2023

AP® Research Academic Paper

Sample Student Responses and Scoring Commentary

Inside:

Sample H

- ☑ **Scoring Guidelines**
- ☑ **Student Samples**
- ☑ **Scoring Commentary**

The Response…				
Score of 1 **Report on Existing Knowledge**	**Score of 2** **Report on Existing Knowledge with Simplistic Use of a Research Method**	**Score of 3** **Ineffectual Argument for a New Understanding**	**Score of 4** **Well-Supported, Articulate Argument Conveying a New Understanding**	**Score of 5** **Rich Analysis of a New Understanding Addressing a Gap in the Research Base**
Presents an overly broad topic of inquiry.	Presents a topic of inquiry with narrowing scope or focus, that is NOT carried through either in the method or in the overall line of reasoning.	Carries the focus or scope of a topic of inquiry through the method **AND** overall line of reasoning, even though the focus or scope might still be narrowing.	Focuses a topic of inquiry with clear and narrow parameters, which are addressed through the method and the conclusion.	Focuses a topic of inquiry with clear and narrow parameters, which are addressed through the method and the conclusion.
Situates a topic of inquiry within a single perspective derived from scholarly works **OR** through a variety of perspectives derived from mostly non-scholarly works.	Situates a topic of inquiry within a single perspective derived from scholarly works **OR** through a variety of perspectives derived from mostly non-scholarly works.	Situates a topic of inquiry within relevant scholarly works of varying perspectives, although connections to some works may be unclear.	Explicitly connects a topic of inquiry to relevant scholarly works of varying perspectives **AND** logically explains how the topic of inquiry addresses a gap.	Explicitly connects a topic of inquiry to relevant scholarly works of varying perspectives **AND** logically explains how the topic of inquiry addresses a gap.
Describes a search and report process.	Describes a nonreplicable research method **OR** provides an oversimplified description of a method, with questionable alignment to the purpose of the inquiry.	Describes a reasonably replicable research method, with questionable alignment to the purpose of the inquiry.	Logically defends the alignment of a detailed, replicable research method to the purpose of the inquiry.	Logically defends the alignment of a detailed, replicable research method to the purpose of the inquiry.
Summarizes or reports existing knowledge in the field of understanding pertaining to the topic of inquiry.	Summarizes or reports existing knowledge in the field of understanding pertaining to the topic of inquiry.	Conveys a new understanding or conclusion, with an underdeveloped line of reasoning **OR** insufficient evidence.	Supports a new understanding or conclusion through a logically organized line of reasoning **AND** sufficient evidence. The limitations and/or implications, if present, of the new understanding or conclusion are oversimplified.	Justifies a new understanding or conclusion through a logical progression of inquiry choices, sufficient evidence, explanation of the limitations of the conclusion, and an explanation of the implications to the community of practice.
Generally communicates the student's ideas, although errors in grammar, discipline-specific style, and organization distract or confuse the reader.	Generally communicates the student's ideas, although errors in grammar, discipline-specific style, and organization distract or confuse the reader.	Competently communicates the student's ideas, although there may be some errors in grammar, discipline-specific style, and organization.	Competently communicates the student's ideas, although there may be some errors in grammar, discipline-specific style, and organization.	Enhances the communication of the student's ideas through organization, use of design elements, conventions of grammar, style, mechanics, and word precision, with few to no errors.
Cites **AND/OR** attributes sources (in bibliography/ works cited and/or in-text), with multiple errors and/or an inconsistent use of a discipline-specific style.	Cites **AND/OR** attributes sources (in bibliography/ works cited and/or in-text), with multiple errors and/or an inconsistent use of a discipline-specific style.	Cites **AND** attributes sources, using a discipline-specific style (in both bibliography/works cited **AND** in-text), with few errors or inconsistencies.	Cites **AND** attributes sources, with a consistent use of an appropriate discipline-specific style (in both bibliography/works cited **AND** in-text), with few to no errors.	Cites **AND** attributes sources, with a consistent use of an appropriate discipline-specific style (in both bibliography/works cited **AND** in-text), with few to no errors.

Academic Paper

Overview

This performance task was intended to assess students' ability to conduct scholarly and responsible research and articulate an evidence-based argument that clearly communicates the conclusion, solution, or answer to their stated research question. More specifically, this performance task was intended to assess students' ability to:

- Generate a focused research question that is situated within or connected to a larger scholarly context or community;
- Explore relationships between and among multiple works representing multiple perspectives within the scholarly literature related to the topic of inquiry;
- Articulate what approach, method, or process they have chosen to use to address their research question, why they have chosen that approach to answering their question, and how they employed it;
- Develop and present their own argument, conclusion, or new understanding while acknowledging its limitations and discussing implications;
- Support their conclusion through the compilation, use, and synthesis of relevant and significant evidence generated by their research;
- Use organizational and design elements to effectively convey the paper's message;
- Consistently and accurately cite, attribute, and integrate the knowledge and work of others, while distinguishing between the student's voice and that of others;
- Generate a paper in which word choice and syntax enhance communication by adhering to established conventions of grammar, usage, and mechanics.

Laura Mercier Natural Skin Perfector Tinted Moisturizer, 5WI Tan, SPF 30 Affecting the Coral Reefs

AP Research

Word Count: 4,079

April 27, 2023

The Laura Mercier Natural Skin Perfector Tinted Moisturizer, 5WI Tan, SPF 30 is effective to the coral reefs in the ocean. You may be asking yourself why if this is a good, well rated product of 4.2 stars in Ulta Beauty and works great for most people that have bought it here, a person that rated this product 5 stars and said it was an ¨Amazing product, that leaves skin feeling moist! And highly recommended this product, as it evens out my areas of concern, moisturizers and adds a little glow to my skin.¨ Even though this review is a good review and worked well for others and gave them a good satisfaction, they don't know the ingredients it has in it. Most people don't really pay attention to what the ingredients and chemicals contain inside the beauty product. Even though they may think this is a good well product for us humans it does affect the coral reefs by the ingredients it has and the main active ingredients in this product is Avobenzone 2.5%, Octinoxate 7.49%, Octocrylene 2.0%, Oxybenzone 1.0%. These are really harmful for the coral reefs in the ocean and the 2 main ingredients that increase coral bleaching are Octinoxate and Oxybenzone. What is coral bleaching, Coral bleaching happens when corals lose their vibrant colors and turn white. There are many reasons why the corals turn white and it could be because of the temperature, light, or even nutrients. Those are some causes of the coral bleaching but sunscreen also has a big impact on the coral reefs in the ocean of at least 90% effective to the coral reefs. The Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan, SPF 30 is a good brand and most influencers use laura mercier nowadays and is barely becoming a good brand that people are starting to get interested in. You may be asking how this is important and why should you even care? To answer the question, marine life is something that we should really care for because once the corals are damaged the fishes that get their food sources from the coral won’t have any food sources because most of the coral would be dead. Once those fish that get their food sources from coral are dead then the other fishes that consume

that type of fish won't have their food source and eventually die. This would keep on going until every marine life is gone and the food chain would basically be off and animals would start being extinct and we won't have any marine life left. Another thing may be that when we put the sunscreen on and go into the water, the water is basically washing away the sunscreen and the chemicals the sunscreen contains will travel along the water and could manage to get to those corals. Besides this point and other cosmetics it sells, tinted moisturizer is effective to the coral reefs with the two most harmful ingredients it has in it that I have found when looking at the ingredients it contains inside the product. Now this reaches on to the question: How is the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan, SPF 30 increasing coral bleaching or leading to the death of the coral?

Lit Review

As I know sunscreen has a common chemical in there that is affecting the coral reefs, in this *Science news by Erin Garcia De Jesus* that talks about the *"Corals turn a sunscreen chemical toxic"*, it talks about how there are some mushrooms coral and sea anemones that have something in them that makes the toxic even worse than it already is for them and it makes it spread to more corals around them meaning more would die. What Erin Garcia De Jesus mentions about saving them is *"Algae coexisting with coral can soak up the toxin and blunt its damage. The bad news is that bleached coral reefs, where helpful algae have been ejected, may be more vulnerable to death."* Meaning what I would think about this is how even if there was a good and helpful algae it would still be contaminated with the toxins of what the coral already has in it and from the water as well. If algae that is something helpful for the corals and could of possibly given the chance of the corals to be healing from the toxins, but the toxins are already in the water and spreading to the living things in the ocean such as like kelp, seaweed,

phytoplankton, sea grass, and sargassum are some of the commonly plants that are in the ocean. Another thing Erin Garcia De Jesus mentions is that he says *"studies have suggested that oxybenzone can kill young corals and prevent adult corals from recovering after tissue damage, some places have banned oxybenzone-containing sunscreens."* Regarding what the studies Erin Garcia De Jesus mentioned of some places banning sunscreens that have oxybenzone was something very true because in Hawaii they did ban any kind of sales of sunscreen that contains any coral-harming chemicals oxybenzone and octinoxate. Not only Hawaii but also other states as Palau, Florida Keys, and Virgin Islands, have banned those sunscreens that contain oxybenzone and octinoxate. The sunscreens that contain these toxic chemicals are Coppertone, Banana Boat, and Neutrogena. They sell the ones as creams but also sell the spray sunscreens, so any of those sunscreen products in either packaging are banned from the states. Another thing regarding to the sunscreens being banned in Hawaii, Palau, Florida Keys, and Virgin Islands from *"Oxybenzone contamination from sunscreen pollution and its ecological threat to Hanauma Bay, Oahu, Hawaii, U.S.A." - Downs CA, Bishop Elizabeth, and more authors to be said.* They mentioned *"Concentrations of oxybenzone and other common UV filters were measured in subsurface water samples and in sands from the beach-shower areas in Hanauma Bay. Results demonstrate that beach showers also can be a source of sunscreen environmental contamination. Hydrodynamic modeling indicates that oxybenzone contamination within Hanauma Bay's waters could be retained between 14 and 50 h from a single release event period."* From what I read about this research is that they were actually able to measure the water in the ocean from Hanauma Bay for the contaminations of the toxins being used in there , not only were they only checking the water for contaminants in it but they were also checking the sand from the beach water to see if the sand was also being contaminated with the toxin

chemicals being used. From what they also discovered was that beach showers can also be a source of contamination from the sunscreens being used at the beaches and could be harmful to the environment. A report from The Washington post about "What you need to know about the chemicals in your sunscreen", by Consumer Reports says "*Some experts are concerned that these chemicals may be absorbed through the skin, leading to skin irritation, hormonal disruption — even skin cancer. The Food and Drug Administration recently called for more research on the safety and effectiveness of these chemicals. In May, a preliminary study by FDA researchers found that the chemicals may be absorbed into the skin at levels higher than previously believed. And a report published in March suggests there may be risks to developing fetuses when pregnant women are exposed to oxybenzone."* Regarding this report it has said that the chemicals like oxybenzone and octinoxate are not safe to use due to those chemicals being absorbed into our skin, and this could lead to some really bad effects on us. What could happen is that those toxin chemicals that those sunscreens contain are well toxic not just to the ocean environment but this report has mentioned that it is harmful to us humans as well. The toxin chemicals that those sunscreens contain can be absorbed into our skin and could cause skin cancer. These studies and reports have mentioned and explained why these toxic chemicals of oxybenzone and octinoxate are bad for the ocean environment damaging the coral reefs and leading to damaging more marine life. Not only marine life but also in our human environment as well. It is affecting us because what the sunscreen carries and our body is absorbing it.

Methodology

To be able to do my experiment for the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan, SPF 30 affecting the corals,I will be using the Experimental Method. I will have to get a small fish tank of 2.5 gallons and make my own salt water. To make the salt water I will need

salt, a beaker to be able to measure how much water I need, and just a stir with a stirring rod to make sure the salt is fully dissolved. I will also need to buy some coral and I'm looking to get a kenya tree coral since it is one of the easiest corals to maintain in a saltwater tank. Of course get the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30 to test out the sunscreen if it contains those two bad chemicals and if it changes the coral reefs color or if we can just see any changes throughout the past two weeks having it in the tank. Once I have all the materials I could possibly get to do my experiment I will start setting up my 2.5 gallon tank and making the salt water. Once that is all set up I will put the kenya tree coral in the tank and add about 1 teaspoon of the sunscreen because if I add too much it might not do much and just make the water cloudy. So I decided to put a little bit so it’s not too much all at once and if maybe just by adding a little bit can be affectful to the kenya tree coral. After putting in the sunscreen I will give it a little mix and leave the kenya tree coral in the tank for about 2 weeks and check up on it once a week on Sundays to see if any changes have been done to the kenya tree coral. Checking it by the end of the week I will be looking for any sort of changes to the kenya tree coral that may be visible from looking at it from outside of the tank. After checking to see if anything is visible from outside the tank and nothing is noticeable, I will carefully take out the coral reef to just examine the coral reef on my own with of course wearing gloves and placing the coral reef in a bowl with a little water. I will examine the kenya tree coral looking for any kind of bleaching happening to the coral, any kind of discoloration on the reef, or if any sort of damage looks to be found on the kenya tree coral that can be found visible and easy to find as well. Any possible changes that could happen to the kenya tree coral could be coral bleaching, due to damage of DNA, young deformation, and can even kill the coral reef. If anything comes to conclude that the coral is in fact dying than I could say my research is in fact going good and could say that my

experiment went well and that the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30 is in fact a bad tinted moisturizer for coral reefs in the ocean and should be aware of how this tinted moisturizer is not a good product for the marine environment. If this experiment does not go the way I expected it to go I can simply just say that my theory was in fact wrong and this tinted moisturizer is in fact not such a bad product to use outdoors when going to the beach or any place including water to damage any marine life and will be a safe tinted moisturizer to wear outdoors and will not have such a big impact on the environment with the ingredients it contains.

Without being said my experiment will be testing out any changes in the kenya tree coral since I unfortunately could not get the water kit tester and or any access at this time for a laboratory certified tester, Which could have gotten me way better results like results such as in maybe the 2 chemical toxins of oxybenzone and octinoxate being found contaminated in the water and maybe even faster results that could lead to being identified that the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30. Which also could have been in fact a sunscreen that had toxic chemicals, having oxybenzone and octinoxate included in the sunscreen and that this sunscreen is doing some pretty bad damage to the kenya tree coral that is a coral that is very easy to maintain it could have possibly done more damage to other coral reefs in the marine environment.

Research Results

In my research I said I would be doing an experiment on whether the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30 is a sunscreen that can contain two harmful ingredients which are oxybenzone and octinoxate. The two chemicals would do any damage to the kenya tree coral that I tested out in my 2.5 gallon tank with salt water contained in

it as well and having one teaspoon of sunscreen. Having my research done for those two weeks I said I would do and checking it by every end of the week on Sundays there was not much change overall in my experiment. I wanted to be able to prove that this sunscreen is bad to use when going anywhere where there is marine life knowing that it contains those two toxic chemicals in it. Going into the water the water will wash off the sunscreen and release those chemicals into the ocean roaming around in it and spreading more throughout the ocean. My original hypothesis was that kenya tree coral would react to the sunscreen and have some differences made on the coral from the sunscreen Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30. My hypothesis was incorrect and didn't come out the way I wanted it too and I believe the reason why is because I needed more time to be able to test out more things on the kenya tree coral, have more ways to be able to test out the water in the tank as well, but mainly focusing on the coral. When leaving the kenya tree coral in the 2.5 gallon tank with salt water and checking it Sundays, there wasn't any change on the kenya tree coral it maintained to look the same with no difference being made with the one teaspoon of sunscreen being added into the 2.5 gallon tank with salt water and the kenya tree coral inside of the tank. The only difference that I saw throughout the experiment was the water changing to more of a cloudy water substance more than clear. The reason for that is because the chemical and or ingredients that the sunscreen contains can make the water throughout the day turn the water to a more cloudy substance.

Discussion

These harmful chemicals can lead to coral bleaching, damage the DNA of corals, and increase abnormal growth and deformities. Sunscreen is likely just one more stressor that is making corals more susceptible to disease, such as the Stony Coral Tissue Loss Disease that is affecting reefs across the Caribbean sea. If it is affecting the Caribbean sea then it will definitely impact more

places where the coral reefs are. The usage of the toxin chemical sunscreens can really affect the waters in the ocean and will expand throughout the whole ocean damaging those coral reefs living there. Once the coral reefs are dying due to these toxic chemicals being spreaded throughout the whole ocean water. The parrotfishes are the ones that consume the coral reefs. The parrotfishes' digestive system, which is what includes more teeth in their throats and is what breaks down the bites of coral reefs turning it into the white sands that they consume. If this fish can't consume their food which is coral reefs, they will end up dying slowly as well and then the ones that consume the parrotfishes won't be able to have their food sources. If it were to keep going on like that then the whole food chain would just be off and every marine animal living will slowly start to disappear. If there is no marine life left then life won't be as possible without them. The reason why is because with what the ocean gives us is a way of performing many essential functions that will lead to lower quality in life. People will end up starving because the ocean is one of the main food sources that we use daily in our life. Even though my research didn't work to prove that the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30 is effective to the coral reefs in marine life this source here from *DOWNS, Craig, "Sunscreen ingredient polluting coral reefs."* says that the "Oxybenzone is found in more than 3500 sunscreen products worldwide, and pollutes coral reefs from swimmers wearing sunscreens and through wastewater discharges from municipal sewage outfalls and coastal septic systems." This explains really well how the toxin chemical of oxybenzone is in almost all of the sunscreens saying there are "3500 sunscreen products worldwide with oxybenzone". What we don't know is how many sunscreens there are overall but having said that 3500 sunscreens have been found to have the toxin chemical of oxybenzone in them. People that attend the beach usually wear sunscreen so they won't get sunburned or anything like that, when they put sunscreen on and

head to the water of the ocean. The water will wash off the sunscreen from swimmers that swim in the ocean and will pollute the coral reefs. Having so much pollution done to the coral reefs can cause stress to coral reefs like condition changes such as light, temperature, and their nutritions which expel the symbiotic algae living in their tissues, causing them to turn completely white. Having the expelled symbiotic algae means that it harvests light and produces energy in the form of carbon rich compounds and is causing the coral to die. There have been studies done on sunscreen affecting the coral reefs but not enough has been done to discover these things. This can be caused by the marine environment being so big and hard to examine. From the National Academies "Review of Fate, Exposure, and Effects of Sunscreens in Aquatic Environments and Implications for Sunscreen Usage and Human Health" say "As a result, the ultraviolet (UV) filters - the active ingredients in sunscreens that reduce the amount of UV radiation on skin - have been detected in the water, sediment, and animal tissues in aquatic environments. Because the impact of these filters on aquatic ecosystems is not fully understood, assessment is needed to better understand their environmental impacts." Due to this happening in the marine environment not many people are aware of what's happening. *"In addition to the harm caused to coral, sunscreen can decrease fertility in fish; accumulate in dolphins; damage the immune systems of sea urchins and deform their young; and impair photosynthesis in algae. While we've greatly expanded our knowledge around this subject in recent years, there is still much more research to be done to fully understand the impacts of sunscreen on coral reefs."*

An animal being affected by the sunscreen is the dolphin especially when the female dolphin is pregnant and needs to breastfeed the young dolphin. The reason why is because the chemicals from the sunscreen are built up in a soft tissue that would transfer to the young dolphins when breastfeeding them. As said there, there is still a lot of research that has to be done about the

sunscreen being affected in marine life but not enough has been done and there could actually be so much more research done regarding this topic of sunscreens affecting marine life.

Limitations/ Further Research

A first solution to prevent the use of sunscreens with oxybenzone damaging the coral reefs is to look for sunscreens that don't contain oxybenzone. Look for mineral sunscreens that contain the ingredients such as zinc oxide or titanium dioxide. Not all mineral sunscreens are safe to use. Make sure to look for the ingredient "non-nano". Non-nano means it is larger than 100nm and therefore won't penetrate your skin. Not only would it be safe for your skin but also for marine life because it is less likely that it would be absorbed by marine life. When looking to buy a safe sunscreen that doesn't damage the coral reefs you can also look around the product with something that says "Protect Land + Sea Certification". As well to make sure that these harmful chemicals such as Oxybenzone, Benzophenone-1, Benzophenone-8, OD-PABA, 4-Methylbenzylidene camphor, 3-Benzylidene camphor, Octinoxate, and Octocrylene are not included in your sunscreen to use anywhere where around marine life is found to be at. Not only this but don't buy any spray-on sunscreens even though it may be easier to use. The reason why is because it creates a chemical cloud that will settle onto the sand and when the tide comes in these chemicals wash into the ocean. Another few solutions would be to stay undercover and the easiest way to do this is by looking for a spot on the beach where there is shade or have or wear something that can protect you from the sun and especially when it's the hottest hours in the day. Covering up means to wear a t-shirt, hat, and or pants , anything really that makes you not wear any sunscreen and especially if it has those toxin chemicals included in them. Be considerate if you wear swimwear clothing that you wear a swimwear that contains UV protection material. If you do wear a swimwear remember to not put any sunscreen underneath. Limitations I had in

doing my research on the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30 doing any sort of damage on the kenya tree coral that I chose to do my experiment on was lack of being able to get sources such as a water test kit, it wouldn't have gotten here on time when I had already planned when to do my research. This could've helped me out in identifying if the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan SPF 30 was what is contaminating the water and if it was releasing any toxic chemicals throughout the water and see how this could have may been affecting the kenya tree coral. In order for me to have been able to do this I would have needed more time than I originally had used because having the kenya tree coral be there in the salt water for only 2 weeks and checking in on it at the end of week on Sundays. Having more time to be able to do my experiment there could have been changes in the salt water and even maybe the kenya tree coral as well. Another limitation there was, was that for me to be able to identify if these two toxic chemicals are being found in my experiment and could of possibly been contained in the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan, it was unfortunately too late in order for me to consider taking my experiment to a certified laboratory to have my water tested out by them and could've had someone with more of a better understanding of what they are looking for and or if they would have seen or tested out more things in the tank and the kenya tree coral. In order for me to have taken my experiment to a certified laboratory I would have needed to get approved and for them to make sure my experiment wouldn't do any harm. With these limitations they could be used to do more further research on, How is the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan, SPF 30 increasing coral bleaching or leading to the death of the coral?

Works Cited

Consumer Reports. “What You Need to Know about the Chemicals in Your Sunscreen.” The Washington Post, 17 June 2019, www.washingtonpost.com/health/what-you-need-to-know-about-the-chemicals-in-your-sunscreen/2019/06/14/3840042c-8ca3-11e9-adf3-f70f78c156e8_story.html.

DE JESÚS, ERIN GARCIA. “Corals Turn a Sunscreen Chemical Toxic.” Science News, vol. 201, no. 10, June 2022, p. 8. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=asn&AN=156955102&site=ehost-live.

Downs, C. A., et al. “Oxybenzone Contamination from Sunscreen Pollution and Its Ecological Threat to Hanauma Bay, Oahu, Hawaii, U.S.A.” Chemosphere, vol. 291, Mar. 2022, p. N.PAG. EBSCOhost, https://doi.org/10.1016/j.chemosphere.2021.132880.

National Academies of Sciences, Engineering. Review of Fate, Exposure, and Effects of Sunscreens in Aquatic Environments and Implications for Sunscreen Usage and Human Health. Nap.nationalacademies.org, 9 Aug. 2022, nap.nationalacademies.org/catalog/26381/review-of-fate-exposure-and-effects-of-sunscreens-in-aquatic-environments-and-implications-for-sunscreen-usage-and-human-health.

“Sunscreen Ingredient Polluting Coral Reefs.” Chemistry in Australia, Mar. 2016, p. 6. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=asn&AN=112702347&site=ehost-live.

Academic Paper

Note: Student samples are quoted verbatim and may contain spelling and grammatical errors.

Sample: H
Score: 2

This paper earned a score of 2. The paper presents a literature review with only five, mostly nonscholarly sources, pages 3–7. The question appears on page 3, " How is the Laura Mercier Natural Skin Perfector Tinted Moisturizer 5WI Tan, SPF 30 increasing coral bleaching or leading to the death of the coral?" While the topic of inquiry is narrow, the line of reasoning is not grounded in relevant scholarly works. The paper cites the Ulta Beauty rating of the tinted moisturizer and consumer rating of the product as a rationale for selecting the product to test for its effect on coral bleaching, page 2.

This paper provides research methods on pages 5–7 with lack of detail of the methodology leading to an oversimplified use of research method. The paper does not provide details on the amount of water in the 2.5 gallon fish tank or the amount of salt added to the water that should mimic the salinity of the ocean where the corals would naturally exist. The results on page 8 is a report on existing knowledge with simplistic use of a research method with no student-generated data. For instance, "The only difference that I saw throughout the experiment was the water changing to more of a cloudy water substance more than clear." The paper does not take any measurements to justify the use of an experimental design. The conclusions on pages 8–10 are based on a summary of sources due to the lack of student-generated data. The limitation on pages 11–12, "lack of being able to get sources such as a water test kit," further illustrates the lack of student-generated data. There are no ethical considerations described for working with coral animals.

This paper did not earn a score of 3 because the observations presented are not a true new understanding, although the topic is carried throughout the paper. The lack of scholarly sources, reasonably replicable methods, and new understanding from student-generated data held this paper from the score of 3.

This paper did not earn a score of 1 because it does *not* present a narrow topic of inquiry that is carried through the methods. The paper presents methods, and the student attempts to use the overly simplified methods, which is more than a report on existing knowledge.