



Welcome to this episode of Next Wave Automation monthly project. This month's project we are going to make a fun marble board game. It has 1 glue up, 4 machining operations.

The samples were made using cherry and maple however, you might use a hardwood of your own choosing. This is a nice project to give as a gift or make for yourself.

The Instructions, crv.files are found on Next wave Automation Website nextwaveautomation.com This project is aimed at the woodworker with moderate skills. You will need access to the current

version of V-Carve with updates, the tools are listed below.

The main topics today are:

- Project Materials
- Designing
- Machining
- Finishing and Assembly

Project material list for Marble Game:

- 16"x16" hardwood blank

Project Tool List:

Tools that you will need for this project are:

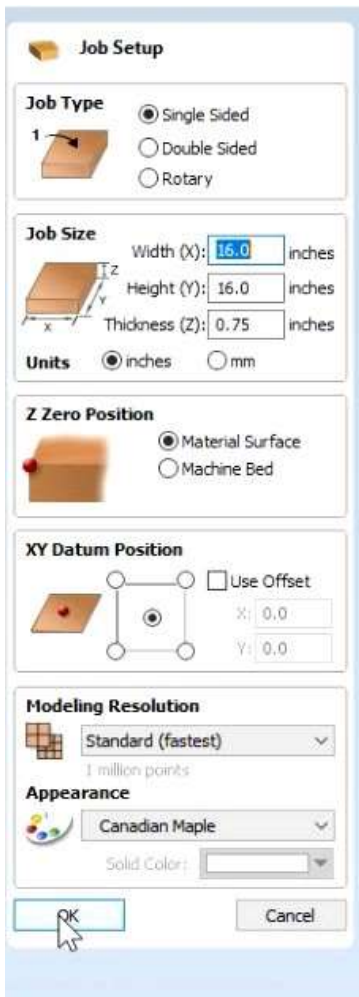
1. 1/16" up spiral bit
2. 60-degree V-Bit
3. 1/8" up spiral bit
4. 1 1/2" surfacing bit

Project CNC Files:

- Marblegame2.crv

Creating the Tap Files:

With the V-Carve software, open the project CNC files. Carefully review all the toolpaths and make necessary changes to suit your tools and machine. The toolpaths are currently set with tool, feeds and speeds that were used in designing the original project. Be sure to review them for your machine. Edit the tools and change the settings to fit you own machine and requirements. It is very important to recalculate all toolpaths after making any changes. Once having made the necessary recalculations for your own machine and tools, reset the preview, and then preview all toolpaths, again, to visually verify the project outcome. Create the tap files for your machine by using the correct post processor. Once satisfied with your settings, save the tool paths using the appropriate post processor for your machine. Check tool paths by air cutting the project or use rigid foam board to run a sample tool path. Now you're ready to make your own **Marble Game!**



Designing information: Step 1: Design

Everybody welcome to this month's video project. This month's project is a board game for marbles some people call it Aggravation. This is be a 14 x 14 board game. We're going to create a new file.

- 16 x 16 x 0.75 of an inch thick. Single-sided job
- the material surface for the Z position
- X and Y datum position is in the center



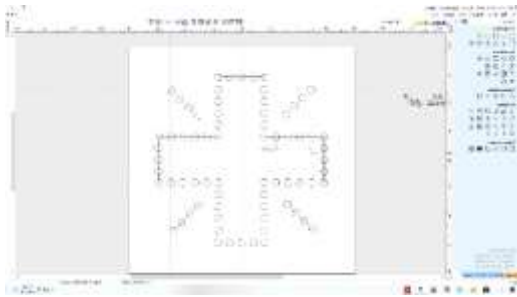
After a little research and I found some pictures of the aggravation game to get an idea of spacing for my marbles.

1st thing will do is we will bring in my bitmap of the gameboard. It basically gives me an idea where things are going to be. When I measured things basically these here are 3/8 inch holes for the marbles There are going 56 marble detents The cross rectangle is 11 3/4" x 3 1/4" the field size for

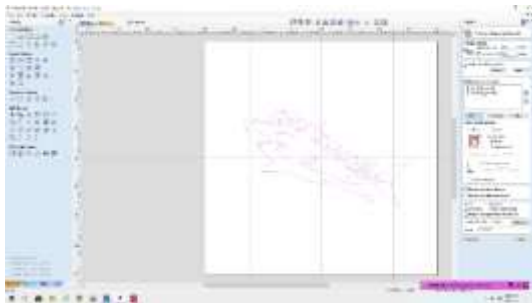
one direction we then want to is copy this and rotate the copy 90°. Now we have a basic cross pattern for my gameboard.

Next thing we want to do is create the detents for the marbles. Now if you will notice we have 56 detents that go around the outside. We will use Copy along vector under Offset and Layout. highlight the vector that we want to copy along with a copy circles that are half

inch in diameter. The reason why is that way will get center points for drilling later. The number of copies I want to make 56.



to model are the start points, Ariel is a good font for me. I like the single-line using the circular copy command copy 4 starts around the board.

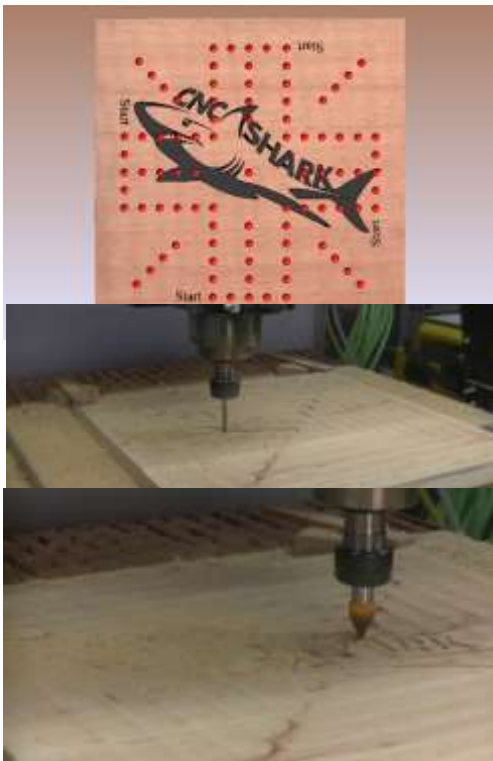


What I want to do now is make a straight line, that's center to center across 4 detents. Shut off the bitmap so not to interfere. Install Guidelines in line with the 2nd detent up. Take your 4-detent line to the intersection of the guideline point and rotate the line on a 45-degree angle. Now take that line a make 4 circular copy rotate on the center. Go back into copy along vectors, but instead of 56 we want 4 on each line. Use the same procedure for the rest on the detents. The last thing

An embellishment you can add is a graphic to the center of the board. Import the graphic of you choose and add it to the board in a size and place that pleases you. Now you create the toolpaths for the detents with a peck drilling toolpath, one for the start words and for the graphic. Make sure you watch the Marble Game Designing Video on nextwaveautomation.com. So were done designing our board. It's ready to go.

Step 2: Machining the marble game board

Now that we have a 16" x 16" blank and our designing done. We are now ready to take our 1 ½ inch surfacing bit and surface the blank. The reason we are surfacing. It is because we want the surface of our blank to be parallel with the gantry. So when we do our v-carve as they all come out at the right depth. The next step is to v-carve the embellishment or are graphic. The 1st bit, we use is a ¼ inch up cut spiral bit this particular bit is cut out a lot of the area. So we don't have to use a small v-carve bit to do it. After we have used the ¼ inch up cut spiral bit. The 2nd bit that were going to use is an 1/8 inch up cut spiral bit with this bit, we are going to carve out the little areas that the quarter inch bit could not get to. The 3rd bit that were going to use is our 60° V bit. This is used to cleanup all the areas to give us a very nice graphic inlay. So that takes care of all of our machining of the graphic.





Now the next step is to fill in the inlay, the inlay will be filled in with polyester body filler with a black dye. We will mask off our graphic mix up our filler and fill in the inlay graphic area. The next step is to sand down the filler flush with the rest of the board.



The next machining operation we are going to do is to drill all the divots for the marbles so we will load our file for the divots and machine the divots out with a 3/8" ball nose end mill. The last step in machining is to machine out all of the start text on the board. This is done with a 60° V bit. Load the program for the start text. That's the machining that we need to do for our marble gameboard.

Step 3: Sanding and Finishing



The last step that we have in this project is the sanding and finishing. 1st thing we need to do is to airbrush the black in all the start text. Mask off all the start text because we don't want to get paint into our divots. Then we airbrush black with very light coats, so it doesn't bleed out of the start text. Then we remove all the masking tape & sand down the black, leaving just the text in black. Now we surface sand the rest of our board lightly round over the edges with sandpaper to knock down all the sharp corners and then were ready to seal with CrystaLac polyurethane. Now you're ready to play your marble game, Aggravation.

Step 4: Game Instructions

Sequence of play

The game starts with each player's placing four marbles in his/her "base". After the order of play is determined through the rolling of the die, each player rolls a single die on each turn to determine the number of spaces to move. All marbles remain in the base until either a 1 or 6 is rolled, which entitles the player to



Projects

Marble Game

move a marble from the base to his/her "start", the first step before entering the track. While this is considered a turn, and the move takes place in lieu of moving a marble that number of spaces, a six, if rolled, entitles a player to another turn whenever a legal move can be made.

The winner is the first player whose pieces all reach home by exact count.[1] If playing partners when your partner has all their marbles in home then they can roll to help get your marbles home faster,

Shortcuts

The hole in the center of the board is known as the "short cut". A player who is able to land a marble in this location by exact count has the option of taking a route even faster to home. The short cut, though, has the drawback in that it may only be exited by rolling a 1.

Aggravating

A player who lands a marble on a space occupied by an opponent's marble "aggravates" that player's piece and sends it back to that player's base. A player's piece may not be aggravated if it is on an inside corner as these are safe from aggravation. You must land on the space either before or after your opponent.

Players are prohibited from landing on or passing their own marble. If this happens they can not move. If you rolled a 6 then you may roll again. If playing teams, you cannot land on or pass your partner. If, however, there are multiple marbles, you can't jump over or aggravate a marble in the middle or front.

Tournaments

The Unicorn Club[clarification needed] has an annual season in which 30 games plus a series of two championship games (total 32 games) are played. Rather than using a board with marbles, a replica of the board is used on a field.[citation needed]

Each color represents a team of 5 players, one of whom is designated as the leader; they wear T-shirts in their respective colors. The four players take the place of marbles; the leader watches, rolls, and makes decisions.[citation needed]

Each team has five home games during a season. Fans of each team, who are usually family and friends of the players, come to its home games and root for the team.[citation needed]

Neutral officials are present at every game, making rulings in disputes.

In team play, the following new rules are added:

The team finishing first wins the game. But all teams are required to finish.

The first-place finisher in the previous game gets three bonus rolls. The second-place finisher gets two, and the third-place finisher gets one. Bonus rolls are used following the move of a player from the base to start with a 1. Their use is required when one is available; they cannot be passed up and stored.

The first-place finisher gets to start the following game first with a player on start rather than on the base. The order is always the same otherwise, resembling the colors of the real board.

The fifth-place finisher must wait until the first 4 teams have a player freed from the base before being allowed to start.



Projects

Marble Game

The last place finisher must wait until all 5 other teams have started, and at least one team (3 if cursed) has reached the home section (safety).

If a team has all its players sent back to start (square one), it is considered as if it had already freed a player for the purpose of allowing other teams to start.

A roll of 5 allows a bonus roll if used to move a player from start to a shortcut (known as "the wheel"). This applies even if it is another team's start. This move is known as a "Hi-Five". Teams have the tradition of holding a player in the start as long as possible, waiting and hoping for a Hi-Five. This is called "Hi-Five ready". Hi-Fives are used to get most players around the board.

Moving onto another team's start is prohibited unless:

That team's base is empty

It is reached by a 6

There is no other possible legal move

However, if a player manages to land there by any of the above methods, she or he may remain there as long as the team wishes.

The super shortcut cannot be used until at least one team has finished. Even then, it can only be accessed from the six spaces from one's own start.

After five teams have successfully finished, if the final team is unable to make a legal move in 6 consecutive rolls, or fails to finish within 6 rolls after bringing its final piece into home stretch (the last seven spaces before the finish), the team does not finish. It is considered "cursed," meaning that it cannot start the next game until at least three other teams bring a player into safety.[citation n

In closing I hope you enjoyed this project, I hope that I have created an interest in doing these kinds of projects and until next time keep on carving

Rick Frazier

Our Sponsors





Projects

Marble Game

Terms of Use: This Project and artwork is provided on the understanding that it will only be used by private individuals. You may use the designs to carve parts for sale but the Files and/or Vectors, Components or Toolpaths within them (or any derivatives) may not be converted to other formats, sold to, or shared with anyone else. This project was created by Rick Frazier and is Copyright 2019 – Silverback Woodworking LLC.