

• CHALLENGE •

MAKE THE TALLEST AND WIDEST TOWER USING LEGO BLOCKS

You have to make the tallest and widest tower using only 15 blocks. The tower has to be freestanding, i.e. it cannot be attached to the table or floor by tape or any other object. For the widest tower you can only use a single block as the base. Your teacher will guide you through this activity, but before we begin: The secret to making a high tower is trying it over and over, while learning from the last round and improving your results.



OK. ENOUGH TALKING! GO! GO! GO! MAKE YOUR TOWER!

Did you notice how your results improve after making the tower several times? You made multiple models of the towers. In each round you probably learned something new, and that led to improvements. The process of making multiple drafts or models is called **iterations**.

We say design is an iterative process. By this we mean that designers tend to make things by first making an imperfect model. We also call this a prototype. Then they slowly make improvements to the model.

We can use a simple iterative process called **TMPI**.



**THINK** → **MAKE** → **PLAY** → **IMPROVE**

You probably naturally used this process while building your tower. TMPI stands for:



### THINK

come up with various ideas for how you can do something.



### MAKE

take one of those ideas and begin to build.



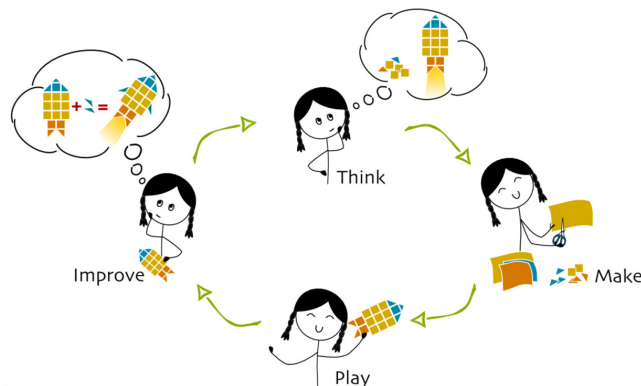
### PLAY

experiment with the thing you made. Is it strong? Is it easy to do again and again?



### IMPROVE

in play, you learn lots of things about your design. Based on what you learn, try to improve it. Guess what you need to do to improve it? You need to THINK again! And thus the whole process goes in a cycle.



## SOME KEY THINGS TO REMEMBER ABOUT THE ITERATIVE PROCESS:

### 1. TMPI cycles can be short or long:

While making the tower, you probably went through the entire cycle repeatedly in a few minutes. Whereas a designer building an actual tower might go through one TMPI cycle in 3 months.

### 2. Every cycle does not result in an improvement:

In the tower activity, we sometimes see our students' towers get shorter after a few iterations. Then it becomes taller again. Because you are trying out new things in each TMPI cycle, sometimes it leads to failure. You just have to be patient and keep trying another approach. The iterative design approach will lead to better results in the long run.

### 3. You don't have to start at Think:

Since a circle has no beginning and no end, you can start anywhere. Maybe you can play with your friend's design and start to improve it. Then you start at Play. Perhaps you can start by making a design you see on the internet, then you start at Make. Remember, the key is to keep moving through each phase of the cycle.

### 4. Don't get stuck:

The secret of this method is to keep moving through the phases. If you find yourself thinking for too long, then stop thinking. Just move into the making stage. If you find yourself making for too long, stop making and start testing. If you don't get stuck in any one stage and keep moving through, then you will get the most out of this method.