

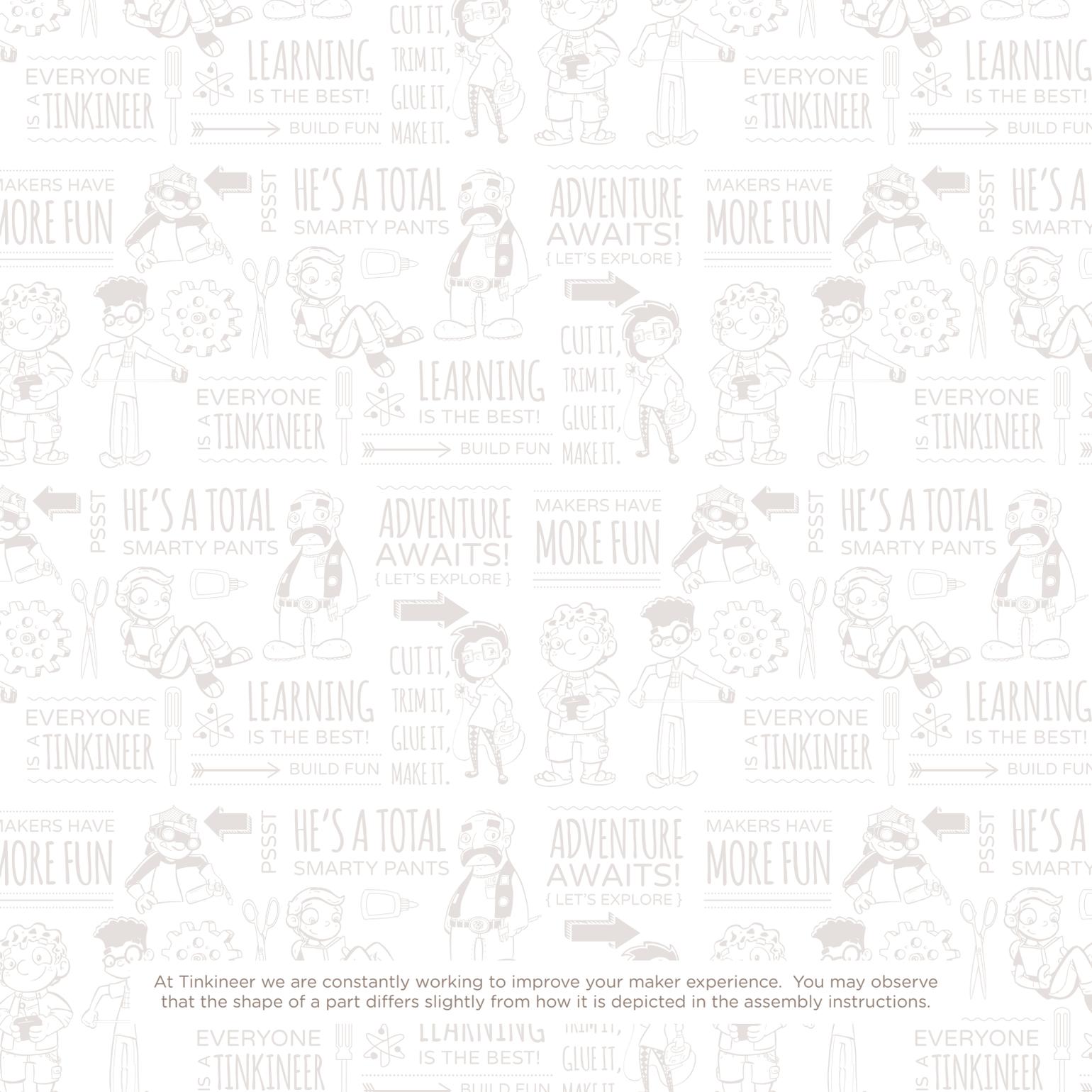
marbleocity™

MINI SKATE PARK

# ASSEMBLY INSTRUCTIONS

LET'S GET THIS  
ROLLING!





EVERYONE IS A TINKINEER

LEARNING IS THE BEST!

BUILD FUN

CUT IT, TRIM IT, GLUE IT, MAKE IT.

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MAKERS HAVE MORE FUN

PSSST

HE'S A TOTAL SMARTY PANTS

ADVENTURE AWAITS!

{ LET'S EXPLORE }

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At Tinkineer we are constantly working to improve your maker experience. You may observe that the shape of a part differs slightly from how it is depicted in the assembly instructions.

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# WELCOME!



I'm Adam, the founder of Tinkineer™ and the creator of the Marbleocity™ product line.

When I was a kid I loved machines, contraptions and, of course, marble ramps. I also loved building models but I found the plastic materials unsatisfying and model cement hard to work with. Today, amazing laser-cutting technology exists to craft highly detailed shapes out of wood. The real wood parts in your kit have a great tactile feel and can be assembled easily with household white glue.

The kit that you are about to build was carefully designed to be a great maker experience that you'll enjoy in-of-itself. But beyond that there's a little physics and a lot of engineering experience waiting for you. The graphic novel that begins on the next page will teach you about some of the science that happens when you are skateboarding. Our goal is to expose you to some introductory physics that you'll encounter when you get to high school. More importantly, the construction of the Mini Skate Park will show you how you - yes you! - can build a seemingly complex machine out of simple parts. Simple parts become sub-assemblies and sub-assemblies come together to construct an amazing, working machine that you built yourself. So grab your glue and let's get started!

Adam B. Hocherman  
Founder, Tinkineer

## GETTING HELP FROM OUR COMMUNITY

Have a question about a step you're working on? Need a video tutorial? We're building a community of Tinkineers - just like you! Please visit us online at [Tinkineer.com/community](http://Tinkineer.com/community).

## LEARNING MORE

Today you'll be learning about projectile motion and centripetal force. You'll see these concepts again, most likely in your introductory high school physics class. With Marbleocity our goal is to expose you to the high-level concepts so that when you get to the classroom, the subject matter is familiar. If you'd like to learn more, on your own, there are great resources available on the web. If you're looking for a place to get started, check out Khan Academy at [khanacademy.org/science/physics](http://khanacademy.org/science/physics).

## A NOTE ABOUT SAFETY

The kit that you are about to assemble is designed for children and adults ages 9+. It contains marbles and other small parts that can be a choking hazard for children under 3 years old. If you have younger siblings or other small children living in your household, please keep these small parts safely out of their reach.

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# LET'S DO THIS!



Hope you enjoyed the Tinkineer's Day and that you picked up a little physics along the way! Now it's time to build the real thing and see those principles in action. The "build" will take you ~1-2 hours and don't be afraid to take your

time! What you're building is not only fun to look at – it's a machine that really operates! Take time to make sure that tabs are fully inserted into slots and that mating surfaces are flush. Follow the tips on this page to achieve a great finished product!

## READY TINKINEER?

For this project you'll need:



Elmer's® Glue-All® Multi-Purpose white glue.\* A good, household white glue is the best glue for the job – it's easy to work with, makes a strong bond in ~20-30 minutes, and dries perfectly clear so your finished marble machine will look great!



(Recommended) Wax paper. Scavenge a sheet of wax paper from your kitchen – it's the perfect work surface. Household white glue will not stick to it and you'll avoid mom's wrath by protecting the kitchen table.



(Recommended) Round toothpicks. These are perfect for applying glue. Make a puddle on your wax paper work surface and use the tip and/or edge of a toothpick to apply glue to your wood parts.



## TIPS ON TECHNIQUE >

Check [Tinkineer.com/community](http://Tinkineer.com/community) for helpful videos.

### Test Fit First!



Most steps can be test assembled without any glue at all! Check your part fit and marble operation first and then apply glue second.

### Applying Glue to Flat Surfaces



Use enough glue so that your parts feel tacky when pressed together but don't go overboard! Wipe away excess glue using your finger or the edge of a clean toothpick.

### Applying Glue to Perpendicular Parts



Lay glue into corners like these using the edge of your round toothpick. In this way, you can test-fit first and add glue second.

### "Check Square"



In engineering the word "square" means "at ninety degrees." Check square, using the included tool, any time you are assembling perpendicular surfaces like these.

## BREAK SOMETHING? NEED A REPLACEMENT PART?

Marbleocity is a natural wood product! Sometimes a hidden knot can slip past our quality control gurus. If you need a replacement part contact us at [Tinkineer.com](http://Tinkineer.com). Please have your batch code handy, which is on the rear jump rail.

603231

\* Elmer's® Washable School Glue will bond but Glue-All® is recommended for the best experience. Do not use glue sticks or generic products.



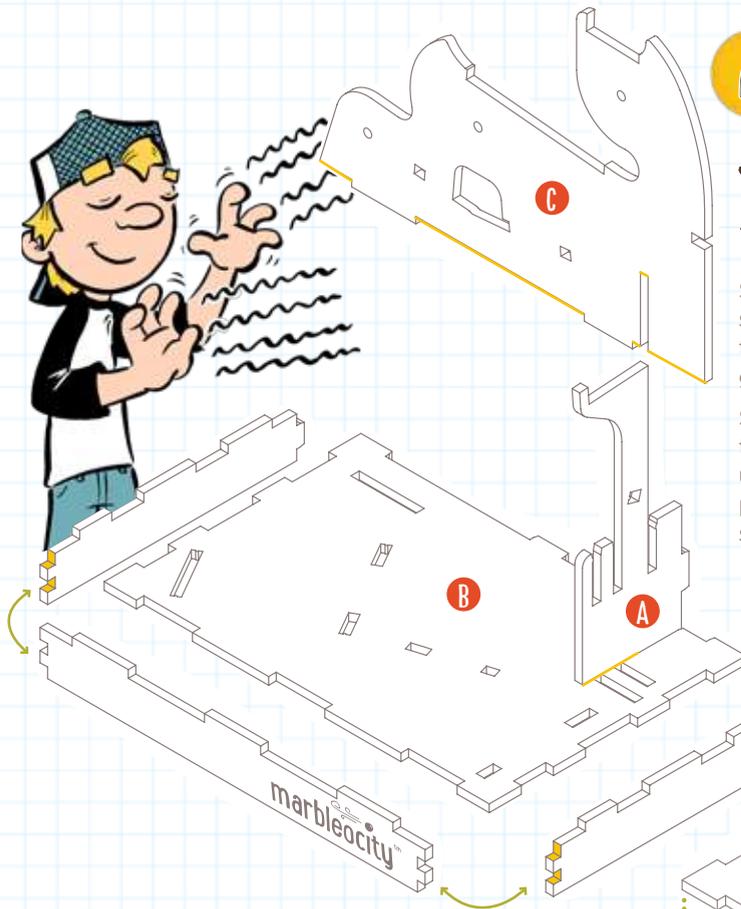
For the first few steps, we'll show you exactly where to add glue, highlighted in yellow.

## LET'S GET STARTED!

### PREPARATION

Spread a sheet of wax paper over your work surface. Make a small puddle of white glue, about the size of a dime, to work from. Remember, a little glue goes a long way - use a toothpick to apply it.

Some wooden parts are contained in a sheet by tiny tabs. Gently rock each part, forward and back, until it falls free. If a small bump remains where the part was attached, use an emery board (nail file) to smooth it down.



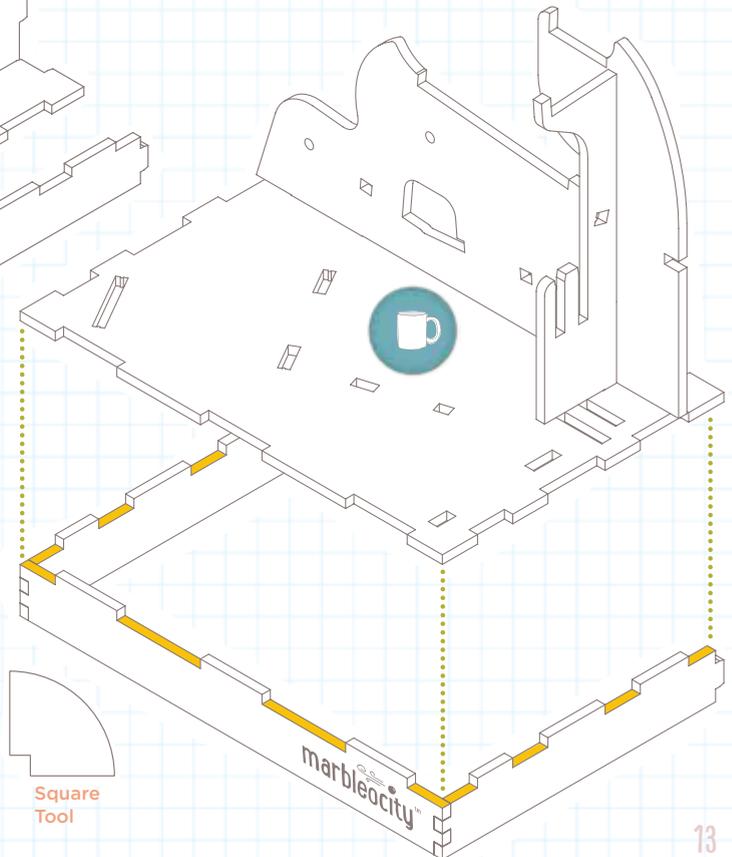
## STEP 1

### PLATFORM

First, glue the platform front and sides together (we call this the "skirt") and set aside.

Separately, slide the jump bracket (A) onto the platform top (B). Then lower inner gear train wall (C) into place. Apply glue to adjoining surfaces.

Next, apply glue and then lower your completed top assembly onto the skirt. Check that all parts are square, using the tool provided, and place a heavy coffee mug on the platform. Set aside to dry for ~20-30 mins.



Square  
Tool

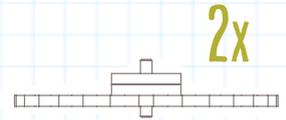
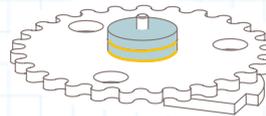
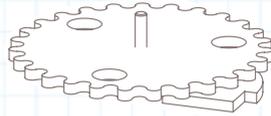
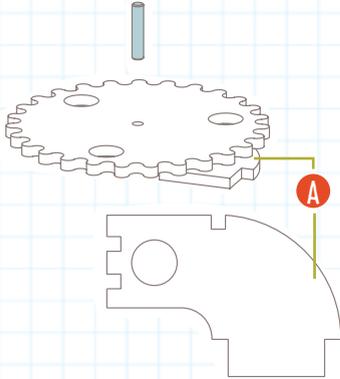
## STEP 2

### LARGE GEARS

Next, you'll build your two large gear assemblies. No glue is required on the axles - the fit is designed to be a little tight so that you have to "press fit" them into place. Here's how:

Use the jump platform (A) as a spacer. Lay one of your large gears over the hole. Now position your axle and use the flat side of your square tool to press it into place until it hits your work surface. Thunk!

Next add two round spacers to your assembly. Add a little glue between your spacers but don't glue your gear assembly to the platform (you'll need it later)!



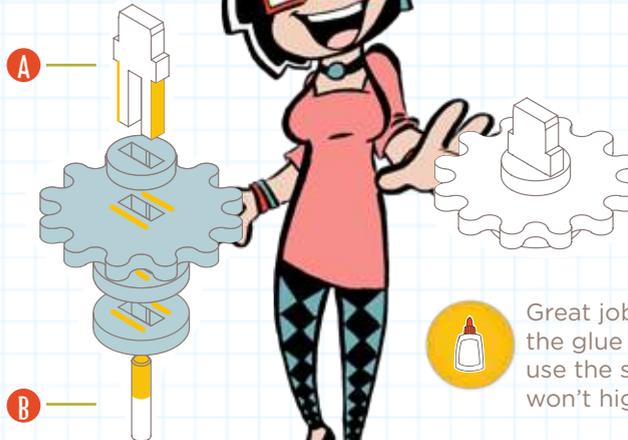
{COMPLETE!}

Your finished assembly should look like this from the side. Now make a second one!

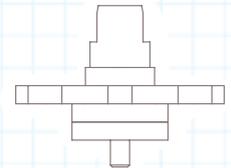
## STEP 3

### PINION GEAR

Assemble your spacers and pinion gear to the wooden shaft (A), as shown. Next, fill the resulting slot with a dab of glue and insert an axle (B), wiping away any excess glue. Make sure the axle is square to the gear face. If it's not, gently adjust it before the glue dries.



{COMPLETE!}



Great job! You've got the hang of the glue technique. From here on, use the same approach but we won't highlight each and every spot.

## STEP 4

### TROUGH AND JUMP

Install your trough support (A) and then your left and right trough tops, (B) and (C).

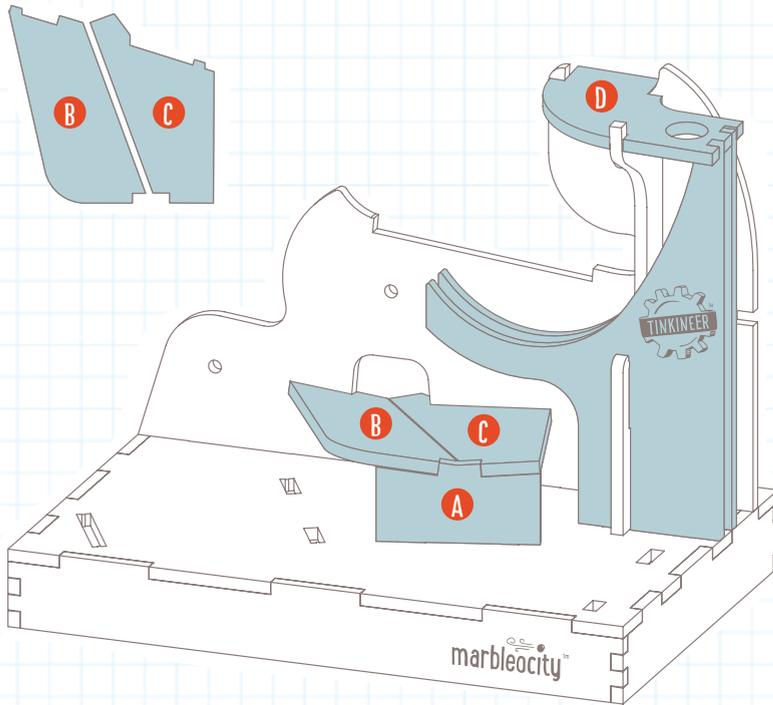
Next, slot your front and rear jump rails in place. The Tinkineer logo faces front.

Finally, lower your jump platform (D) into place. When properly seated, the jump platform tilts toward the front of your model.



**NEED  
HELP?**

See helpful videos at  
[tinkineer.com/community](https://tinkineer.com/community).



## STEP 5

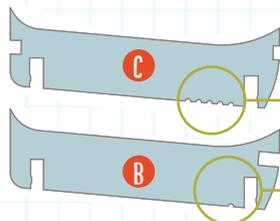
### STAIR INFRASTRUCTURE

Cool! It's time to begin assembling your stairs and rail slide. Add the parts highlighted, in the order indicated by the letters A-F.

There are five stairs in all but for this step you'll just add the two shown. Notice that your stairs have little notches which will help you identify the correct parts.

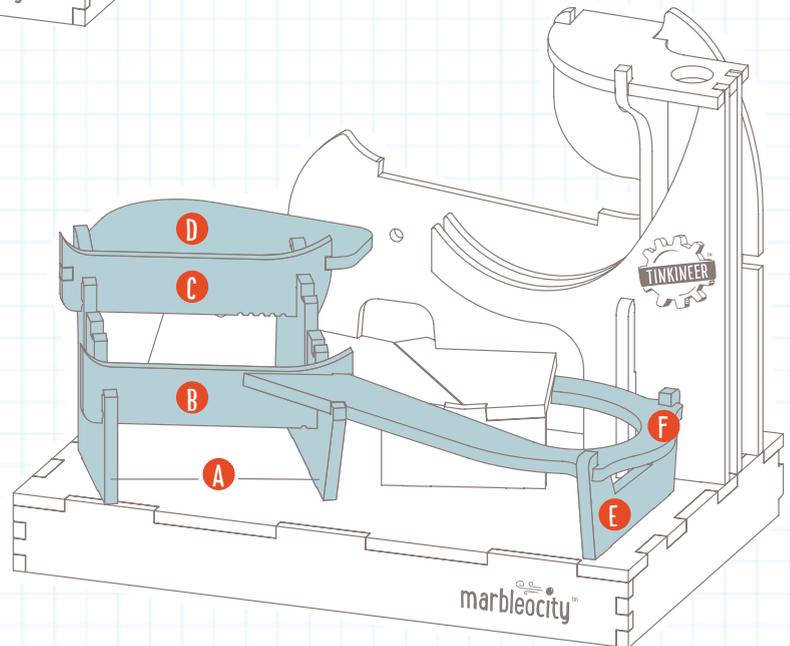


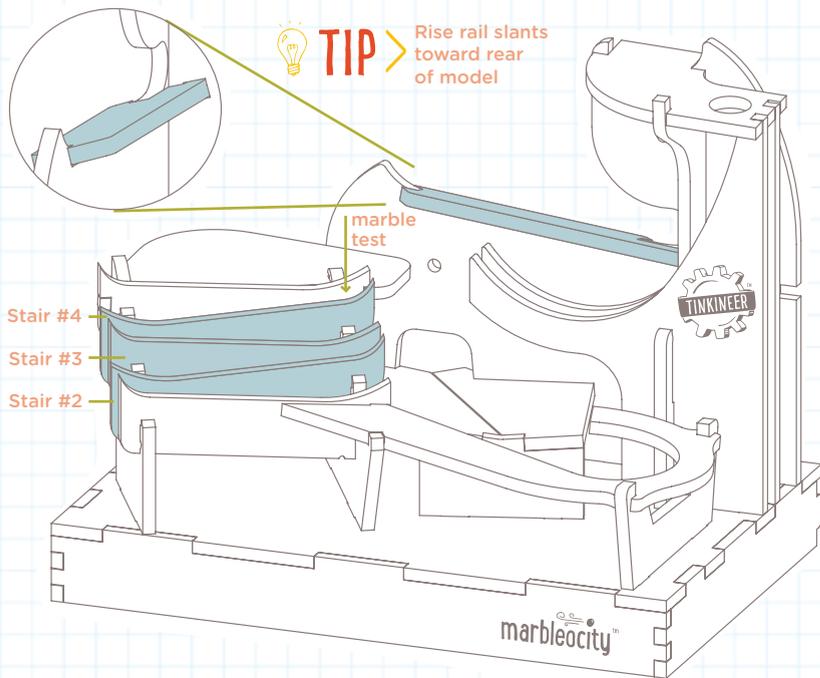
**TIP** Note the notches



Stair #5 has  
5 notches

Stair #1 has  
1 notch





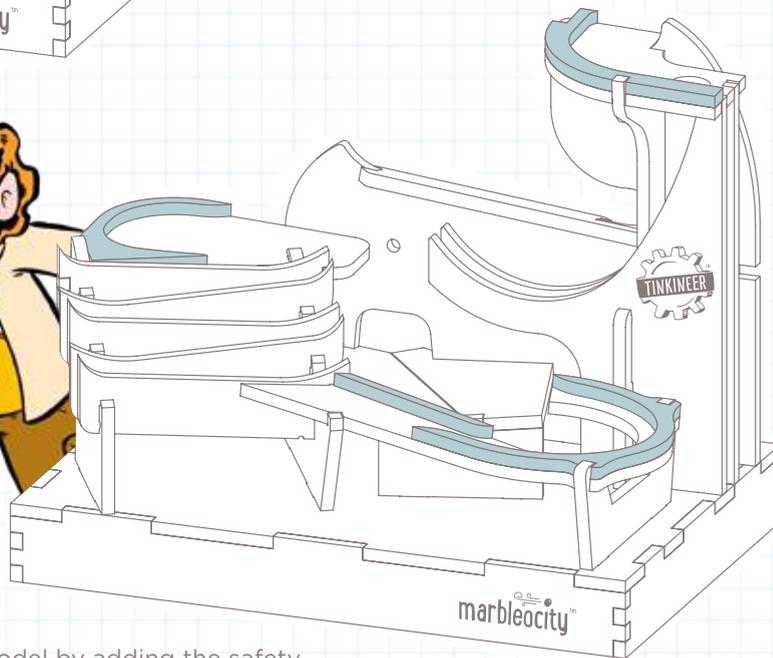
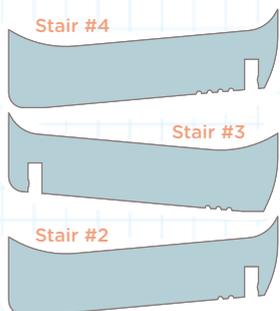
## STEP 6

### STAIRS (CON'T) AND RISE RAIL

The rise rail shuttles your marble from gear to gear. Notice it can rock a little - ensure that it tilts toward the rear of your model when glued.

Next, complete the staircase. Test fit stairs 2, 3 and 4 without glue. The notches indicate the stair number and install toward the right side.

Place a marble at the arrow and ensure it rolls all the way down to the bottom. If it doesn't, ensure your stairs are fully seated. Now apply your glue!



## STEP 7

### SAFETY RAILS

Complete the descent portion of your model by adding the safety rails. As soon as the glue sets you can trial a marble from top to bottom. Choose a nice, level table for your test runs!



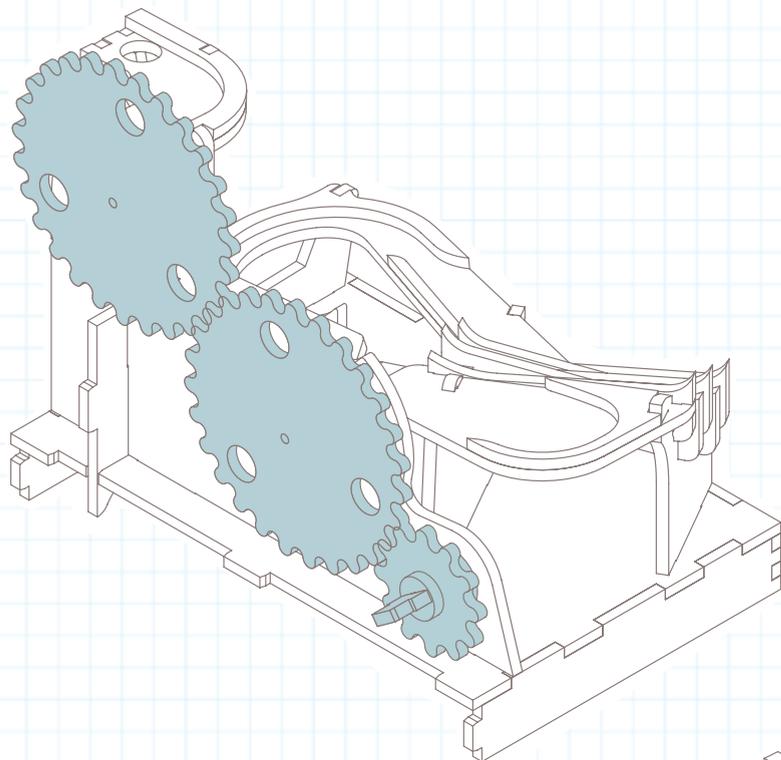
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## STEP 8

### INSTALL GEARS

Without glue, install your gears. You can tilt your skate part up on its front face to make this step easier.



## STEP 9

### COMPLETE ASSEMBLY

Assemble the two halves of your crank arm (A) and lay it flat on your work surface. Dab the handle (B) in some glue and press it into the crank arm - check square and set aside.

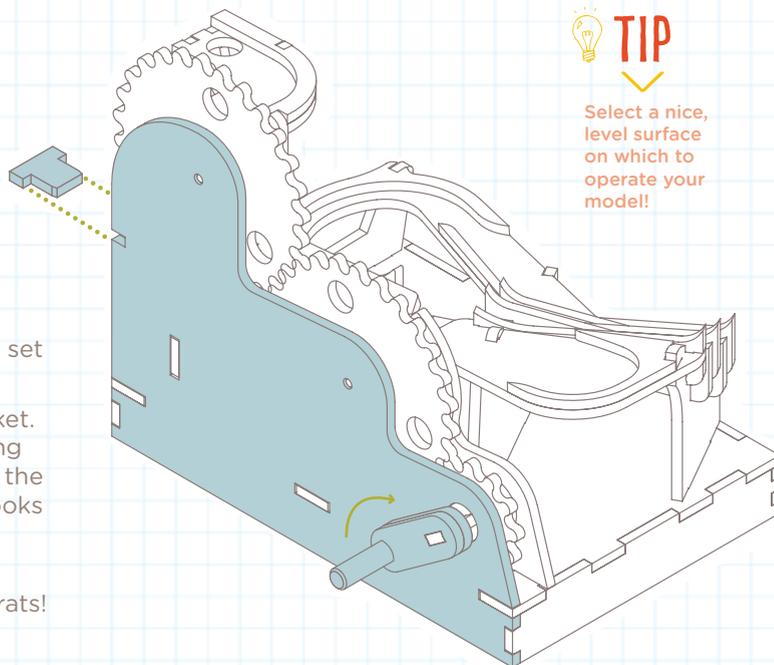
Meanwhile, without glue, trial fit the rear bracket. Test the operation of your gear train by twisting the exposed wooden shaft with your fingers - the gears should rotate freely. When everything looks good, add glue.

Finally, glue your crank arm assembly in place and make sure it's square while it dries. Congrats! You're ready to roll!



**TIP**

Select a nice, level surface on which to operate your model!



# WHERE TO FROM HERE?



## CONGRATULATIONS!

You've just built a complex, three-dimensional marble machine out of flat wooden parts and learned some physics in the process. Nice work!

## TELL US ABOUT IT! SHOW US!

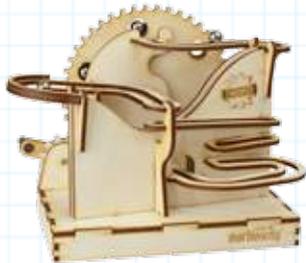
We hope you enjoyed building/making with us. We'd love to see your Marbleocity Mini Skate Park. Did you decorate your model? Where did you put it?



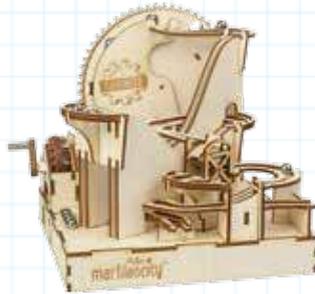
Share your photos and comments on our Tinkineer Facebook page and Instagram feed.



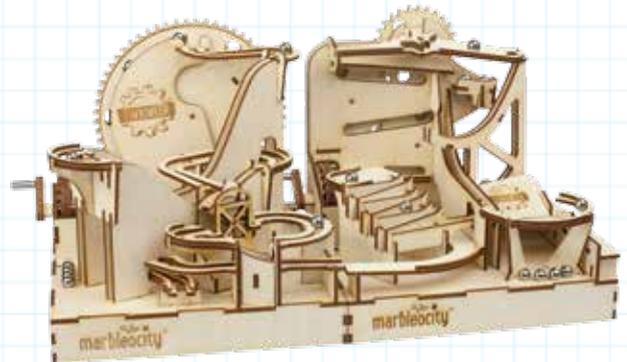
Tag us @tinkineer. Or contact us directly at [www.tinkineer.com/community](http://www.tinkineer.com/community).



Good news, there are more kits available in the Marbleocity line. They come in two sizes. The model you just built is from our "Mini" series. Each kit takes 1-2 hours to construct. You can build these in any order. The Marbleocity™ Mini Coaster is pictured above.



Ready for something ... bigger? The full-size Marbleocity kits are more challenging and are designed for the intermediate maker. Each one is designed to be completed in five, one-hour sessions. It's a great project to complete together with a parent.



What's even cooler is that the large models interconnect! Any large model will work as a stand-alone marble machine but if you have more than one, you can link them up ... passing marbles between the modules to build an expanding marble empire!

Pictured above is the Marbleocity™ Dragon Coaster connected to the full-size Skate Park model. You can even add an electric motor!

VISIT [TINKINEER.COM/PRODUCTS](http://TINKINEER.COM/PRODUCTS) TO LEARN MORE. WE'LL SEE YOU THERE!



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**⚠ WARNING:**  
**CHOKING HAZARD.**

Kit contains marbles and small parts.  
Not for children under 3 years old.



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