物聯網智慧生活應用整合實務

TINKERCAD 3D設計

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3D設計技巧

- 組合、分解
- 挖洞、開孔、切割

https://sites.google.com/a/jbps.ttct.edu.tw/3d-lie-yin-ke-cheng/01gong-neng-jie-shao

練習

設計名牌

https://www.sculpteo.com/blog/2017/08/23/tinkercad-tutorial-how-to-design-3d-models-with-this-online-design-tool

列印材質介紹

https://youtu.be/iRdzJJbZqW4

NYLON: (Polyamide)

- Also called White, strong & flexible / Durable plastic / White plastic
- Strong and flexible plastic
- 1mm minimum wall thickness
- Naturally white, but you can get it colored
- About 10 layers per 1mm
- Made from powder
- Alumide = Polyamide + Aluminum
- Interlocking, moving parts possible (chain)

plastic

Strong & flexible

1mm
Min. wall thickness

Details & texture

$$$$$
Price

ABS: (Home printers)

- Strong plastic like legos are
- Made from spaghetti like filament
- Many color options
- About 3 layers per 1mm
- 1mm minimum wall thickness

RESIN: (Multiple options)

- Also called White-, Black-, Transparent detail / White detail resin / High detail-, Transparent-, Paintable Resin
- Rigid and a bit delicate
- Liquid Photopolymer cured with UV light
- White, black & transparent most typical colors
- About 10 layers per 1mm
- 1mm minimum wall thickness

metal

Strong & rigid	Min. wall thickness	Details & texture	Price
	3mm		$$$$$

STAINLESS STEEL:

- Very strong material
- Made with multiple steps or from powder directly
- Coloring options like gold and bronze plating
- About 6 layers per 1mm
- 3mm minimum wall thickness

GOLD & SILVER:

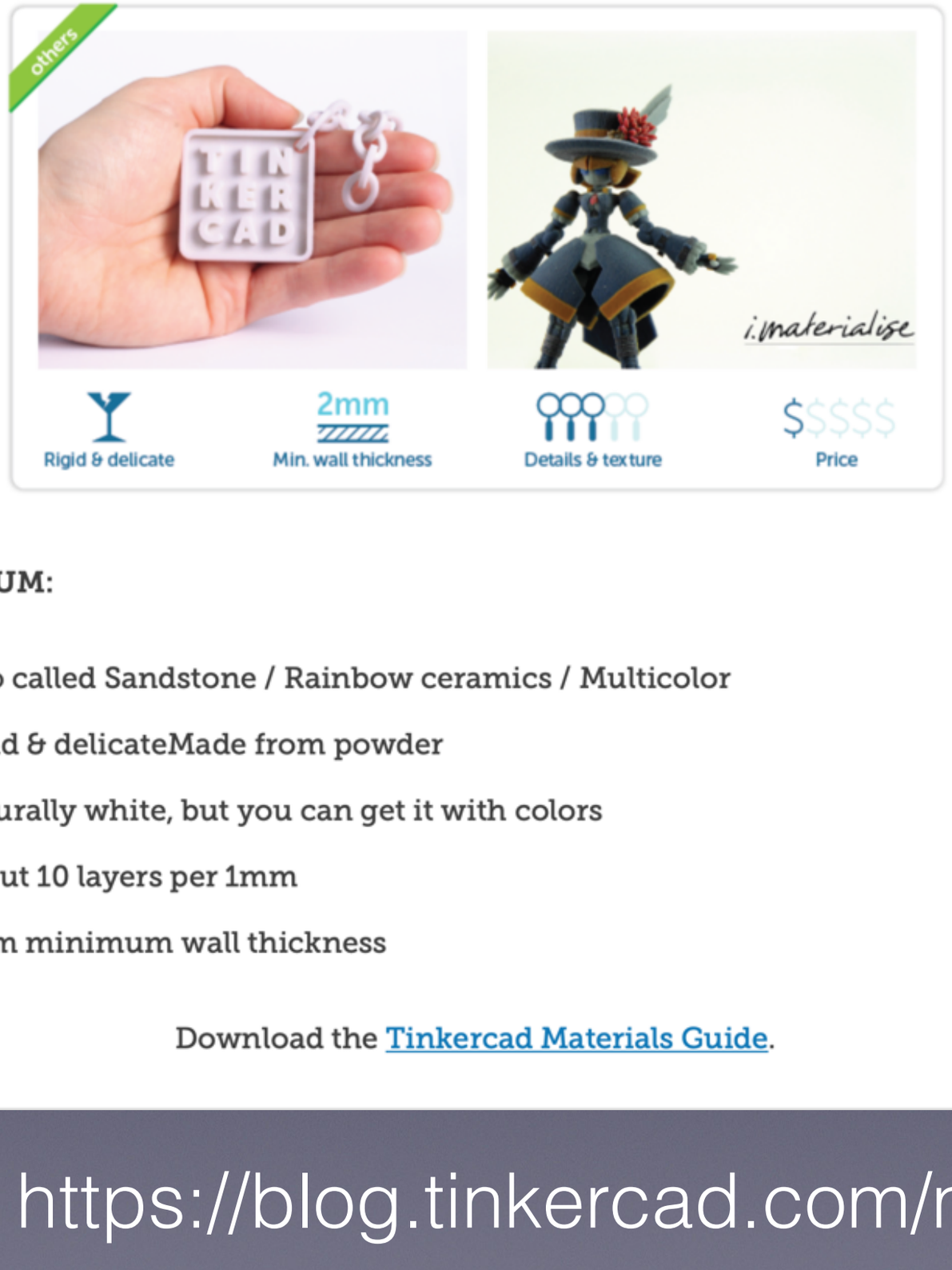
- Strong materials
- Made from wax and then casted
- About 10 layers per 1mm
- 0.5mm minimum wall thickness

TITANIUM:

- Strongest material
- Direct metal laser sintering
- About 30 layers per 1mm
- 0.2mm minimum wall thickness

CERAMIC:

- Rigid & delicate
- First ceramic is printed then surface is glazed
- Ceramic white, glaze typically white
- About 6 layers per 1mm
- 3mm minimum wall thickness



GYPSUM:

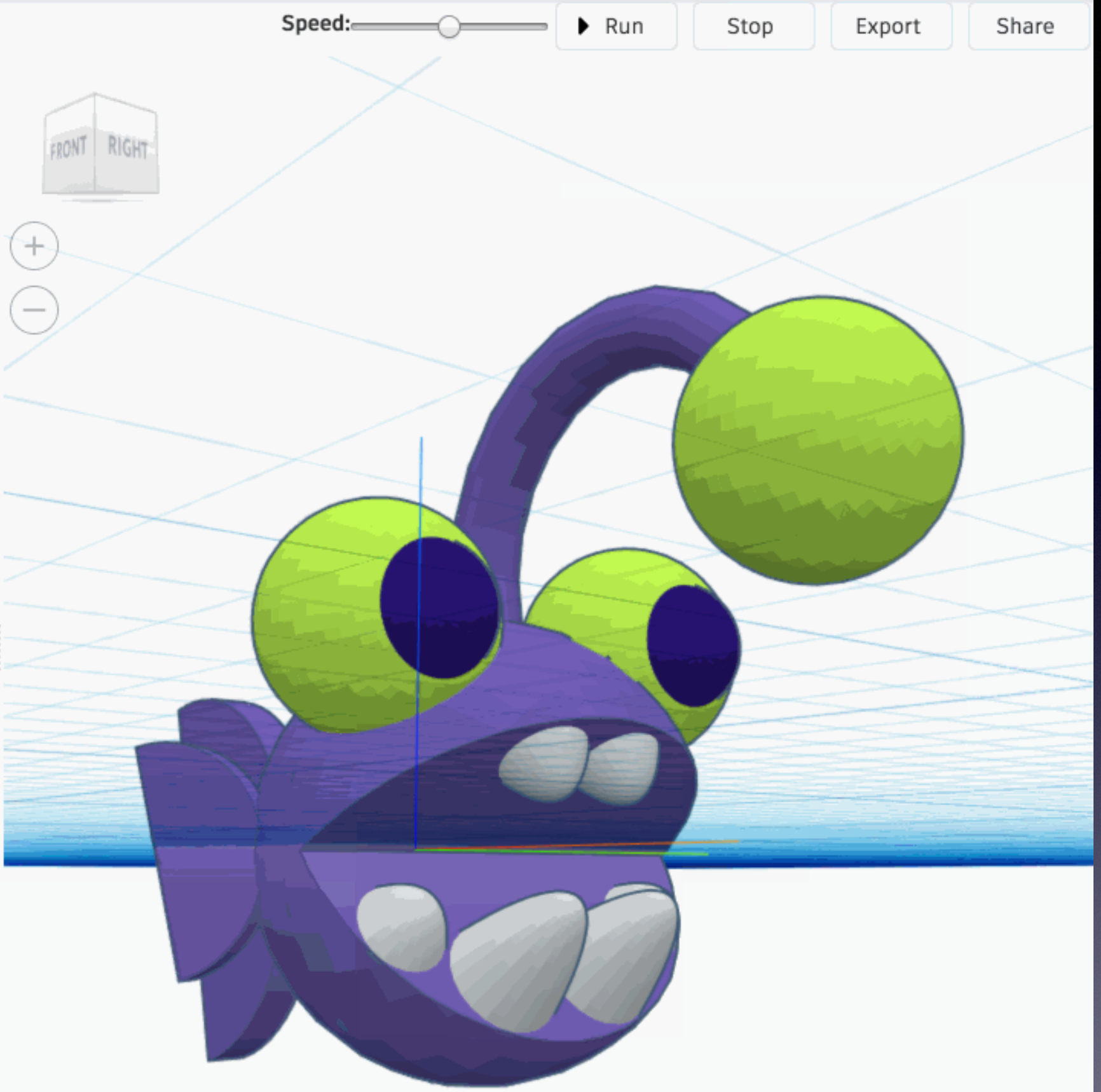
- Also called Sandstone / Rainbow ceramics / Multicolor
- Rigid & delicateMade from powder
- Naturally white, but you can get it with colors
- About 10 layers per 1mm
- 2mm minimum wall thickness

Download the Tinkercad Materials Guide.

https://blog.tinkercad.com/materialsguide/

用程式做3D設計

Speed: Run Stop Export Share



Create New Object body

Add

Rotate around Axis y By 90 Degrees from Pivot

Move: X: 5 Y: 0 Z: 0

Add

Rotate around Axis y By -90 Degrees from Pivot

Move: X: -5 Y: 0 Z: 0

Add

Scale: X: 1 Y: .1 Z: 1

Rotate around Axis y By 75 Degrees from Pivot

Move: X: -15 Y: 0 Z: 0

Add

Scale: X: .5 Y: .05 Z: .5

Rotate around Axis y By 75 Degrees from Pivot

Rotate around Axis z By -30 Degrees from Pivot

Move: X: 0 Y: 10.5 Z: 0

Add

Scale: X: .5 Y: .05 Z: .5

Rotate around Axis y By 75 Degrees from Pivot

Rotate around Axis z By 30 Degrees from Pivot

Move: X: 0 Y: -10.5 Z: 0

Add

Rotate around Axis x By 90 Degrees from Pivot

Move: X: 14 Y: 0 Z: 12

Add

Scale: X: 2 Y: 2 Z: 2

Rotate around Axis y By -80 Degrees from Pivot

Move: X: 16 Y: 0 Z: -2

Create Group

Create New Object eyesnLight

Add

Rotate around Axis y By 90 Degrees from Pivot

Move: X: 24 Y: 0 Z: 14

Add

Rotate around Axis y By 90 Degrees from Pivot

Move: X: 7 Y: 7 Z: 9

Add

Rotate around Axis y By 90 Degrees from Pivot

Move: X: 7 Y: -7 Z: 9

Add

Rotate around Axis y By 90 Degrees from Pivot

Move: X: 10 Y: -7 Z: 9

Add

Rotate around Axis y By 90 Degrees from Pivot

Move: X: 10 Y: 7 Z: 9

Create Group

練習

https://blog.tinkercad.com/2018/06/24/cad-and-code-together-at-last/

- 講義、範例程式下載：
- https://github.com/ycwang812/UCH