

MATHEMAGICAL BIRDHOUSE

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Gardner's Mathemagical Birdhouse

My project for this class is Gardner's Mathemagical Birdhouse. The roof of the birdhouse is a 9-3 configuration game reimaged into a 3D structure. Just like in the original game, there are 3 ways to win a) put 3 pieces on the same color strip (blue, green, or purple), b) get 3 pieces in the same ring (top, middle, or bottom), or c) get 3 pieces on the house of the same pattern (spotted, solid, or striped). Each player will take turns placing either their red square or orange triangular "crackers" onto the 9 perches on the roof until either a player wins based off those 3 conditions or there is a draw. While this is a configuration game, it also has several references to other Gardner inspired ideas, which are tangrams, sliding block puzzles, and toothpick teasers. And of course, peeking out of the birdhouse is a little bird, ready to eat the crackers after you place them on his perches. The birdhouse is made of wood, which I painted the appropriate color schemes on. I constructed the crackers, the bird, and the other references to Gardner out of Model Magic, a lightweight foam air-drying clay. The perches were all made out of wooden pegs that I cut to the appropriate weight and glued to the birdhouse.

This project fits all of the requirements. It is creative because I have not seen any 3-dimensional configuration games. I was inspired by the configuration games presentation last week and did not use anything other than the image of the 9 3 configuration game to draw a rough idea of a cone. Upon adventuring around stores, I was inspired on the theme of a birdhouse to make the game friendly for children my cousin Evan's age (9-11). This project had

personal interest to me because it was by far my favorite topic in class. I was so excited at the prospect of presenting on this topic that I immediately changed my idea at the last minute. I have a strong passion for crafting and building. Most of the work I do in my usually academic life is writing papers and learning about psychological theories so I greatly enjoyed implanting my hobbies of crafting and weekly game nights into this project. Usually, my projects are not something I can bring home and my family would understand, but I am hoping that I can give this as a gift to my cousin Evan whose favorite subject is math and has just started making his own garden with a bird feeder. So, this will help him engage in educational games and continue to allow him to embrace his passions for math. This project also relates directly to Martin Gardner due to the roof of the birdhouse being the 9-3 configuration game that Professor F would win at continually placed onto a cone shape rather than a sheet of paper or flat board. I turned that configuration game into a 3-dimensional game. Configuration games were a large topic we discussed due to it being its own student-led presentation in class that was suggested on the list of potential ideas for presentations at the beginning of the semester. There are also references to other topics that were covered in student-led presentations, such as sliding block puzzles, tangrams, and toothpick teasers.

This project was connected to the goals of the Butler Honors Program, namely, willingness to explore new areas of knowledge and innovative methods of learning. My willingness to explore new areas of knowledge is shown through my lack of schema in configuration puzzles. I was thoroughly excited by the idea of choosing to focus on a topic I did not cover in my prior presentations. I also demonstrated my progress through thoroughly reading through other student led presentation's PowerPoints and other sources online on 9 3 configuration games to help inspire me to create this project. If you ask my roommates, they will

tell you I have been talking about how excited I was to do this and my roommate and I even have played the game many times since I've made it. I also used innovative methods of learning by drawing in my own personal inspiration to not only meet the project requirements but make these theories accessible to children. I have always loved the educational toy stores and I integrated interdisciplinary concepts of education and mathematics to make a project that I believe will make great use. I spent many afternoons of trial and error to find the right shape to make this configuration game both fun and easy to interact with.

References

Brown, Katy & Burkley, Jessica. Configuration Games. 2019. *Class PowerPoint Presentation*.

Gardner, Martin.

PICTURES- of final project

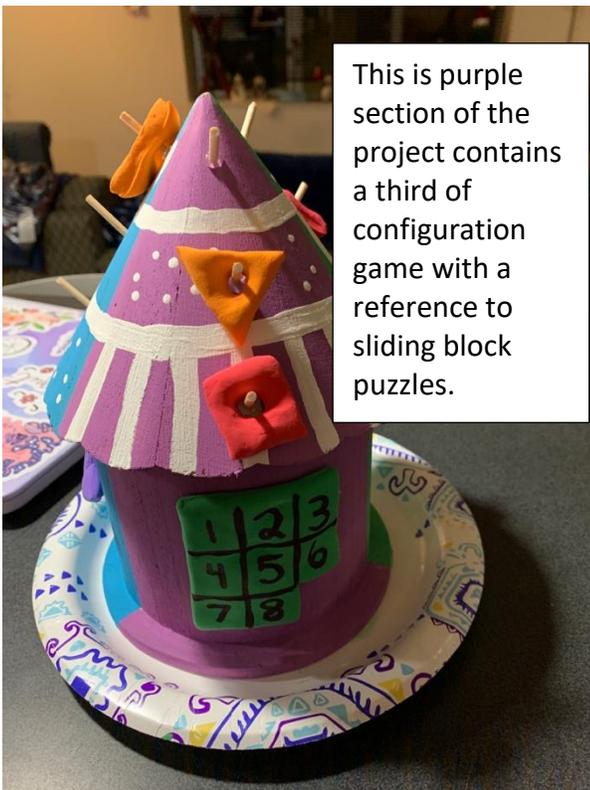
This is the configuration game only. The ways of winning (color, ring, and pattern) are shown below. Each of the 9 sections are outlined in white and divided by color with their own perch.



The green section shows one third of the configuration game and a reference to the toothpick teasers.



This is purple section of the project contains a third of configuration game with a reference to sliding block puzzles.



The blue section contains the a third of the configuration game and a reference to tangrams.

