Sample Journal 7

Year: 2024-2025

Grade: G10

Semester: 2nd Semester

Question 1:

If a friend is suffering from organizing their timeline during Ramadan, suggest three strategies they can follow to help address this issue.

Studying in Ramadan is a challenge we must overcome to make the most out of this great month. However, our usual study schedules become useless during Ramadan.

There are three strategies I use to solve this issue.

The first strategy is to change my study schedule. The best schedule in my opinion is the "Before Dust" schedule. After school, I study for 2-3 hours. I take a short nap. Then, I have breakfast, pray for Tarawih, and chat with my friends. Afterwards, I go to sleep from 7 pm to 2 am. I study from 2 am to 7 am. This time has been scientifically proven as the best time for deep work and concentration. It's quiet, peaceful, and empty of distractions. Then I go to school. I have tried this schedule for many years and its results were astonishing. It only needs discipline.

The second strategy is to write down tasks. A lot of my time was wasted trying to figure out what to study or what I had to work on. By writing my tasks beforehand, I could get straight to work after I woke up. This saved me from getting distracted and procrastinating.

The third strategy is studying in groups. Studying in Ramadan requires a lot of effort and willpower since we are tired all the time. Essentially, studying with your friends using the same techniques can be a great help. When I first tried to apply these strategies, it was hard to keep up. However, one of my friends was interested and joined. It felt wholesome to study together and it motivated me to study hard.

Grade: Blue

Feedback:

Strengths:

1. The response is clear and directly answers the question.
2. It presents a real experiment related to the strategies given, demonstrating the effect of each strategy and how it helped.
3. The use of English is appropriate, clear, and linguistically accurate.
4. The first strategy is well illustrated; with examples and the student's personal opinion.

Weaknesses:

1. The second strategy could be slightly expanded with an example to match the depth of the first one.

General Notes:

The response is highly effective overall. A brief concluding sentence would help tie the strategies together and leave a more rounded impression. While the first strategy is understandably longer due to its depth, a slightly more balanced distribution of content might improve clarity. Minor punctuation adjustments could further polish the writing, though they do not hinder understanding. These are not issues that detract from the quality, but areas that could enhance an already strong response.

Question 2:

You have chosen your challenge problem and researched previous trials to solve similar issues. Explain three modifications you made to the selected prior solutions to meet your design requirements.

During the research step, we research prior solutions akin to our solution. We analyze their strengths and weaknesses, their goals and how to improve upon them

We researched real-life vertical wind turbines. Nevertheless, being such a small-scale project, it was hard to find famous prior solutions. So, we had to research deeper and in a lot of resources.
The first modification we made to the prior solutions is making it a hybrid. Vertical wind turbines are either savonius or darreius, and both types have their own drawbacks. We got a brilliant idea; we created a design that involved both types and made sure it worked by running simulations. The new design had the strengths of both types and covered their weaknesses.
Most prior solutions were connected to the grid so it could directly provide the electricity produced. However, the second modification is to connect our solution to a rechargeable battery so we can use its power whenever needed. This was more efficient and had many uses as we can later exploit the battery's electricity whenever we wanted instead of using the electricity provided by the turbine right away.
The third modification is using recycled materials. Most prior solutions are small-scale, and they still use expensive materials. Despite adding a little more efficiency to the turbine, it was costly, and it was hard to get the material needed. For our solution, we decided to use recycled materials like big old cans, wood, sticks and used batteries. This significantly reduced the cost of our solution, and we ensured it still works as desired.

Grade: Blue

Feedback:

Strengths:

1. The response is well-developed and clearly structured into an introduction, body, and implied conclusion.
2. The student gives three distinct and thoughtful modifications with real examples from their project, showing deep understanding of how prior solutions can be adapted.
3. Technical terms like Savonius, Darrieus, and simulations are used correctly, reflecting solid research and learning.
4. Each modification is well explained, showing both the reason for the change and its impact, such as improving efficiency or reducing cost.

Weaknesses:

1. Even though the ideas are very strong, there are slight grammar problems. e.g.: "we research prior solutions akin to our solution" ➔ "we researched prior solutions similar to ours"; "we had to research deeper and with a lot of resources" ➔ "we had to research deeper using many sources."

General Notes:

The answer clearly shows how the student improved existing ideas to fit their own design needs. It's creative, well-researched, and practical. There are a few small language issues, like verb tense and wording, but they don't affect the meaning. Adding a clear ending sentence and using topic sentences (like "The first modification we made…") would make the writing smoother. Also, the phrase "prior solutions" is repeated a few times and could be replaced with similar words. Still, these are small fixes, and the overall quality of the response is strong.

Question 3:

In (PH.1.09) you have studied the principles behind general properties of fluids, continuity equation, Bernoulli's equation, and others. Explain two different benefits you have got from your study in designing your challenge "Harvest and store clean energy.*

In order to overcome our challenge, we need to design a prototype to collect clean energy from its environment and store it efficiently. To do that, we required the aid of some physics principles like the continuity equation, Bernoulli's equation, pressure difference, and others. Our prototype is a wind turbine that rotates by the force of wind.

The first benefit, we can use Bernoulli's equation to calculate the amount of kinetic energy generated by the wind and converted into rotational energy by the turbine then into electrical energy by the generator. Bernoulli's equation: $P_1 + ½\ p_1\ v^2 + p_1 g v_1 = P_2 + ½\ p_2\ v^2 + p_2 g v_2$. The variables in this equation represent potential energy, kinetic energy and pressure. By using this equation, we can predict the amount of energy we can get based on the speed of wind.

The second benefit is using the continuity equation to maximize the speed of wind. The continuity equation: $A_1 V_1 = A_2 V_2$. This means that if the area the wind passes through is small, its speed will increase and vice versa. We can use this by setting up a tube with two ends in front of our turbine. The first end has a large area so it can take up as much air as possible. The second end is in front of our turbine and its area is equal to the diameter of the circle created by the turbine's rotors. When big amounts of wind pass through the tube, the area will decrease leading to the wind speed increasing, which leads to the wind turbine rotating faster and producing more electricity.

Grade: Blue

Feedback:

Strengths:

1. The response has evident links between curriculum physics concepts (PH.1.09) and the architecture of the capstone project.
2. Bernoulli and continuity equations are mentioned and correctly stated with formulas, with a good grasp of the subject.
3. The description of how each principle was implemented in the design of the prototype is realistic, especially the second advantage, which allowed showing that airflow manipulation can be used to enhance efficiency.
4. The response employs the proper scientific terms and wording (e.g., “rotational energy”, “pressure difference”, “area of the circle created by the turbine’s rotors”) which reinforce the academic tone of the language.

Weaknesses:

1. One or two concluding sentences would be great to sum up the response.

General Notes:

The response shows a clear and thoughtful application of physics principles from PH.1.09, especially Bernoulli’s and the continuity equation. However, the phrase “big amounts of wind” could be replaced with a more appropriate scientific expression like “large volumes of air” or “strong airflow.”