

Whether your students are doing a science fair project, a classroom science activity, independent research, or any other hands-on science activity, understanding the steps of the scientific method is important. The Scientific Method has five parts:

ASK A QUESTION RESEARCH THE ANSWER CONSTRUCT A HYPOTHESIS

DO AN EXPERIMENT ASK (DID IT WORK?) & REPEAT...

In the Brontosaurus Fossil model project, students will need to think about a question they would be interested in exploring. Doing a model building project could be an “experiment” for them as they use various techniques in the creative process.

Brontosaurus Fossil Model Project



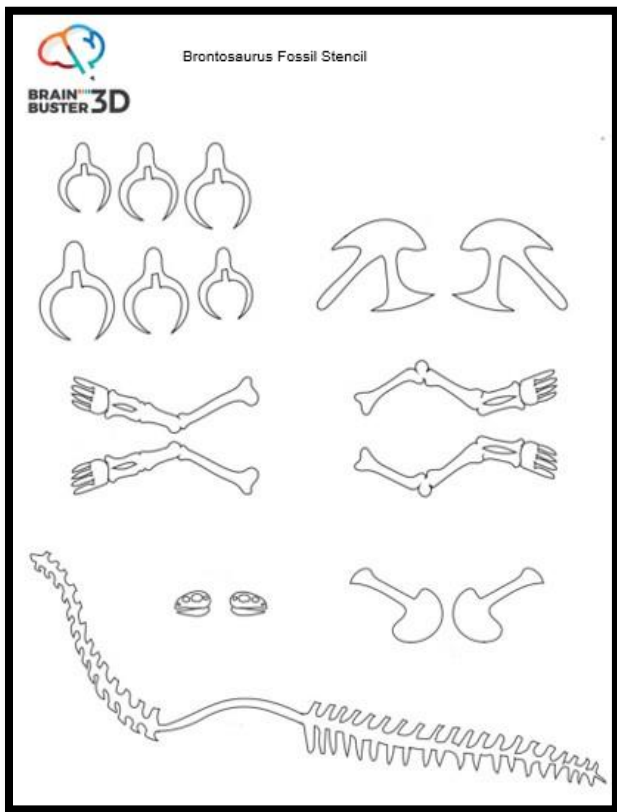
STEAM: Science

Building a Brontosaurus Fossil model will help students learn Science. How?

- They will use a stencil to create each part of dinosaur fossil.
- They will need to arrange the parts of the brontosaurus as they would a puzzle, and select the parts needed to weld together to create the 3D fossil skeleton of the dinosaur.
- They will use techniques such as heating areas, holding in place and welding to reinforce the structure to form the model. They will need to use caution when working with hot plastic as they hold the bones in place as they attach.

Materials Needed: Brontosaurus Fossil Stencil, 3D Pen, 1 color of PLA filament, scissors, silicon thumb & finger protectors, a paper towel or napkin.

Optional: To keep the 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

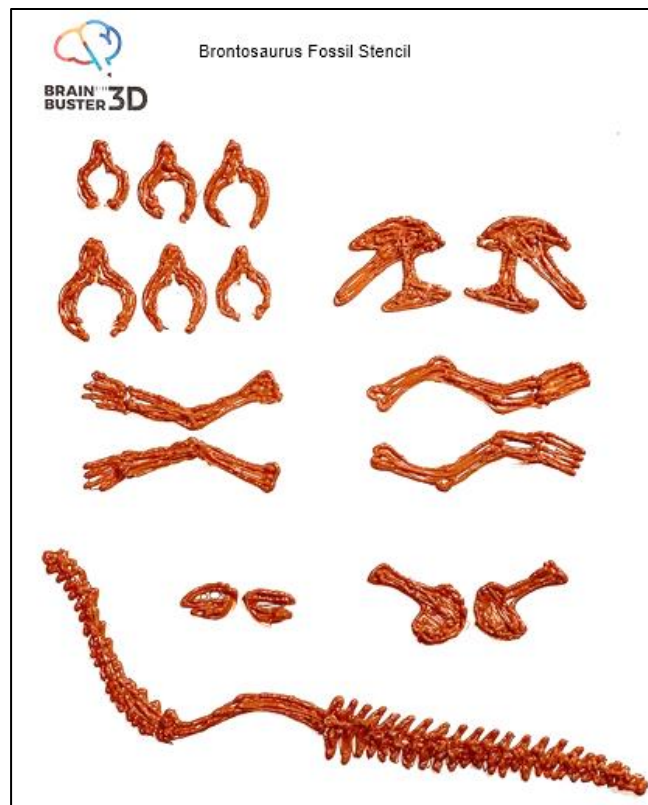


Plastic Tool



Art Pro Plus
3D Printing Pen

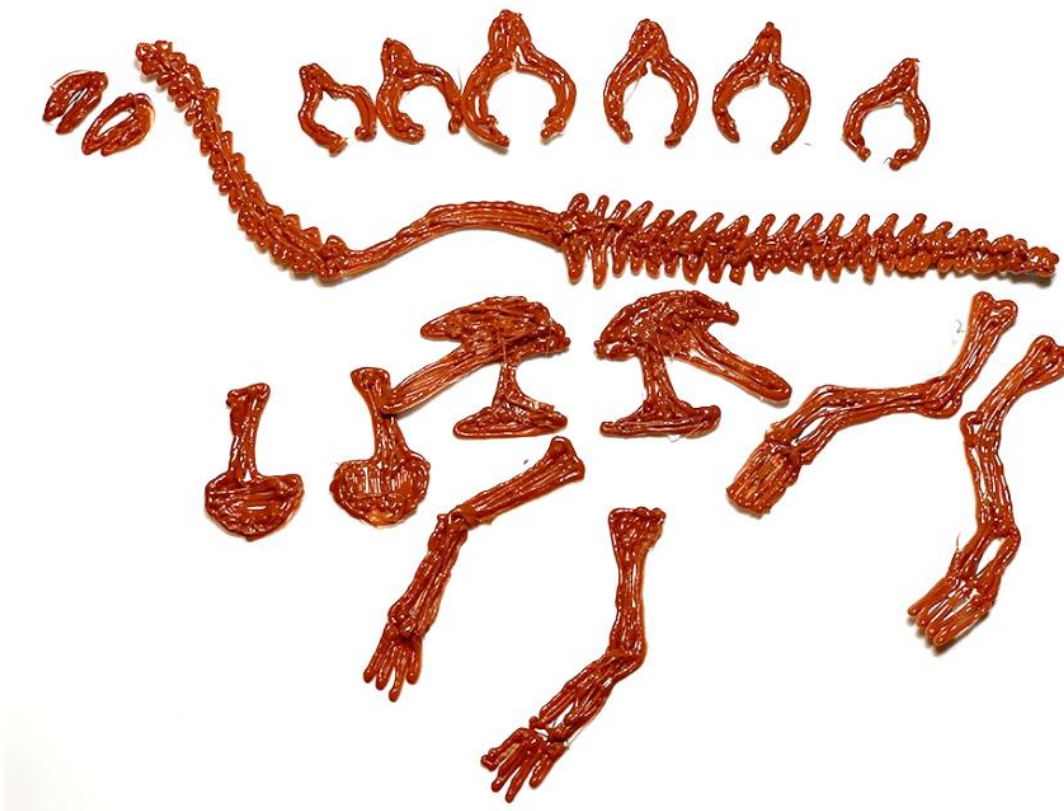
STEP ONE:



Make a copy of the Brontosaurus Fossil Stencil. If you need directions about how to operate a 3D pen, please refer to the ***Teacher 3D Pen Operator Guide***. Once the 3D pen is heated and loaded with filament, direct students to find a starting point on the stencil to anchor the filament. They will then move the 3D pen along the lines to outline each part. Once all the parts are outlined, they will fill in each part by moving the 3D pen back and forth between the outline they made.

They can select any color of filament to create their dinosaur model. If they do not like the PLA filament colors' that they have, they can paint the parts with acrylic paint before they remove them from the stencil or paint their finished brontosaurus fossil model.

STEP TWO:



If students used a plastic sheet protector, the parts should peel off the stencil easily. If they made the parts by extruding the filament directly on the paper stencil, some of the paper will stick to the back of the parts they made. To remove the paper, rinse the plastic parts with warm water and dry them with a paper towel.

Arrange the parts as they would a puzzle to see which ones will need to be welded together to form the 3D brontosaurus model.

STEP THREE:



Students will need to find the two parts to make the head of the dinosaur. They will need to use the 3D pen to melt the plastic at nose area of the head and weld and attach the two pieces together in the shape of a “v” as seen pictured above. The spine will slide into the gap through the back of the head.

Remind students to use caution when they use the pen to heat the plastic and shape the plastic with their fingers. It is best if they are wearing silicon thumb and finger protectors. The plastic will stay pliable as it cools so they can easily shape it without the plastic being excessively hot to touch.

STEP FOUR:



In the next step, students will melt the plastic inside the head and will position the top of the spine into the melted area. They must hold the spine in place until it is attached.

STEP FIVE:



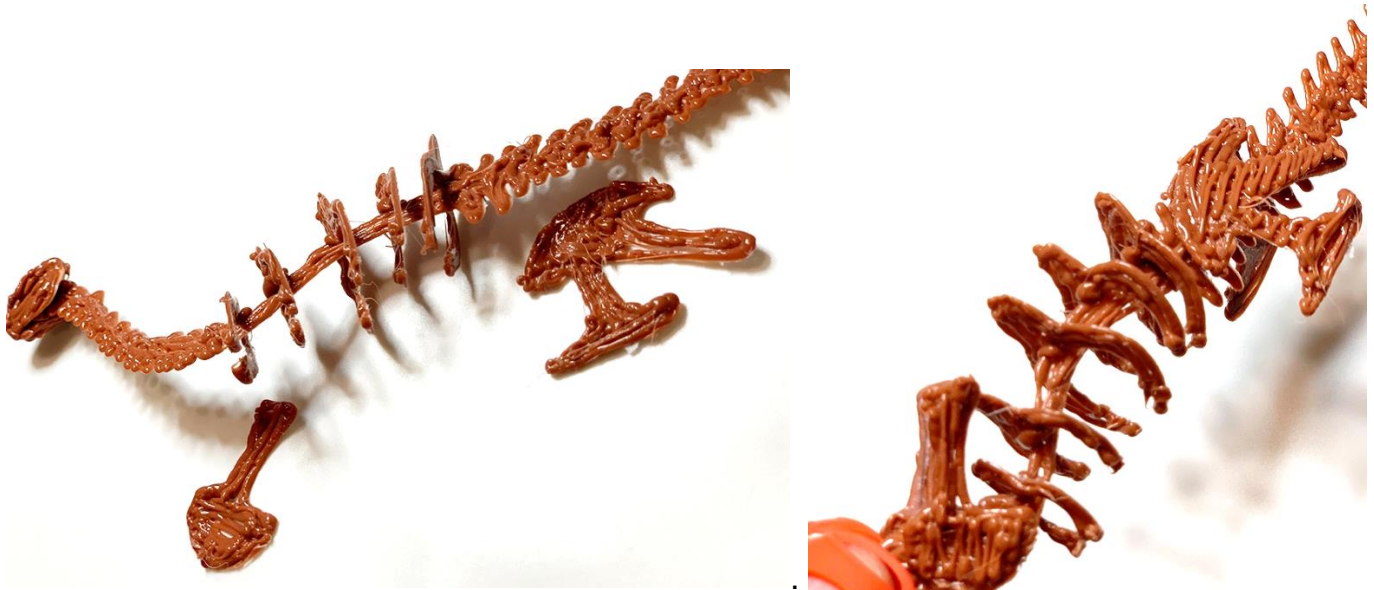
The ribs need to be arranged as pictured. The ribs will be welded to the smooth area of the spine.

STEP SIX:



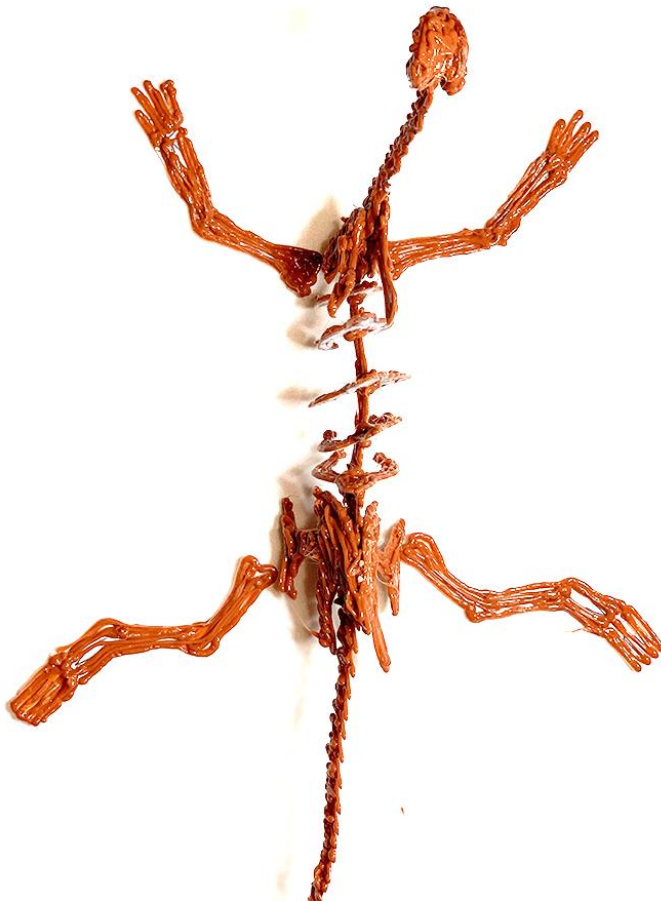
The plastic inside each rib must be melted slightly then held in place along the spine. Adding filament helps reinforce the weld.

STEP SEVEN:



Weld the shoulder and hip bones to the spine as pictured above.

STEP EIGHT:



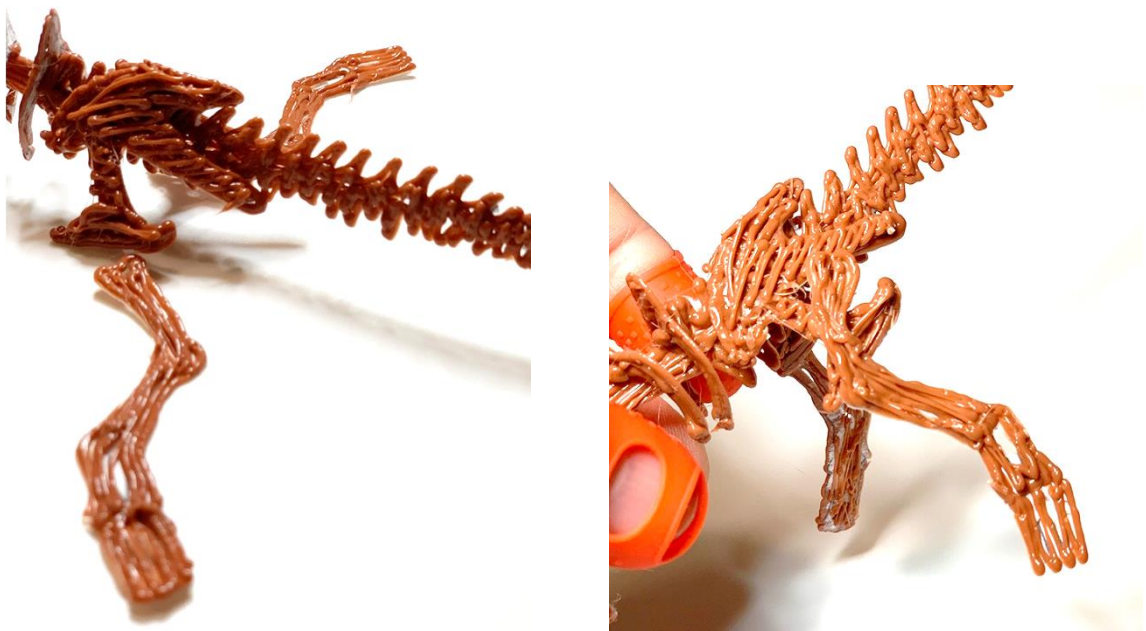
Arrange the shorter arm bones near the shoulders and the longer leg bones near the hips.

STEP NINE:



Have students attach the arms to the shoulders. They will need to melt the inside top of the arm and hold it until it attaches to the shoulder blade. Repeat and secure the second arm into place.

STEP TEN:



Have students attach the legs to the hips. They will need to melt the inside top of the leg and hold it until it attaches to the hip bone. Repeat and secure the second leg into place.

EXTEND the LEARNING:

Encourage students to learn the names of the bones in the brontosaurus fossil and compare it to the human skeleton.

Find pictures of brontosaurus dinosaurs and add muscle and skin to the skeleton to create a 3D brontosaurus model.



