Lesson 7 Layering Structure

Learning Objectives

Students will:

1. learn about what a layering structure is.

2. learn to design wood stamps.

Preparation:

1. Engraving material: 3mm basswood sheets
2. A4 paper
3. Wood glue
4. **LaserBox**

Session 1 Lead-in

Ask students: " How many times do you think you can fold a piece of A4 paper in half? And have you ever thought about why? Take the A4 paper and try folding it in half to figure out."

Have students give it a try.

Possible answer: 6 times.

Give explanations: "Each time the paper is folded, the thickness goes up by 2 times. Therefore, when we fold the paper in half 6 times, we may find it hard to give it another fold. You might want to use a tool to help fold the paper. However, the paper itself is not strong enough to withstand another fold so the paper will be torn under that condition."

Ask students: "Let's suppose one piece of paper is 0.1mm thick and we fold it in half 6 times. Then what is the thickness of the paper?"

Have students answer the question.

Explain to students: "If we fold a piece of paper 6 times, then the paper will be as thick as 64 pieces of paper (0.1*2*2*2*2*2*2=6.4mm). Each time the paper is folded, the thickness goes up by 2 times. But what if we pile pieces of paper, instead of keeping folding the same piece of paper in half? By piling paper, we can turn pieces of thin paper into a whole sheet of thick paper. "

The method also applies to our laser cutting projects. By piling the engraved pieces, we can create densely layered artworks that take on a 3D form.

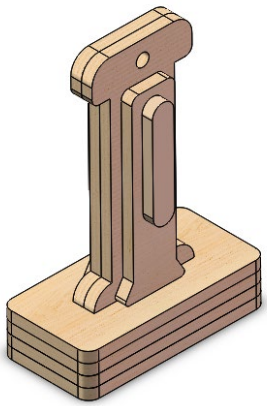
Session 2 Show Examples

Some designers use laser cutters to create layered wood sculptures. They sketch different images into multiple sheets of wood and then layer these sheets to create beautiful artworks. One single sheet of wood might look unattractive but when sheets

of wood are piled, they come out as an artwork that is densely layered and gorgeous.

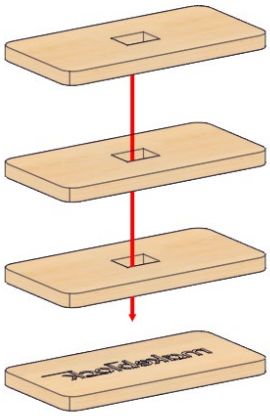
Session 3 In-class Task

Today's lesson teaches students how to design a stamp. Using what's learned in Lesson 6 (a base supporting structure) and a layering structure, we can create a beautiful wood stamp that is fully dimensional.



Expert tip:

When we are making a laser engraving project, we use a layering structure mainly for three reasons: 1) A layering structure can give you the desired thickness when sometimes the material itself is not thick enough. 2) A laser cutter always has a maximum thickness limitation. When the thickness of materials exceeds the limitation, the laser cutter can hardly produce a good outcome. This is when we can resort to a layering structure. 3) We use a layering structure to design different layers to establish a hierarchy and add visual interest.



Review what's done previously: "In the last lesson, we've learned about designing a base supporting structure. With the LQ file I gave to you, you can design a pedestal for the chess piece."

Get all the LQ files situated before the class so that you can maximize the class time by sending them to students. If students want to make stamps of their own style, let them use the software's built-in settings to design structural parts as they would like. You have to make sure they use a layering structure in their stamps (this is what this lesson is about)!

Ask students: "We've got almost all the materials necessary for making a wood stamp but we missed one thing. What's that? Texts. The wood stamp needs texts, but how do we engrave texts on the wood stamps correctly? Is there anything we need to pay attention to?"

Possible answer: The drawing software has a **Text** T tool. We use the tool to write words on the wood stamps. And we should pay extra attention to the direction of the words."

Explain to students: "That's right. We use the **Text** tool in the software to write words on the stamp. But there's one thing that needs attention: direction of the engraved texts. When we hold a stamp facing us, the order of how the words read actually goes

in an opposite direction. As you can see, in the picture below, the direction of the stamp is different from how we normally read. If we engrave words in a normal direction, then what we get when we stamp will be a reverse order. "

Demonstrate

- Import the digital resources that are needed for engraving a stamp (Students can design the shapes using the software's built-in figure tools, so long as the shape fits into the slots).
- Draw slots in the pedestal of the stamp (just as what we did in Lesson 6).
- Design a layering structure and images (students can adjust the thickness).
- Import the alphabet.lq file.
- Design texts and adjust their directions.
- Use **LaserBox** to process the wood pieces.
- Slot the laser-cut parts together and glue them in place.

Independent Practice

Ask students to work on their designs.

Use **LaserBox** to cut and engrave students' designs.

Session 4 Share

Ask students to share their designs with the class and explain the ideas behind their projects: What words do you engrave? Is there any deeper meaning behind these words?

Session 5 Wrap-up

Conclude the lesson: "In today's lesson, we applied a layering structure and **LaserBox** to make a wood stamp. We learned one thing: a layering structure adds visual interest and establishes a hierarchy in our projects."

Session 6 Extension

Layering structures are commonly seen in our everyday life, for instance, bricks walls. Another example is ancient Egyptian pyramids. Try using a layering structure to build a mini pyramid or you can use your imagination to create a unique project with a layering structure.