PAS MS/HS Design Thinking Project Rubric

Evaluation Criteria	Exemplary Competency	Proficient Competency	Foundational Competency
1. Discover *How do I find, design, and approach problems or challenges?*	**Make Observations (1.1)** I can take a highly broad, deep, and inquisitive approach to noticing and recording information (e.g. different perspectives, disciplinary lenses, or conditions), and keep detailed records in generating ideas for inquiry. **Pose Questions (1.2)** I can employ strategies for generating questions that drive deeper thinking, and produce high quality questions that elicit deep knowledge of the user and the topic. **Find Information (1.3)** I can find relevant and credible information through academic research and user-focused/empathetic methods.	**Make Observations (1.1)** I can notice and record substantive information to generate ideas for inquiry. **Pose Questions (1.2)** I can generate a large number and variety of open-ended questions for inquiry. **Find Information (1.3)** I can find information through academic research and/or user-focused/empathetic methods.	**Make Observations (1.1)** I can notice and record basic information within a narrow scope to generate a few ideas for inquiry. **Pose Questions (1.2)** I can generate a few questions for inquiry, but struggle with volume and/or depth. **Find Information (1.3)** I can find limited or superficial information through academic research and/or user-focused/empathetic methods.
2. Define *How do I interpret information and define problems or challenges?*	**Define Evaluative Criteria (2.1)** I can define sound criteria for determining if a problem is appropriate as a project focus and, after ideating, to what extent a solution could solve the problem. **Consider Constraints (2.2)** I can define constraints based on user needs and/or resources to show a deep understanding of my design space. **Define Problem (2.3)** I can evaluate complex information to produce a nuanced and significant problem statement.	**Define Evaluative Criteria (2.1)** I can define clear criteria for determining if a problem is appropriate as a project focus and, after ideating, if a solution could solve the problem. **Consider Constraints (2.2)** I can define constraints based on user needs and/or resources. **Define Problem (2.3)** I can evaluate information to produce a clear and significant problem statement.	**Define Evaluative Criteria (2.1)** I can define some criteria for determining if a problem is appropriate as a project focus and, after ideating, if a solution could solve the problem. Some aspects are overlooked. **Consider Constraints (2.2)** I can identify some constraints based on user needs and/or resources. **Define Problem (2.3)** I can evaluate information to produce a problem statement that lacks clarity and/or significance.
3. Ideate *How do I generate, refine,*	**Generate Ideas (3.1)** I can generate a large number of both wild and realistic ideas.	**Generate Ideas (3.1)** I can generate a large number of mostly conventional ideas.	**Generate Ideas (3.1)** I can generate some ideas, but they may be insufficient in

			volume or originality.
and evaluate ideas?	**Refine Ideas (3.2)** I can organize, classify, and prioritize ideas, drawing complex connections between them, to possible directions, trends, or constraints.	**Refine Ideas (3.2)** I can organize, classify, and prioritize ideas to determine possible directions, trends, or constraints.	**Refine Ideas (3.2)** I can classify ideas, but may struggle to determine possible directions, trends, or constraints.
	Develop a Plan of Action (3.3) I can create an initial plan for further exploration that articulates a sophisticated methodology (e.g., experimental design, advanced research methods).	**Develop a Plan of Action (3.3)** I can create an initial plan or method for further exploration.	**Develop a Plan of Action (3.3)** I can create a plan or method for further exploration, but it may be narrow, inflexible, or lack a clear vision of the end product.
4. Iterate *How do I build on and improve my ideas and products?*	**Make Prototypes (4.1)** I can create testable attempts at a solution that respond elegantly to the problem and are easy for others to understand.	**Make Prototypes (4.1)** I can create testable attempts at a solution that respond to the problem and others can understand.	**Make Prototypes (4.1)** I can create attempts at a solution but they may not be fully testable, responsive to the problem, or understandable to others.
	Test/Submit for Feedback (4.2) I can seek out relevant users for feedback on my prototype and create an effective system for soliciting useful feedback.	**Test/Submit for Feedback (4.2)** I can seek out feedback on my prototype from multiple sources.	**Test/Submit for Feedback (4.2)** I can seek out feedback on my prototype from at least one outside source.
	Integrate Feedback (4.3) I can analyze and evaluate feedback to refine my criteria and generate a stronger solution.	**Integrate Feedback (4.3)** I can analyze and evaluate feedback to generate a stronger solution.	**Integrate Feedback (4.3)** I can use feedback to refine my solution.
	Reiterate (4.4) I can take action to repeat the iterative cycle and refine my work until it effectively meets user needs and evaluative criteria.	**Reiterate (4.4)** I can take action multiple times to repeat the iterative cycle and refine my work with an aim to meeting user needs and evaluative criteria.	**Reiterate (4.4)** I can take action to repeat the iterative cycle and refine my work.
5. Deliver *How do I share my ideas and products?*	**Present to an Audience (5.1)** I can construct an engaging and substantive presentation based on the audience and purpose (e.g., inform, persuade, or entertain). I can present with preparation, enthusiasm and confidence.	**Present to an Audience (5.1)** I can construct an engaging and substantive presentation based on the audience and purpose (e.g., inform, persuade, or entertain).	**Present to an Audience (5.1)** I can construct a presentation to share my process and/or product.
	Visual Presentation (5.2) I can design a thoughtful and attractive visual presentation	**Visual Presentation (5.2)** I can design a visual presentation that is organized to guide the audience and	**Visual Presentation (5.2)** I can include visual components, but some visuals and/or the organizational

	that guides the audience and enhances the spoken message. **Website Presentation (5.3)** I can design a website that is intuitive to use and has an outstanding visual design.	supports the spoken message. **Website Presentation (5.3)** I can design a website that is user-friendly, well-organized, understandable to an outside audience, follows visual design conventions.	structure may detract from the message. **Website Presentation (5.3)** I can design a website that meets content expectations.
6. Evolve *How do I reflect on and evolve my ideas and products?*	**Reflect on Design (6.1)** I can consistently record sophisticated reflections on both process and product, thoughtfully justifying my reasoning. **Identify Next Steps (6.2)** I can determine future stages in the design or research process. I can set goals and describe a plan for future skill and project development.	**Reflect on Design (6.1)** I can reflect on both the process and product and consistently record my reflections. **Identify Next Steps (6.2)** I can determine future stages in the design or research process. I can set goals for future skill development.	**Reflect on Design (6.1)** I can reflect on both the process and product and inconsistently record my reflections. **Identify Next Steps (6.2)** I can determine future stages in the design or research process.
7. Group Collaboration *How do I work with others and add value to collective work?*	**Abide by Group Norms (7.1)** I can work with my group to help build and maintain consensus with regard to expectations, holding myself and others accountable to them. **Task Management (7.2)** I can work with my team to create a detailed task list that divides work reasonably and sets priorities; assign roles as needed; set a schedule and track progress; and run meetings efficiently. **Work as a Whole Team (7.3)** I can develop ideas and create products with involvement of all team members, bringing tasks done separately to the team for critique, revision, and coherence. **Encourage Diverse Perspectives (7.4)** I can help manage airtime and make connections between and build on others' ideas to generate new and unique insights. I can be open to new and diverse perspectives. I can explain revisions in my own	**Abide by Group Norms (7.1)** I can work with my group to establish expectations and hold myself and others accountable to them. **Task Management (7.2)** I can work with my team to create a detailed task list; assign roles as needed; set a schedule and track progress; and run meetings efficiently. **Work as a Whole Team (7.3)** I can develop ideas and create products with involvement of all team members, bringing tasks done separately to the team for critique and revision. **Encourage Diverse Perspectives (7.4)** I can help monitor airtime and make connections between and build upon others' ideas. I can be open to new and diverse perspectives. I can help clarify areas of agreement and disagreement, and help the group evaluate its ideas.	**Abide by Group Norms (7.1)** I can work with my group to establish expectations and hold myself accountable to them. **Task Management (7.2)** I can work with my team to create a task list with some division of labor; assign roles; set a rough schedule and track progress. **Work as a Whole Team (7.3)** I can develop ideas and create products with team members, but tasks may be done separately or in isolation. **Encourage Diverse Perspectives (7.4)** I can build upon others' ideas. I can be open to new and diverse perspectives.

	thinking and help the group evolve its ideas. **Critical Reflection (7.5)** I can help the group to critically examine conventional or authoritarian assertions, challenge my own assertions and beliefs, and willingly express unconventional and possibly unpopular views.	**Critical Reflection (7.5)** I can challenge my own or the group's assertions and beliefs, and willingly express unconventional and possibly unpopular views.	**Critical Reflection (7.5)** I can challenge my own or the group's assertions and beliefs, but may not be willing to express these insights.
8. Personal Habits and Mindsets *How do I approach and think about intellectual and personal growth?*	**Time Management (8.1)** I can come to class prepared all of the time and go beyond expectations. **Growth Mindset (8.2)** I can rate my level of agreement with each statement and explain my reasoning, using moments of personal growth or struggles to demonstrate a clear and accurate understanding of growth mindset. I can set goals for future progress with clear evaluative criteria. **Grit (8.3)** I can rate my level of agreement with each statement and explain my reasoning, using moments of success or failure to demonstrate a clear and accurate understanding of grit.. I can identify potential obstacles to achieving my goals, and create, adjust, and follow a plan to overcome them.	**Time Management (8.1)** I can come to class prepared all the time. **Growth Mindset (8.2)** I can rate my level of agreement with each statement and explain my reasoning, providing examples based on moments of personal growth or struggles. I can set goals for future progress. **Grit (8.3)** I can rate my level of agreement with each statement and explain my reasoning, providing examples based on moments of success or failure. I can create a plan of improvement.	**Time Management (8.1)** I can come to class mostly prepared. **Growth Mindset (8.2)** I can rate my level of agreement with each statement and give an example. **Grit (8.3)** I can rate my level of agreement with each statement and give an example.

Rubric Criteria	Evidence: Entry Name, Date, and URL	Explanation for How I Met the Criteria
Make Observations (1.1)	**Make Observations (1.1)**	I believe I demonstrate Proficient Competency in this criterion because I was able to come up with initial ideas as to what might be a problem we can solve at or beyond PAS and then choose one to work on after analyzing the significance of the issue. My evidence is my list of ideas that I came up with and then later discussed with my group.
Pose Questions (1.2)	**Pose Questions (1.2)**	I believe I demonstrate Proficient Competency in this criterion because I was able to come up with a large amount of questions for the interview. My evidence is the list of questions that I came up with for our interview preparation that I beleive target the user's inner motives through methods such as the 5 whys and conditional questions that deepen the conversation.
Find Information (1.3)	**Find Information (1.3)**	I believe I demonstrate Proficient Competency in this criterion because I was able to find compelling sources and information about the topic we decided to do as a group. That included researching scientific journals on studies about sleep and health as well as looking at studies of heart rate pattern detection and the factors that may affect it.
Define Eval. Criteria (2.1)	**Define Evaluative Criteria (2.1)**	I believe I demonstrate Exemplary Competency in this criterion because we used the SVI scale to rank our ideas by making each member give a number for each rating. After totaling the scores, we ordered our top 4 ideas in the list by SVI score ranking. We then eliminated another 2 ideas and we have 2 similar ideas remaining. After consulting Mr.Manning, we decided to go with topic 2. I believe this is an efficient and accurate approach to evaluating ideas.

Consider Constraints (2.2)	**Consider Constraints (2.2)**	I believe I demonstrate Proficient Competency in this criterion because we came up with a list of constraints that our product must meet. Then we created a table of criteria for our product that must be met in order to make it a usable product from the user's perspective. We covered pleasantness, usability, willingness to use, effectiveness, and affordability. All of which are important aspects to consider when creating a solution to a habit based problem.
Define a Problem (2.3)	**Define a Problem (2.3)**	I believe I demonstrate Proficient Competency in this criterion because I initially had a little bit of trouble coming up with a good problem statement because we had so many different topics and because some members left our group and so some ideas were left not explained as clearly. I did a lot of elimination and created up to 4 versions of the problem statements and eventually voted on one best statement we can stick to.
Generate Ideas (3.1)	**Generate Ideas (3.1)**	I believe I demonstrate Exemplary competency in this criterion because some of the ideas I came up with were extreme, and some were possible, while others difficult to create. Some ideas I left slightly vague so that we can further discuss how we should approach those topics. With ideas such as caffeinated air and coffee machine, I tried to consider how realistic and feasible they were and kept my ideas creative, yet not too far from reality.
Refine Ideas (3.2)	**Refine Ideas (3.2)**	I believe I demonstrate proficient Competency in this criterion because I took our list of ideas and eliminated ones where both of us thought were either impossible or potentially dangerous. Once that was done, we went for an idea based on interest. Which initially didn't work because we had to change our idea. We later decided to switch to an idea that was more feasible in terms of do-ability given our school's unusual circumstances right now.
Develop a Plan of Action (3.3)	**Develop a Plan of Action (3.3)**	I believe I demonstrate Exemplary Competency in this criterion because I developed a plan of what needs to be done after we picked our topic, which I personally thought is highly likely to be replaced. I planned out how we are going to test out our idea to see if we want to actually work on it or not. Once we changed our idea topic, I laid out a rough task list of what needs to be purchased, installed, and coded so that we have a rough idea of how much work needs to be done and to pace our development on the project.

Make Prototypes (4.1)	Make Prototypes (4.1) + 4.2 & 4.3	I believe I demonstrate Exemplary Competency in this criterion because I created/built a tangible prototype that attempts to solve the issue of motivating people to wake up that was well received by multiple testers. We effectively used the feedback of multiple testers to make changes to and improve our prototype.
Test/Submit for Feedback (4.2)	Test/Submit for Feedback (4.2)	I believe I demonstrate Proficient Competency in this criterion because we got feedback from multiple users for our unfinished prototype that we used along the way to make our final prototype include their feedback. Since we did not have enough time to finish a complete prototype before getting feedback, we showed our testers the parts of our product that were already functional. This was the best we could do given our unusual circumstances and lack of members, time, and resources.
Integrate Feedback (4.3)	Integrate Feedback (4.3)	I believe I demonstrate Exemplary Competency in this criterion because I was able to take the feedback we received and incorporate into the design of our prototype as we were building it. We have documented the whole procedure and we have physical proof of the changes we implemented.
Reiterate (4.4)	Reiterate (4.4)	I believe I demonstrate Exemplary Competency in this criterion because we had over 3 iterations of our prototype as we continually made changes on the go as we built our prototype and received new feedback. Every reiteration has been documented along with the changes made and the process we used to make those changes.
Present to an Audience (5.1)	Presentation1	
Visual Presentation (5.2)	Presentation1	I believe I demonstrate exemplary competency in this criterion because we created a presentation with a lot of visuals (but not too much) to capture the audience's attention without distracting them too much. That included not having too much text while not having too many complicated images.
Reflect on Design (6.1)	Reflect on Design (6.1)	
Identify Next Steps (6.2)	Identify Next Steps (6.2)	

Abide by Group Norms (7.1)	Abide by Group Norms (7.1)	------------ before Wayne and Author left --------- I believe I demonstrate Exemplary Competency in this criterion because In order to follow group norms, we must first *define* the group norms and reach consensus. We came up with a table of collaboration guidelines by compiling each member's input, which can be seen below the first table. Additionally, I made use of Trello to track, assign, and update tasks and due dates for the team in a timely fashion, with the exception of the interview tasks due over the winter, which was impossible for me to complete because I was overseas the entire time. I also used Google Drive in the way we all agreed to, after we discussed where each file should be submitted. ------------ after Wayne and Author left --------- I have no idea what my competency in this criterion is because we eliminated many aspects of the old group norms that we had. Group norms make sense for a group of multiple people because it makes management and task allocation easier. But for a group of two, abiding by strict team management tools is actually a burden because we end up spending more time managing, than actually doing the project. We decided to drop our usage of Trello and turned to messenger applications to directly communicate plans and tasks. Google Drive and our documents directory system was still used. In addition, since we now have to deal with code, we added Github to the list of tools we used as a team.
Abide by Group Norms (7.1)	Abide by Group Norms (7.1)	

Task Management (7.2)	Task Management (7.2)	------------ before Wayne and Author left ---------
		I believe I demonstrate Exemplary Competency in this criterion because as the task manager, I split each task so that each person has an approximately equal amount of workload. The tasks were listed on Trello and each member was tagged to the tasks along with a due date. Tasks also had color labels so that related tasks can easily be grouped together.
		------------ after Wayne and Author left ---------
		I believe I demonstrate Proficient Competency in this criterion because as I continued my task manager role, I used an ASAP approach to deadlines, which worked well for me, but didn't work too well with Daniel. I was thinking that since there was only 2 of us, flexible deadlines would work well. Unfortunately there was a disparity in terms of effort. With the deadlines for tasks being 'ASAP', I gave it my all and did what I could to get things done in my spare time, including every other afterschool day and the weeklong moving break. This led to me finishing my part pretty quickly and I was at a point where Daniel must have completed his part in order for me to continue, only to find out he has barely started.
		I realized I had to be more strict and turned to darker methods to force Daniel to work at the necessary pace we needed to complete the project in time.
		My new policy was that we both spend the same number of hours on the project. If Daniel spends 3 hours outside of school on the project, then I will do the same. If he spends 0, I will also do nothing.
		This policy eventually led to us staying after school together after Innovator Space classes to work on the project, which brought lots of productive progress to our project.

| Work as a Whole Team (7.3) | | ------------ before Wayne and Author left ---------

I believe I demonstrate Exemplary Competency in this criterion because we have been coordinating our research so that each member researches a piece of the project and then we get back together and put it together to form results. We heavily utilize modularization so that tasks can be broken down and easily rescheduled or changed when necessary, without affecting other tasks. This way we can simultaneously work as a team instead of waiting for someone to finish something in order to move on to the next task.
Furthermore, we have a "under review" section on our Trello board that allows members to put their work up for peer review from the team. This is the check and validation process we use to make sure contributions are meaningful and as another point of collaborating as a team. It also allows us to fairly evaluate unpopular opinions instead of skipping through.

------------ after Wayne and Author left ---------

I have no idea what my competency in this criterion is because we aren't really a 'whole team' anymore and there is only so much "teamwork" I can facilitate when the other member refused to put in an equivalent amount of effort (first half of Q3). I decided to remove Trello from our team because the other member only looked at it if I reminded him to do so on Messenger. It would be much more efficient and time saving for me if I message Daniel directly about what needs to be done instead of listing tasks out on something only half the team(I) looks at. I tried to communicate with him multiple times to organize a time for us outside of class to build the project, but it was immensely difficult. He had driving class, he had tutoring, and he insisted he take his dad's car home every day at 4pm. He even refused to help during the week long moving break. Thus I bought all the components and built the physical machine by myself over the break. I refuse to call that teamwork. Teamwork only happens when all members make adjustments and personal schedule sacrifices for the success of the project; and that didn't really happen. Instead, my teammate chose the selfish route and earned himself a driver's license while I built the project.

------------ Second half of quarter 3 ---------

I believe I demonstrate Exemplary Competency in this criterion because once Daniel got his driver's license he was more willing to |

		spend time afterschool to work on the project. On days when we had the "innovator space" class, we would continue working for another hour on the programming part. I would provide the research and sample code for each module we use, and Daniel would combine the code into one program. During this time, I also threatened Daniel that if he doesn't do work, I would also stop doing work, because I think he was relying on the idea that I would "pull the project through" even if he only put in minimum effort. This resulted in both of us having a near equivalent amount of time spent on the project during the second half of Q3; work was very evenly distributed between the two of us (except for the website) and we both used each others' strengths to benefit the project.
Encourage Diversity (7.4)	Encourage Diversity (7.4)	------------ before Wayne and Author left --------- I believe I demonstrate Proficient Competency in this criterion because when we have discussions, we always make sure each person has a similar amount of speaking time so that every idea is heard before we move on to make a decision on anything. This along with making sure every idea is discussed makes it so that a diverse range of ideas. ------------ after Wayne and Author left --------- I have no idea what my competency in this criterion is because after wayne and author left it was just the two of us. And at this point in time, we were just building prototypes so there was little to no discussion involved, only building, coding, and troubleshooting, which were all resolved through mathematical or logical means. As for the part where Daniel and I went through Ideation, our ideas were pretty much in line with each others' or we made decisions in a manner that purely focused on getting things done before the due date, thanks to the school administration's irresponsible decision (that actually violates the student handbook) to remove two team members from our group mid year from a year long course. (please make sure this doesn't happen to next year's students, the increased workload required a lot of extra effort from me in order to complete the project)

Critical Reflection (7.5)	Reflection (bottom of page)	I have no idea what my competency in this criterion is because there was only just the two of us and I can't really evaluate how I examined unconventional or unpopular ideas or put down authoritarian assertions. The both of us just looked at each other's ideas and in many cases, we just went with whatever that would result in the fastest solution. Our ideas were also based on profession. Since I was better at the hardware part, everything I said about how we are going to do the hardware was accepted as stated. Daniel was better at programming so programming style and methods were done in his fashion.
Time Management (8.1)	Google Classroom	------------ before Wayne and Author left --------- I believe I demonstrate Proficient Competency in this criterion because at first I wasn't really that efficient at turning things in on time because I had a lot of other work overlapped (a lot of robotics work was due before the competition date). Later on, after the competition date was passed, I spent more time working on assignments for this course and I near the end of the semester I was back on track with turning things in on time. ------------ after Wayne and Author left --------- I believe I demonstrate Exemplary Competency in this criterion because as the project lead, I made sure that our team of two was able to produce a presentable and testable product (without faking it) as well as a product introduction website before the due date. I used a dynamic approach to managing time/tasks for the project so that if one method doesn't work, I can apply and try another method. We initially used the ASAP everything method because I thought we were both responsible enough. But it didn't work out because the other member thought it means there was no deadline. We changed so that the new method was "you do one thing, then I'll do one thing". It worked pretty well because it forces progress, even from someone who isn't really motivated.

| Growth Mindset (8.2) | | ------------ before Wayne and Author left ---------

I believe I demonstrate Proficient Competency in this criterion because after each step in the Design Thinking process from the last project, I wrote down what could be done to improve what we did. I tried to integrate those ideas more into this project. Such as better task management and using team drive to manage our files.

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I believe I demonstrate Exemplary Competency in this criterion because throughout the project I looked for areas that might need improvement and tried to make changes in the way we do things for increased efficiency or to make our product better. I constantly tried to use new methods every time a member leaves so that we can adjust to the increased workload from a member leaving. I also observe how our team's members made use of our team tools. If I find out that people are not using things efficiently, I tried to slightly modify our team norms or tools usage so that we are operating with efficiency. |

Grit/Persistence (8.3)		------------ before Wayne and Author left ---------
		I believe I demonstrate Exemplary Competency in this criterion because despite numerous iterations of my design thinking website, I continued to make changes to it so that it better fits the criteria, even when the criteria changed a couple of times over the year.
		------------ after Wayne and Author left ---------
		I believe I demonstrate Exemplary Competency in this criterion because despite the continuous stream of irresponsible decisions by our school office, which led to half of our team leaving, I took the place of the members that left and continued to work on the project, to make sure that it is still on track, despite the increased workload. I initially considered doing a topic that can be solved via virtual means (website, app, etc) so that we can easily fake progress, but on second thoughts I wanted to actually get something more interesting out of this class, at least for once. So unlike the other groups, I decided that we should actually do something, even if we have to go the extra mile to get it done. And we sort of did.