

STUDENT GUIDE

Robot Model Project



STEAM: Technology (Robotics)

Technology (Robotics) design process is a series of steps used to work and solve problems. There are four main steps in robotics:

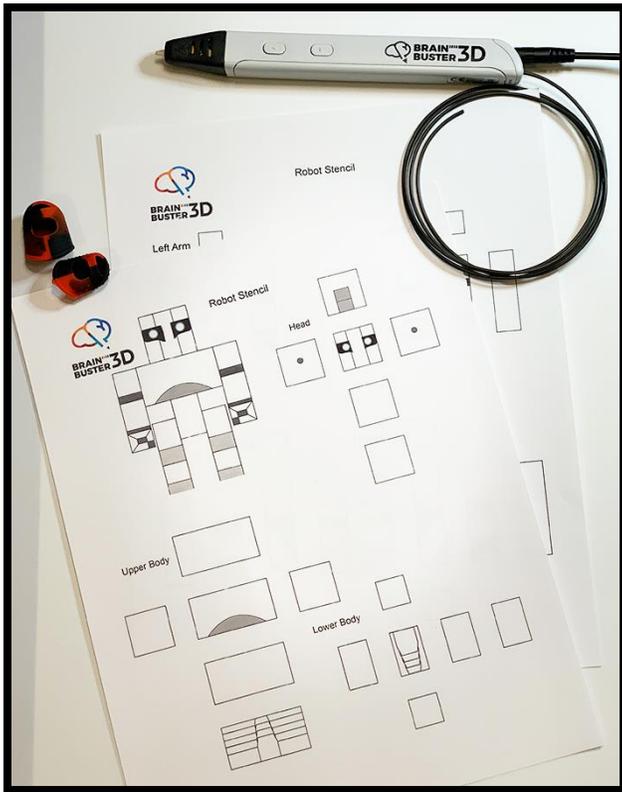
DESIGN BUILD CONTROL OPERATE

Building a robot model will help you learn Technological skills. How?

- You will be using the stencil which is your DESIGN to create each part of the robot model.
- You will need to arrange the parts of the robot as you would a puzzle, and determine which parts need to be welded together to BUILD the 3D form of the robot.
- When you finish the model, think about ways you could CONTROL and OPERATE the actions of the robot. Examples would be to give the robot mobility, sound, or light.

Materials Needed: Robot Stencil, 3D Pen, 2-3 colors 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

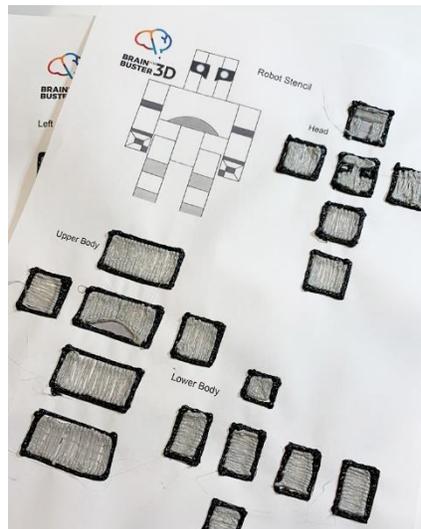


Plastic Tool



Art Pro Plus
3D Printing Pen

STEP ONE:



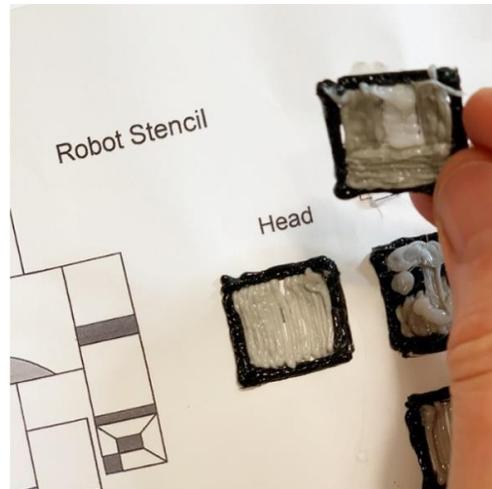
Find a starting point on the stencil to anchor your filament.

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 build your robot 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 robot 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.

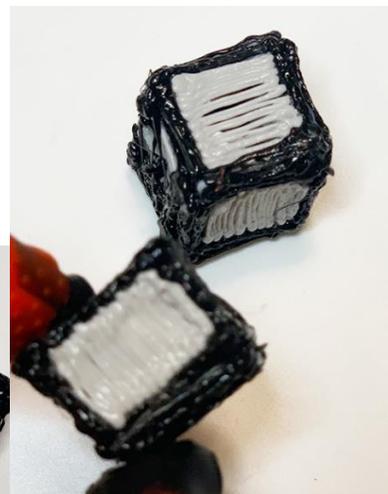
STEP THREE:



Robot Head



Robot Arms



Robot Neck

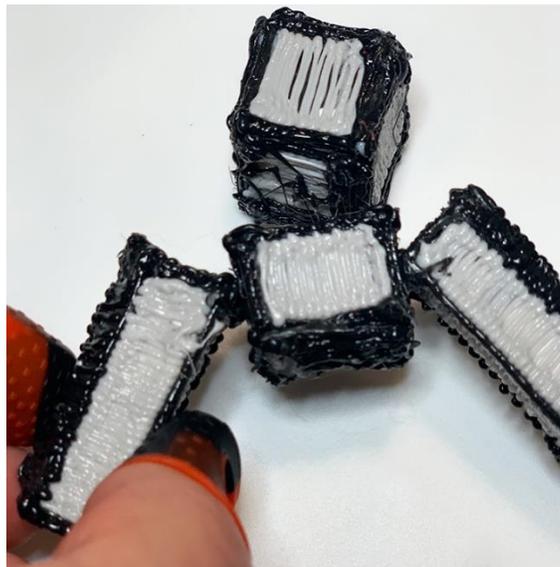
For the model of a robot, you will be welding squares and rectangles together to make a series of cubes and rectangular prisms. Build all the cubes and rectangular prisms.

Helpful Hint: Use playdough or clay to hold the pieces together as you weld the seams from the inside. When you no longer can weld from the inside, add filament to the corners outside of the cube or prism to weld the parts together. Add filament along the outside seams to reinforce them.



Once all of the cubes and prisms are built, arrange them as you see pictured above as you would a puzzle to help you see which parts will be welded together to form your 3D robot model.

STEP FOUR:

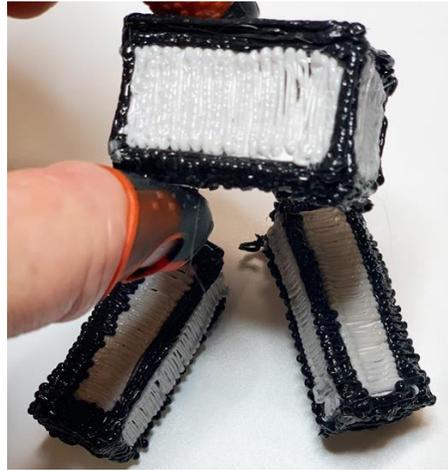


Weld the head to the neck. Then weld the arms to the neck at an angle as pictured.

STEP FIVE:



Robot Legs



Robot Body



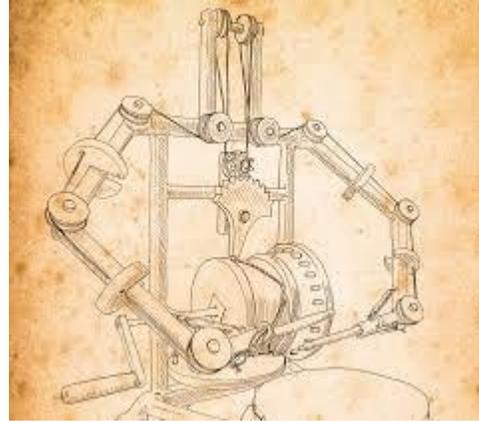
Robot Body & Legs

Weld the legs to the body as pictured.



Congratulations! Your 3D robot model project is complete.

Inspiration from Leonardo Da Vinci:



Have you heard of the famous Renaissance painter and inventor Leonardo da Vinci? When he was only 12 years old, his first design was the plans for a mechanical knight which moved its head, raised its arms, and would sit up. Later when he was an adult, Leonardo built the mechanical knight with the ideas he had from his childhood designs!

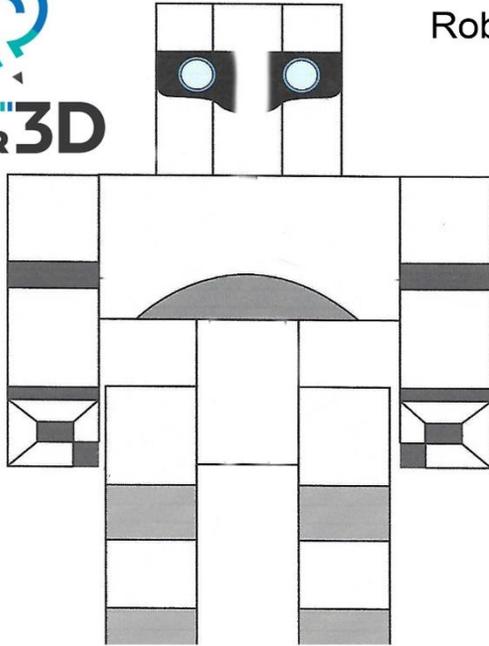
Take the da Vinci challenge! Next time you build a robot, plan the technology for adding movement. You can get ideas from drawings by innovators like Leonardo Da Vinci.

Think about how you would make the head, arms, and legs of your robot to move side to side or back and forth?

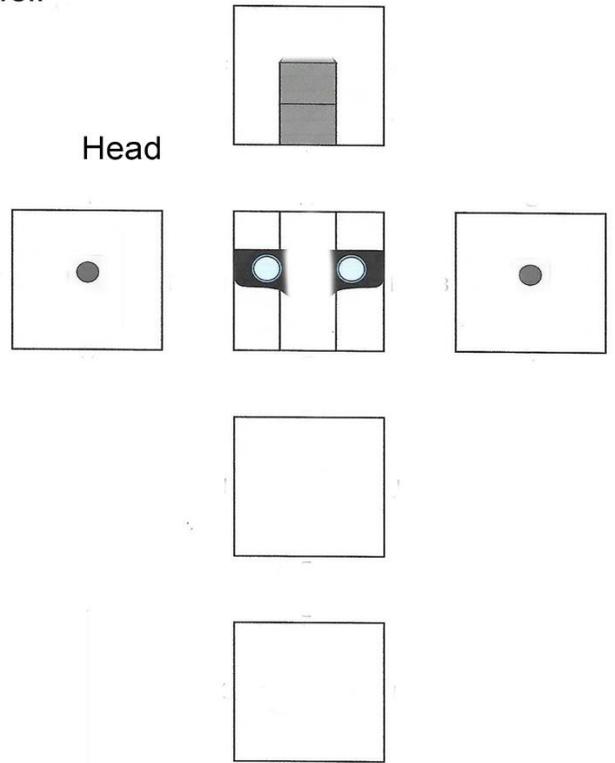
**You have a great advantage over Leonardo Da Vinci.
You do not need to wait until you are an adult to build your designs.
You can build them today!**



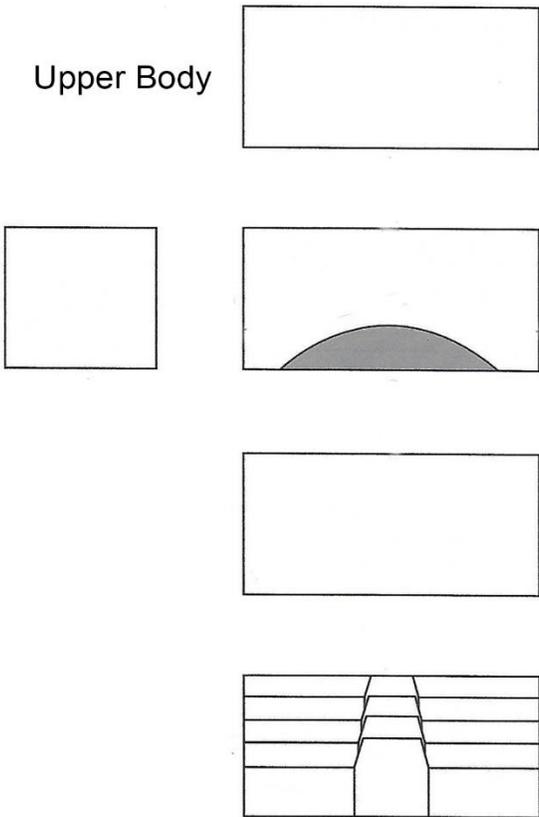
Robot Stencil



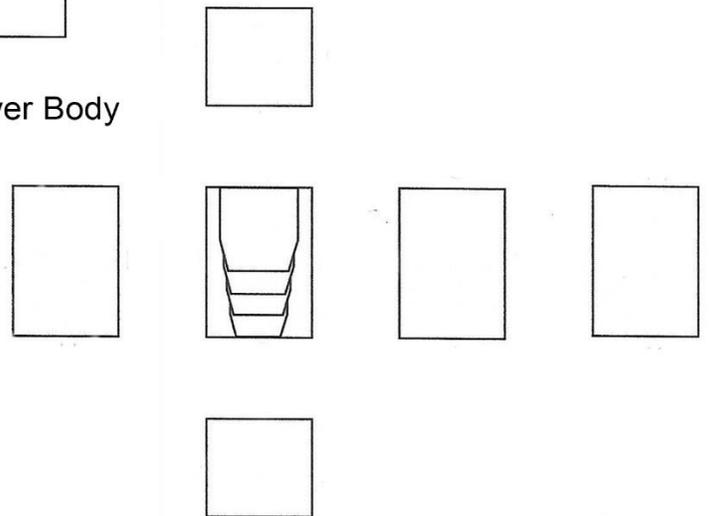
Head



Upper Body



Lower Body



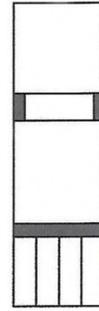
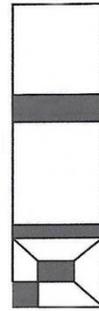
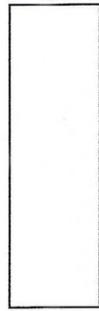
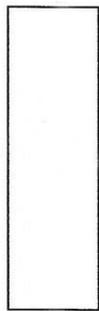
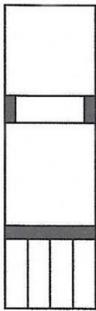
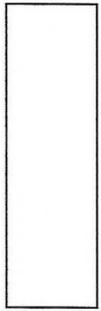


Robot Stencil

Left Arm



Right Arm



Left Leg



Right Leg

