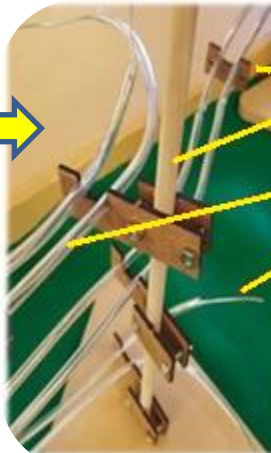


Welcome Aboard Marble Max Track Building!

WARNING Small Parts are a Choking Hazard. Not intended for children under 4 years. **CAUTION: Cut Hazard:** Wire has sharp points that may result in injury. Handle with extreme care. **Disclaimer:** By using the contents and/or activities in this kit you agree to follow all safety best practices and release and hold harmless the developer, manufacturer(s) and marketer(s). You also assume all responsibility for claims, accidents, and injuries to users, bystanders or property associated with the contents of this kit.



First of all, as you unpack, get to know the names of the **Marble Max Track** parts. This will help you make sense of the project instructions.



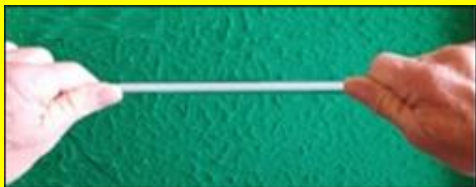
Marble Max Track Parts

- Ten spacers
- Six 3/8-inch dowel rods* & base plates.
- Ten brackets (with #8-32 x 1/4 screws and nuts*)
- Six 48-inch track rails* (1/4-inch vinyl tubing*)
- Six 52-inch length of #16 galvanized wire* (threaded inside tubing)
- 5 Small Marbles

* Available at your local hardware store.

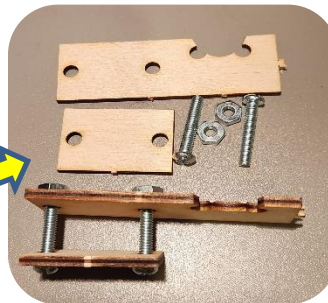
Final assembly required. Righty tighty, lefty loosey"

Step 1. Uncoil and straighten the 4-foot sections of track rails make them perfectly straight, no bumps or kinks.



Tip: Grip a 4-foot section with both hands and stretch and pull the track rail between your thumbs and fingers, like you are wiping the surface clean.

Step 2. Assemble the brackets. To tighten, hold the screw and turn the nut clockwise, to the right.



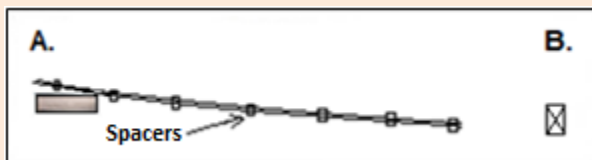
Tip: To add height to your track, join 2 dowel rods together with an "extender".

. Righty tighty, lefty loosey"

Project #1. Construct a Straight-Away track.

Parts Required: 4 to 6 spacers and 2 track rails and a book or box (A) to elevate one end of the rack.

Goal: Construct a Straight-Away marble track that will successfully deliver a marble off the end of the track to a target, like a block of wood (B), four feet from the end of the track.

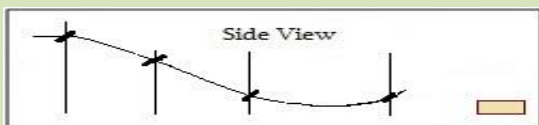


- Step 1. Lay out two perfectly straight track rails.
- Step 2. Attach 4 to 6 spacers along the track.
- Step 3. Elevate one end of the track on a book or box several inches from ground level.
- Step 4. Test the track with a marble.
- Step 5. If necessary, make other improvements to the track rail until it successfully carries 3 marbles down the track.

Project #2. Construct a Jump Ramp (like a ski jump).

Parts Required: 3 or 4 brackets and spacers, 2 track rails and 3 or 4 dowel rods and base plates. A small container (not included).

Goal: Build marble track that will launch marbles airborne, into a container past the end of the track.

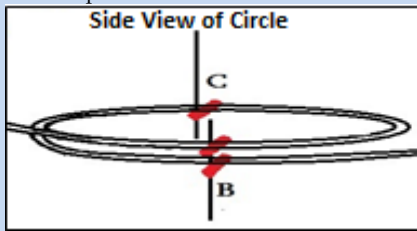


- Step 1. Insert the dowel rods in the pre-drilled holes in the base plates.
- Step 2. Attach assembled brackets to the dowel rods.
- Step 3. Attach the track rails to the brackets.
- Step 4. Add an upward curve at the end of the track.
- Step 5. Tighten the bracket's nuts and screws.
- Step 6. Place a container at the end of the track.
- Step 7. Release a marble from the higher end of the track.
- Step 8. If necessary, adjust the elevation of the starting point or the angle of the ramp at the end so the marble will go airborne and successfully land in the container 3 times.



Project #3. Construct a circular marble track.

Parts Required: 4 to 5 brackets and spacers, 4 track rails and 4 to 5 dowel rods and base plates.

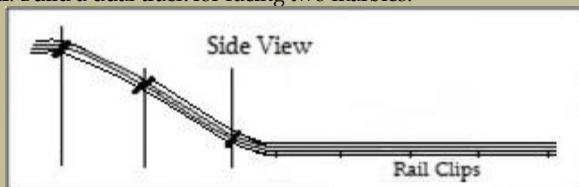


Goal: Design and build a track that carries a marble in circular motion; 360-degree circle.

Project # 4. Construct a Race Track

Parts Required: 10 brackets assembled back-to-back, and 10 spacers, 6 track rails and 5 to 6 dowel rods and base plates.

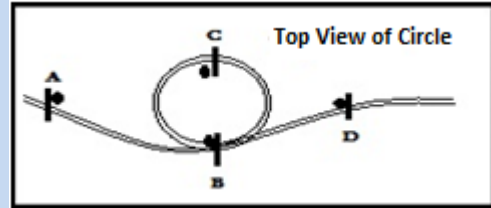
Goal: Build a dual track for racing two marbles.



Note: Assemble two brackets back-to-back, and attach to each dowel rod.



Step 1. Make a sketch of how you will lay out the dowel rod assemblies and brackets.



- Step 2. Set out two dowel rods & base plates (B and C) 12 or more inches apart.
- Step 3. Set dowel rods and base plate at the starting point (A) and the end of the track (D).
- Step 4. Attach 2 brackets to dowel rod B, and 1 bracket to dowel rod A, C and D.
- Step 5. Attach two brackets to dowel rod B, and one bracket to dowel rod A, C and D.
- Step 6. Join two sections of 4-foot sections of track together, inserting the lead wires sticking out of the tubing inside the adjoining tubing and butt two sections together.



- Step 7. Repeat Step 6 so you have two 8-foot sections.
- Step 8. Attach the inside track rail first, then the outside track, making sure the two track rails are running perfectly parallel.
- Step 9. Add extra spacers around the circle to keep the track running parallel.
- Step 10. Angle spacers B and C upward so the outside rail provides a bank for the marbles.
- Step 11. Test the track often with a marble from the beginning.

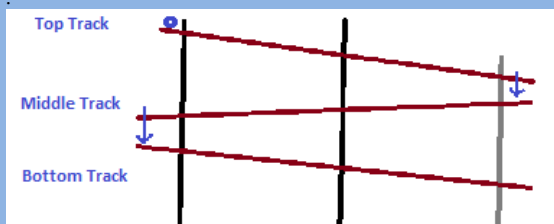
- Step 1. Insert dowel rods in the holes in the base plates and set them in a straight line.
- Step 2. Attach back-to-back-brackets to each dowel rod and loosely tighten.
- Step 3. Make two 6-foot track rails as instructed in Project 3.
- Step 4. Elevate and tighten the starting point bracket on the first dowel rod.
- Step 5. Arrange and tighten the 5 back-to-back brackets creating a gradual slope.
- Step 6. Attach the two 6-foot track rails to the brackets running parallel to each other.
- Step 7. Test with marbles and modify, to make sure the track is running smoothly.

Step 8. It's race time!

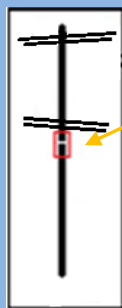


Project #5. Construct a Double Dropper

Parts Required: 6 8 brackets and spacers, six 4-foot rails and 6 dowel rods and 3 base plates. 1 dowel rod extender.



Goal: Build a three-level, double drop track..

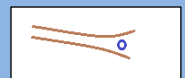


Extender

- Step 1. Set out three dowel rods and base plates.
- Step 2. Attach 3 brackets to each dowel rod.
- Step 3. Using the *dowel rod extender*, stack a second dowel rod on the starting point dowel rod.
- Step 4. Attach the three 4-foot sections of track, one on top of the other, in a zig-zag design,
- Step 5. Spread the rails at the end of the top and middle track, so the marbles will drop to the track below.

Note: Viewing from the top of the track, the ends of the track must be perfectly vertically aligned.

- Step 6. Release a marble and watch it drop from track to track.



Project #6. A Loop De Loop

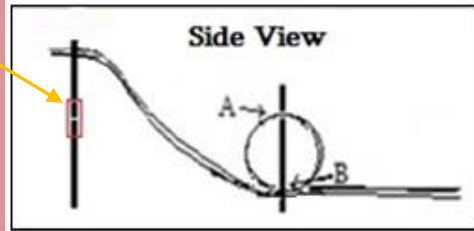
Parts Required: 5 to 6 brackets and spacers, Two 8-foot track rails (see Project #3, Steps 6 and 7) and 3 to 4 dowel rods and base plates. 1 dowel rod extender.



Goal: Design and build a track that carries a marble in circular motion; 360-degree circle.

Note: The key to keep the loop 3 times smaller than the release point and using the dowel rod extender to elevate the height of the release point.

- Step 1. Set out at least 2 to base plates and insert dowel rods.
- Step 2. Stack a second dowel rod on the starting point dowel rod using the dowel rod extender.
- Step 3. Attach bracket to the starting point dowel rod.

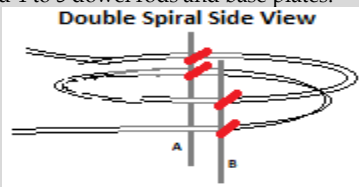


- Step 4. Attach two brackets at the base at point B of the dowel rod that will support the loop and one bracket upside down at point A., 6 to 7 inches higher.
- Step 5. Attach one 8-foot track rail beginning at the starting point bracket, bend it into a loop and attach it at Point A and B.
- Step 6. Attach the second 8-foot track rail running parallel to the first track rail.
- Step 7. Add several spacers on the loop and on the track rails after the loop to make sure the two track rails are running perfectly parallel.
- Step 8. Release a marble to see where you need to adjust the track.
- Step 9. The loop de loop is a difficult feature. Congratulations.



Project #7. A Double Spiral

Parts Required: 6 to 8 brackets and spacers, 4 track rails and 4 to 5 dowel rods and base plates.



Goal: Create a track that carries a marble around two complete, 360-degree, circle.

- Step 1. Follow Project 3 instruction, only this time attach two brackets on dowel rods A and B opposite each other.
- Step 2. Be generous with spacers attaching them as need around the curved points on the track.
- Step 3. Stack dowel rods using **extenders** if you want the spiral to start higher.
- Step 4. To even out the end of the track rails, bend the longer rail and insert the wire it in the shorter rail, creating a loop.



Adding a U-shaped loop at the end of the track will stop the marbles and cover exposed lead wires.

The more complex model picture below was awarded the blue ribbon at the Kansas City Maker Faire in 2018 at Union Station in Kansas City, Missouri. It required several Marble Max Track kits and lots of ingénues to create.



I hope you enjoy using wire and tubing to build Marble Max Tracks. The sky's the limit, so use your imagination.

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