GRADE 12 APPLIED
RESEARCH PROJECT

Situation

1. Being able to investigate your own mathematical concepts and express them to others is important. Some day you might have to keep a niece occupied by inventing a game, or you might have to explain some geometry to a nephew or you might have to fully explain to your Aunt why it costs so much to redecorate a room.

2. This project allows you explore some of your own ideas and explain them to others.

Mission

3. Research and clearly explain a *teacher-approved* mathematical concept.

Conduct

4. **Project Participants**. You may work alone or as a pair. If you work as a pair the product should be twice as good or at least $\sqrt{2}$ times as good.

Project Concept

5. Your concept must be approved by the teacher. The teacher is eager to give you some advise.

6. The preferred categories of effort are:

   a. a Game;

   b. a math Lesson

   c. a Design and Measurement project.

7. This is meant to be a fun project and should consume no more that 10 hours of your individual time. So the calibre of your submission need only be representative of that limited amount of genuine effort. It is not meant to be an onerous Master's Thesis!

Game

8. Invent a game, pretend you are inventing a game for the "**Price is Right!**". It could be a board game, a mechanical game, …and actually manufacture a 'prototype' of the game. It should involve some randomness of course. You must calculate some probabilities (theoretical or experimental) and some 'expected values' (ie: payoffs).

**Games may not refer to money or gambling. Any 'wagers' are to be for tokens, or discs, or opportunities to enhance your chances at a final 'prize'. Like in 'The Price is Right'. **

** Teacher has 12 and 8 and 20 sides dice if you want, or you can do randomness electronically, ….ask teacher.**

Biography and Lesson

9. This category you research a famous mathematician. I recommend the Indexes of Biographies: http://www-groups.dcs.st-and.ac.uk/~history/BiogIndex.html website. Find an idea your mathematician discovered and explain it. It **cannot** be an idea we have already covered in class. The teacher is eager to help direct your attention in this also. So for example, you might investigate one of those Geometry Laws that Napoleon discovered. The teacher has an ∞ number of suggestions.

10. **Presentation format**. Your project must be written up. Three double-spaced pages (not counting diagrams) of at least 400 words. A PowerPoint presentation is certainly a suitable option also. Further, you will need to present your game or your lesson verbally to the class for 10 minutes and allow at least 5 minutes of questions or play. Departures from this format may be authorized by the teacher in the event you are too bashful to speak in front of your classmates.

Design and Measurement Project

11. Calculate the cost and material required to redecorate your room or to build an outdoor deck or paver patio of your own design or with which you are familiar. If you have no experience with that, teacher can provide you with a redecoration project.

Rubric

12. A marking Rubric will be published. It will emphasize accuracy and comprehensibility, neatness, uniqueness, and your comprehension of the chosen concept.

13. The project will be worth 10% of your course mark.

Conclusion

14. Don't forget to consult teacher to make sure you have the appropriate scope of your project and for suggestions.

15. Have fun and learn.