Craft Kit #35: Polygon Sculpture

Jonathan Hils

Facets

February 6 – March 21, 2021

108 CONTEMPORARY

Art. Craft. Design.





Welcome to 108|Contemporary!

We are a non-profit gallery in Tulsa, Oklahoma that specializes in contemporary craft. From February 6 through March 21, 2021, we are excited to have an exhibition called *Facets*, all by artist Jonathan Hils. Let's take a look at the exhibition before we make a sculpture inspired by the pieces we see there.

On the way we'll ask ourselves some questions. There are no wrong answers! When you view fine art and craft, your experience will be unique and personal. Perhaps the person next to you will have different answers to the same questions. By hearing each other's perspectives, we may find new and exciting ways to interpret each work.

Who is Jonathan Hils?

Jonathan Hils is a professor and artist. He works in large-scale sculpture with metal, laser-cut acrylic, and 3-D printing. Some of his work is outdoor, public art while other pieces are meant for indoor display.

- Hils says his first creative act was mowing the lawn when he was 12 years old. He was inspired by patterns on baseball fields and decided to recreating that effect at his home. What chores have you turned into something creative?
- What skills might you need to learn to sculpt with metal? With lasers on acrylic? With 3-D printing?
- How would you plan for a permanent outdoor sculpture? What might you need to know about the location or your materials?





As Hils got older, he says, the physical toll of working with metal changes what he was able to do with material. Using software to design his art allowed him to continue to create. Now Hils uses CNC laser cutting technology to cut steel, and then he welds the pieces together. He also says it makes the design process faster—he wouldn't have the patience to draw it!

• Have you ever used technology to make your life easier? Do you think you could use it to help make your creative ideas come to life?

With 3-D printing he wants the final product to reflect what it's made of. He says "I'm not concerned with making it look like another material." He also says that he has been influenced by quilting.

- Can you find other examples of 3-D sculpture? How would it compare or contrast Jonathan Hils' sculptures to that of other artists?
- Take a look at "Deep Recesses." Can you find similarities to a quilt? Does it remind you of anything else?

Hils says that he "plays around" in the software program until he has designed something that he likes. He can take a picture of a landscape or something like a dragonfly wing, for example, and then has the software render it into something that could either be etched into acrylic with lasers or 3-D printed. The software uses straight lines to interpret these photos, so often its version of the original photo is almost unrecognizable!

- This is what one of Jonathan Hils pieces looks like in the software. Can you tell which of the sculptures it might be?
- You can try recreating the software rendering by tracing over a picture. Use a ruler or straight edge to keep your lines straight, and don't draw any curves. Do you think your drawing looks like the original?





When painting plexiglass pieces like Protein, Hils has to paint in layers before he uses the laser to etch designs into each panel. Then he peels off the protective paper to see what the finished product looks like—it's often a surprise! The side we see is the opposite of what the artist works on.

- Have you ever had to start a project from the end and work your way backwards? What did you learn about the process?
- What else is made from plexiglass? What other industrial materials can be used, with technology, in an artistic and creative way?



Jonathan Hils is always careful to thank the people who helped him assemble his work. Each piece requires specific connectors that he has to 3-D print and number in order to install the artwork properly. His wife, his students, his friends, and more have helped him put together his public art, install the *Facets* exhibition, and even inspire the painting and style of different pieces.

- Did you imagine that artists tend to work alone or with partners and teams?
- Are there different crafts or art styles that you think would be better or easier with a group of artists (instead of someone working alone)?
- If you had a little help, which of your creative ideas could become reality?

Polygon Sculpture Step-by-Step Instructions

Let's create a version of Jonathan Hils' piece "All That Glitters"!





Materials

- Equilateral pentagon (see the last page of the slide show for a printable version)
- Heavy paper or cardboard (like an old cereal box)
 - We used 3 pieces of letter-sized cardstock paper
- Finger paint, crayons, colored pencils, or markers
- Pen or pencil
- Ruler or straight edge
- Scissors
- Tape

Step One: Decorate

Decorate your paper or the inside of your cereal box. We tried a couple of different methods and liked them all. You could make your design abstract like ours or draw a picture. Fill the whole surface! If you use paint, make sure the paper is dry before you continue to the next step.





Step Two: Trace Pentagons

Turn your paper or cardboard so that the decorated side is down. Grab your pencil or pen and the pentagon cut-out. Trace two pentagons on the edge of your paper and cut them out. These will be the top and bottom of your sculpture.

Step Three: Trapezoids

Next, draw a line from the edge of the paper that is twice the height of your pentagon (marked B on the cut-out). Align a flat side of your pentagon with the edge of the paper so that the opposite point is on the line you just drew. Trace the two sides of the pentagon that touch the edge of the paper. Now use your ruler to extend those lines until they look a little longer than the first line you drew. You should have three lines now: one straight and two angled.

• You can reverse the order of this step—draw the sides, then the center line—and still get the same result





Step Three: Trapezoids (cont.)

Now draw a straight line that intersects those three lines, parallel to the edge. You have a trapezoid with two equal sides! Cut this shape out to use as a tracing guide. You'll need 10 trapezoids for the sculpture.

Step Four: Triangles

Use the first trapezoid you drew as a guide for your triangles. The width of your triangle should be the same length as the longer parallel side of the trapezoid. Mark this length on the edge of your paper. Next draw a line parallel to the edge you just marked. This is the height of your triangle.

• We used the width of our ruler to determine the height of our triangles, but yours can be different! The height of your triangle will change the circumference of the final sculpture.





Step Four: Triangles (cont.)

On this second line make a dot halfway between the length of the triangle base. You can use the centerline of your trapezoid as a guide. Connect these three dots to get an obtuse triangle with two equal sides.

You need 10 triangles for the sculpture.

Step Five: Construction

Now that you have all of your shapes—2 pentagons, 10 trapezoids, 10 triangles—it's time to put them together. You'll be taping the inside of the sculpture together so that, like in Jonathan Hils' pieces, the connecting pieces are on the inside.









Step Six: Base & Top

Use tape to connect the short side of each trapezoid to one side of a pentagon. You should have two "flowers" with a pentagon at the center.

Step Six: Base & Top (cont.)

Choose one of these "flowers" as your base. Use tape to connect the top side of each trapezoid to the matching side of a triangle. You should have five triangles remaining.





Step Seven: Building Up

To make connecting the trapezoids together a little easier we attached tape on the right side of each. Then we began sticking the long sides together until they all stood up.

Step Eight: Triangle Belt

Now you can start adding the remaining triangles. Just like with the trapezoids we found it easiest to work our way around the shape. The long side of 5 triangles should be at the top of your shape now.





Step Nine: Adding the Top

Add the top of the shape by first connecting a triangle to the matching length of a trapezoid, then the long side of that trapezoid to the one next to it. Work your way around the 5-sided shape. You may have to stick your finger into a corner to attach the final side.

You Did It!

Who knew that math would be so handy for making art?

Post your sculpture on social media and tag @108contemporary with the hashtag #craftkits!



Other Resources

- Other Craft Kits:
 - <u>https://108contemporary.org/craft-kits/</u>
- Jonathan Hils Artist Talk
 - <u>https://youtu.be/DH50GLSVdxw</u>
- Virtual Tour
 - <u>https://youtu.be/vNde-xncGAU</u>



Printable Equilateral Pentagon

TO PRINT:

Print this page out at 100% size to get a pentagon with 2 inch sides. Print it out at 50% to get a pentagon with 1 inch sides. Etc.

50% = 1 inch 100% = 2 inches 150% = 3 inches 200% = 4 inches 250% = 5 inches

 $A = the length of one side. \\ B = the height of the pentagon. \\ C = the interior angle.$

