

# STUDENT GUIDE

## Eiffel Tower Model Project



### STEAM: Engineering

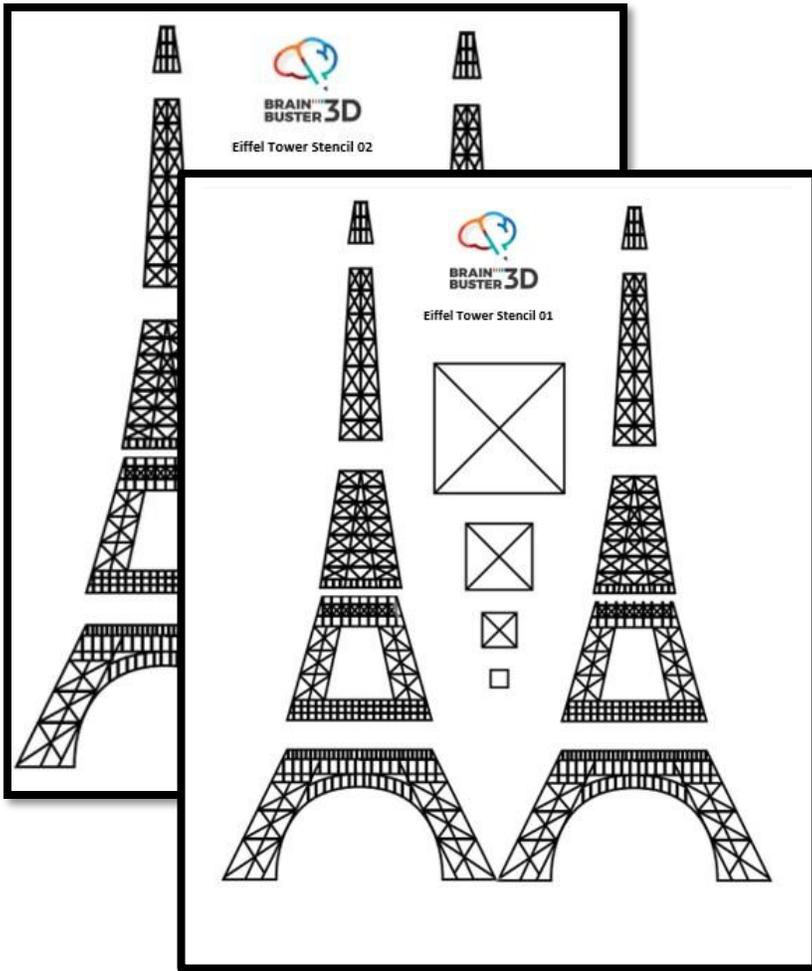
The engineering design process is a series of steps engineers use as they work to solve problems. There are five main engineering steps: **ASK IMAGINE PLAN CREATE IMPROVE**

#### **Building an Eiffel Tower Model will help you learn Engineering Skills. How?**

- You will be using the stencil which is your **PLAN** to create each section of the tower.
- You will need to arrange the parts of the tower as you would a puzzle, and determine which parts need to be welded together to **CREATE** the 3D form of the tower.
- When you finish the model, think about ways you could **IMPROVE** the process or design.
- **ASK** and **IMAGINE** how you could **PLAN** and **CREATE** your own design for a 3D tower model.

**Materials Needed:** Eiffel Tower Stencil 01 & 02, 3D Pen, 1 color of PLA filament, scissors, silicon thumb & finger protectors, a paper towel or napkin.

**Optional: To keep your stencil intact, place it in a plastic sheet protector.**



**BRAIN BUSTER 3D Art Pro Plus Kit Contents**



AC/DC Adapter & USB



Thumb & Finger Protectors



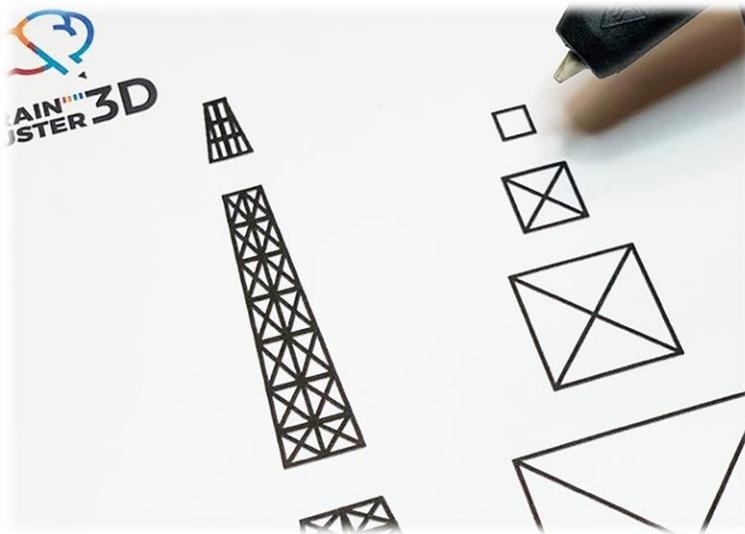
3 Pack of PLA Filament



**Art Pro Plus**  
3D Printing Pen

Plastic Tool

**STEP ONE:**



Find a starting point on the stencil to anchor your filament.

Move your 3D pen along the lines to outline each part.

Once all the parts are outlined, fill in each part by moving your 3D pen back and forth between the outline you made.

You can select any color of filament to create your Eiffel Tower model. If you do not like the PLA filament colors' that you have, you can paint the parts with acrylic paint before you remove them from the stencil or paint your finished tower model.

## STEP TWO:

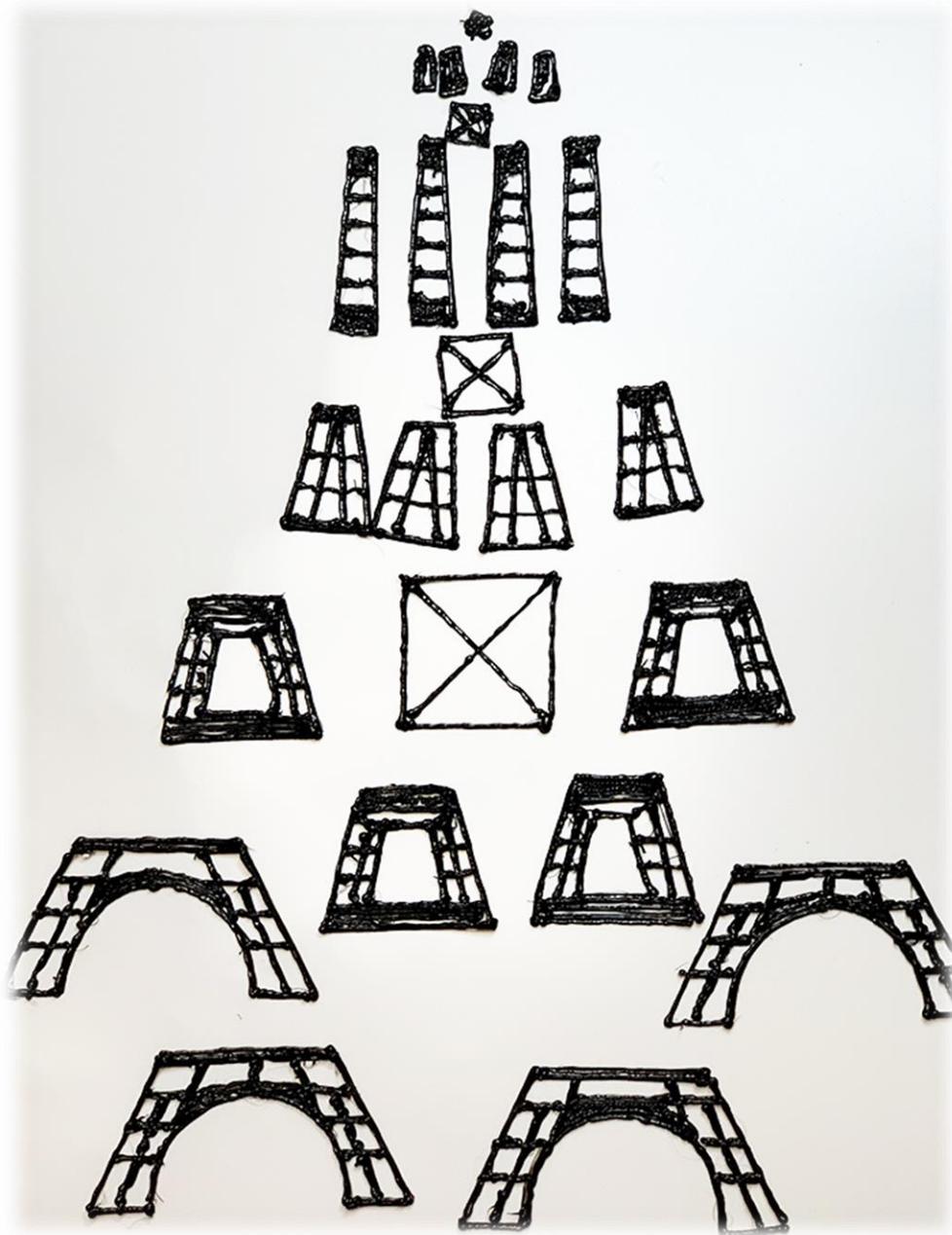


If you use a plastic sheet protector, the parts should peel off the stencil easily.

If you made the parts by extruding the filament directly on the paper stencil, some of the paper will stick to the back of the parts you made.

To remove the paper, rinse the plastic parts with warm water and dry them with a paper towel.

### STEP THREE:



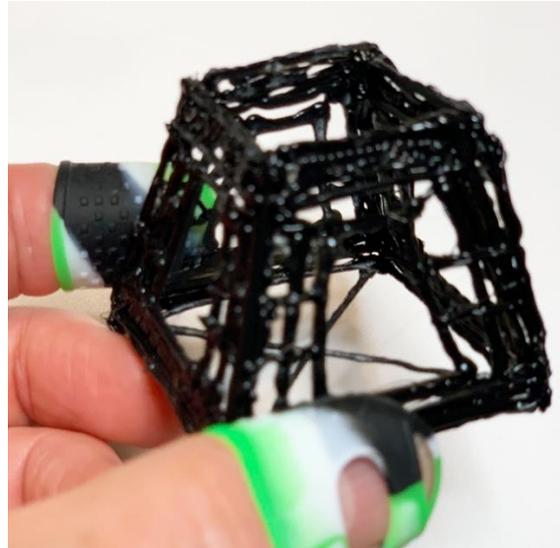
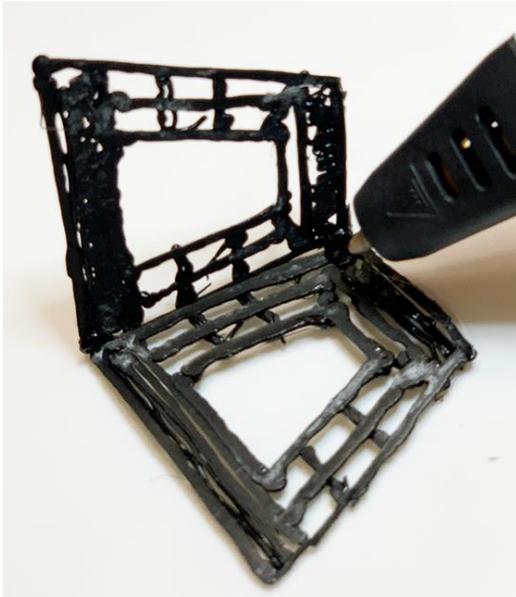
Arrange the parts as you would a puzzle to see which ones will need to be welded together to form your 3D Eiffel tower model.

## STEP FOUR:



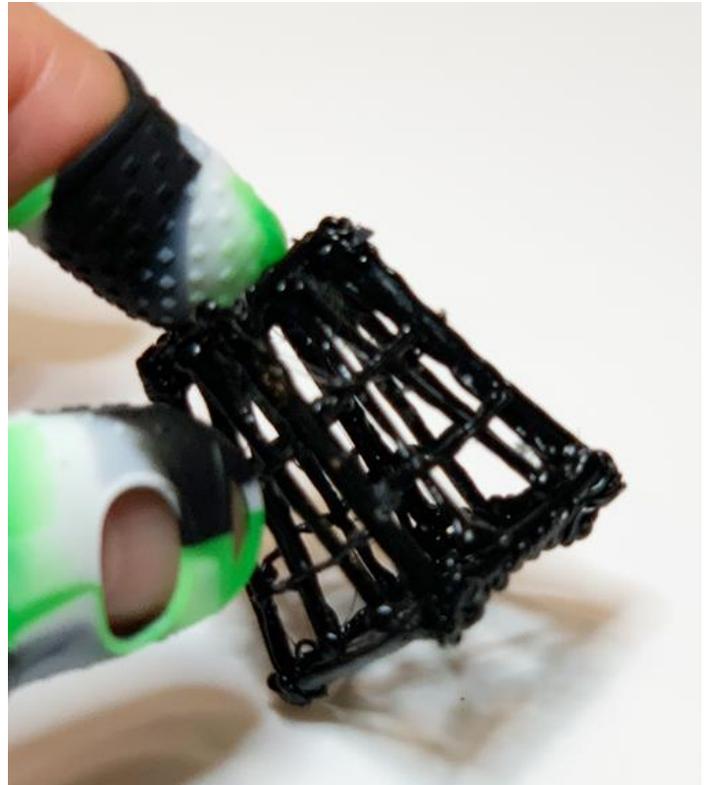
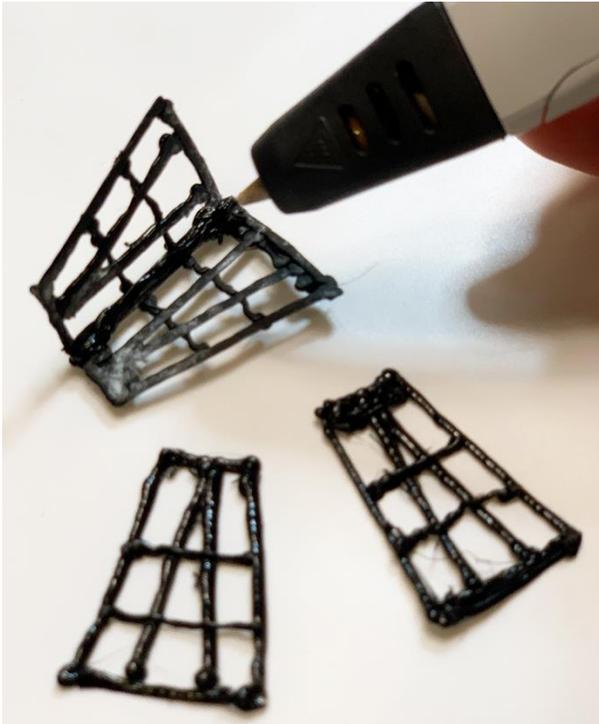
Find the four largest parts for the base of the tower. Weld two parts edge to edge, welding them together from the inside at 90 degree angles as pictured above.

## STEP FIVE:



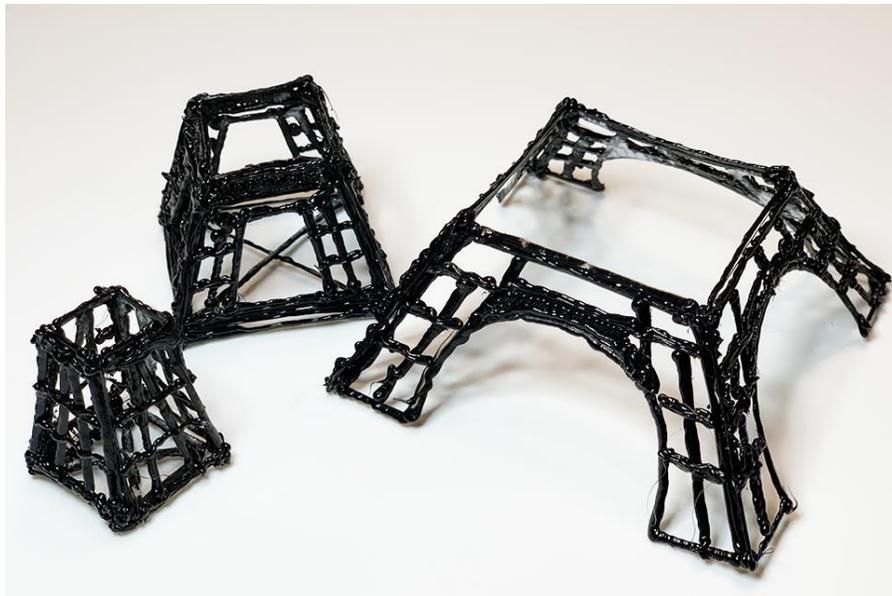
Find the parts for the second level of the tower. Repeat the same process and technique you used to build the tower base.

## STEP SIX:



Find the parts for the third level of the tower. Repeat the same process and technique you used to build the tower base.

## STEP SEVEN:



Stack the two levels of the tower on the base and weld them securely in place.

## STEP EIGHT:



Build the top section of the tower and weld it in place at the top of the tower.



- When you finish building the tower, think about ways you could IMPROVE the process or design.
- IMAGINE how you would PLAN and CREATE your own design for a 3D tower model.

# The Eiffel Tower



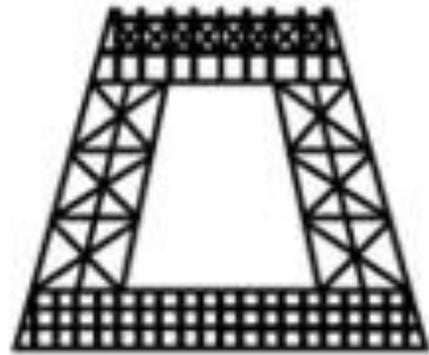
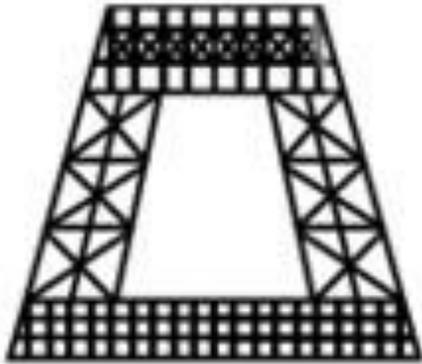
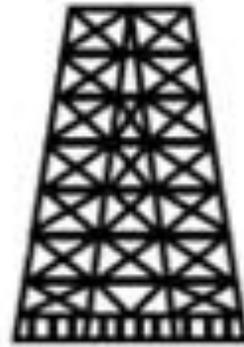
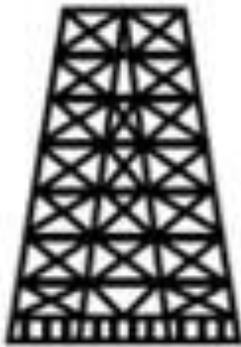
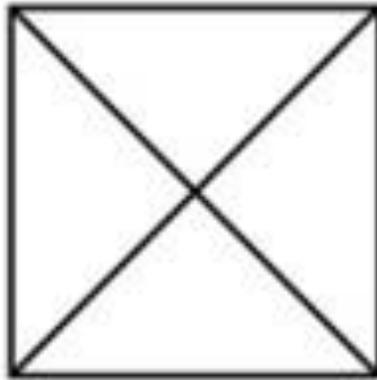
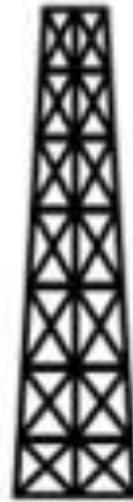
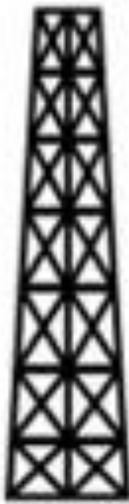
## 3 Interesting facts:

- The Eiffel tower is 986 feet tall and is constructed out of iron material.
- The Eiffel Tower was built in 1889 and was the tallest structure in the world until 1930.
- The tower was named after its designer and engineer, Gustave Eiffel, and over 5.5 million people visit the tower every year.



BRAIN BUSTER 3D

Eiffel Tower Stencil 01





BRAIN BUSTER 3D

Eiffel Tower Stencil 02

