. YOU MAY NOT SOURCE THE SAME PUBLICATION TWICE.

10. Where am I getting most of my information from?

Ideally it will come from the source, meaning the scientist who has done the work or the academic paper they have published. You will state in the beginning that the essay is about that science, and you will reference the paper as needed. However, it may be expected that general knowledge will come from other sources, such as Wikipedia or textbooks. If it is commonly known information that you understand and state IN YOUR OWN WORDS, it need not be cited. Anything else would be considered plagiarism.

11. I am confused about quotes and citing sources. When do I do what now?

You will only cite a source when getting a quote for your human subject. If you interview someone personally, you don't need to cite any sources. Just state that it was a personal interview below the title of your piece. If you are citing a source for another reason, first be sure it's really necessary. Common information (stuff that could be found in an encyclopedia or a biology textbook) doesn't need to be cited as long as you aren't copying the text. Anything that comes from the researcher's study doesn't need to be cited more than once, because the article is about their study and once you introduce the study, it is implied that's where the information has come from.

12. How do I paraphrase without plagiarizing?

Easy. Read the material until you understand it, then restate it in your own words. Beware that simply changing a few key words with a thesaurus means you still fail an online originality check, because sentence structure and sentence logic are also measured in the plagiarism algorithms.

Popular Science Essay Quick Summary

1. 3-4 pages, moderate margins, page numbers, double sided (give me a blank sheet of paper at the end for notes).
2. Just a single human subject is best.
3. It needs a Title! I'm not saying it has to be a pun, but they often lend themselves to these titles. Have fun with it.
4. Remember this isn't a typical academic essay. It will not follow any format you've written before.
5. Do NOT repeat information. Say it once, move on.
6. Don't use a professor from the Dept. of HHP. They've been doing these for years. Choose another department.

7. If you are interviewing someone as your subject for quotes, no other quote sources or citations are needed.
8. If you conducted the interview personally, say “Personal Interview” on the first page below the title.
9. Regarding general knowledge—no quotes or citations are needed. Rely on your human subject to explain the specifics of their work. You can either quote them or paraphrase their studies/work for details.
10. Needs 4-6 quotes. Only one source per quote.
11. Make it efficient. Do not repeat any ideas. Get right to the facts. Dive in.
12. DO NOT MAKE CLAIMS. Avoid authorial bias and do not state personal opinion. Your human subject’s opinion is what we are interested in.
13. Your sentences need to follow logically, one after the other. They need to make sense and support each other.
14. The first time you introduce the human subject, state their full name and title. Afterward, it’s either “Dr. Lastname,” or (if not a doctor) “Lastname.”
15. Quote example: In a 2015 interview with Slate.com, Dr. Fulano said, “Blah, blah, blah.”
16. a) Intro/hook
b) Body (Human and Informative threads)
c) END using memorable image or strong quote

Thoughts for live interview questions:

1. Thoroughly research your human subject online BEFORE you meet them. Find out their professional history, degrees, publications, etc. When you meet, you will tell them what you learned about them and ask them to confirm that it’s all accurate. I.e., “You did your undergrad at UPenn in Chemistry, and your PhD at UMass in Genetics, correct?” This will impress upon them that you have done your research.
2. Remember you can present a summary or history of the field to help give your subject context. In general, it’s almost always necessary to do so, even if just a little.
3. Next ask questions that can open the door for more interesting and specific questions. For example:
 - What choices in your career led you to the research you’re doing now? What do you like most about it?
 - What is up the future? What are the next steps you plan to take?
 - What specific problems/ challenges have you encountered along the way?
 - Have you had any mentors or teachers that have most influenced/aided you? What advice do you have for someone who might like to follow in your footsteps?
 - What are the implications of the work, as you perceive them? Meaning: scientific, ethical, humanistic, etc.

4. In terms of personal history, you can ask questions such as where they live, how they like their town, if they are married, have kids, pets, hobbies, etc. You can ask how their loved ones feel about their work/research. If any of this is useful or they seem particularly forthcoming, you can ask more. Just beware of getting too personal or “nosy.” This is a paper about their professional lives, mainly.

5. You MUST read their research! One of the best ways to get useful quotes is to read their latest studies and pull any useful, complex quotes. Then repeat the quote to them and ask them to restate the quote in simplest terms. This way, ideally, they will say exactly what you are looking for in a nice, tight soundbite.

6. Remember that above all, you should let them talk about what they LIKE. Whatever they are most interested in/excited to talk about, that is where your story lies.

7. If you are interviewing over email, try to ask a question with follow ups. Avoid letting them have questions that can be answered with a simple Y/N.

Rubric:

This assignment is graded on three components:

1. Structure: (33%) Is it longer than three pages and under four pages? Does it have a hook, body, and “end” as directed? Are the topic sentences working and does the essay flow organically throughout?

2. Content: (34%) Is it written about something new? Are the human subject(s) relevant to the topic? Do we get all the information we need to understand what is happening (enough for a general audience—roughly \geq high school reading comprehension)? Did you properly refer to any sources (no citations) and follow the guidelines?

3. Language: (33%) This includes, grammar, punctuation, spelling, style, logic, etc. Does the work follow the proper style preferences as laid out in the course pack style guide? Do the sentences have logical consistency internally? Is punctuation inside the quotes? Are words spelled correctly? Are numerals used only when needed? Was this effectively proofread? Did you catch all the basic errors? Did you use only one space after periods? Did you remember to always use the serial comma?