



Arlington 250

Design and 3D print a star

library.arlingtonva.us/theshop



The Shop

Arlington 250 Stars - Sit & Make Project

Design & Print a 3D Star:

- This is a Sit and Make activity in which patrons can design a star to be 3D printed in red, white, or blue to celebrate Arlington 250.
- Designing a star can be done at home or at The Shop. **Patrons must be 9 or older to visit The Shop.**
- Patrons must submit their completed star design through The Shop's [online print request form](#) and email the file. There is no charge for the finished stars.

Please Note:

- Patrons will not operate the 3D printers for this project.
- Patrons will receive an email when their star is ready for pick-up at the downstairs checkout desk at Central Library.
- Limit 1 star per patron.



3D Design in TinkerCad

TinkerCad

A free, online 3D design tool that is great for beginners!

Design from home

To get started at home, you need to set up a free Tinkercad account at <https://www.tinkercad.com/>

Design in The Shop

To get started at The Shop, you need an Arlington Public Library card and a completed Maker User Agreement.

Drop in during Open Shop hours and staff will get you started with TinkerCad. (Makers ages 9 – 13 must always remain with a caregiver over the age of 18.)



lib-makers

🏠 Home

🍏 Classes

🗄️ Designs

📁 Collections

🎓 Tutorials

🚩 Challenges



Bring healing-centered design into your classroom with this student challenge. »



Invite students to design resilient spaces after disasters and compete for scholarship prizes. »



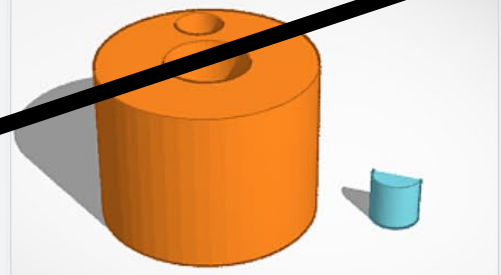
Teachers and Parents: We're updating Tinkercad's data retention policy. »

+ Create

📦 3D Designs

View 720 more >

This is TinkerCad's dashboard. Click "Create" to start a new project.



Glorious Krunk
6 days ago
Private
🔄 0 ❤️ 0

TinkercadText
7 days ago
Private
🔄 0 ❤️ 0

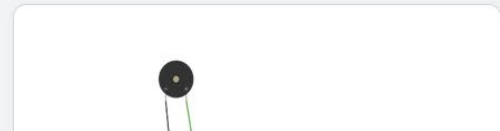
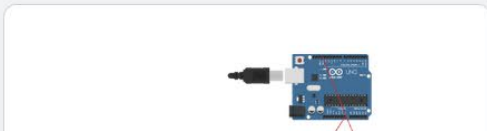
Cool Gaaris-Duup
8 days ago
Private
🔄 0 ❤️ 0

Bodacious Amur
8 days ago
Private
🔄 0 ❤️ 0

🔍 Help center

🔌 Circuits

View 9 more >





lib-makers

🏠 Home

🍏 Classes

🗄️ Designs

📁 Collections

📖 Tutorials

📈 Challenges



Bring healing-centered design into your classroom with this student challenge. »



Invite students to design resilient spaces after disasters and compete for scholarship prizes. »



Teachers and Parents: We're updating Tinkercad's data retention policy. »

+ Create

📦 3D Designs

Click "3D Design" to start a 3D design project.

📦 3D Design

🔌 Circuits

📄 Codeblocks

Glorious Krunk

6 days ago
Private

🔄 0 ❤️ 0

TinkercadText

7 days ago
Private

🔄 0 ❤️ 0

Cool Gaaris-Duup

8 days ago
Private

🔄 0 ❤️ 0

Bodacious Amur

8 days ago
Private

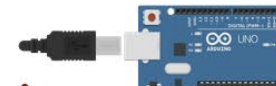
🔄 0 ❤️ 0

🔌 Circuits

View 9 more >



library.arlingtonva.us/theshop

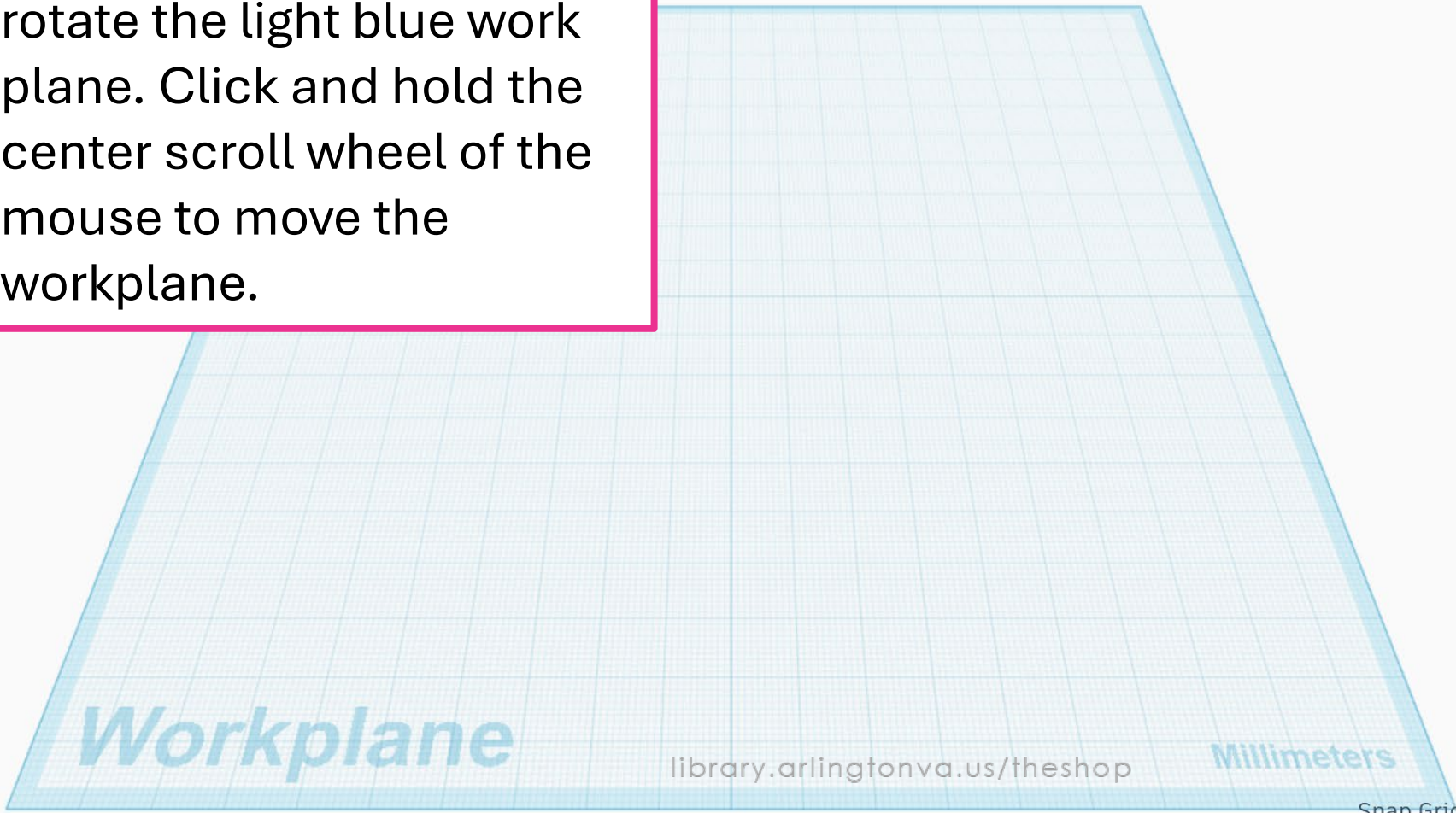




Import Export Send To

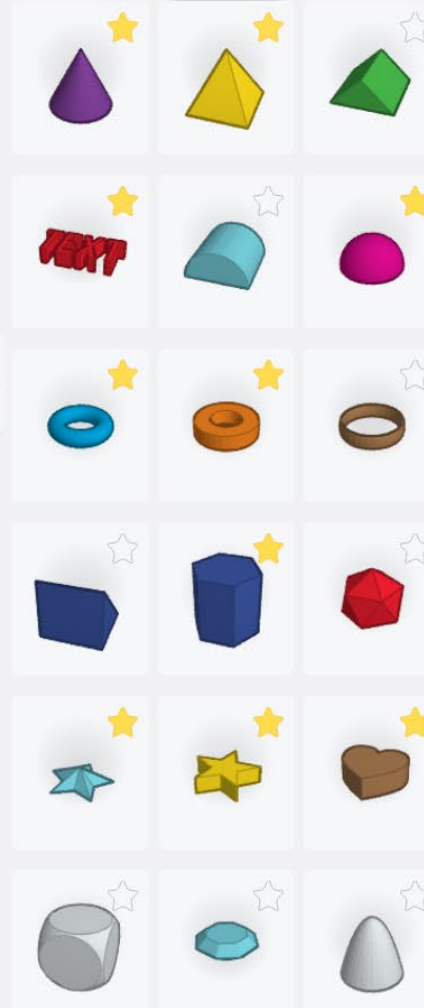


This is your 3D design space. Right click on your mouse and hold down to rotate the light blue work plane. Click and hold the center scroll wheel of the mouse to move the workplane.



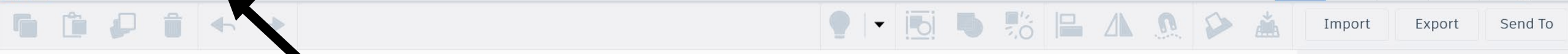
Basic Shapes

New!

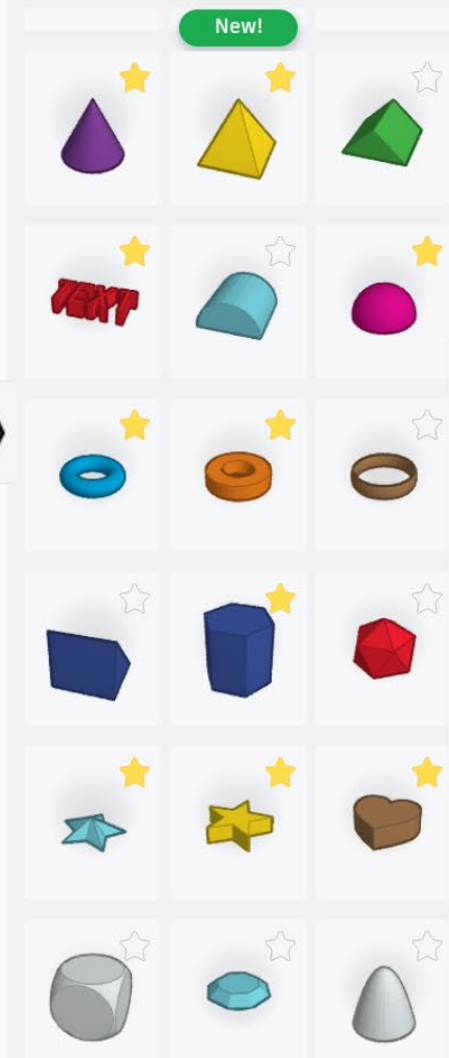
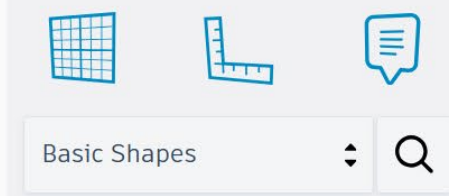
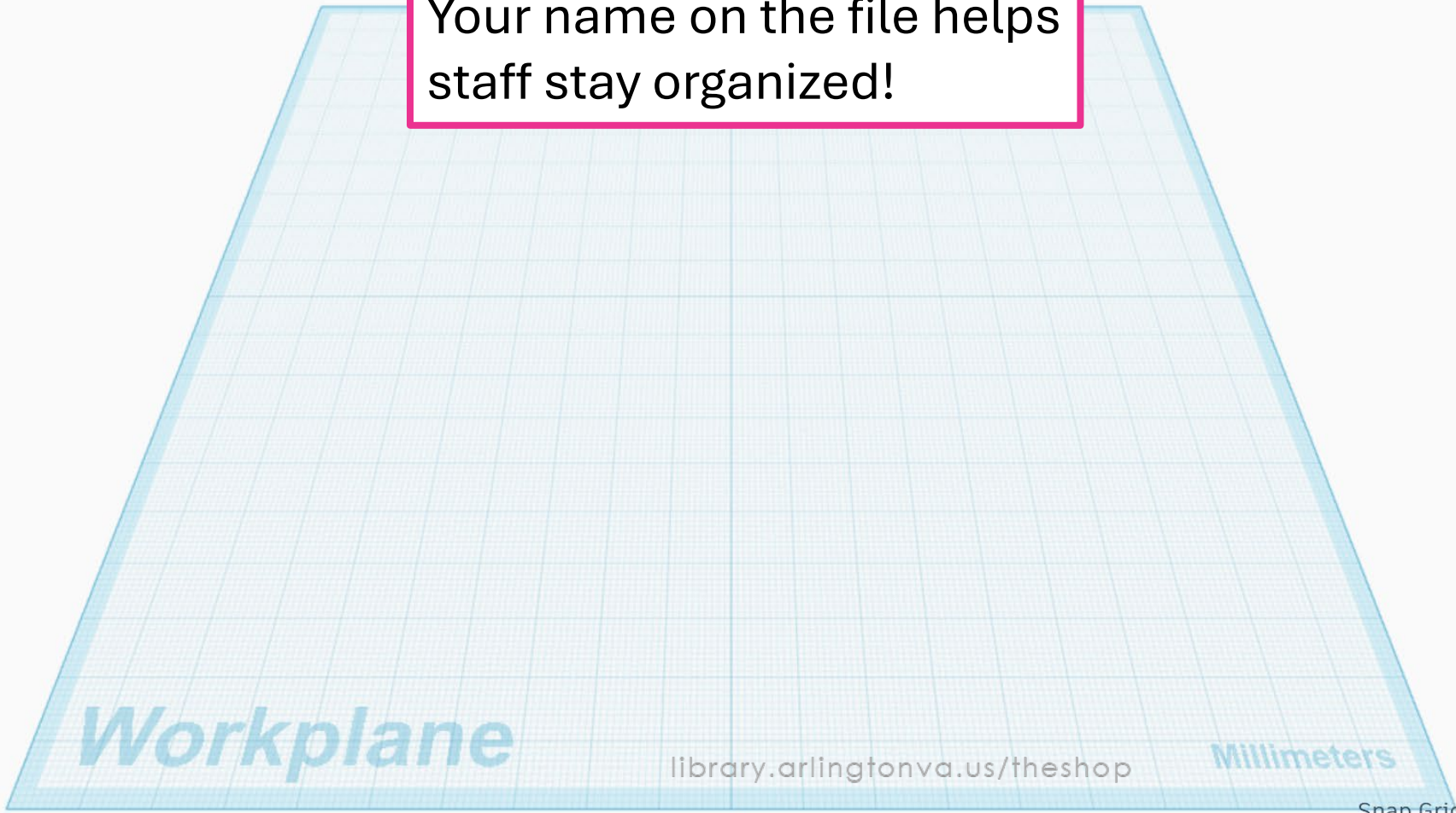


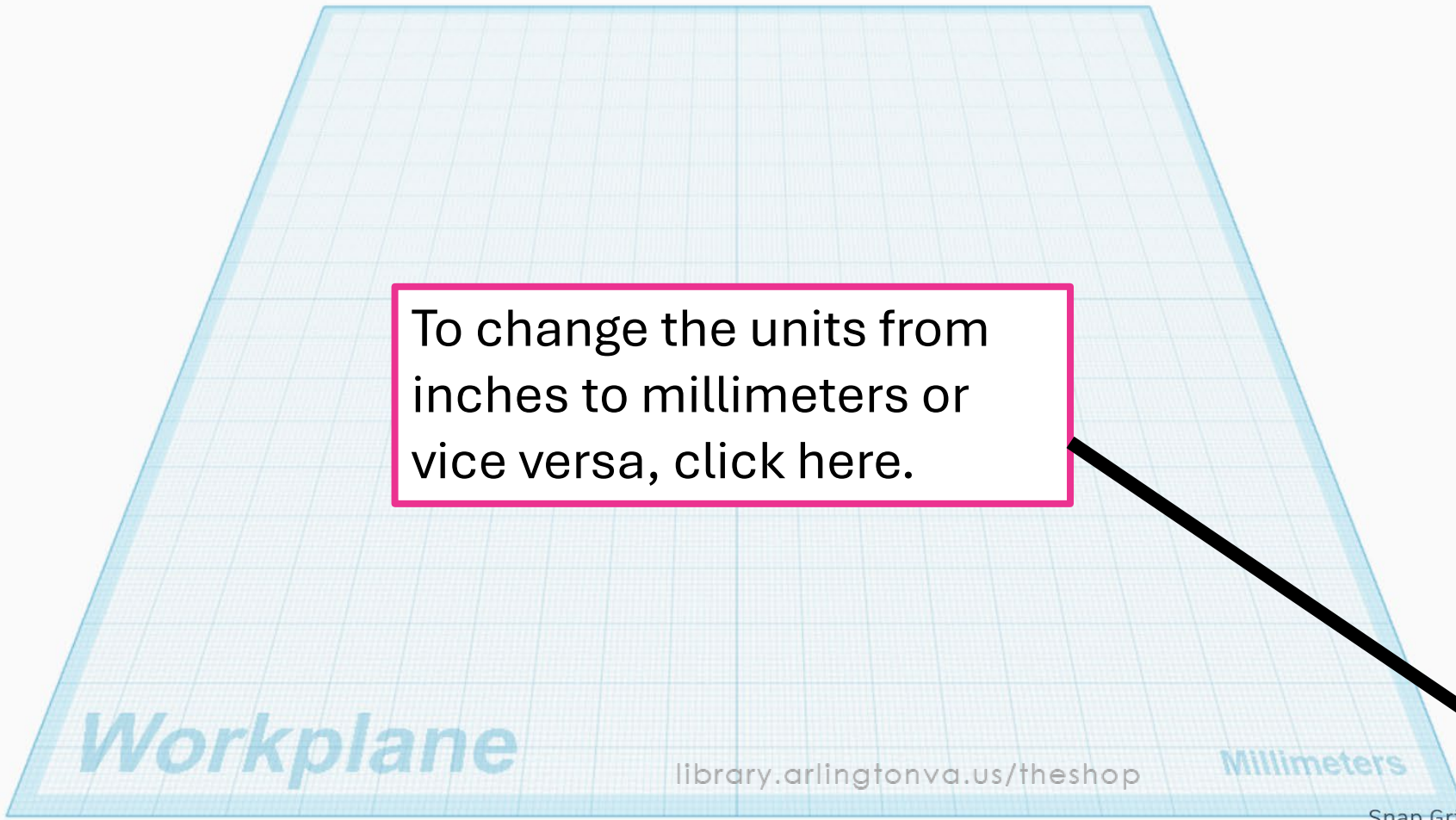
Settings

1.0 mm

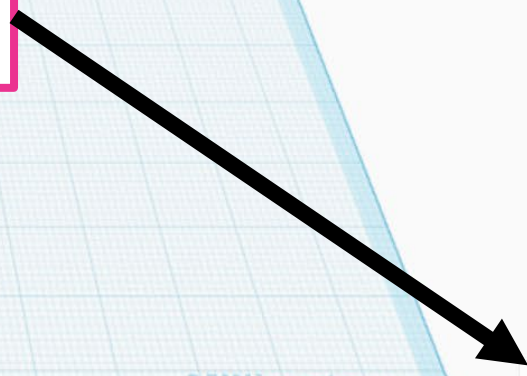


Update the file name: To rename your file, click here and type in your name. Your name on the file helps staff stay organized!





To change the units from inches to millimeters or vice versa, click here.

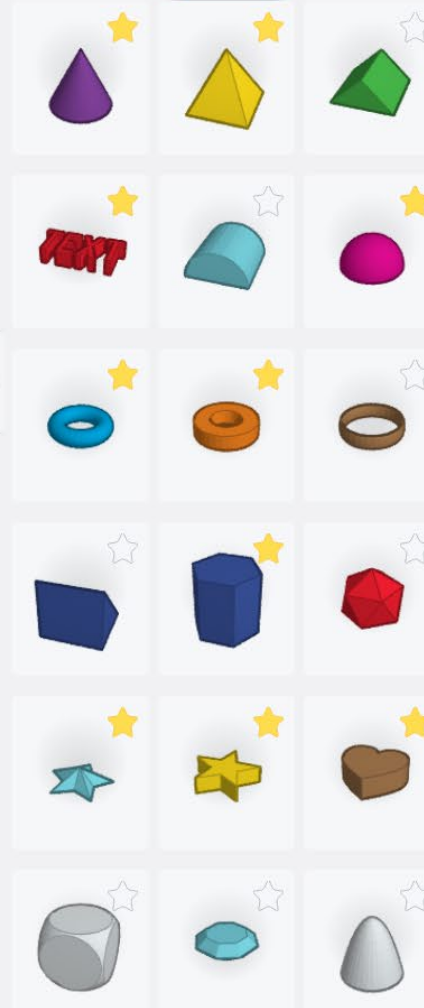


Settings
1.0 mm ▾



Basic Shapes

New!



Workspace settings

Background color



Show shadows



Show grid



Show Action Modifier



Cruise when adding new shapes



Zoom speed



Units

Metric (Default)



Scale

1:1 (millimeters, default)



Presets

Tinkercad (Default)



Width

200.00

Length

200.00

Make default

Close settings

Set the units to whatever is the most comfortable for you by clicking here

* Imperial = inches

* Metric = millimeters

Click "Close settings" when done.

Basic Shapes

New!

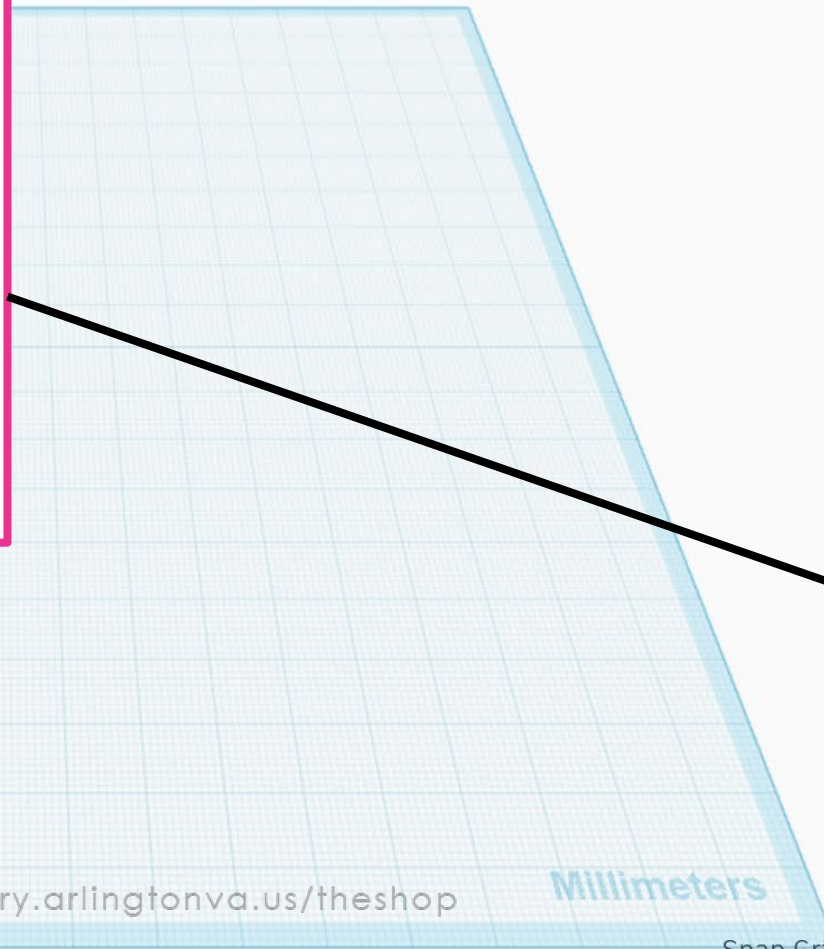
JERT

Workplane



Adding a Star

Start designing by adding a star to your plane!
In the “Basic Shapes” panel on the right, scroll down to the yellow star and click the yellow star icon in the basic shapes panel. You may have to scroll down to find it.

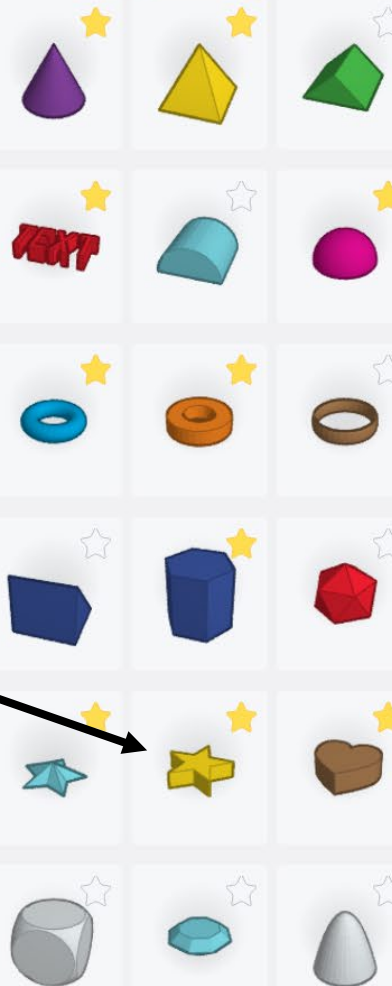


Import Export Send To



Basic Shapes

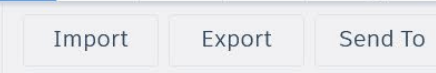
New!



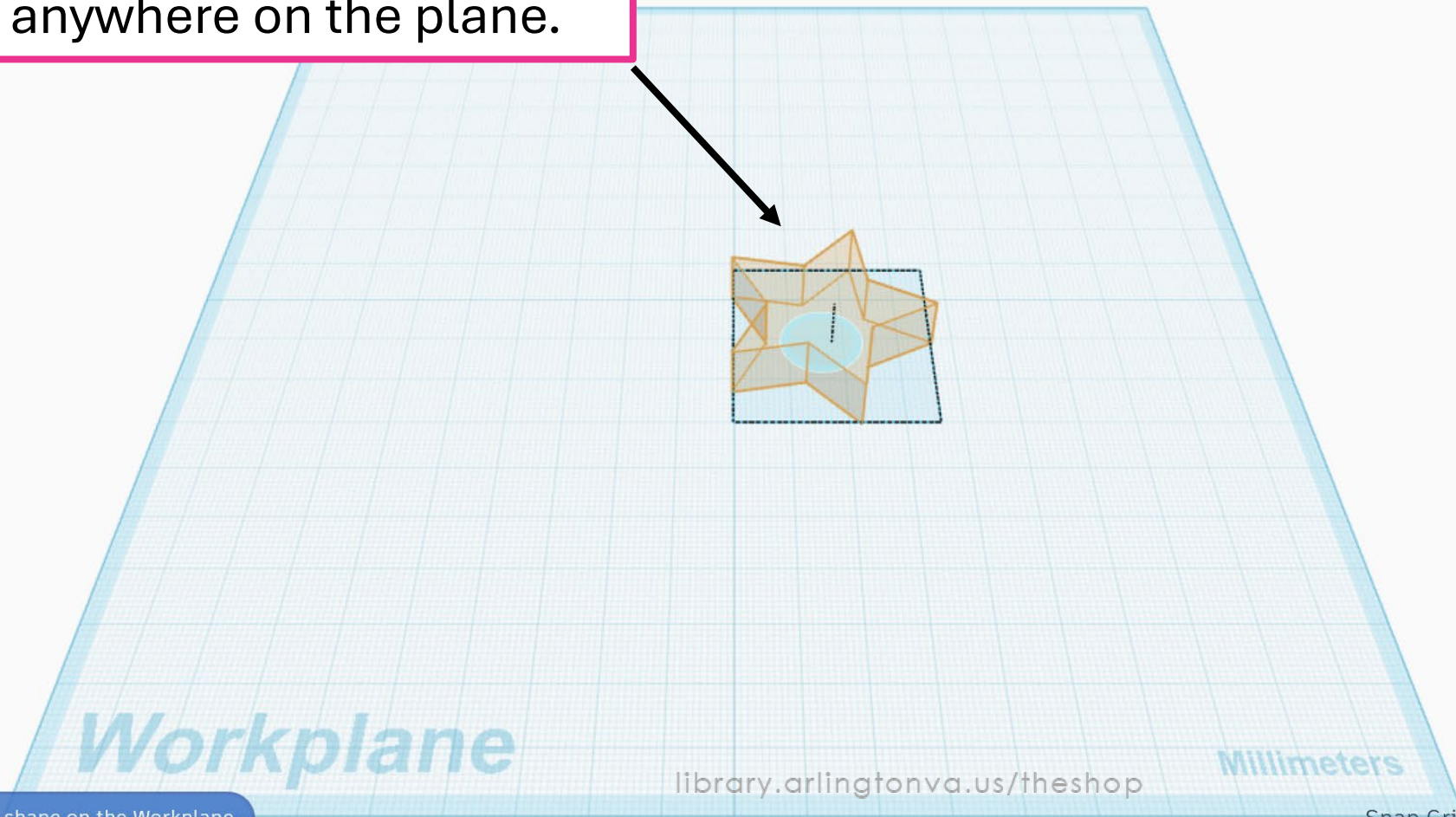
Settings

1.0 mm

Snap Grid

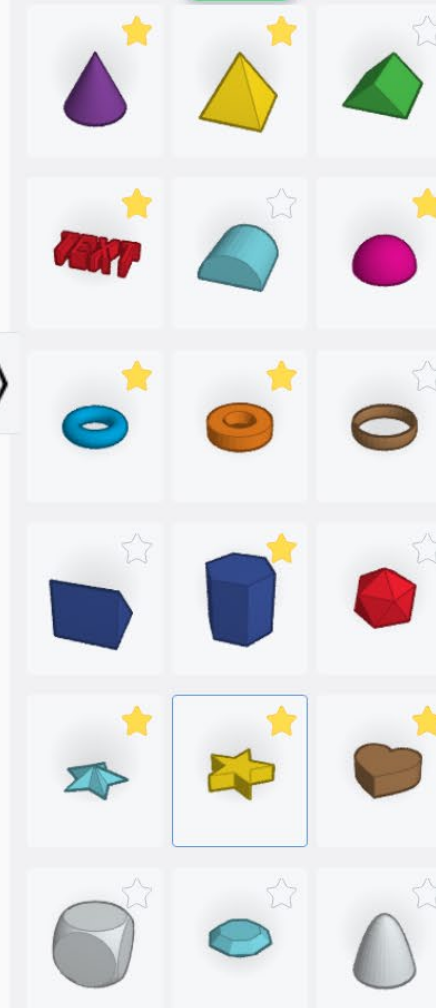


Click on the yellow star icon and drag it onto the workplane. It may go anywhere on the plane.



Basic Shapes

New!



Hold C to place shape on the Workplane

Settings

1.0 mm

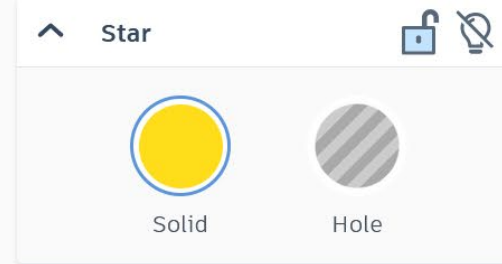
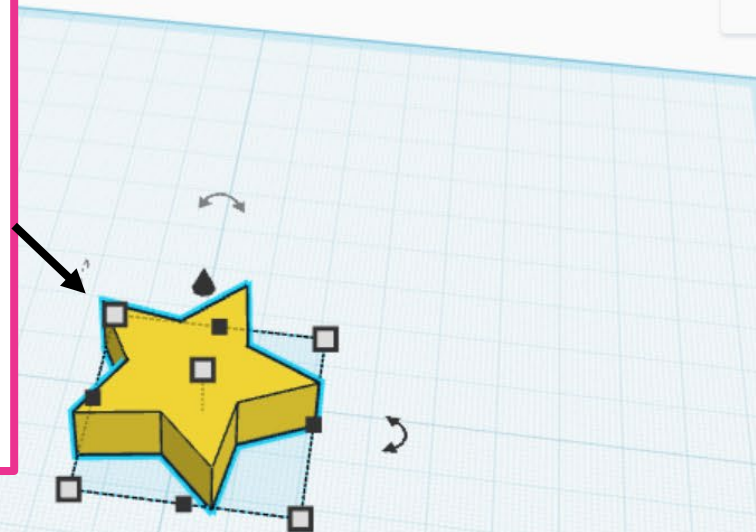
Snap Grid



Import Export Send To

Click on the star again to make it solid.

- If you click on the star, you may drag it wherever you want.
- If you click on the gray or black squares, it will change the dimensions of the star



Basic Shapes

New!



Settings

Snap Grid 1.0 mm



The square icons will resize your object.



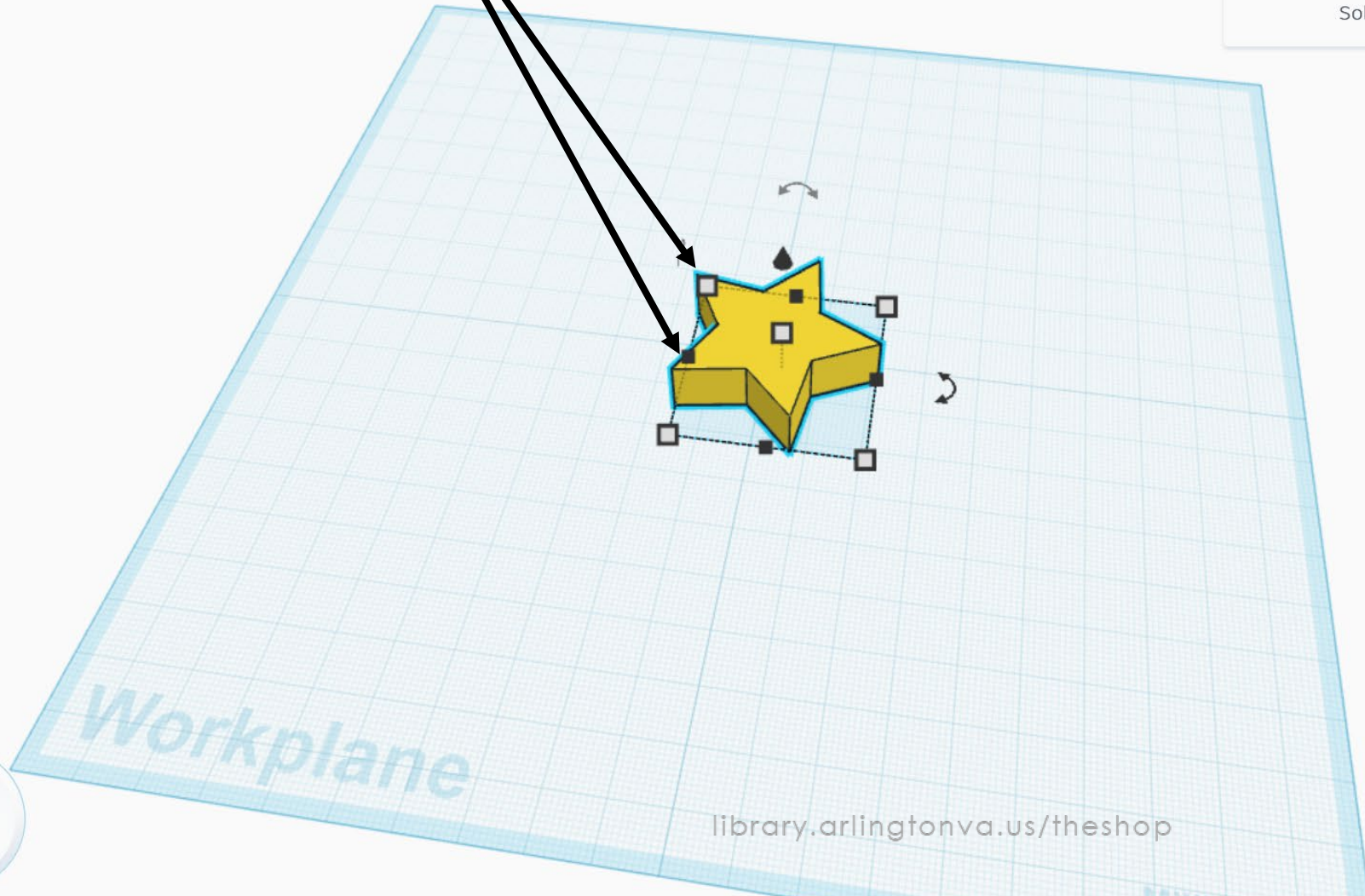
Star

Solid Hole



Basic Shapes

New!





Import Export Send To



Clicking on the small cone will move your object up and down on the workplane



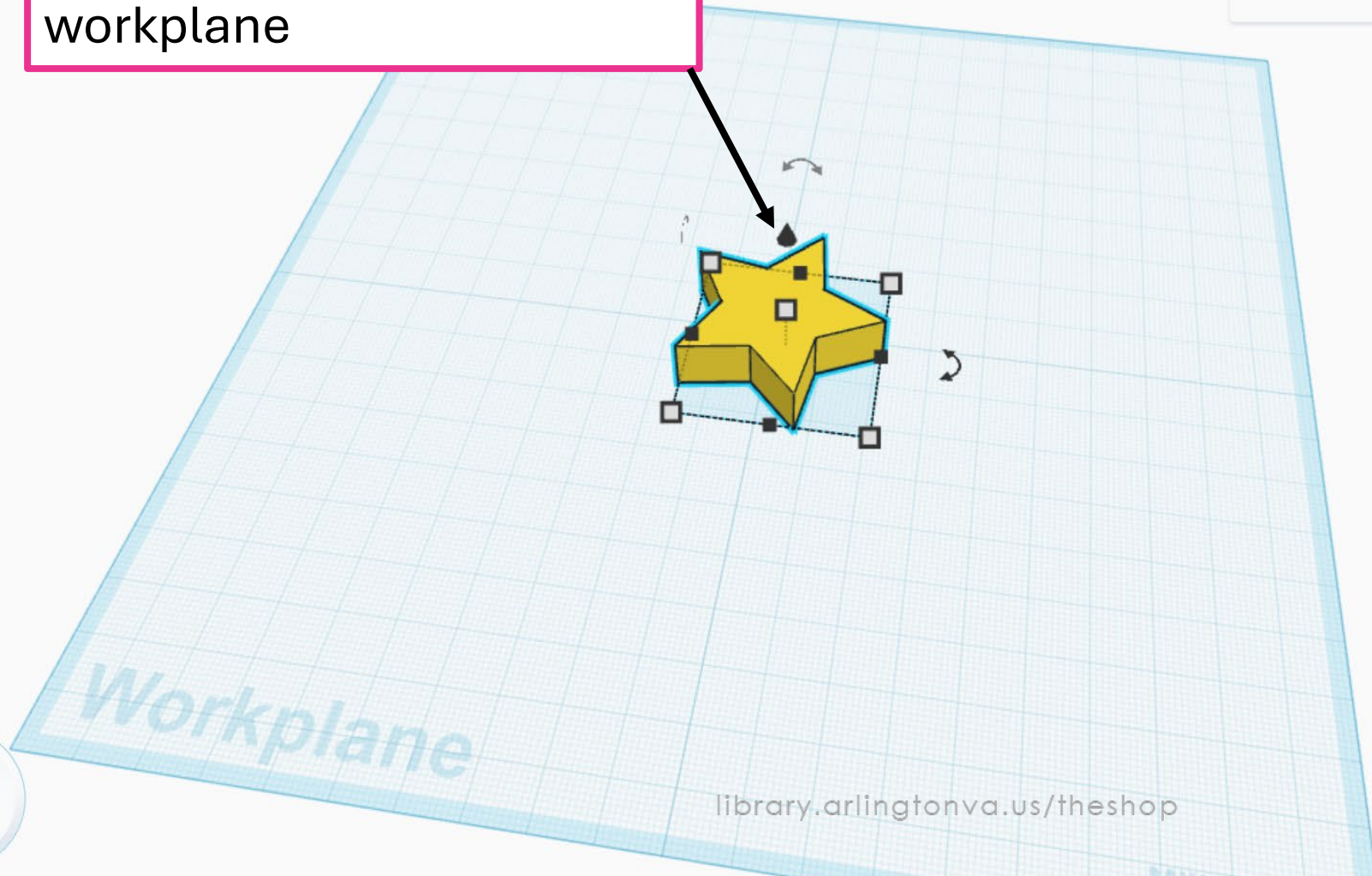
Star

Solid Hole



Basic Shapes

New!



Settings

Snap Grid 1.0 mm



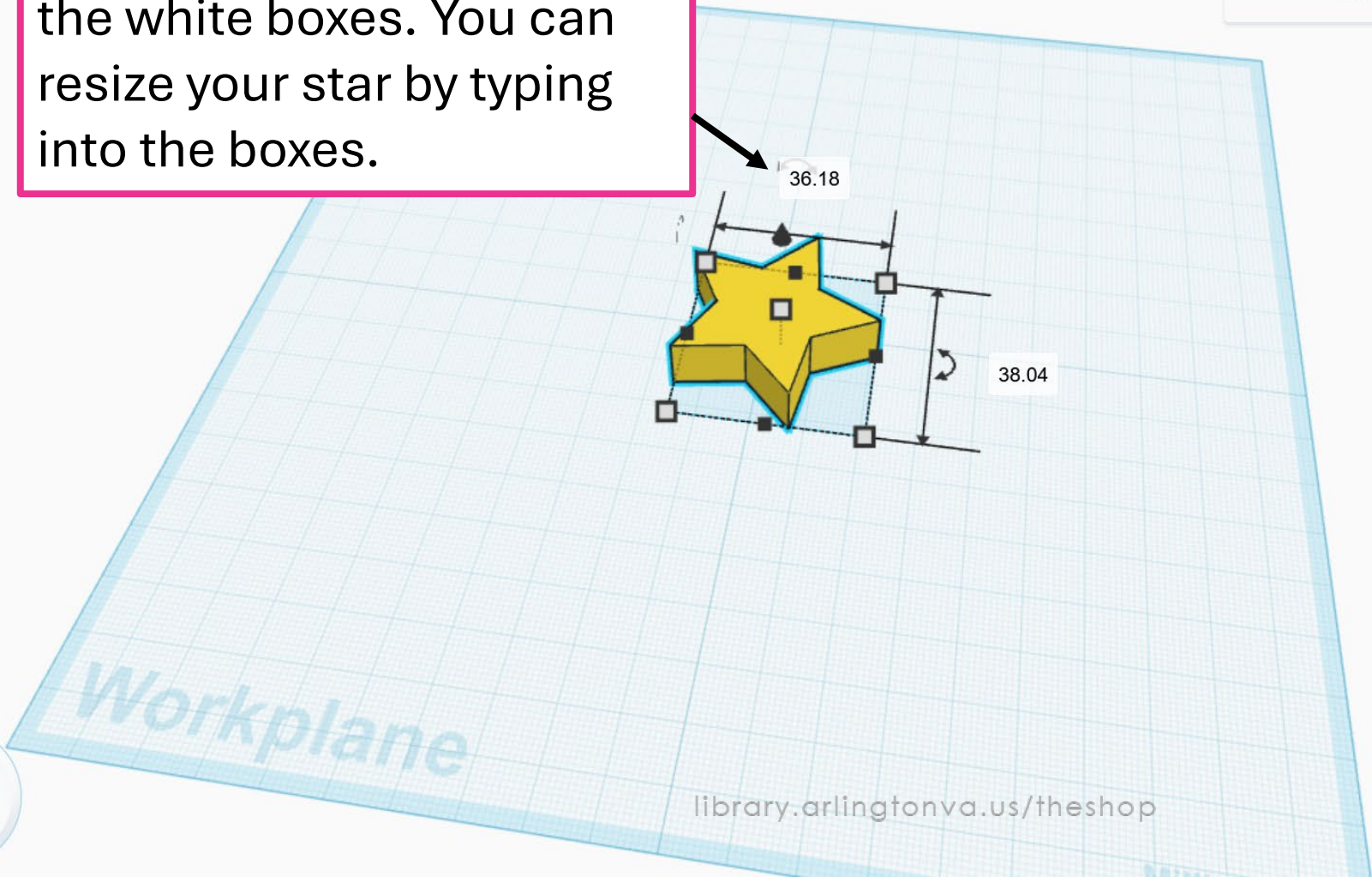
If you click the gray squares, you will see the dimensions of the star in the white boxes. You can resize your star by typing into the boxes.

Star

Solid Hole

Basic Shapes

New!

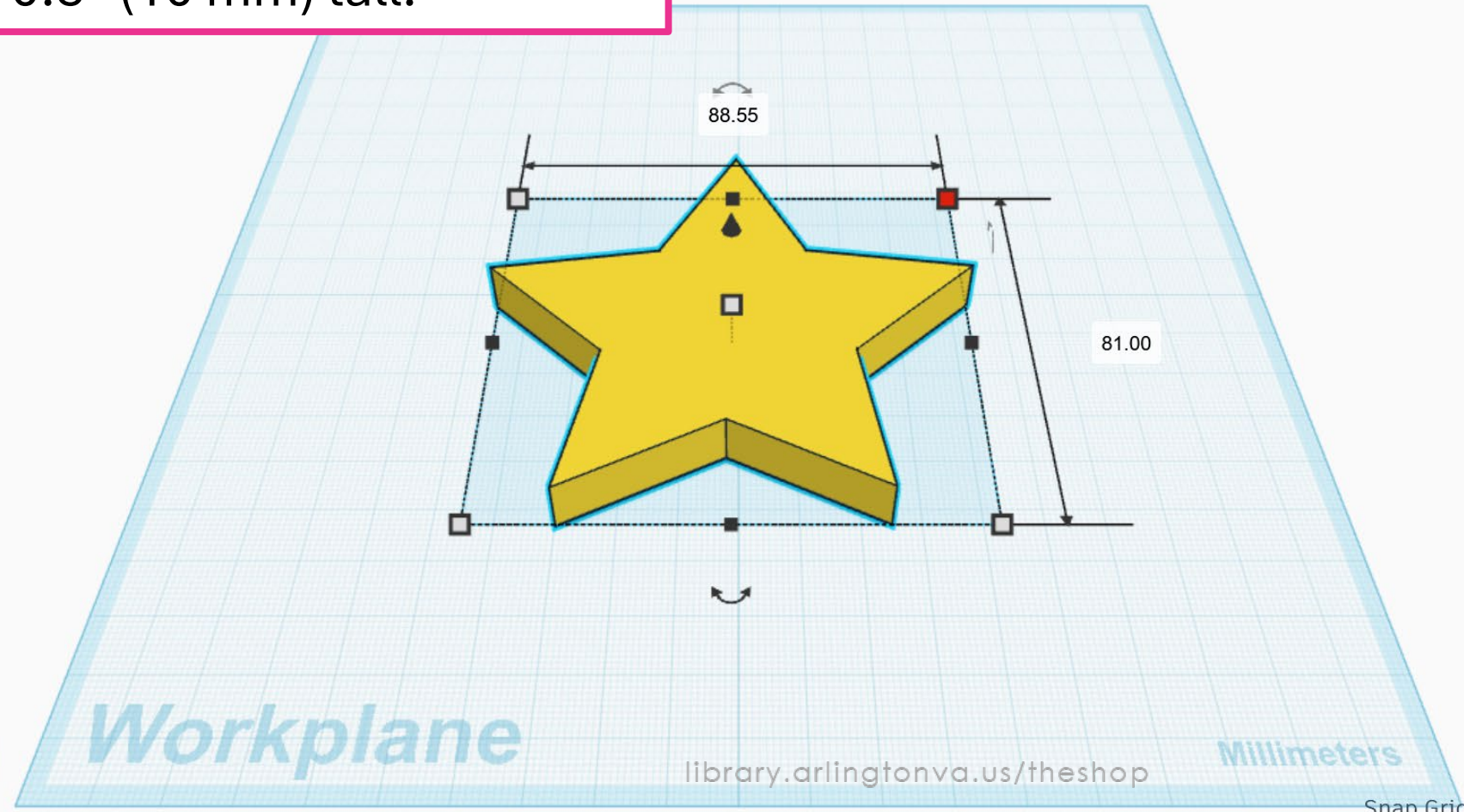


The size of your base can be up to 3.5" x 3.5" (89 mm x 89 mm) wide and up to 0.5" (10 mm) tall.

Star

Basic Shapes

TOP FRONT



Settings

1.0 mm

Snap Grid



Adding in Text

In the "Basic Shapes" panel on the right, add text by clicking on "TEXT".

Star

Color selection: Yellow, Grey

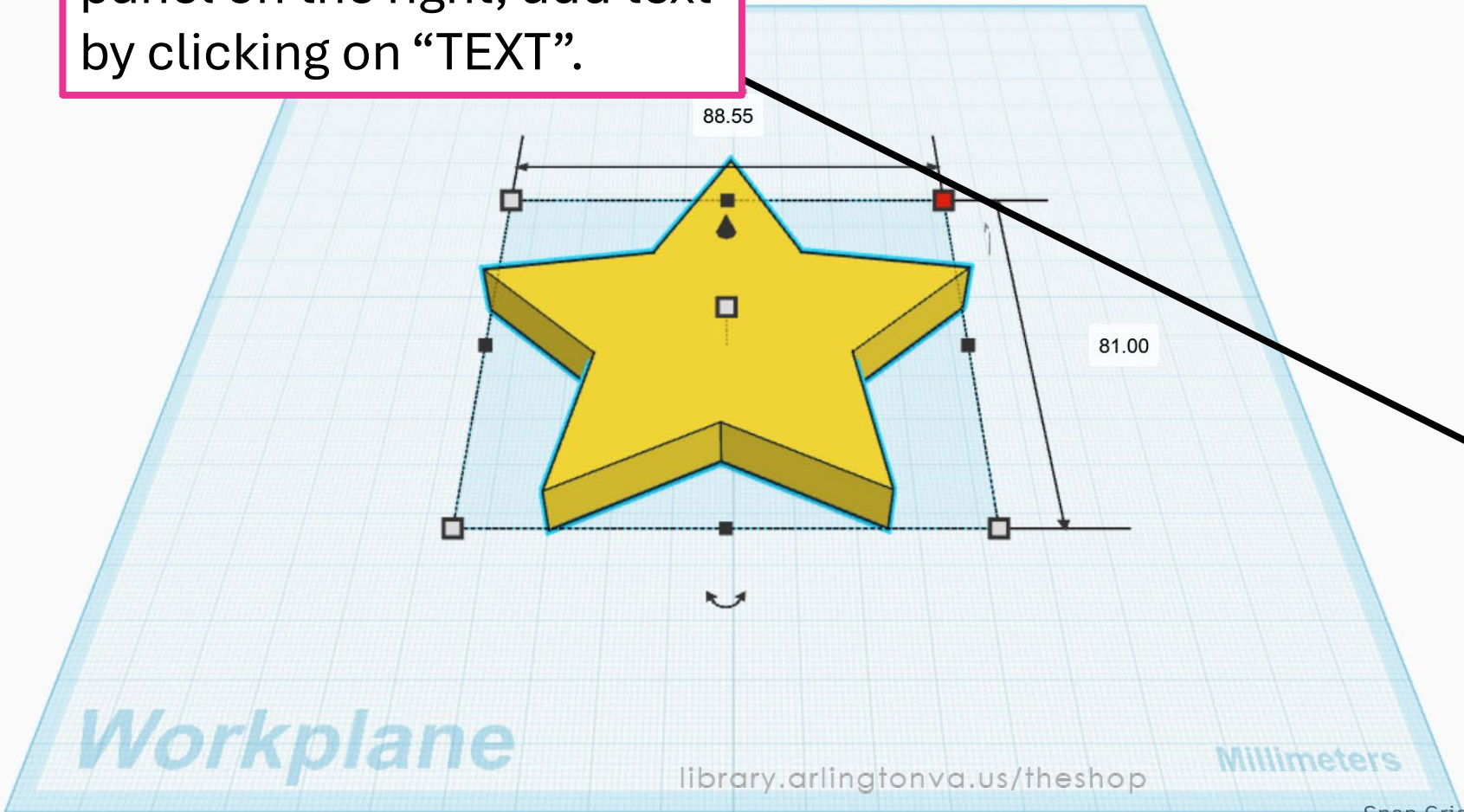
Lock/Unlock icons

Grid, Ruler, Chat icons

Basic Shapes

Grid of 3D shapes: cube, cylinder, sphere, red cube, orange cylinder, blue sphere, pen nib, green bell, blue hand, purple cone, yellow pyramid, green pyramid, **TEXT**, blue cylinder, pink sphere, blue ring, orange ring, brown ring

Home, Rotate, Zoom, Pan, Viewport icons



Settings

1.0 mm



Move the "TEXT" on top of the star and then click again to make it solid.

Text

Solid Hole

Text: TEXT

Font: Multilanguage

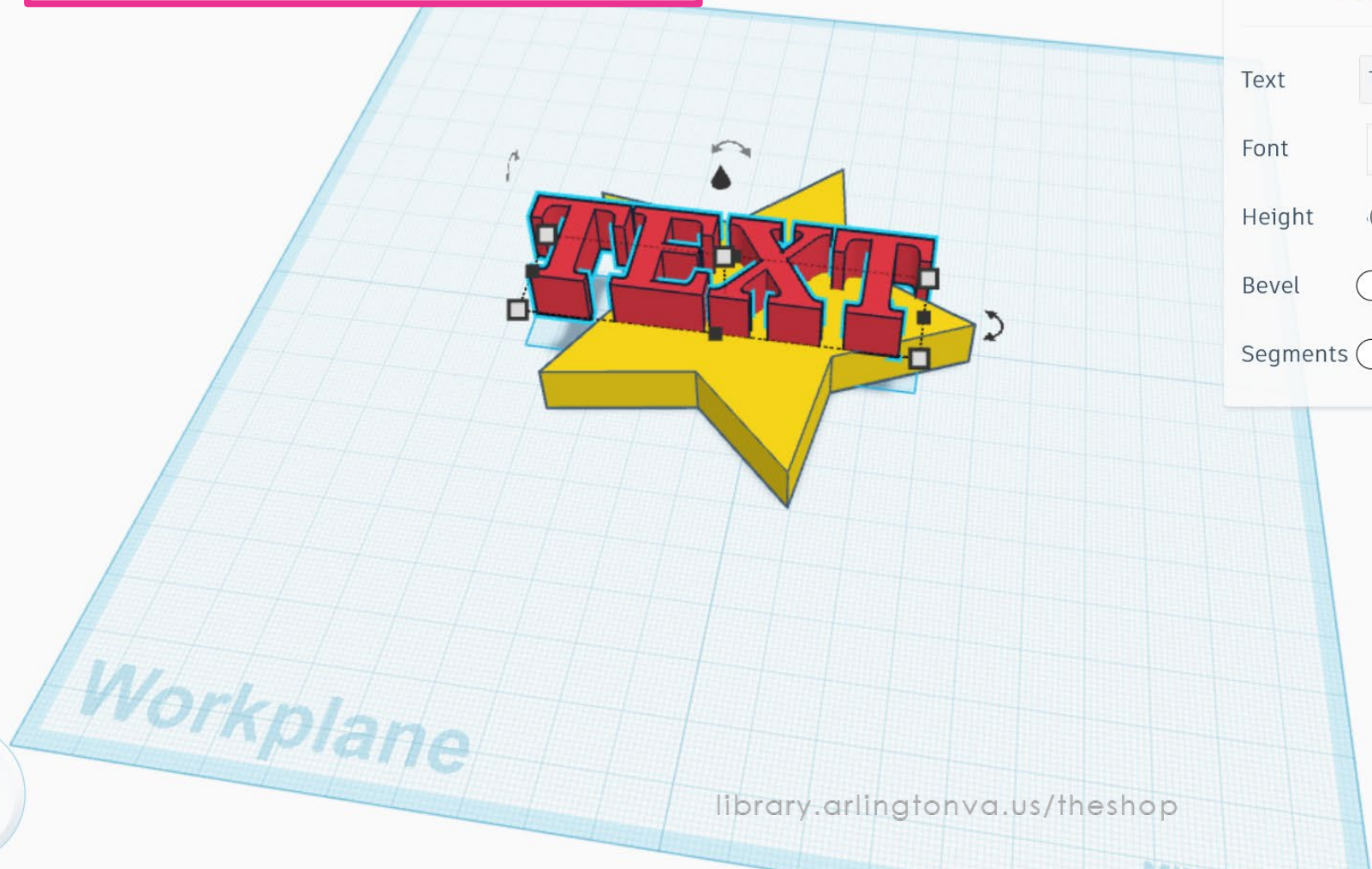
Height: 10

Bevel: 0

Segments: 0

Basic Shapes

New!





Editing Text

Edit your text here. For multiple lines, you must add additional "TEXT" blocks.

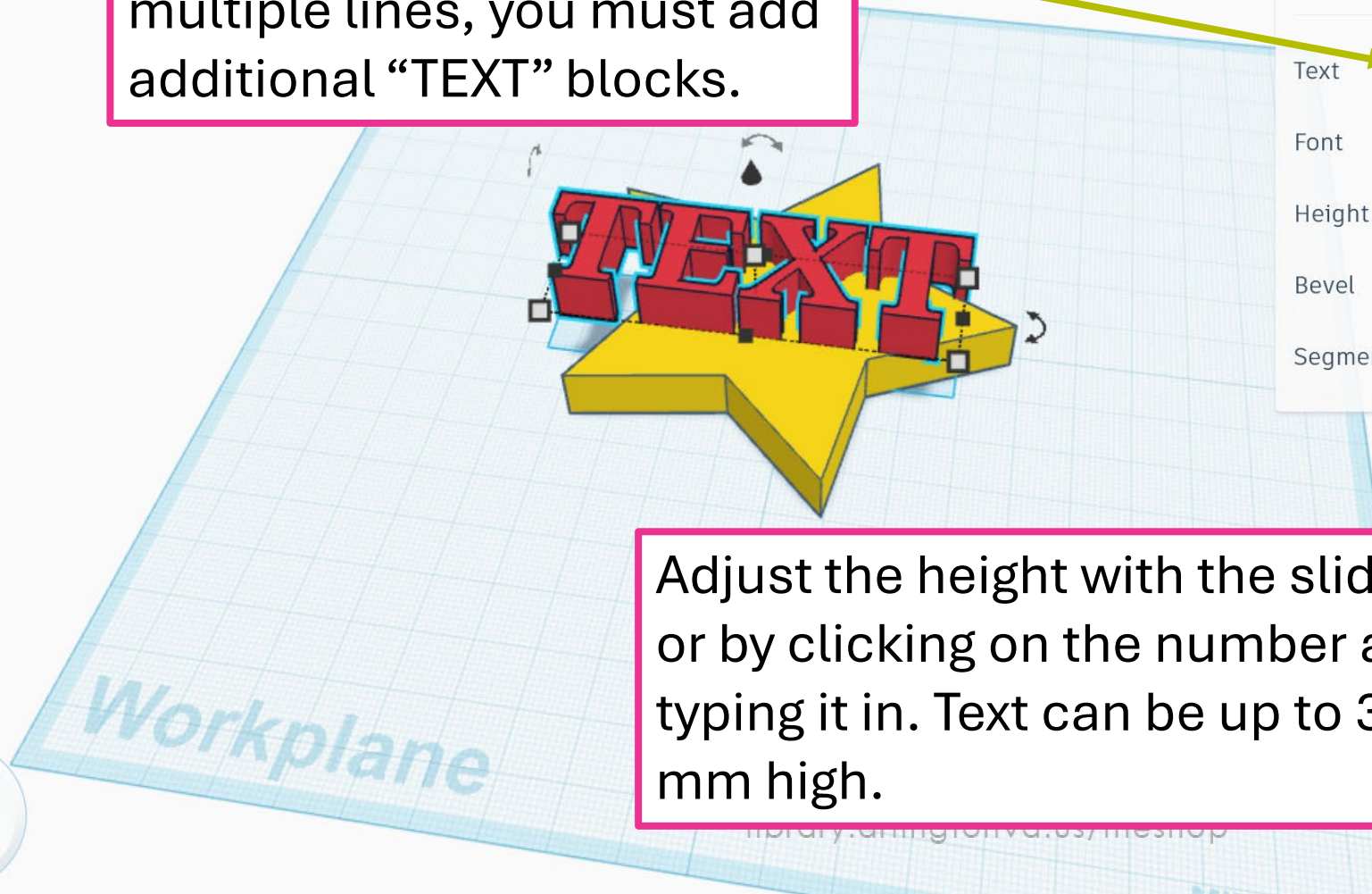
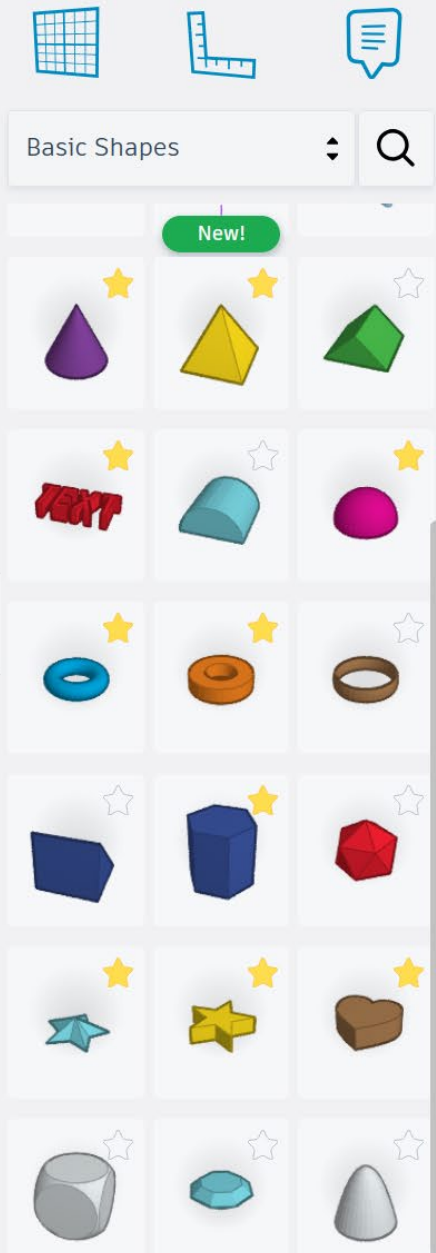
Text

Font: Multilanguage

Height: 10

Bevel: 0

Segments: 0



Adjust the height with the slider, or by clicking on the number and typing it in. Text can be up to 3 mm high.

Adding in Embellishments

Find additional shapes to add to your star on the panel at the right. Follow the same process as adding text.

Star

Basic Shapes

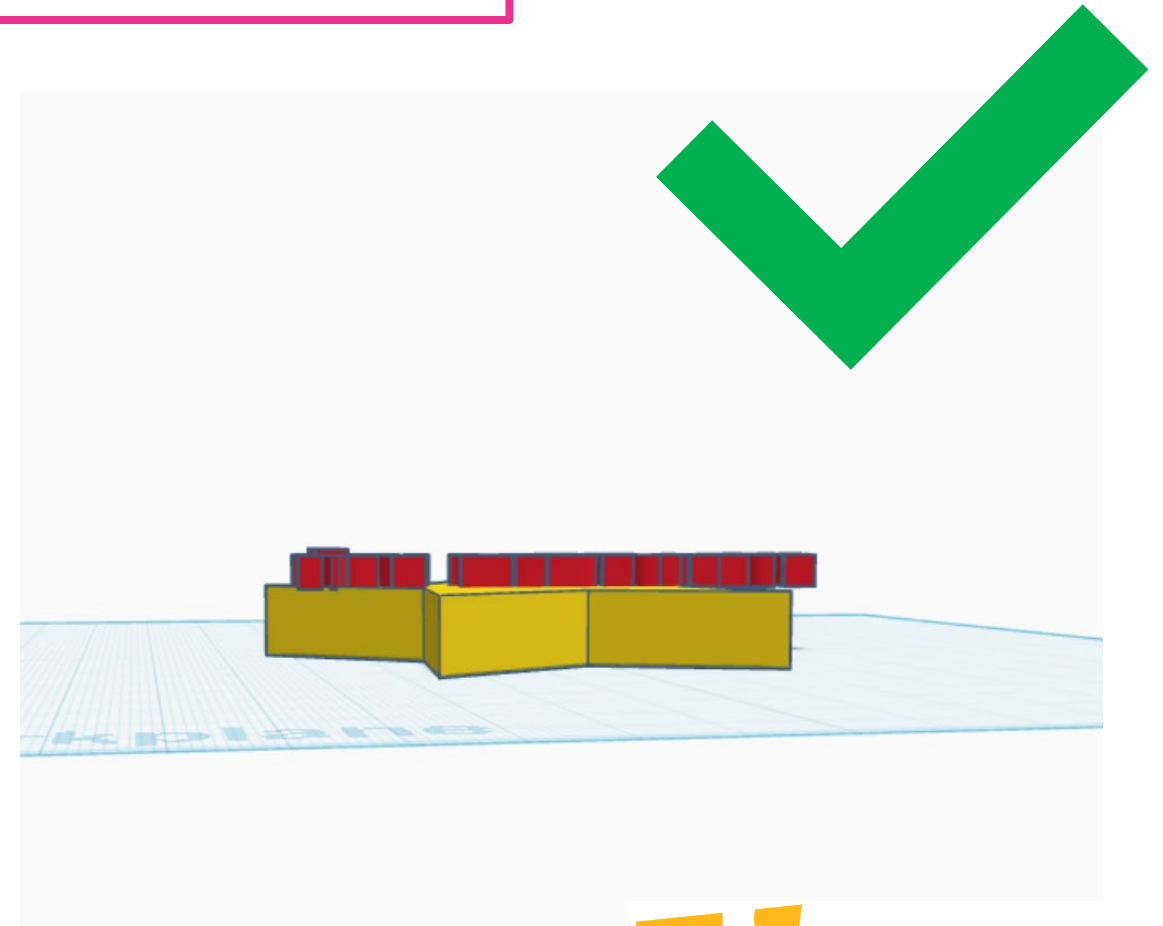
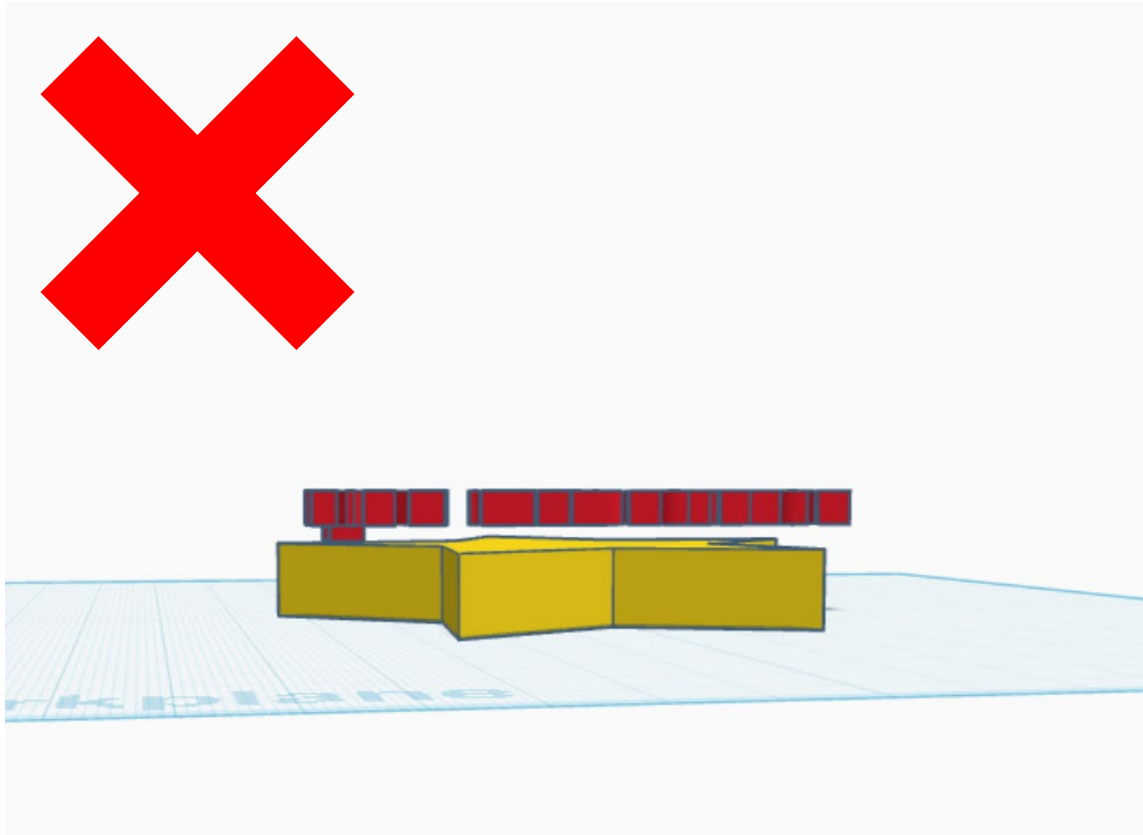
TOP
FRONT

Home, Rotate, Zoom, Pan, Rotate Y, Rotate X

Settings
1.0 mm

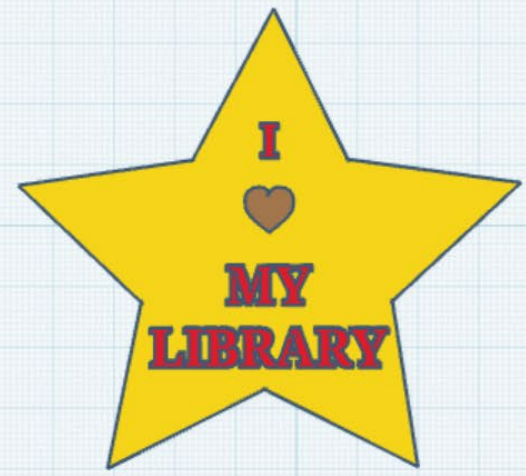
Snap Grid

Make sure that your text and any other embellishments are touching the surface of your star!



TOP

Size and align your design to your liking



Workplane

library.arlingtonva.us/theshopmeters

Basic Shapes

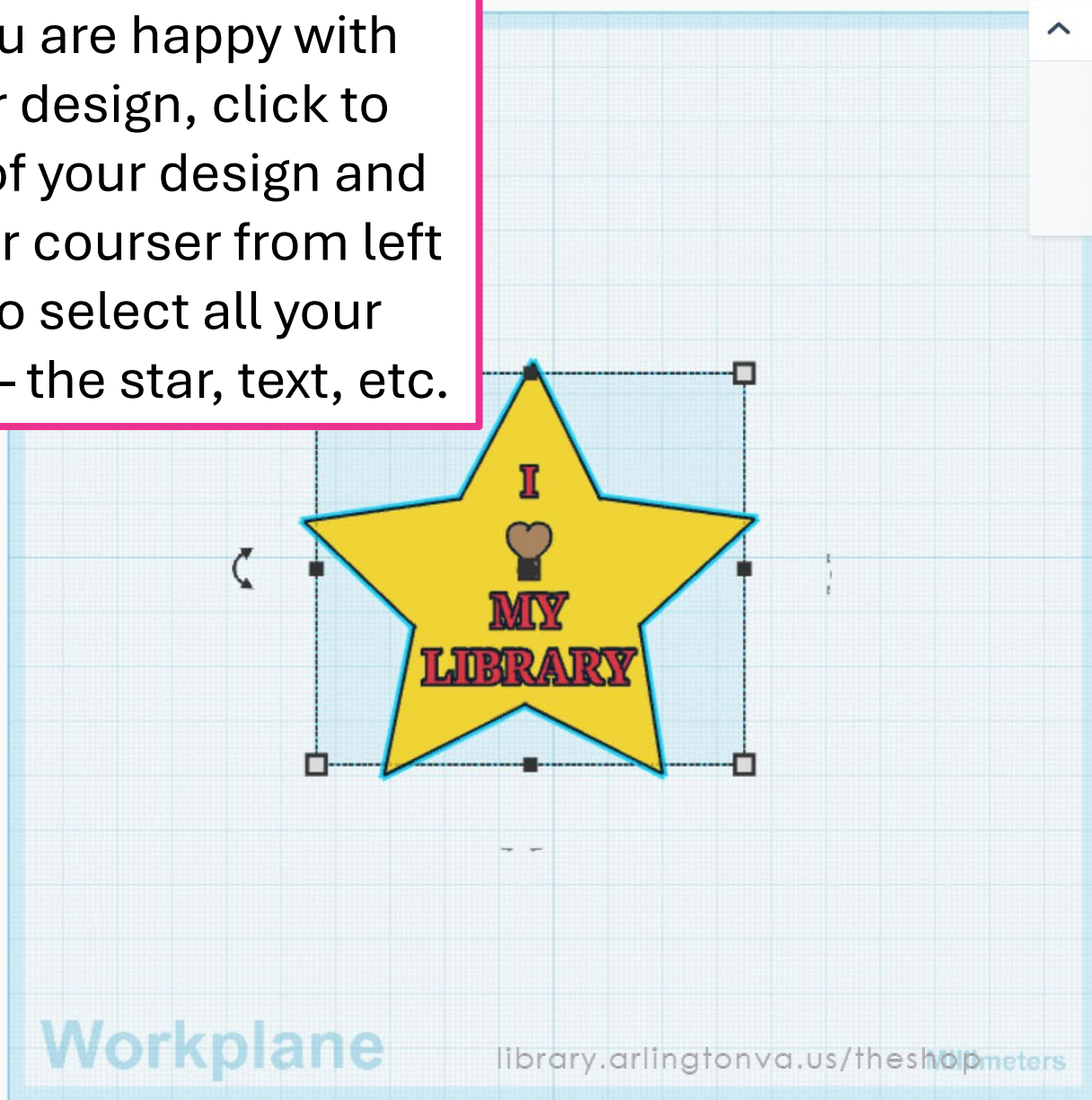
Settings

Snap Grid 1.0 mm

Home, Rotate, Add, Subtract, Assemble icons



Once you are happy with your star design, click to the left of your design and drag your cursor from left to right to select all your objects – the star, text, etc.



Shapes(5)

Solid (brown circle icon)

Hole (grey striped circle icon)

Basic Shapes

Grid, L-shaped ruler, Chat icon

Star, Cube, Cylinder, Sphere, Red cube, Orange cylinder, Blue sphere, Pen tool, Green bell (New!), Hand, Purple cone, Yellow pyramid, Green pyramid, Text, Blue dome, Pink sphere, Blue ring, Orange ring, Brown ring

Settings

Snap Grid 1.0 mm

TOP

Home, Select, Add (+), Subtract (-), Hide/Show




TOP

Click on the "Union Group" icon to combine all the individual pieces into one solid object.




Union Group



Ctrl + G

Join shapes together to make one big shape. Solid parts add more, and holes take pieces away.

Hole



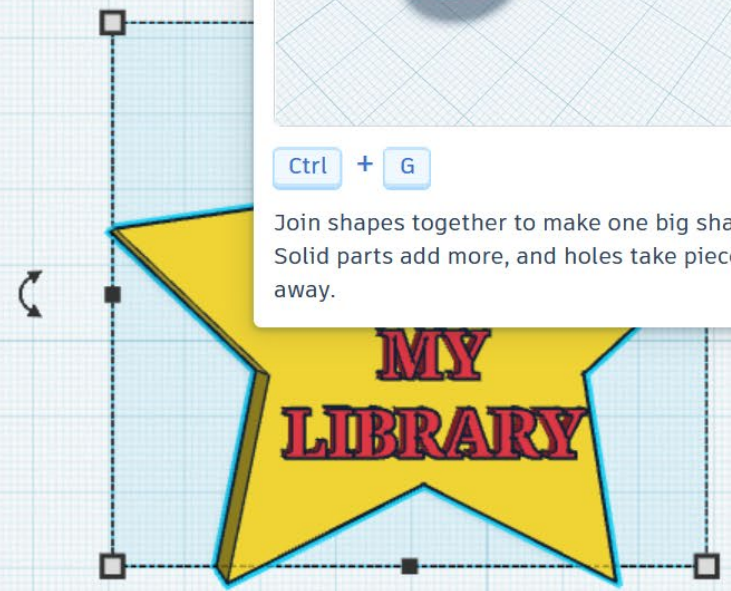
Basic Shapes



Basic Shapes grid:

- Row 1: Purple cone, Yellow pyramid, Green pyramid
- Row 2: Red 3D text, Blue cylinder, Pink sphere
- Row 3: Blue ring, Orange ring, Brown ring
- Row 4: Blue cube, Blue cube, Red cube
- Row 5: Light blue star, Yellow star, Brown heart
- Row 6: Grey cylinder, Teal hexagonal prism, Grey cone

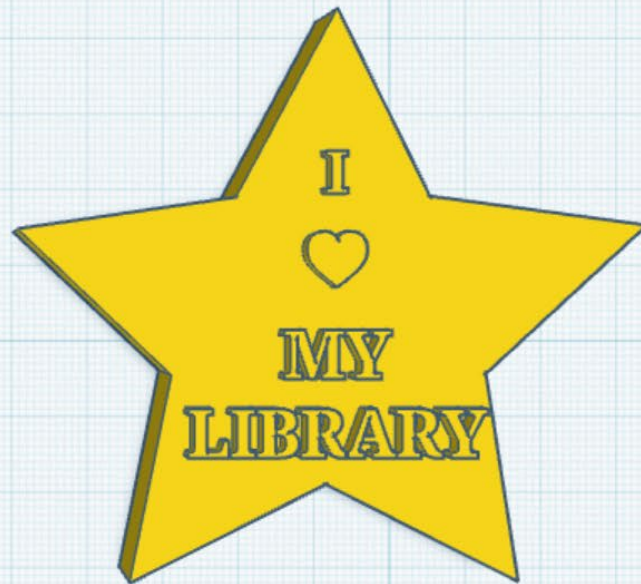
Navigation icons: Home, Rotate, Zoom in (+), Zoom out (-), 3D View





TOP

Once you click on the “Union Group” icon, your star should now be one solid color.



Basic Shapes

New!



library.arlingtonva.us/theshop

Settings

Snap Grid 1.0 mm

Download your Star

To download your star from TinkerCad to your computer, you must export the design.

To export your design, click here.



Export your design as a .stl file. It should automatically save to the downloads folder on your computer.

Download 3D Print

Include Everything in the design.
 Selected shapes (you need to select something first.)

Take Your Designs Further with Autodesk

- Autodesk Fusion
- AUTODESK Forma

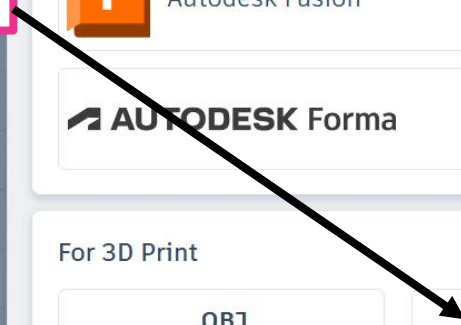
For 3D Print

- .OBJ
- .STL**
- GLTF (.glb)

For Lasercutting

- .SVG

More information



Workpla

Basic Shapes

Submitting your print request

library.arlingtonva.us/theshop



Submit your print through our online print form

To submit a print, visit [The Shop's online form](#).

Select "I will email the print file to lib-makers@arlingtonva.us"

5

Please indicate how you will be providing your 3D print file.

- (Accepted file types are: .stl, .obj and .stp/.step)
- Please note that some file-sharing sites require payment to download files. If a file must be purchased, patrons are responsible for buying it before requesting a print.

*

I will email the print file to lib-makers@arlingtonva.us

I will provide a link below

6

If providing a link, enter the URL here:

Enter your answer

7

Please provide the exact file name. *

Enter your answer



Select your color.

To submit a print, visit [The Shop's online form](#).

Select red, white, or blue for your color. We are only printing stars in these colors.

8
Brief Item Description *

Enter your answer

9
What color filament would you like? If you have no preference, just write "Any." You can also provide a first and second choice in case we run out of your first choice color.

Filament colors: Red, Yellow, Green, Blue, Purple, Grey, White, and Black.

Resin Grey is now an option for printing. Please indicate Resin Grey for resin prints. *

Enter your answer

10
If you have selected Resin Grey, please acknowledge that The Shop charges \$0.15 per mL of resin used and we currently limit to 100 mL per print. Resin prints are ideal for smaller items with a higher resolution. For a size idea: 3"x3"x3. Any additional questions can be sent to lib-makers@arlingtonva.us

I accept



Select your infill and flag your project as ARL250.

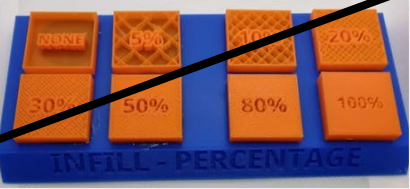
To submit a print, visit [The Shop's online form](#).

Type 5% infill

11

What percentage infill density would you prefer? (e.g. 15%)

Most prints don't need more than 20% infill, but the ideal infill for your project will depend on the intended use of your print. All resin prints have an infill of 100%. If you're not sure, you can briefly describe the use-case or how sturdy you want it to be, and Shop staff can take their best guess for you. *



Enter your answer

Type "ARL250" Here so staff know your submission is for this specific printing activity.

12

Anything else staff might need to know about your print request? **We will size as imported unless otherwise specified here.**

Enter your answer

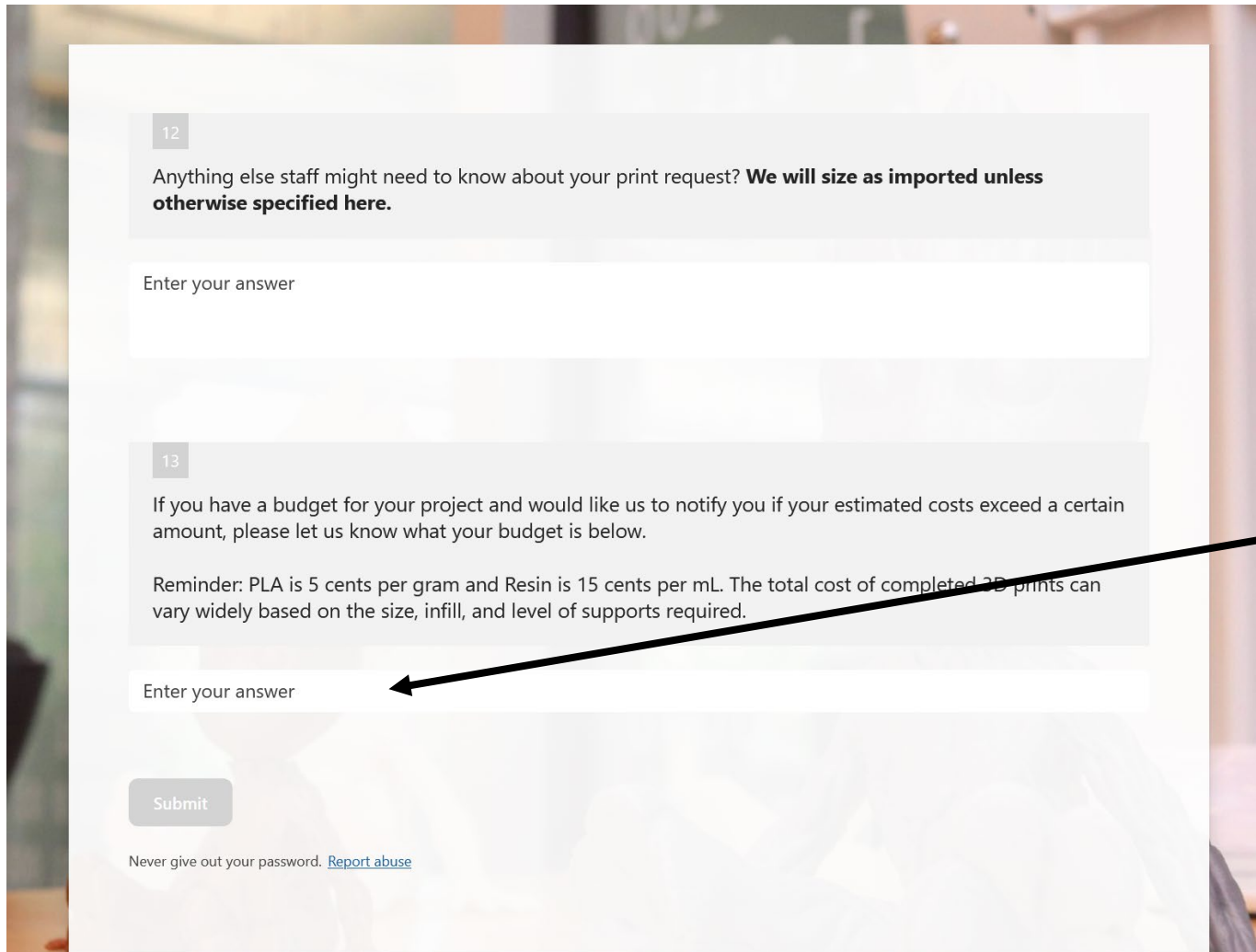
13

If you have a budget for your project and would like us to notify you if your estimated costs exceed a certain amount, please let us know what your budget is below.

Reminder: PLA is 5 cents per gram and Resin is 15 cents per mL. The total cost of completed 3D prints can vary widely based on the size, infill, and level of supports required.

Remember—your first Arlington 250 star is free!

To submit a print, visit [The Shop's online form](#).



12

Anything else staff might need to know about your print request? **We will size as imported unless otherwise specified here.**

Enter your answer

13

If you have a budget for your project and would like us to notify you if your estimated costs exceed a certain amount, please let us know what your budget is below.

Reminder: PLA is 5 cents per gram and Resin is 15 cents per mL. The total cost of completed 3D prints can vary widely based on the size, infill, and level of supports required.

Enter your answer

Submit

Never give out your password. [Report abuse](#)

Leave blank or type N/A – there will be no charge for submitting a print as a part of this program!

Email your downloaded .stl file to Lib-Makers@arlingtonva.us

- Attach your file in an email to lib-makers@arlingtonva.us so staff can begin printing.
- If staff have any questions about your submission or need to make any changes they will reach out.

What comes next?

- Staff will print requests in the order they are received. The current expected wait time is 1 week but may be longer.
 - Keep an eye out for emails from Lib-Makers@arlingtonva.us. Your print will not be available until you have received that email.
 - Once it is ready, stop by during library open hours and pick your print up from the circulation desk on the first floor of Central Library. **Your print will not be at The Shop.**
- **NOTE – 1 star limit per patron**