

Turn Your Photo Into a 3D Printed Night Light

3D Print a Lithophane



What is a lithophane?

- An etched or molded artwork in very thin translucent porcelain that can only be seen clearly when back lit with a light source
- “Lithophane” derives from Greek "litho"... which means stone or rock, and "phainein" meaning... "to cause to appear suddenly".
- First produced in France, Germany, Prussia, and England around the later part of the 1820s
- May have been made in China a thousand years earlier
- The European process:
 - Wax carving > Plaster or metal mold > Cast in porcelain > Fired
- Our goal: use software and a 3D Printer to achieve the same effect

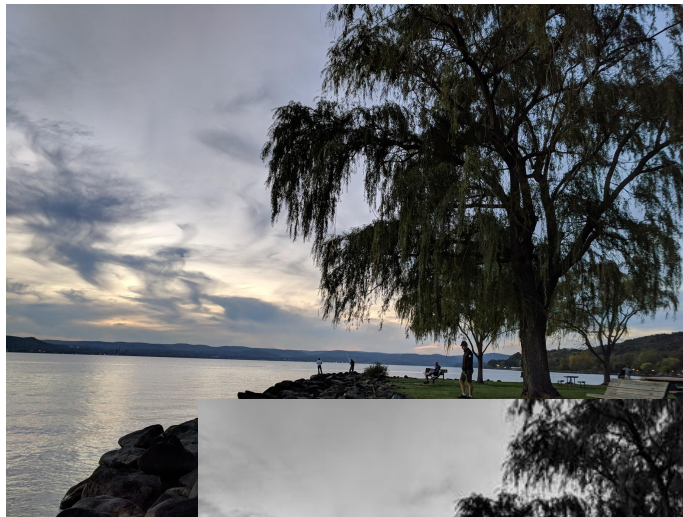


Select the Image

- File formats jpg, png, gif
 - 96-600 dpi resolution (higher is better)
 - High contrast
- If a B/W version of your photo has areas of dark/black and light/white, especially next to each other, it's likely to work well.
- Resize the photo if needed so it's close to its final size - 50mm x 37mm

Tip: To view in B/W,

- Insert into a Word document and Go to Picture>Color>Grayscale
- Open in Google Photos>Edit>Choose a grayscale option



[Instructable: Lithophanes 101](#)

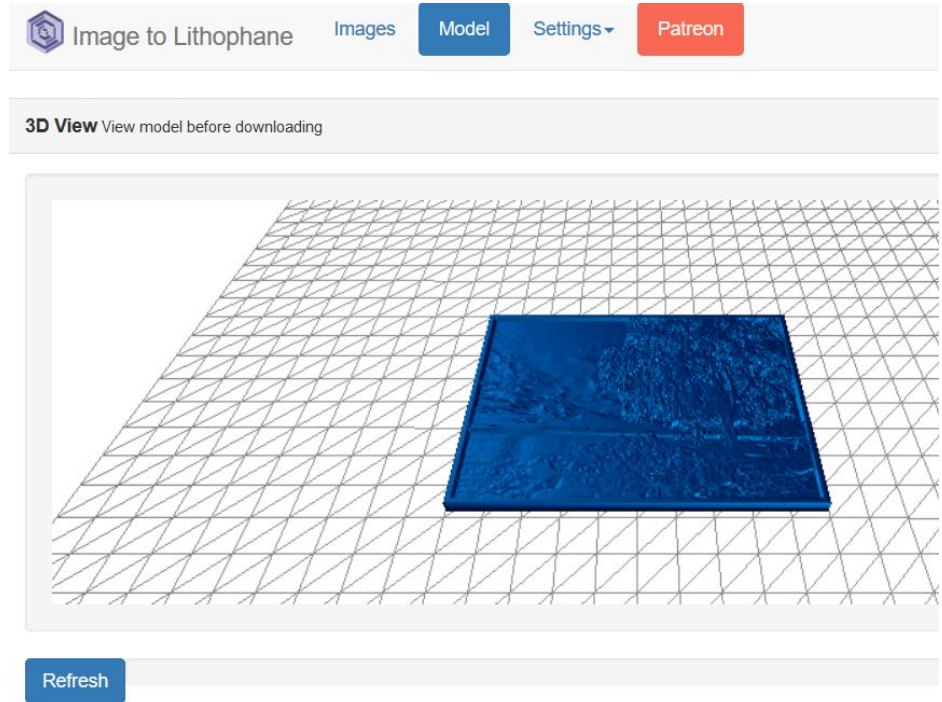
Select the image (10 minutes)

Convert the image

- Go to <http://3dp.rocks/lithophane/>
- Go to Images, browse to your file, and open it.

The file will load in the Model display.

Tip: Refresh the model and zoom in. You will see the dark parts of the photo convert to thin parts of the 3D model and the light parts of the photo convert to thick parts. Settings will adjust this.



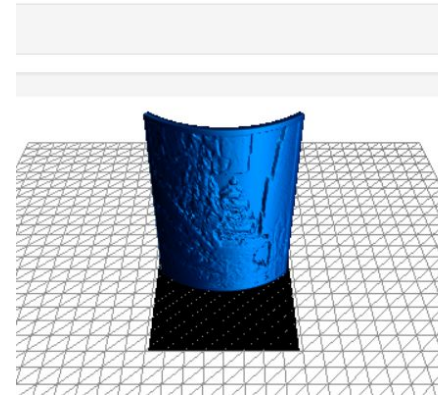
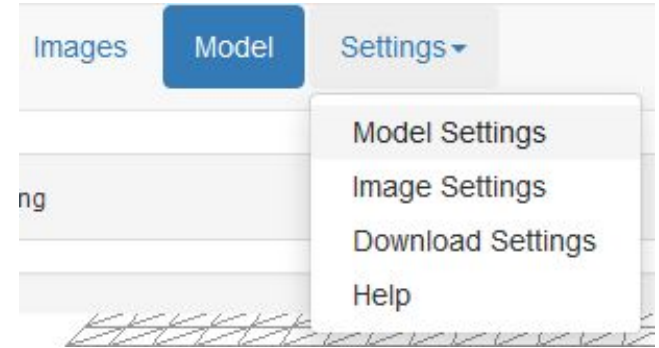
[Instructable: Lithophanes 101](#)

Convert the image (5 minutes)

Choose image settings

- Image Settings
 - Choose positive so the dark parts of your image will be thickest in the print.
- Model Settings
 - Maximum Size = 75
 - Border = 3
 - Vectors Per Pixel = 2

Scale the default down to simplify your model. Set to 2 for Tinkercad import if you are going to modify your design.
- Go back to Model. Select Outer Curve. Refresh.
- Download the model to create an stl file, saving to the desktop or downloads folder.

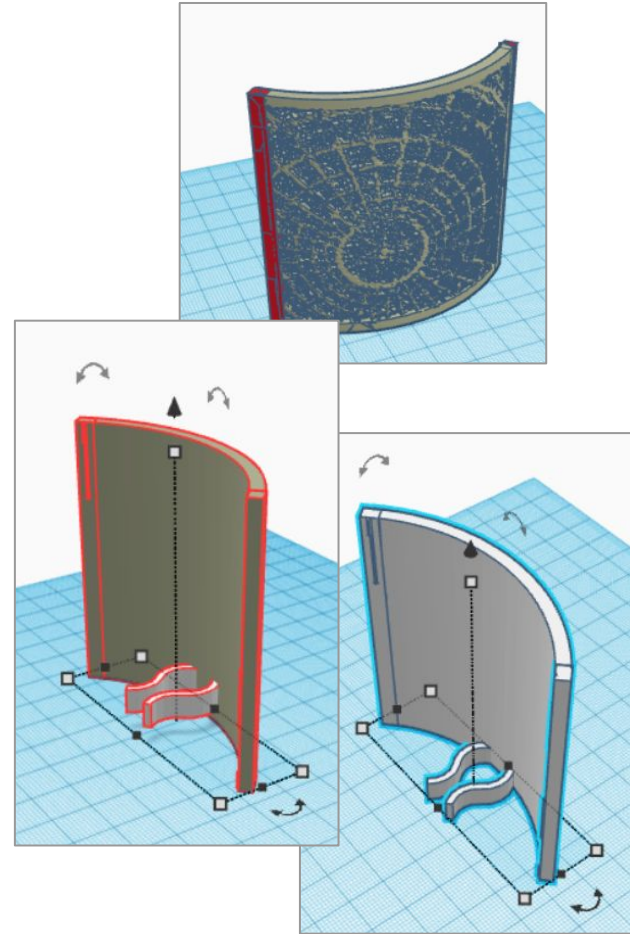


Choose image settings (10 minutes)

Modify in Tinkercad (optional)

For users with previous Tinkercad 3D modeling experience

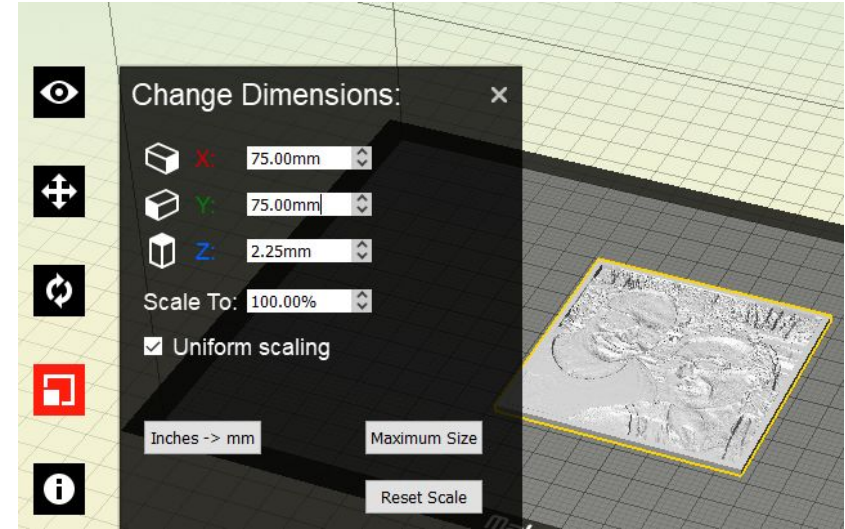
- Open Tinkercad> Create new model
- Import your file
- If needed, drag to add boxes to complete model edges and clean up any issues from import. Group.
- Add a Shape Generator>Clip.
- Resize internal diameter to 18mm and height to 4mm
- Position at back of model. Adjust angle if needed so that clip is perpendicular to other part
- Align to center across model.
- Group.
- Export to create an stl file, saving to the desktop or downloads folder.



Add clip and modify in Tinkercad (10 minutes)

Convert For Your 3D Printer

- Load the file into your 3D printer software
 - At WLS, open MakerBot Desktop
 - File>Open> your file
- In Settings
 - Select raft, 15% Infill
 - Set ABS filament, 230/230/110 degrees
- View Preview. If print time is more than 90 minutes, scale to reduce size and check Preview again
- Save the code (x3g)
- Transfer to SD card
- Print



Convert the image (15 minutes)

Saving and File Types

STL (STereoLithography)

- a file format native to the stereolithography CAD software created by 3D Systems
- after-the-fact backronyms are "Standard Triangle Language" and "Standard Tessellation Language"
- supported by many software packages
- it is widely used for rapid prototyping, 3D printing and computer-aided manufacturing.
- describes only the surface geometry of a three-dimensional object without any representation of color, texture

Help Links

- [Lynda.com 3D Printing and Modeling Courses](#)
- On the TotalBooX Shelf - [3D Printing and More](#)



- [WLS LEADER Lab on the IT Wiki](#)
- Allison Midgley - amidgley@wlsmail.org

Wrap up and survey (15 minutes)

Preparation For Workshop

This can be a 2-part workshop. It's recommended to hold sessions 1 week apart to allow for printing between sessions

- Day 1: Design night light cover and prepare for printing.
- Day 2: Assemble night light

Supplies

- Ivory/cream or light-colored but **opaque** filament
- [TopTools Night Light \(box of 6\) - 4@31.96 ea](#)

Patron Survey

Program Survey (Part 1)

Your response to this brief survey helps to improve programming in the short and long term. Thanks in advance for your input!

On a scale of 1 to 5, rate your knowledge of and confidence about the activity BEFORE the program.

- 1 - I've never heard of it.
- 2 - I've heard of it but don't have much knowledge of it. I haven't participated in it.
- 3 - I have participated in this activity once. I am a novice.
- 4 - I have some knowledge about the activity and have participated in it as a hobby or past time.
- 5 - I am an expert or professional in this field or activity.

On a scale of 1 to 5, rate your knowledge of and confidence about the activity AFTER the program.

- 1 - I've never heard of it.
- 2 - I've heard of it but don't have much knowledge of it. I haven't participated in it.
- 3 - I have participated in this activity once or twice. I am a novice.
- 4 - I have some knowledge about the activity and have participated in it as a hobby or past time.
- 5 - I am an expert or professional in this field or activity.

What did you like most about the activity?

Patron Survey

Patron Survey (Part 2)

How likely is it that you will recommend this program to someone?

Very likely

Not likely

If you answered "Not likely" above, why not?

It needs to be better organized.

It wasn't fun.

I didn't like the materials.

I wasn't happy with my finished product.

Other:

What suggestions do you have for making the activity better?

What suggestions do you have for other programs at the library?