

Lots of Ways to Learn to Build



A Family Inventors' Lab Original



If you want to make something,
there are lots of different ways to
learn to build.

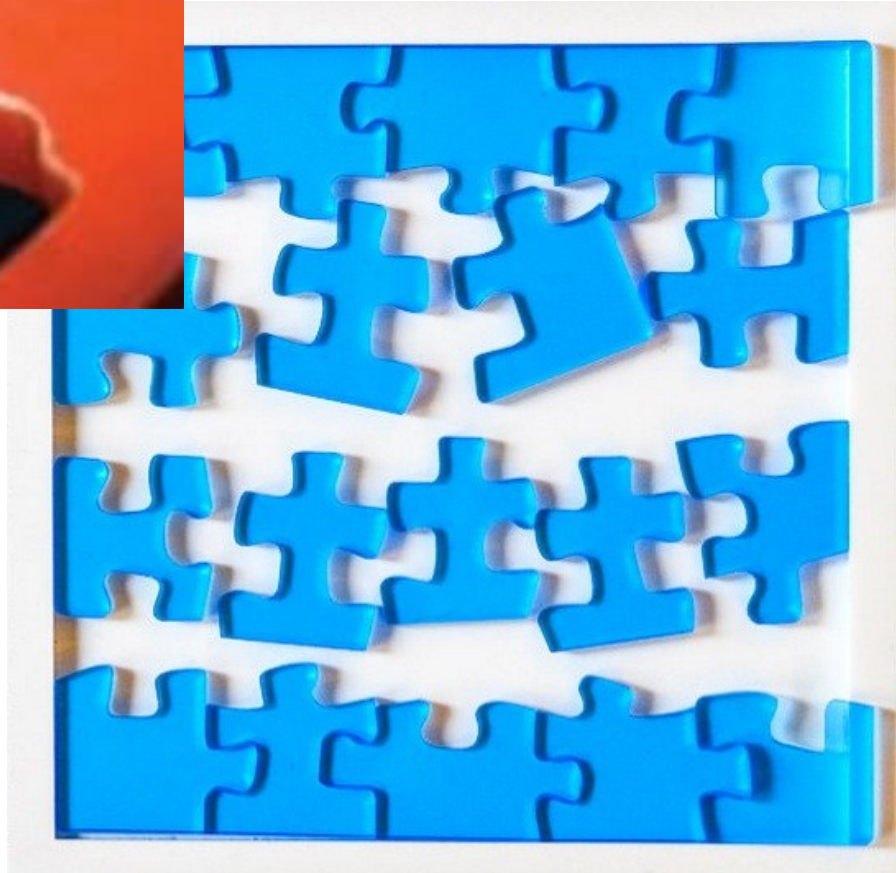


Puzzles and Shape Sorters



You can assemble – put together—something that someone else designed where there's only one right way to do it.

If you try to do it wrong, it won't work.



But when you do it right, you'll know, because it works! Hurray! That feels satisfying!



Building puzzles is a good way to build observation skills. You have to notice details, like exactly what shape something is, so you know where it fits.

Kits. You can build a kit someone else designed. Kits contain exactly the materials you need, and if you follow the instructions right, your product will look like the design.

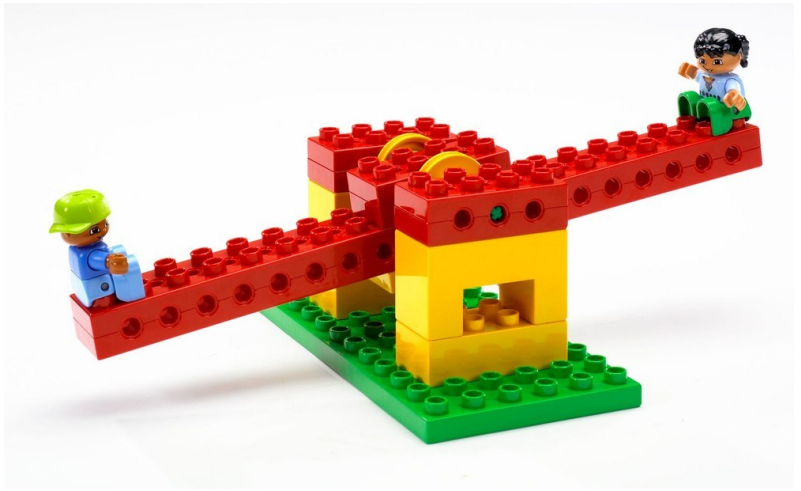


If you run out of pieces or have extra pieces left over when you're done, you can go back through the directions and check whether you made a mistake.



Learning how to read and follow directions is helpful for all sorts of things we need to do in life.

Models with Reuseable Parts



Some toys have pieces that can be used in lots of ways but they are sold as model kits with instructions. You may choose to follow instructions and build the exact model shown.

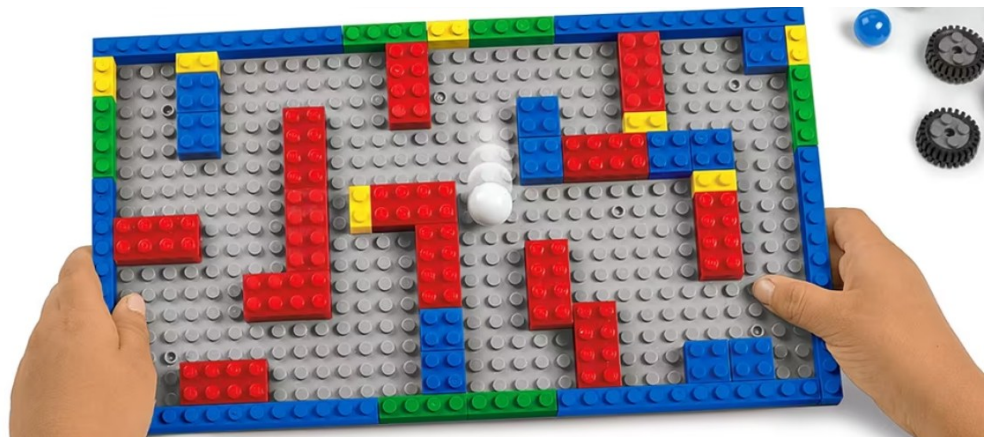
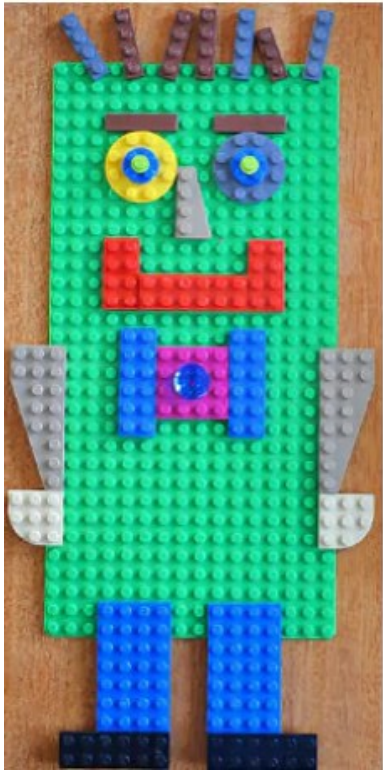
You might keep the completed model on your shelf to look at.



Or you can take models apart and mix all the pieces together for free building.

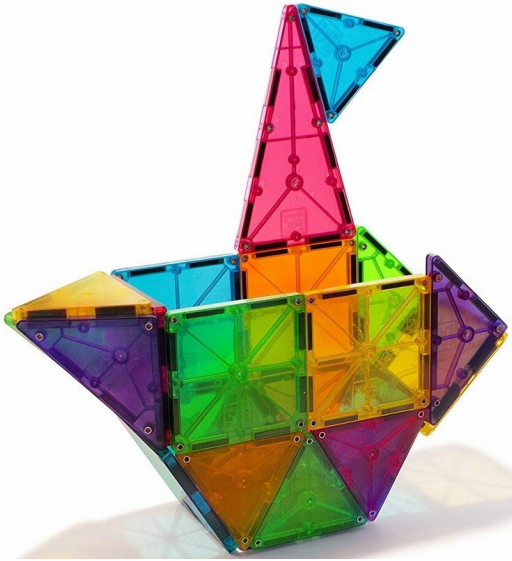
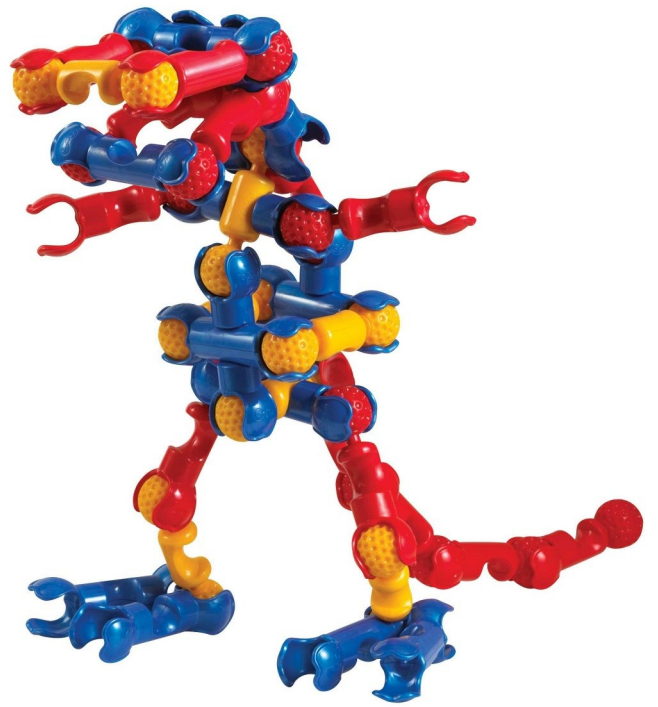


During a free build, you can make anything you want.

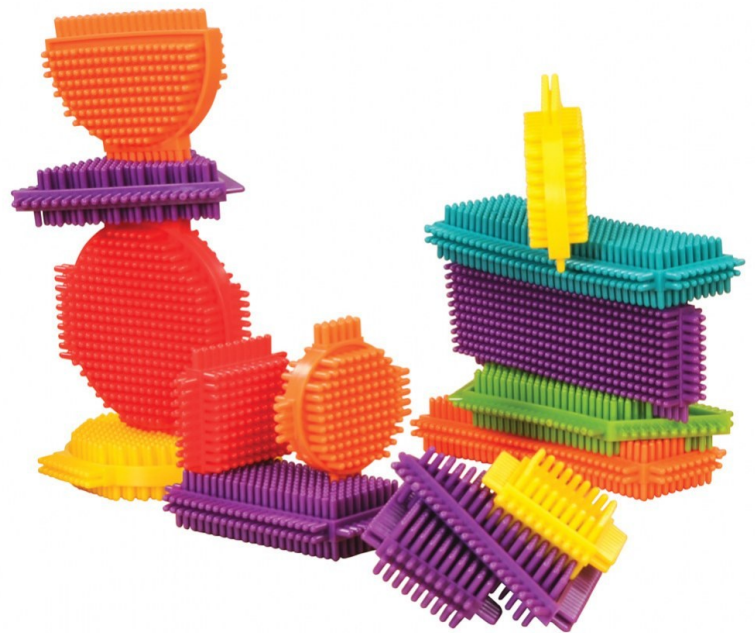
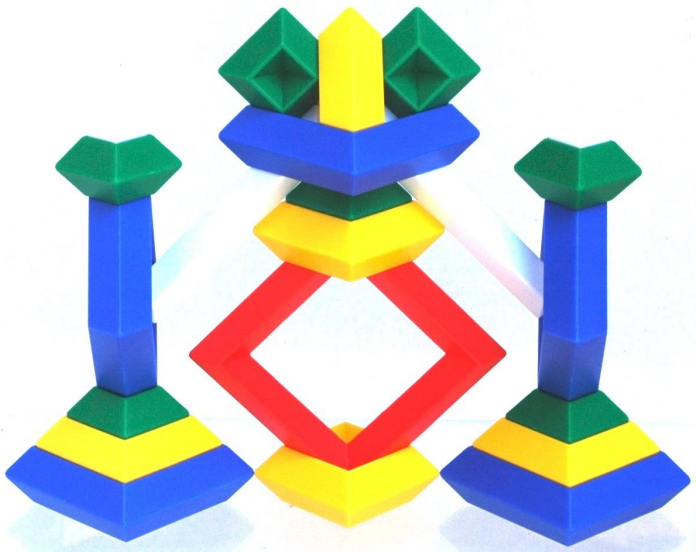


Building models helps you learn construction skills. Free builds let you be creative, as you mix things up in new ways.

Building Toys



There are all sorts of toys that are specially designed to build with. But there's not a specific thing you are "supposed" to build. You can build anything you want!



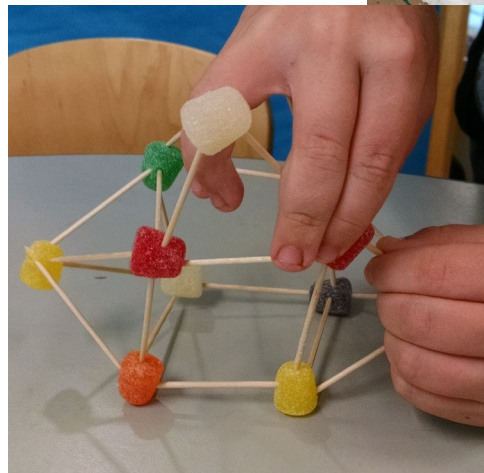
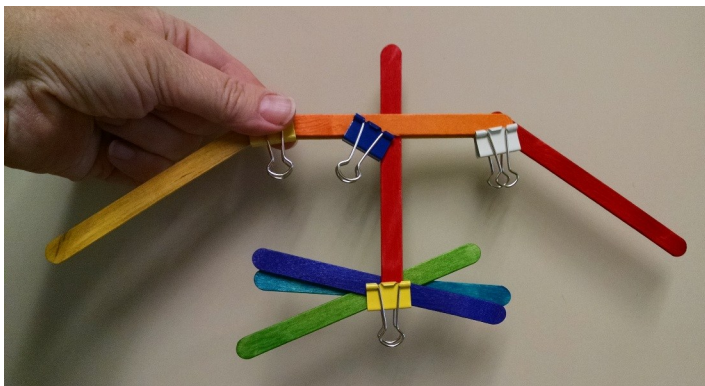
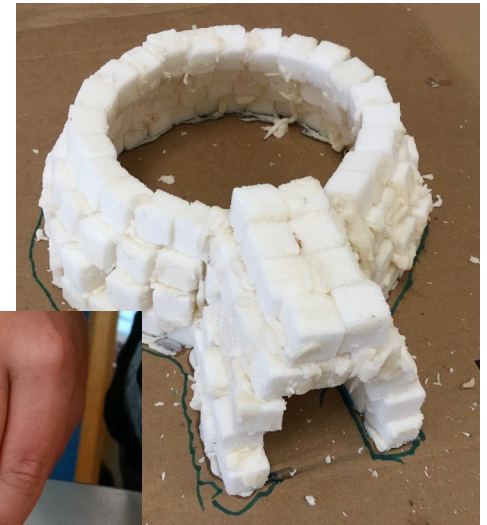
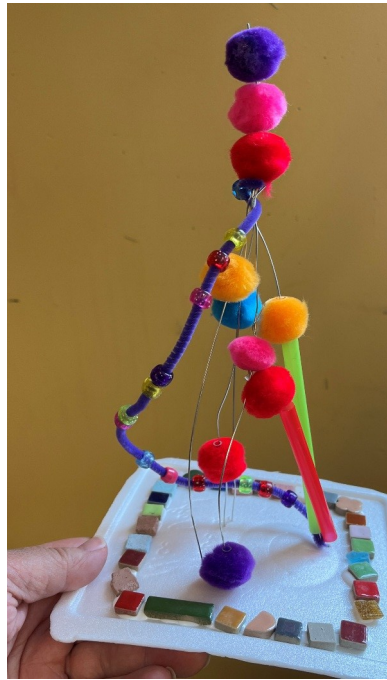
Every building toy has strengths and limitations. Sometimes choosing the right tool is the first step in reaching your goal.

When anything is possible, it can be hard to decide where to start.



You can challenge yourself to achieve goals like: what's the tallest thing I can build? Can I use *all* the materials in one structure? Can I build something that will hold a lot of weight?

Building with Miscellaneous Materials



But you don't have to have specially designed toys to build. You can build with **ANYTHING!!!**

Some things are easy to build with, and your structures stay stable and strong.



Some things are much trickier to build with, and your structures might fall apart easily.

Fasteners

It helps if you know lots of different ways to fasten things together.



Permanent or Temporary

Some things we build can be taken apart, and all of the pieces can be re-used in a new creation.



(Taking things apart can be as much fun as building them – like when we knock down tall towers!)

But there are other things where once we put them together, we can never take them apart. Or once we take some things apart, we can never put them back together. It's important to be careful before you do anything permanent.



Prototypes and Scale Models

If you want to make a complicated project, first make a prototype, with reusable cheap materials, then make the permanent version.

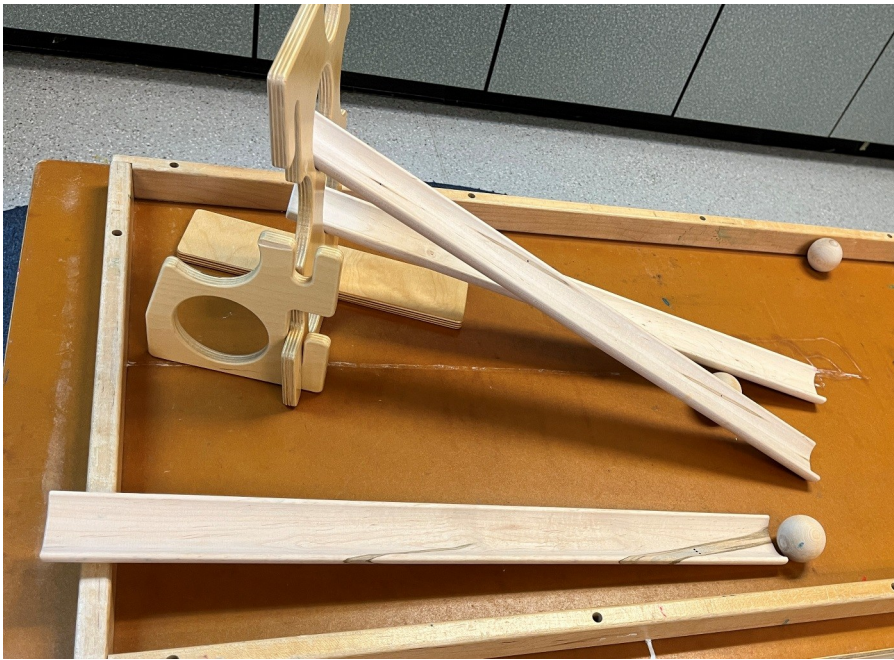


Sometimes we build a small scale model first, and then build it full size.

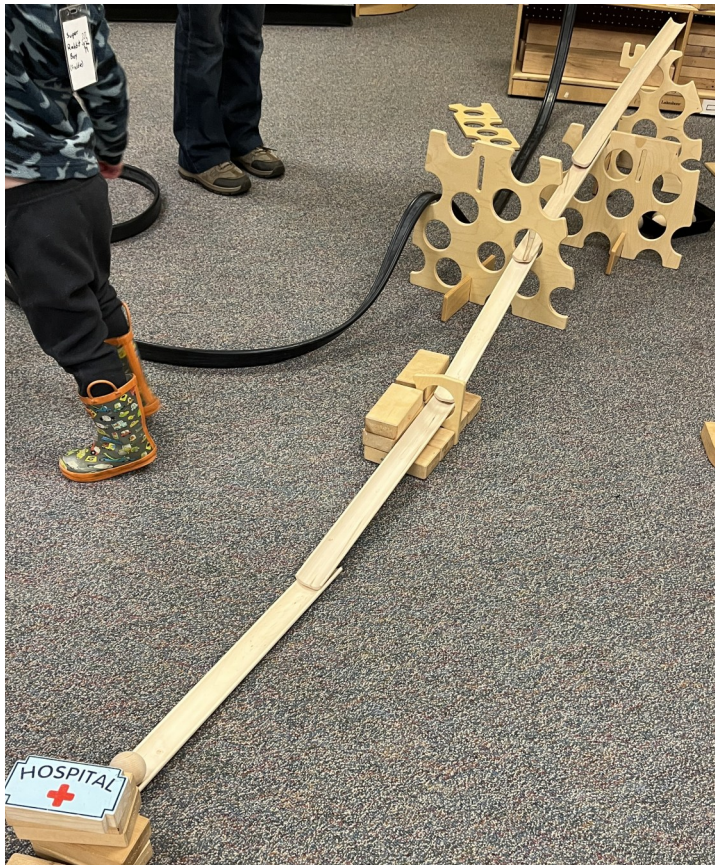


Tinkering

“Tinker” can mean a couple things. It can be “try things out.” You just pick things up, start exploring them, and testing to see what they can do.



Tinker also means improving something by making little adjustments. You build something, test to see how it works, tweak it a little and test it again. And repeat – making it better and better.



Engineering

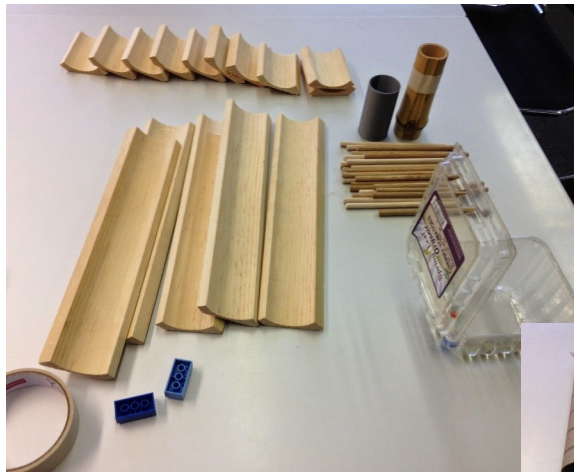
An engineer is someone who can see problems and fix them, or take an idea and make it a reality.

They follow these steps:



What's the challenge?

Sometimes there's a problem that needs to be fixed. But sometimes you just want to build something cool. Let's explore a "marble machine." Can you start a ball at the top, and run it down tracks to the bottom?



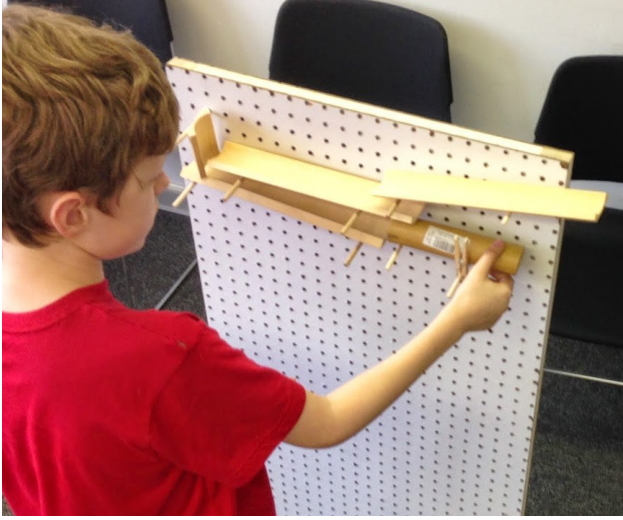
Brainstorm Ideas

Choose Supplies

You can look at what supplies are available, explore how they work, and then start to brainstorm what you could do with them.

Build a Creation, Adjust as You Build

You start building. As you build, you learn more about the materials, so you adjust your plan as you go.



Test and Improve

You test it out to see what works. Then fix what's wrong. Then you tweak it (make small adjustments) to make it better and better.



Mistakes are Part of the Process!

Sometimes it doesn't work on the first try.
Sometimes it doesn't work on the tenth try!
That can be frustrating, but just think how many things you've learned! Keep trying.



When it works, celebrate!
And share your ideas with others.

There are so many ways to learn to build!
You can build your engineering skills by tinkering.
Come up with an idea for a problem you want to solve, or a challenge you want to beat, and start building! Keep trying new things and making little adjustments until you have made your best invention yet!

Note to Parents and Teachers:

This book is intended to introduce children ages 4—8 to some basic engineering concepts.

The photos include lots of sample building materials, but you can build with anything that you have handy! The whole idea of for kids to see how possible it is to build anytime anywhere.

Have fun experimenting together!

If you'd like ideas for more hands-on STE(A)M activities for kids, check out my website, www.InventorsOfTomorrow.com

This is a book I wrote to use in my own classes. Most images are "free to share and use." This material can only be used for educational purposes, with no profit taken from their use.

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The more you build, the more you learn.
Keep challenging yourself to use new
materials and try new things.

