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Recreational Mathematics is a branch of mathematics that is done for self-education and enjoyment. Some examples of recreational mathematics are logic puzzles, chess, origami, and tic-tac-toe. I stumbled across this branch of mathematics while I was doing an assignment for my mentor’s class on STEM education. After reading more and more about recreational mathematics, I started questioning why it wasn't used in schools! The very definition of it is math that is done for enjoyment. One could argue that all math is fun, but many students think of themselves as “not a math person” and dread math classes. I plan to explore this branch of mathematics to get a better understanding of it and to speculate how it can be used in the classroom. Recreational mathematics is often overlooked in schools in favor of what is seen as a more rigorous curriculum. I believe that students would benefit from the use of recreational mathematics in the classroom by showing mathematics in a more fun and approachable light.

Method for Carrying Out the Project:

I plan on conducting a self-study on my experience with recreational mathematics. This involves me actually experiencing different types of recreational math including, but not limited to, logic puzzles, paper-folding, and board games. Each week I will journal about my experiences with different types of recreational mathematics and think about the following questions: What types of thinking did I engage in? What skills are needed? Was this fun? Is this something that I found interesting? Are there practical applications of the thinking and skills that I used?

After engaging in a variety of activities that are considered to be recreational mathematics I will analyze my journals and extend my thinking to practical applications and implications of the activities. How can I use recreational mathematics in the classroom? Are these things practical to use? Can I use them to create a better understanding of mathematics? Will this make mathematics fun for students that see math as something to dread? I will address these questions and many others in a more in-depth analysis of my journaling.

Anticipated Significance:

Mathematics is something that we use everyday in our lives. I find it very unfortunate that many people are scared of mathematics and have anxiety when the idea of engaging in mathematical thinking is brought up. I believe that recreational mathematics can help these people see that mathematics is not as scary as they think. Recreational mathematics can be incorporated into classrooms to help foster a love and new appreciation for mathematics. People should not fear mathematics and see how it can be fun and enjoyable.

- Schedule:
- Week 1: Gather Materials, Introduction
 - Week 2: Paper-folding, Journal
 - Week 3: Logic Puzzles, Journal
 - Week 4: Mathematical Games, Journal
 - Week 5: Modern Games, Journal
 - Week 6: Mechanical Puzzles, Journal
 - Week 7: Brain Teasers, Journal
 - Week 8-12: Journal Analysis and Conclusions

Timeline (dates)	Goals and Objectives	Actions:	How Actions Support Goals and Objectives
Goal I: Gather materials and familiarize self with the topic			
Week 1	First objective: Gather materials for future weeks	Purchase paper, games, books, etc.	I will need these items to complete my experience with them.
	Second objective: Familiarize self with recreational mathematics	Read existing literature on the topic	I should be more familiar with the field to write about it and explore it.
Goal II: Data Collection			
Weeks 2-7	First objective: Experience different types of recreational mathematics	Immerse myself in the recreational mathematics activity of the	My experiences will allow me to come to meaningful

- R1: Goals of project stated.
R3: Explicitly stated objective
- R1: Would be more persuasive if data/supporting evidence is cited. Defining what ‘school’ here means (K-12? A subset of K-12? Post secondary?) will help narrow down the focus of the research and help your reader understand the motivation behind your project better.
- R4: This is a helpful intro but could be tightened and citations are needed to provide the foundation for your thinking.
- R3: The activities are explicit and certainly seem feasible... however, I'm not sure whether doing this study on one's own self will really achieve the overarching goal
R4: A citation is needed here to provide the source for this approach.
- R1: Good reflective research questions – stating these allow evaluators to understand the guiding questions behind this project and gives the reflection some structure and coherence.
- R4: How are you doing this? What type of analysis of your reflection do you plan to do - are you using your research questions to then pull out themes from your writing?
- R1: While this is a valid approach, I think it gives the project additional credibility if the framework or resources used to help answer these questions are included in the proposal. The framework can be the experience of the mentor or one or more citations.
R3: A little explanation on what type(s) of in-depth analysis(es) would be conducted would have been helpful here... I'm still not sure how this study on just one participant would be useful, though
R3: What type of outcome is even expected from a project like this... a journal? I can't see a dataset or art object coming out of this project, though the timeline seems pretty feasible
R4: This is a compelling reason. Could be strengthened by tightening your writing and adding a practical classroom example beyond 'allaying fears'.

- R1: This timeline seems very condensed unless the applicant is already familiar with the subject matter or the mentor and mentee are conducting preparative work not described here in the timeline. Clarifying that would lend additional support to the feasibility of the project.
- R1: It would be helpful to provide a short description or criteria of the selection of these materials.
- R1: It would improve the proposal greatly if some select examples for consideration is cited.
- R4: This sounds like a 'lit review' and 1 week to do that is not enough time.

		week	conclusions about that particular type of recreational mathematics.
	Second objective: Record my experiences	Record how I felt, thought, and acted throughout my experience.	I will use this journal for further analysis of the practical and classroom applications of recreational mathematics.
Goal III: Analysis and Summary of Results			
Week 8-12	First objective: Practical and classroom applications of recreational mathematics	I will analyze my journals of my experience and meet with my mentor about them	This will be the summation of my results and is the main purpose of my research
	Second objective: Create an easily deciphered summation of results	I will create my poster to show my results and conclusions in an easy-to-read fashion	Creating the poster and having it ready is very important to share my results with others
Goal IV: Presentation of Results			
Undergraduate Research Day	First objective: Present my findings at Undergraduate Research Day	Print poster before UGR day	I need the poster printed before I can present it.

[R2: This is a wonderful project in theory \(and the student could see it in practice any time/day within the department of Art and Design\). The scope seems too narrow. Is there a potential for actual implementation and in what arena does the researcher see that happening? I would recommend a larger study with willing faculty/students/student orgs.](#)

Evaluation:

- 1) Are project activities and outcomes connected to the stated goals and objectives? **Strongly agree.**
- 2) Project feasibility. How realistic and appropriate is the study for this student in the time available?
Appropriate, but as commented on the timeline section, the apparent timeline for the beginning phase of the project seems very condensed.
- 3) Likelihood of project outcomes. Is the project likely to result in a data set, creative performance, art object, or academic project that can be presented and/or published? **Likely.**

R4: This is big piece of the research and project and will enable you to make meaningful connections, say more here and above re: the process for analysis (coding, reading for themes connected to ques?). How will you 'make sense' of your 'data'?