3D PRINTING BOOKLET FOR BEGINNERS

The MediaLab at the Metropolitan Museum of Art’s Spring 2014 Intern Expo

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3 SIMPLE STEPS

STEP 1
SCANNING

STEP 2
MODELLING

STEP 3
PRINTING
Step 1

Scanning

What do you need?

Step 01

The best way to get your 3d model is to photograph it with your smartphone or digital camera, then send the pictures to be processed into a 3d model online.
There are many interesting objects in the museum. Do explore with some tips below.

Museum Awareness

- Try to avoid objects behind glass.
- Look for signs that say 'no photography'.
- Try to avoid dim light rooms.
- Don't use flash.
- Be careful not to block people and don't get too close to the object.
- Don't use a tripod.
Take pictures around an object about 20 sequential photographs.

Be careful, don't get too close to the object and please take a look at the environment around you.

Keep the distance between you and the object.
WHAT DO YOU NEED?

This step, we will upload pictures that we take from the object. We need a computer, internet and a web browser to process pictures to be a 3d model.

File format that we use for 3D printing is STL

STL is a tessellated triangle surface format. It turns your geometry into triangles to produce a surface that approximates your model. Therefore, It’s a 3D printer friendly file format.
UPLOADING A MODEL

STEP 01

Go to 123DCATCH website http://www.123dapp.com/catch
And sign up to get an account

STEP 02

Launch 123D Catch online
Press launch button

STEP 03

Select images All images
Uploading models from 6-20 pictures (minimum)

STEP 04

Wait for 123D Catch’s cloud servers to process your images (5-20 minutes)
Now we’ve retrieved our model, but it might not be perfect, with holes and other irregularities. Don’t worry, we can fix this by filling the holes.

**STEP 01**

Go to 123D Catch website and sign up
http://www.123dapp.com/catch

**STEP 02**

Go to “Me” and “Models” menu then see the model that you’ve just uploaded and click edit > 123D Catch model (see the picture below). Then, Import your model using STL file to 123Dcatch.
Select the object

Click heal mesh icon.

123D Catch will shows you some areas that need to be fixed then select point to fill the hole or use fill all button.

The holes will be fixed completely and our model is ready to be used.
This model doesn't have a flat base, so it's hard to stand by itself.

**Plane cut the model**

Plane cutting helps our models base to be flat so that we can make a base for the next step.

1. **STEP 01**
   - Click plane cut icon in 123dcatch

2. **STEP 02**
   - Move up and down to the right position for cutting.

3. **STEP 03**
   - Click plane cut below the mesh then apply
Now that we’ve fixed all the holes, we can make a base, so the printed model can stand by itself.

**STEP 01**

Sign up and Import your model into tinkercad website  https://www.tinkercad.com/

**STEP 02**

Click the cube icon to show geometric shapes that we can bring them to make our own base

Shortcut keys video is here.
https://www.youtube.com/watch?v=erEUtG8SejE
MAKING A BASE

STEP 03
Select a base that you like, drag it onto the work area, and resize it as needed.

STEP 04
Combine the base with the model then click group icon.
If we want our model to be in a different position, building support is structure important in this case.

3D printing services provide support structure from most of the software.

Try to avoid positions like these example because your models will not be able to stand on its own.
3D PRINTING SERVICES

It’s time to print! We can send our STL files to 3D printing services at the websites below.

3D printing services
http://www.thingiverse.com
http://www.shapeways.com
http://i.materialise.com
https://www.ponoko.com
http://www.sculpteo.com
http://staples.myeasy3d.com/

3D modeling website / inspiration
http://www.thingiverse.com/met/designs

More inspirations
http://makezine.com/

Free 3D modeling software
http://www.123dapp.com/catch
https://tinkercad.com/
http://meshlab.sourceforge.net/
“This sculptures is possible to see in the gallery, but now this the scrupture is reproduced and can be seen in a different places at the same time.”

Now, it’s our time to explore reproduction art in order to see art in different ways.

**FUN PROJECT / CHESS SETS**

This is one example to explore reproduction art. Each gallery has its own unique objects. As an example of an interesting project, we can make a chess set by 3D printing objects from different galleries.

Let’s explore more with 3D printing. We hope that you can apply a tutorial from this book in a creative way.
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