



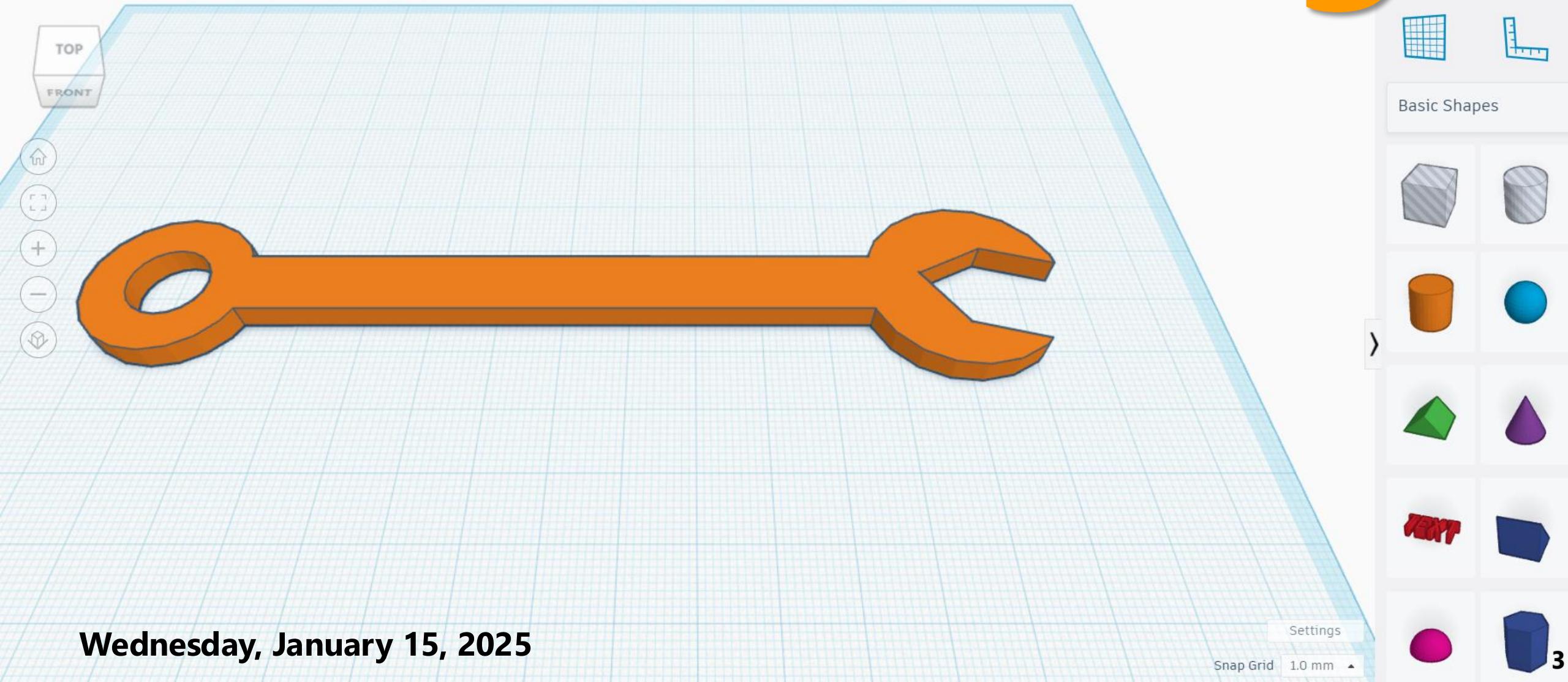
ULNOOWEG EDUCATION CENTRE

Wednesday, January 15, 2025

Land Acknowledgement



3D Modelling



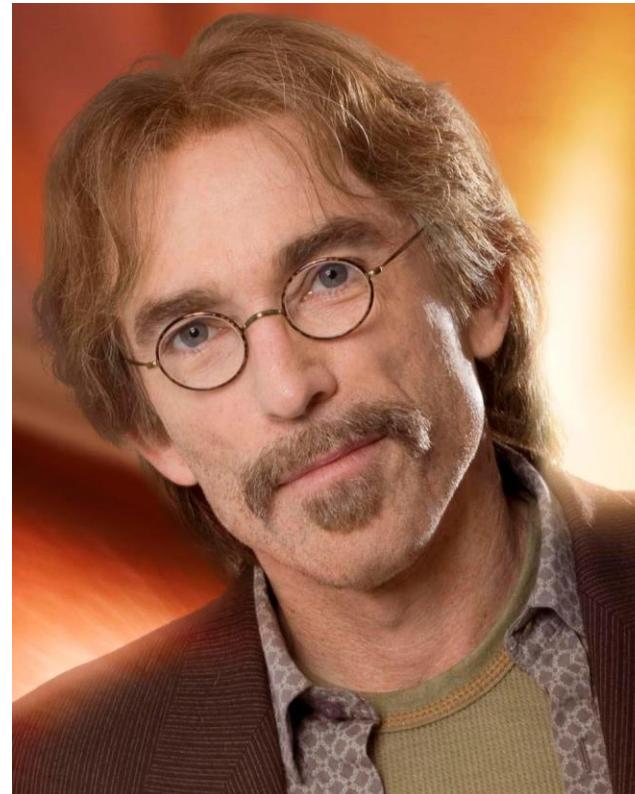
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Settings

Snap Grid 1.0 mm

3

Team Introductions



ALEX

SEYIT

CASS

SAMSON

3D Modelling: Introduction

- Before computers: hand-made models.
 - Architects, real estate, films & tv, etc.
 - Lengthy process (weeks-months): sketches, sculpting, revisions.
- **3D-modelling** & 3D-printing: greatly speed up the design process.



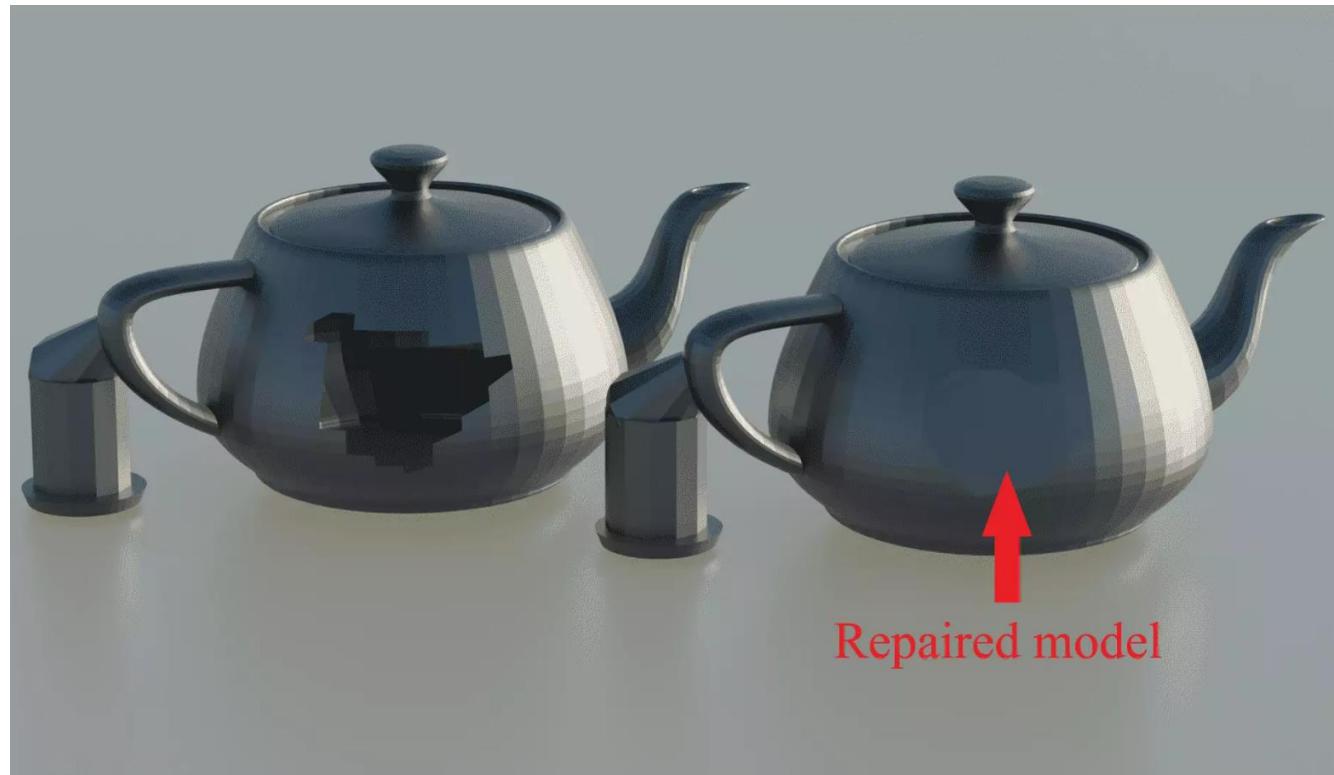
3D Modelling: Introduction

- **3D modelling:** Using software to create three-dimensional visual models of physical objects (real-world and conceptual).
- Techniques and skills relevant to many industries: arts and entertainment, virtual reality, video games, 3D-printing, marketing, films and tv, commercials, Computer-Aided Design & Manufacturing (CAD/CAM).



3D Modelling: Introduction

- Advantages of 3D models:
 - Better project visualization
 - Noticing design issues early on
 - Easily and quickly create 3D designs + scale them up or down
 - 3D designs can be materialized in great quality and quantity



3D Modelling: Industrial Applications

- Most 3D modelling software are either **CAD** or **CAM**.
 - CAD: Computer-Aided Design (**virtual**)
 - CAM: Computer-Aided Manufacturing (**tangible products**)
- Construct, assemble, test, observe functionality of designed parts
 - Automobile manufacturing
 - Filmmaking, animation
 - Medical equipment
 - Architecture
 - Space exploration



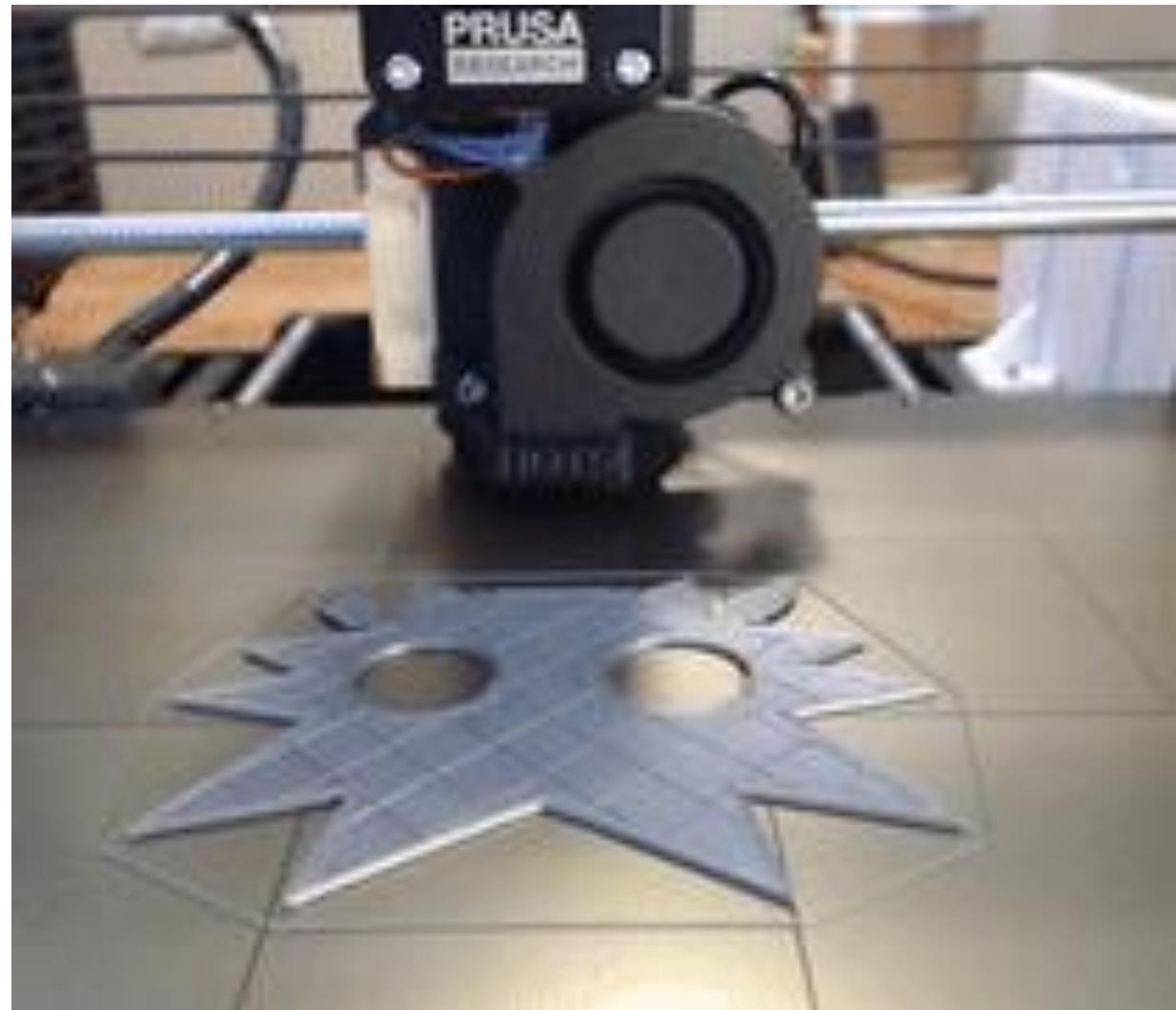
3D Printing

- 3D Printing: heat-melting a material, then stacking layers to create solid objects (e.g. making lasagna).
- THREE dimensional plane coordinates: X, Y, and Z.
- Design files are exported (e.g. as .STL files), and put through a “slicer”.
- Slicer slices design files into cross-sections (e.g. as .gCode files).
- gCodes tells the 3D printers how to translate the cross-sections into mechanical movements.



3D Printing

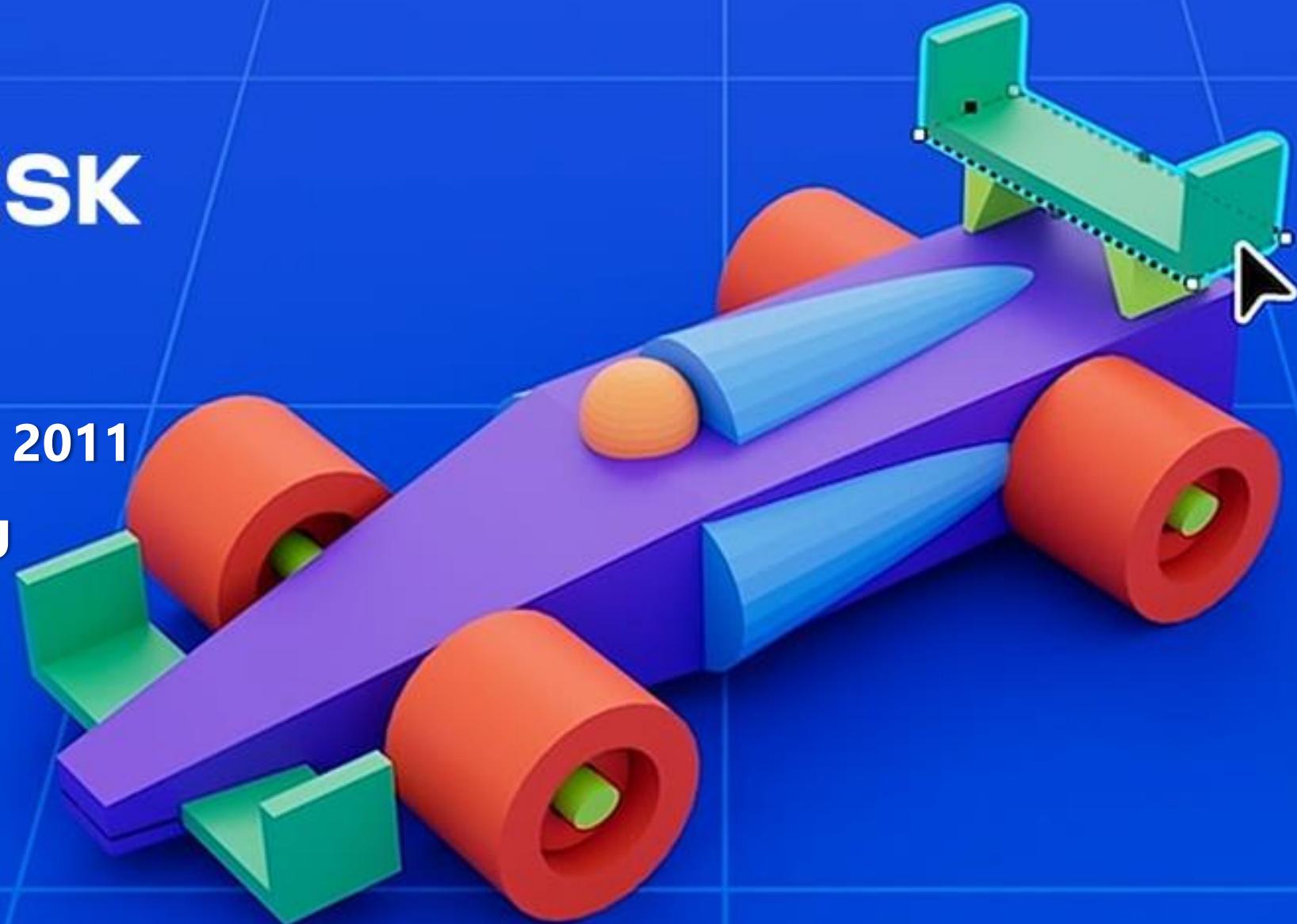
- 3D printers work in **ONE** direction only
 - Upwards or downwards, NOT both
- Printing speed depends on many factors
 - Nozzle size
 - Print complexity
 - Type[s] of support[s]
 - Room temperature fluctuations
 - Etc.





AUTODESK Tinkercad

- Launched by Autodesk in 2011
- Free, online 3D modelling program
- Run entirely through an internet browser
- Entry-level intros to 3D modelling and geometry



TinkerCAD

- Beginner-level 3D modelling tool
- Create new designs (CAD)
- Export files for CAM later
 - 3D printing, laser cutting
- Owned by Autodesk, a U.S. software corporation
- Fusion360: TinkerCAD for experts



AUTODESK®
TINKERCAD®

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Start designing in 3D in minutes.

3D Design

Add light and movement to your designs.

Write programs to bring your designs to life.

Codeblocks

Get things moving.

Sim Lab

Level up your designs.

Autodesk Fusion

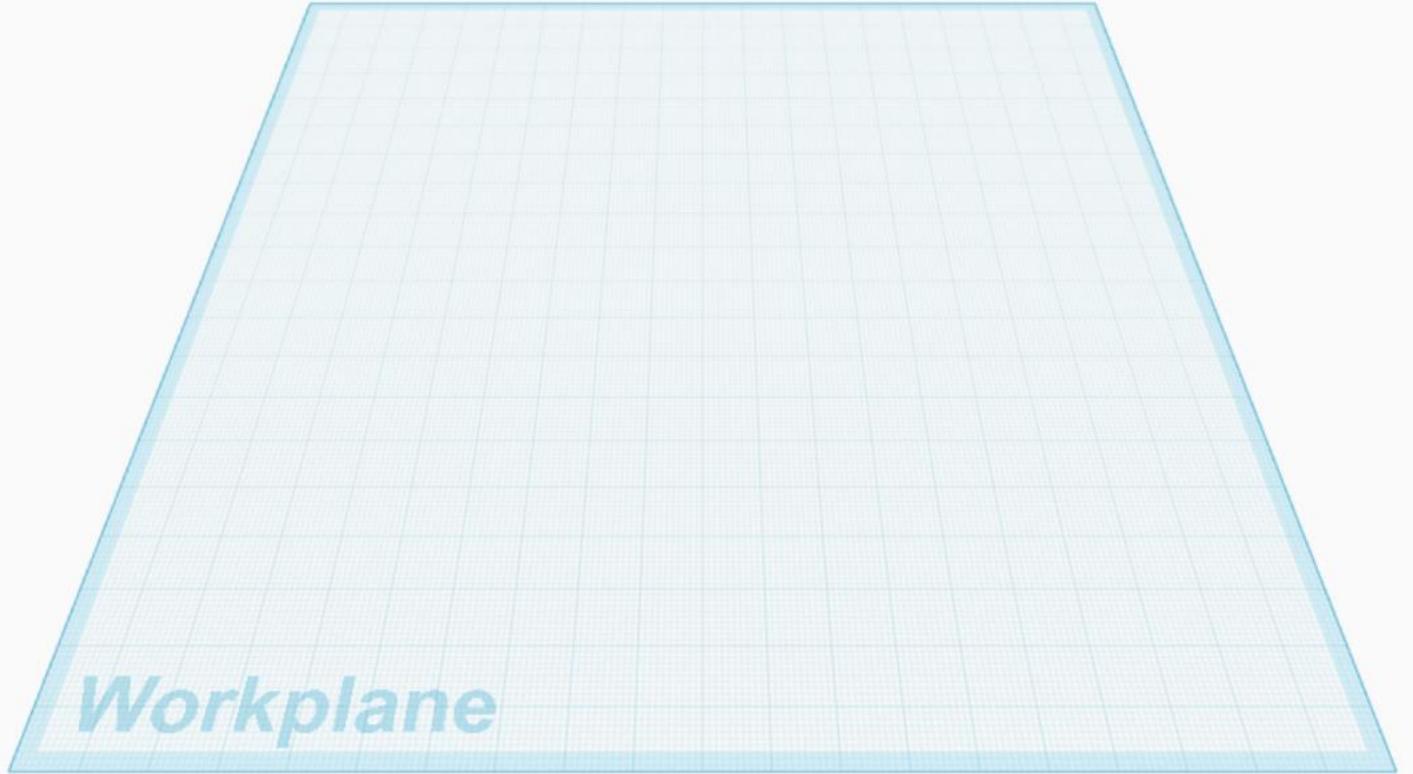
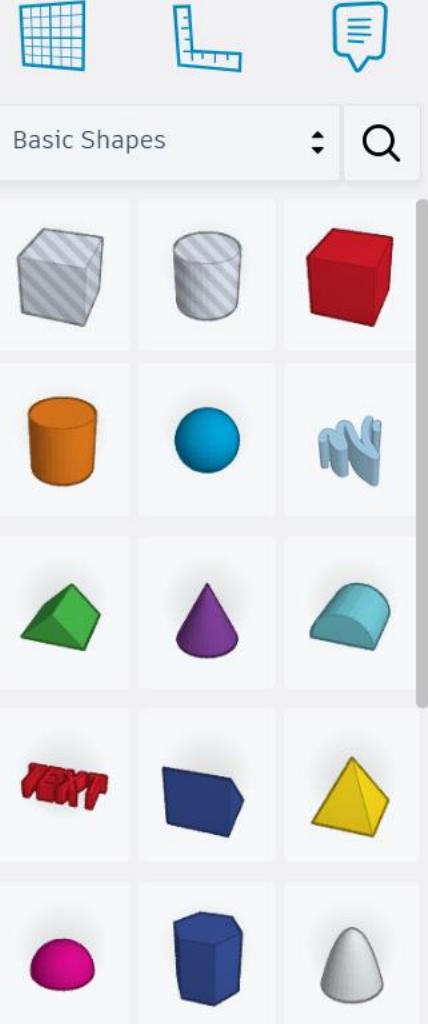
TinkerCAD



Import Export Send To

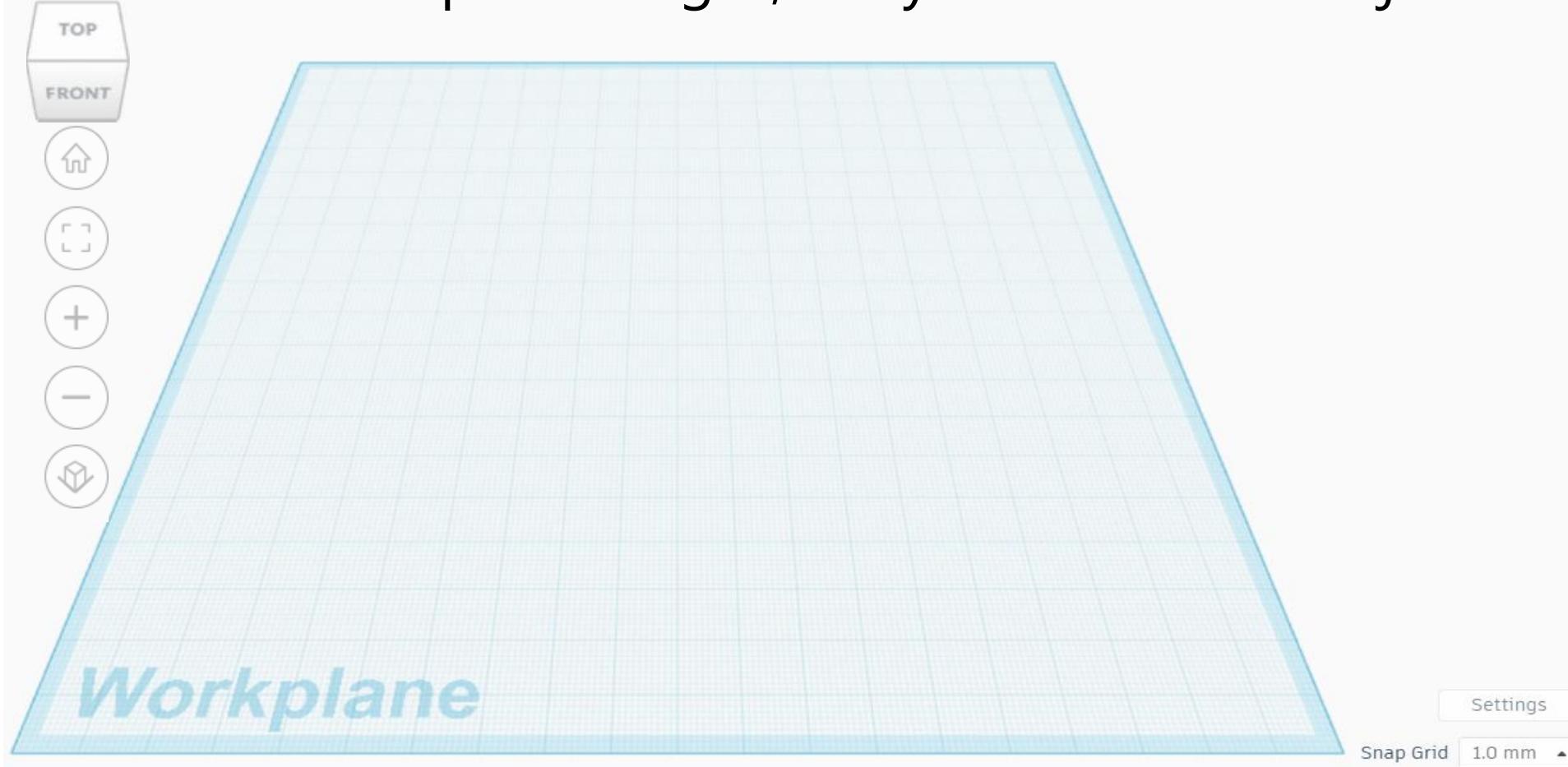


- This is the Workplane. Our design[s] will be placed on here.

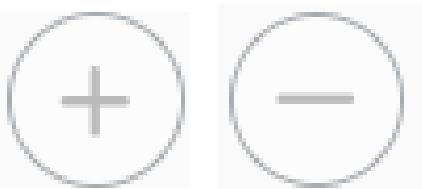
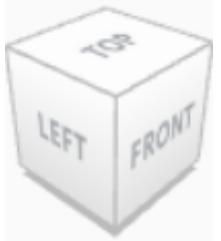
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TinkerCAD

- On the workplane's right, are your tools and objects.



TinkerCAD: The Buttons

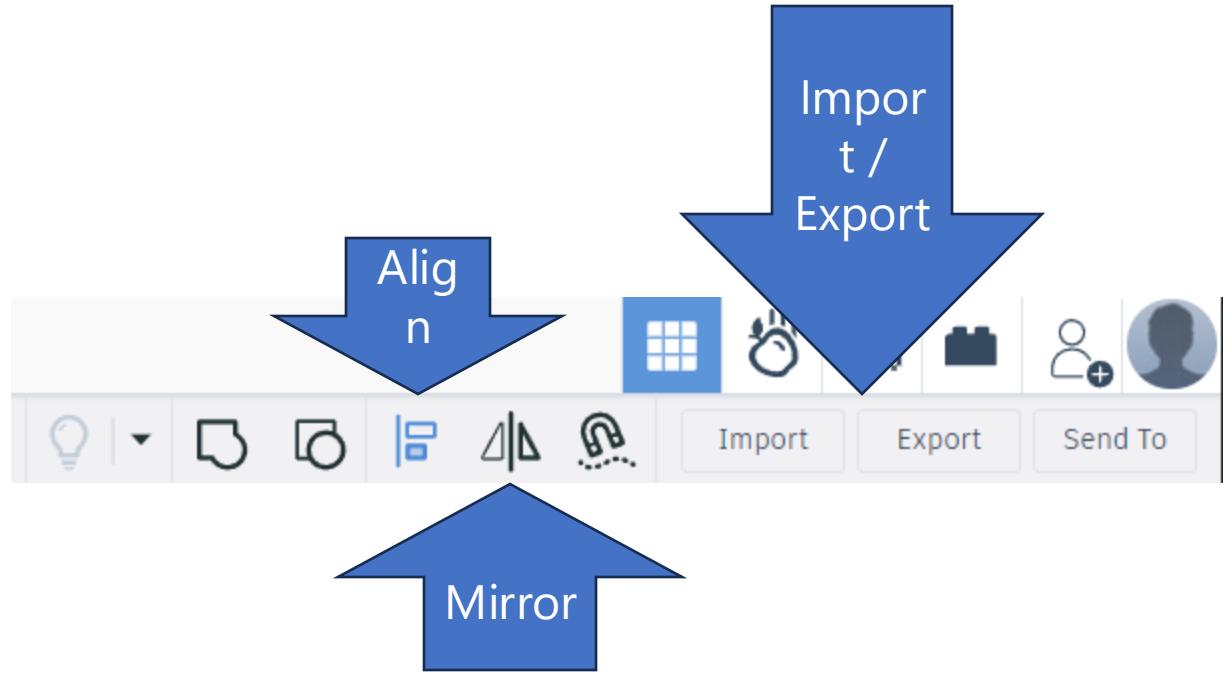


- “Cube/dice”: drag to change viewing angle of your workplane.
- “House view”: Re-centers your workplace view.
- “Fit all in view”: Zooms in/out to fit everything.
- “Zoom in” & “zoom out”: Shows details better.
- “Switch to flat view (orthographic)” & “perspective view”:

Different viewing options, to help you design better.

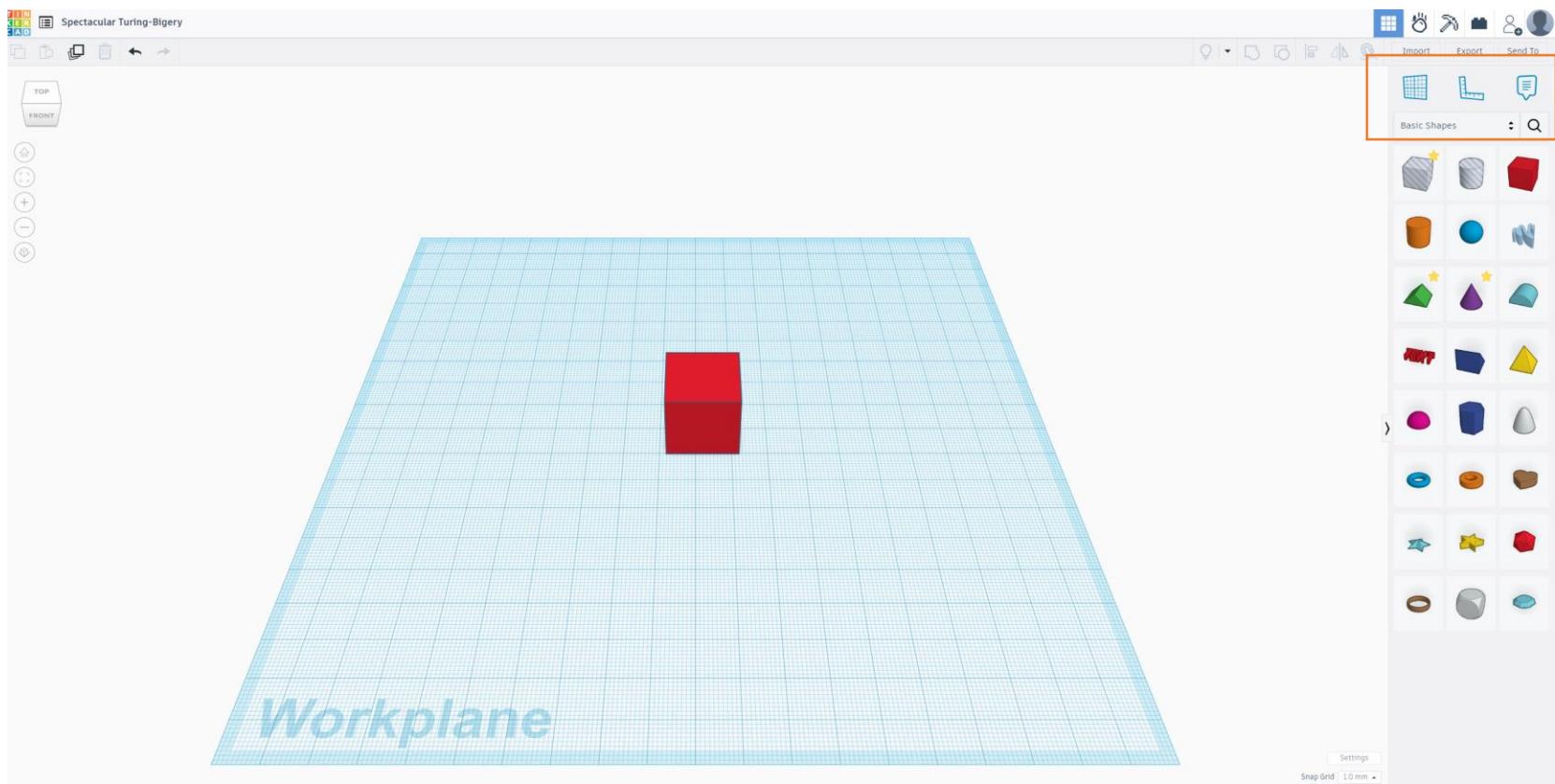
TinkerCAD: The Buttons

- You can align two objects with the align button and mirror them using the mirror tool.
- When you are done with your design, you can export it to send it to 3D printer.
- You can also import your existing designs and share it with your friends.



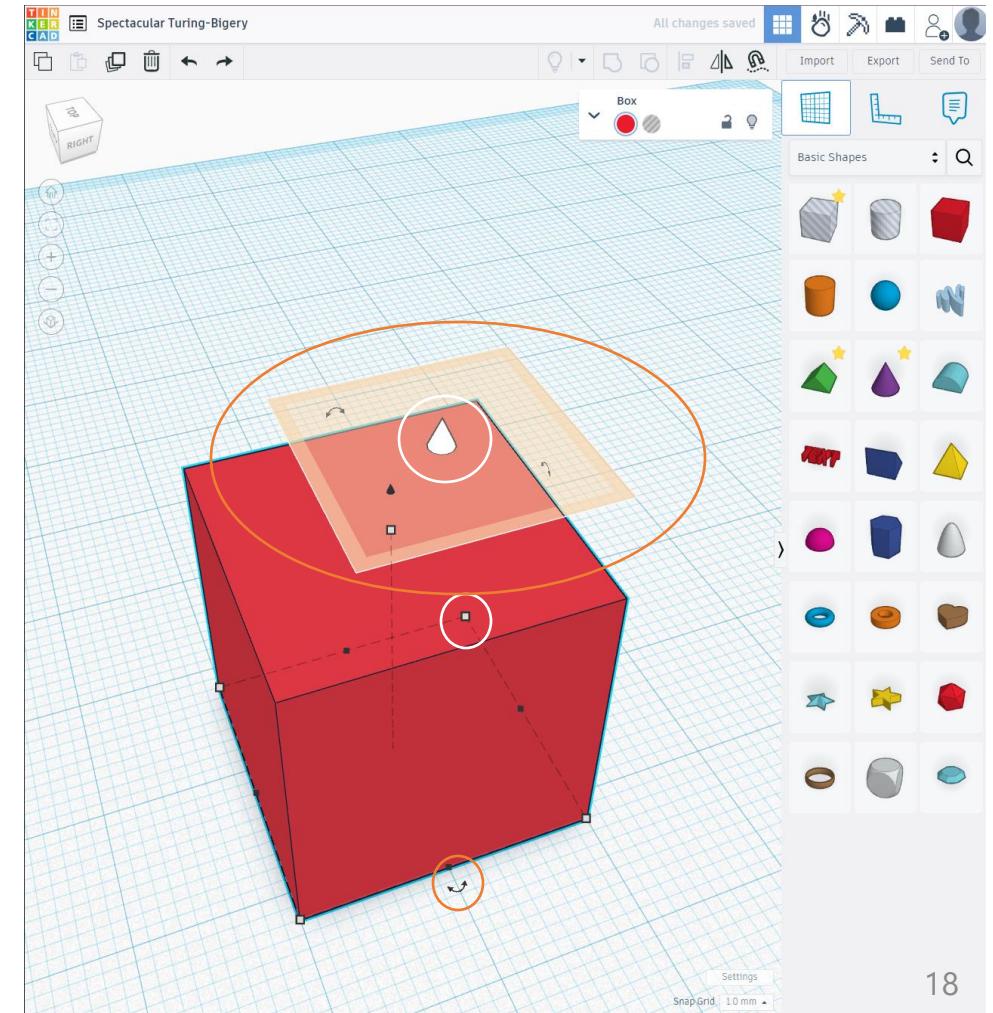
TINKercad – buttons

- We can click on objects from the right bar and drag them into the workplane.
- Notice the toolbar at the top of the objects, workplane, ruler and notes.
- Workplane tool allows us to create new surfaces to place objects on
- Ruler tool will help us design more precisely.



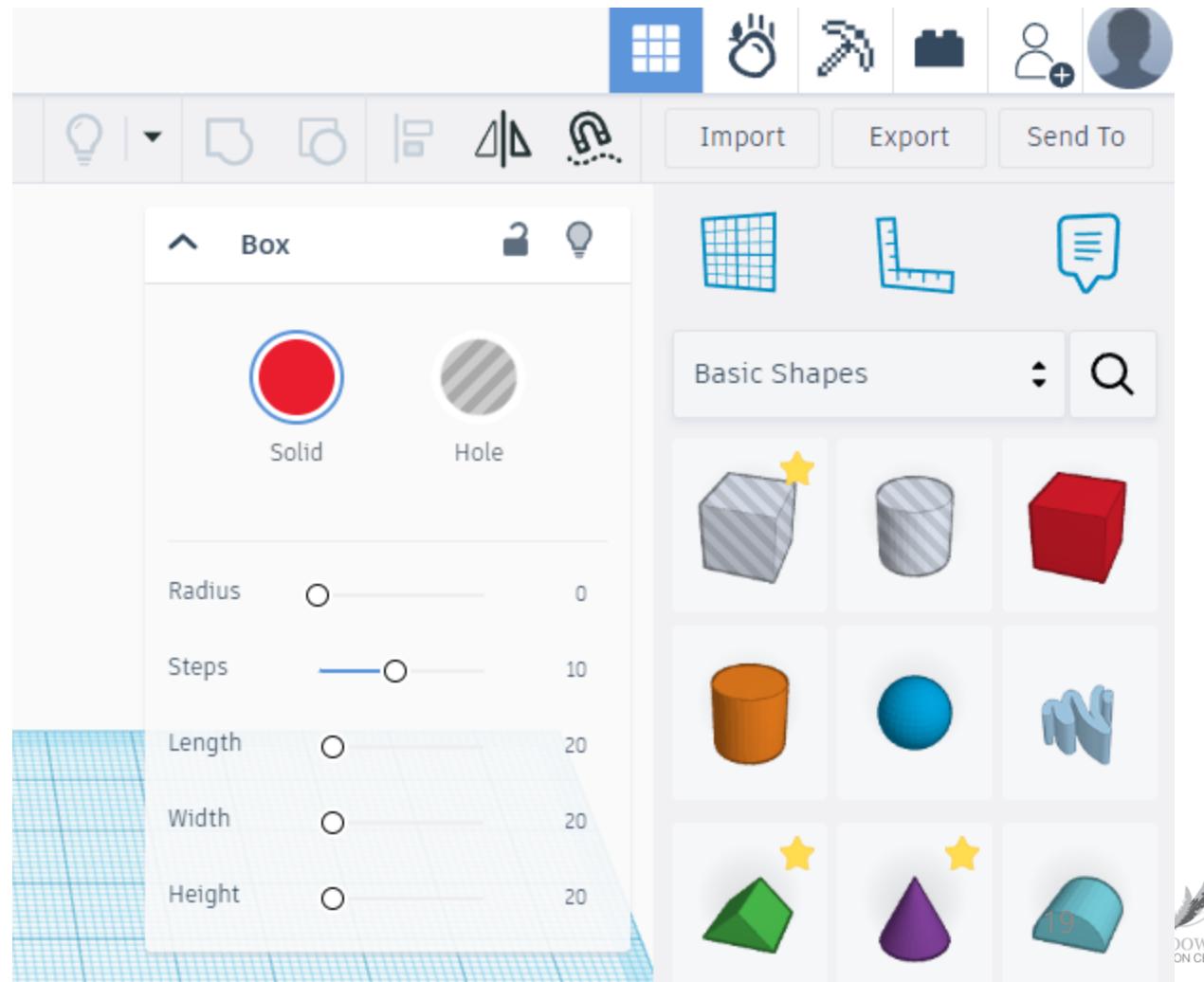
TINKercad - Moving around

- You can place the workplane on any surface – the objects you will then place will sit right on top of it, making it easier to fit objects.
- White squares at the corners of your objects allow you to resize your object.
- Use the two-sided arrows to rotate the shape.
- To move the shape up and down, drag the cone arrow on top of the shape.



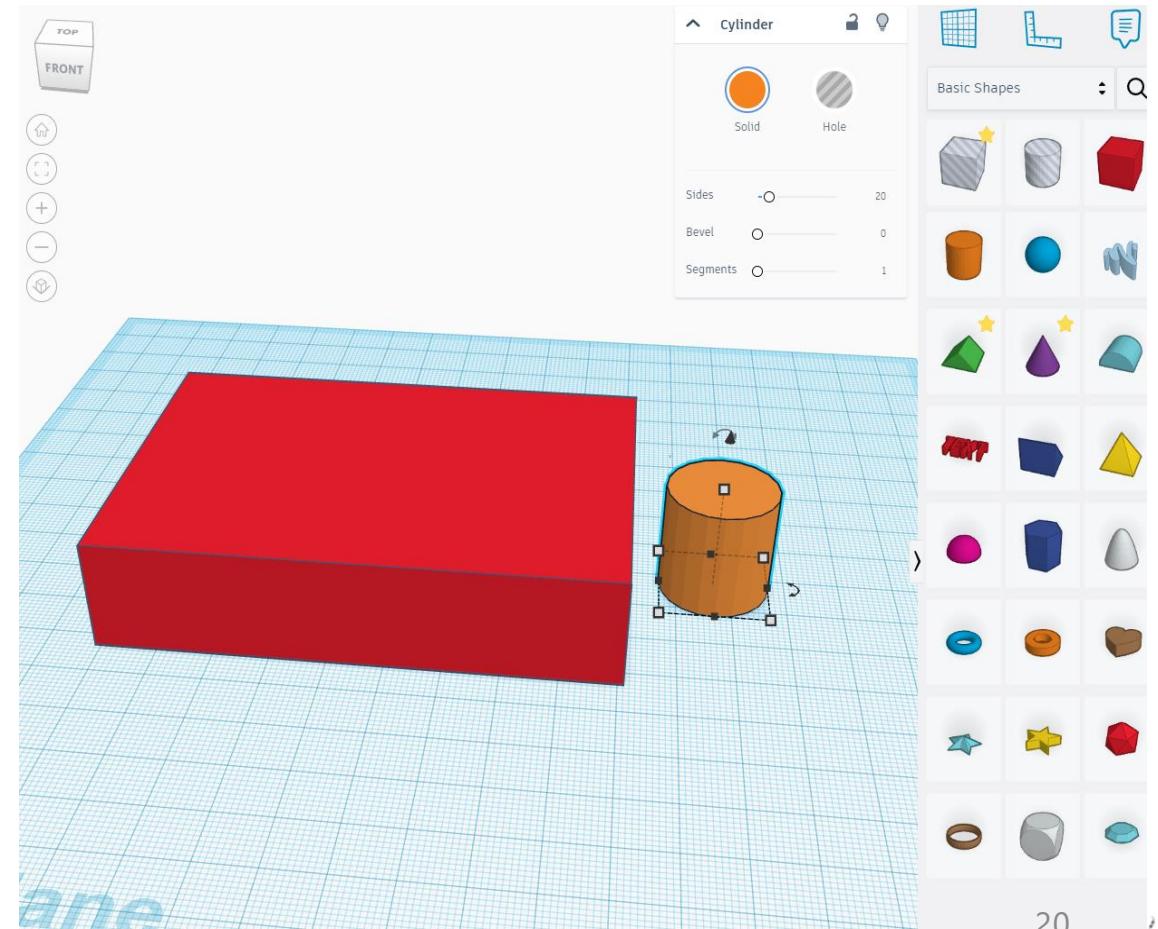
TINKercad – object properties

- Object properties menu - opens when you click on an object in the workplane
- Change your object's colour, make it solid or hollow, change the radius, length, width and height.



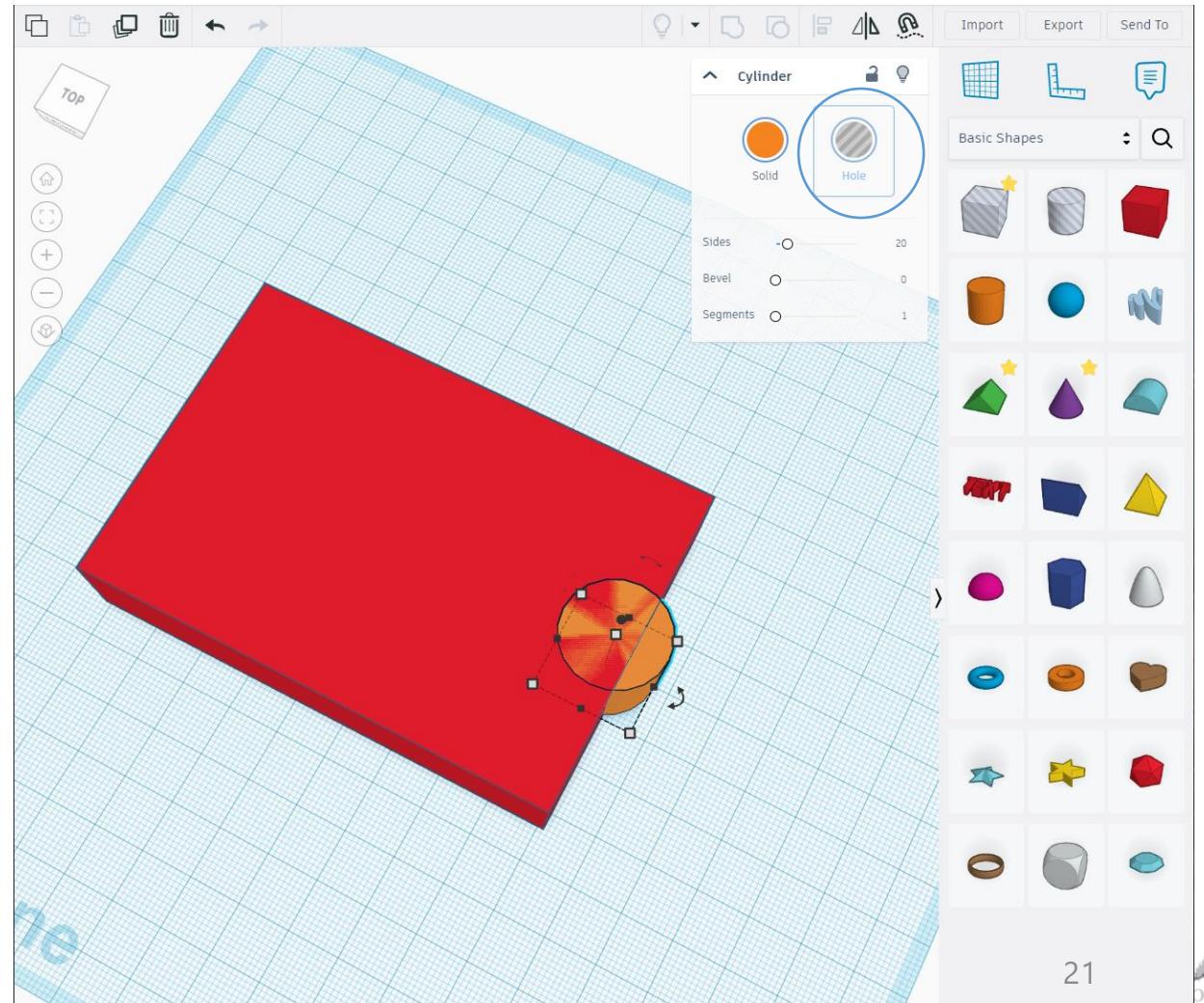
TINKercad – object properties

- To cut out a piece from an object, you can combine it with a hollow element.
- Here we are cutting out a cylinder- shaped object from the red rectangle.



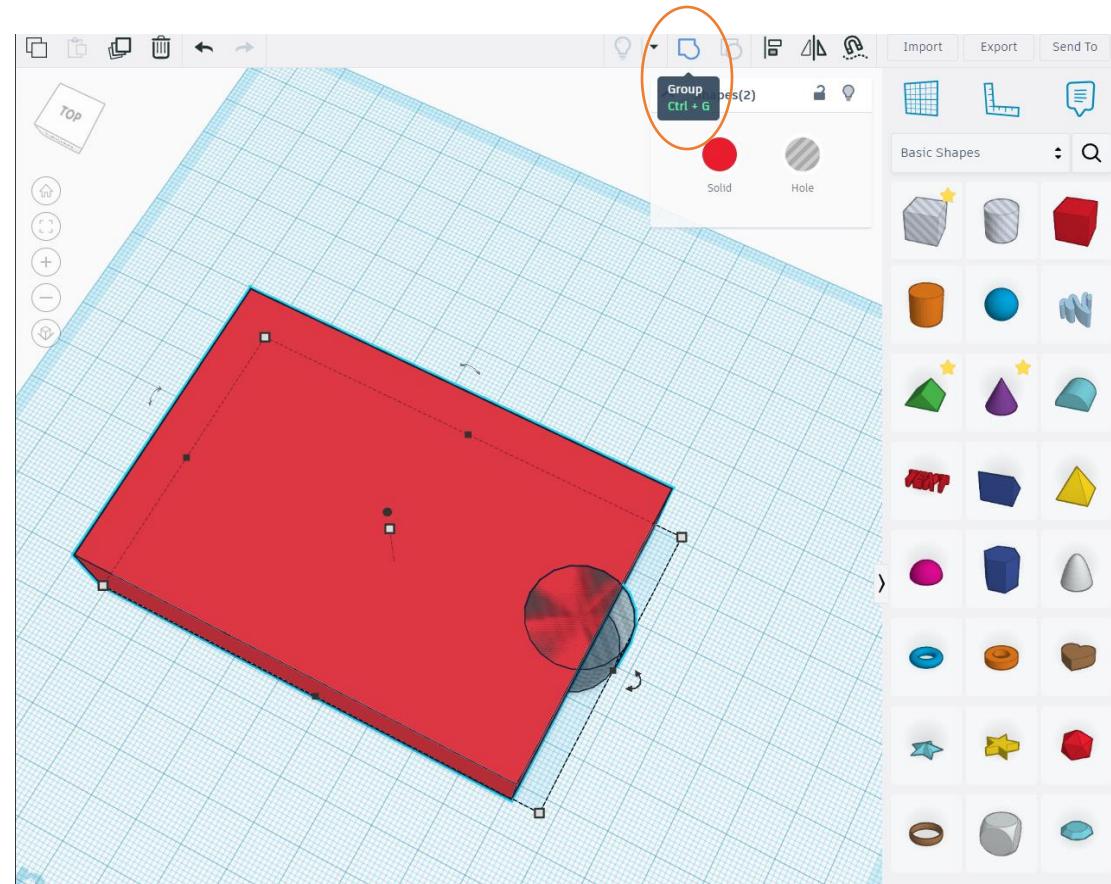
TINKercad – Solid - hollow

- We place the cylinder inside, and turn it into a hollow object.



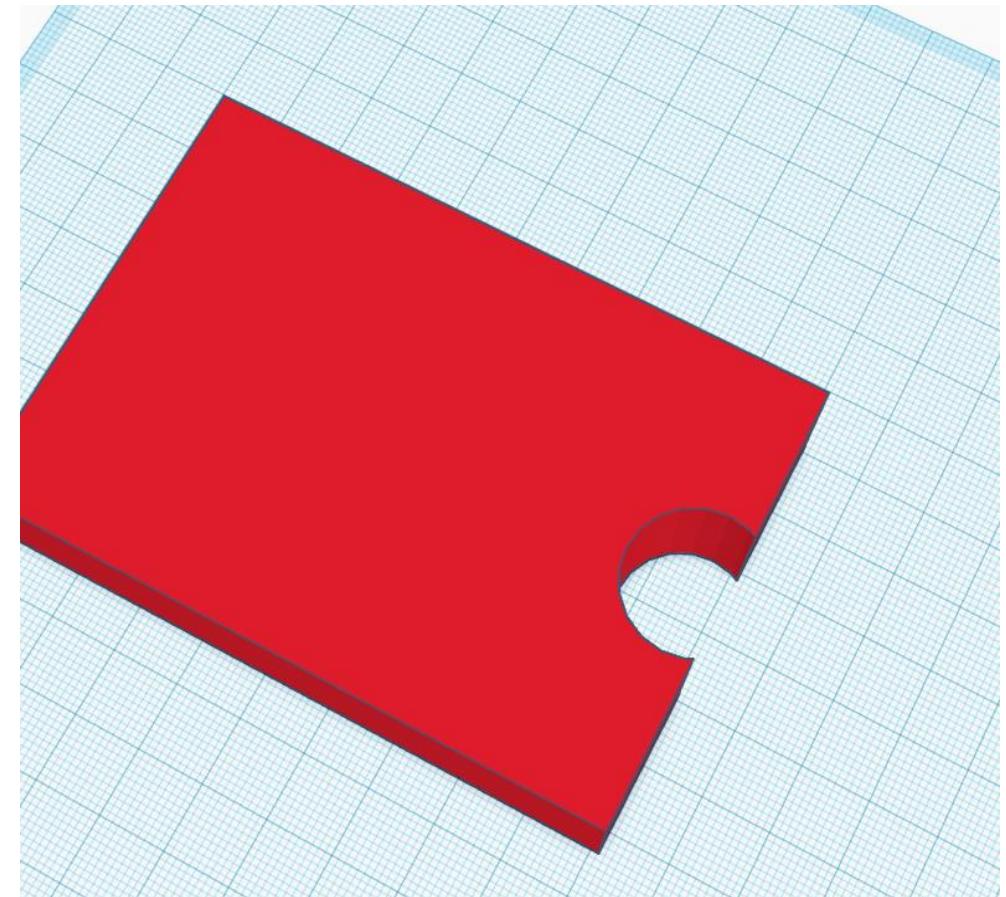
TINKercad – Solid - hollow

- Then select both solid and hollow objects and click on the group button on top bar.



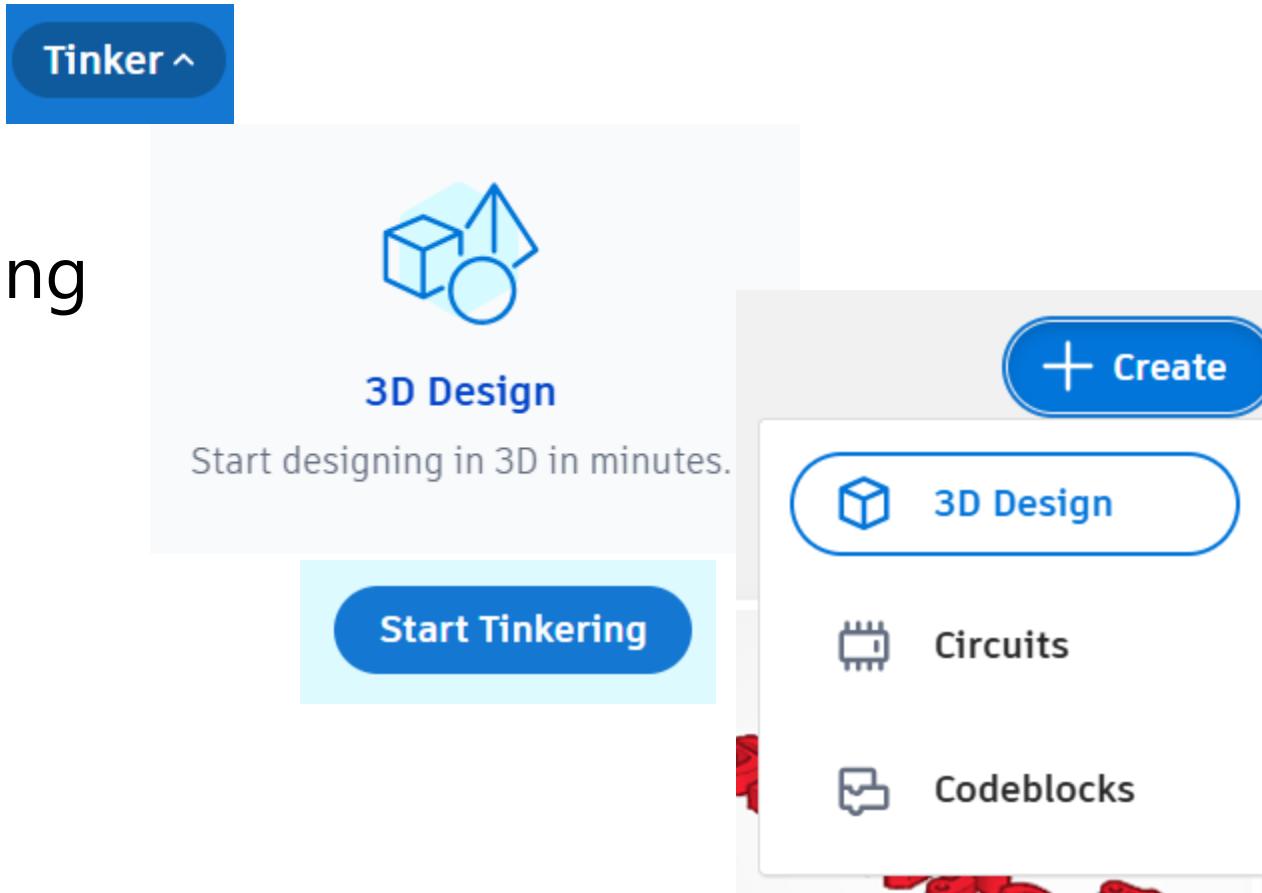
TINKercad – Solid - hollow

- You have now cut out a piece from a solid object successfully.



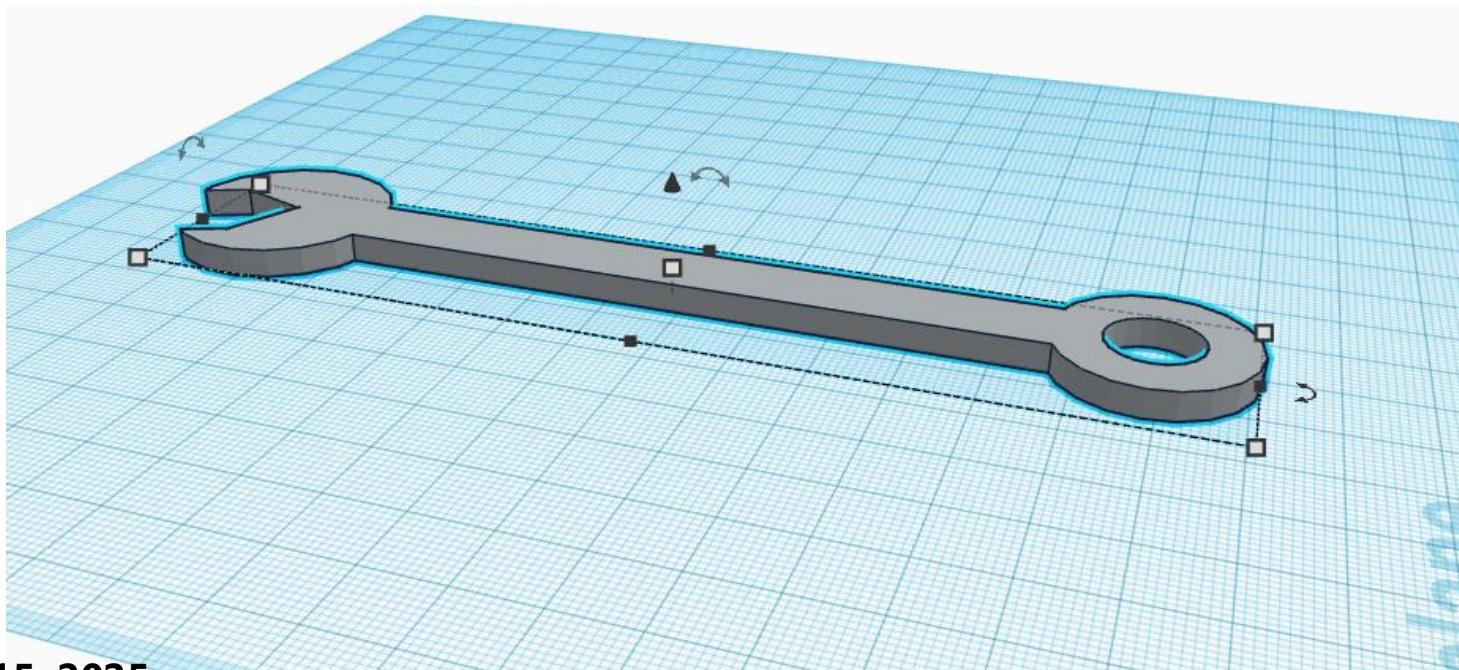
【SIGN UP FOR AN ACCOUNT】

- TinkerCAD.com
- Tinker
- 3D Design
- Start Tinkering
- + Create
- 3D Design



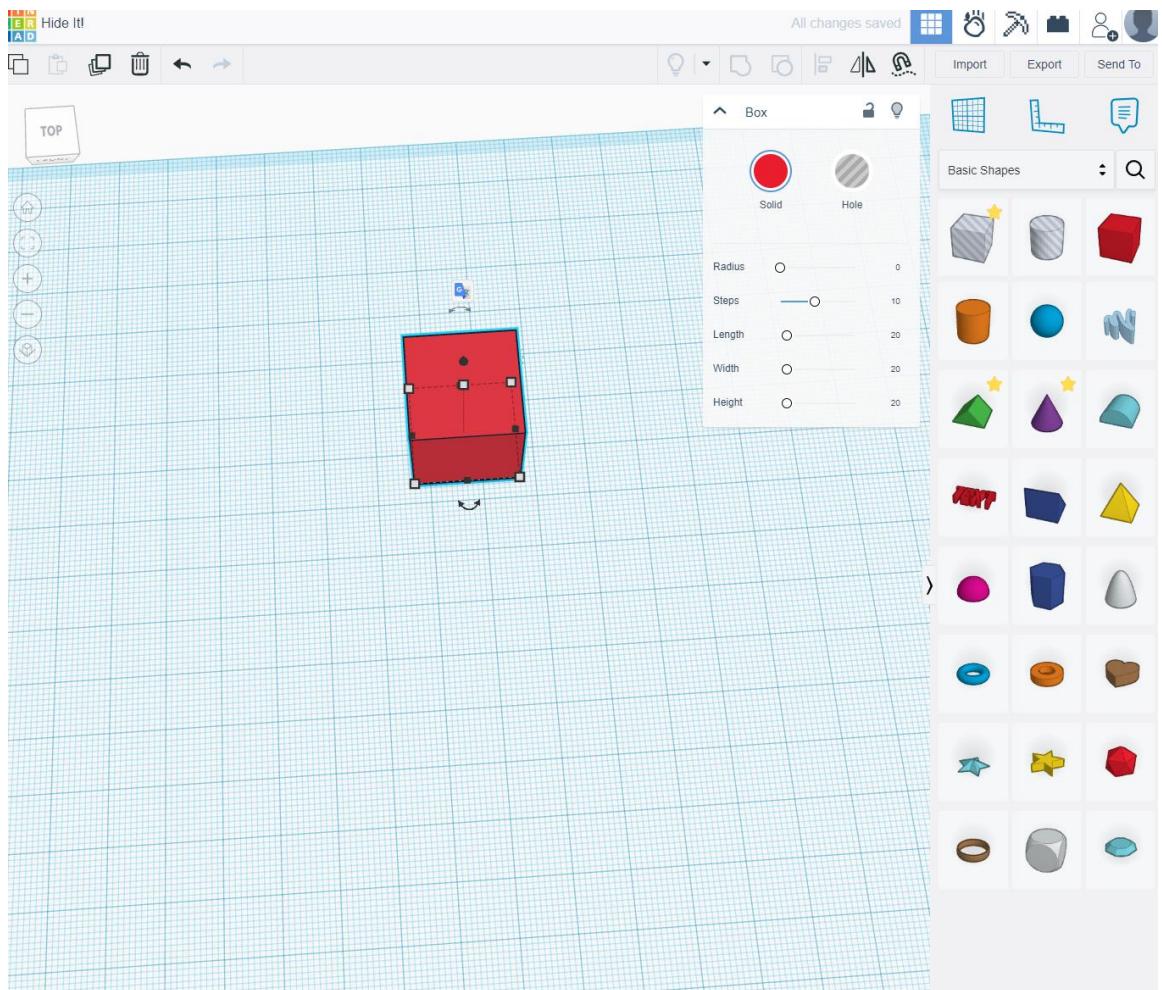
Tinkercad tutorial: build a wrench

- In TinkerCAD we will be building a wrench together,
- Follow the steps in the slides to create a wrench like the one shown here:



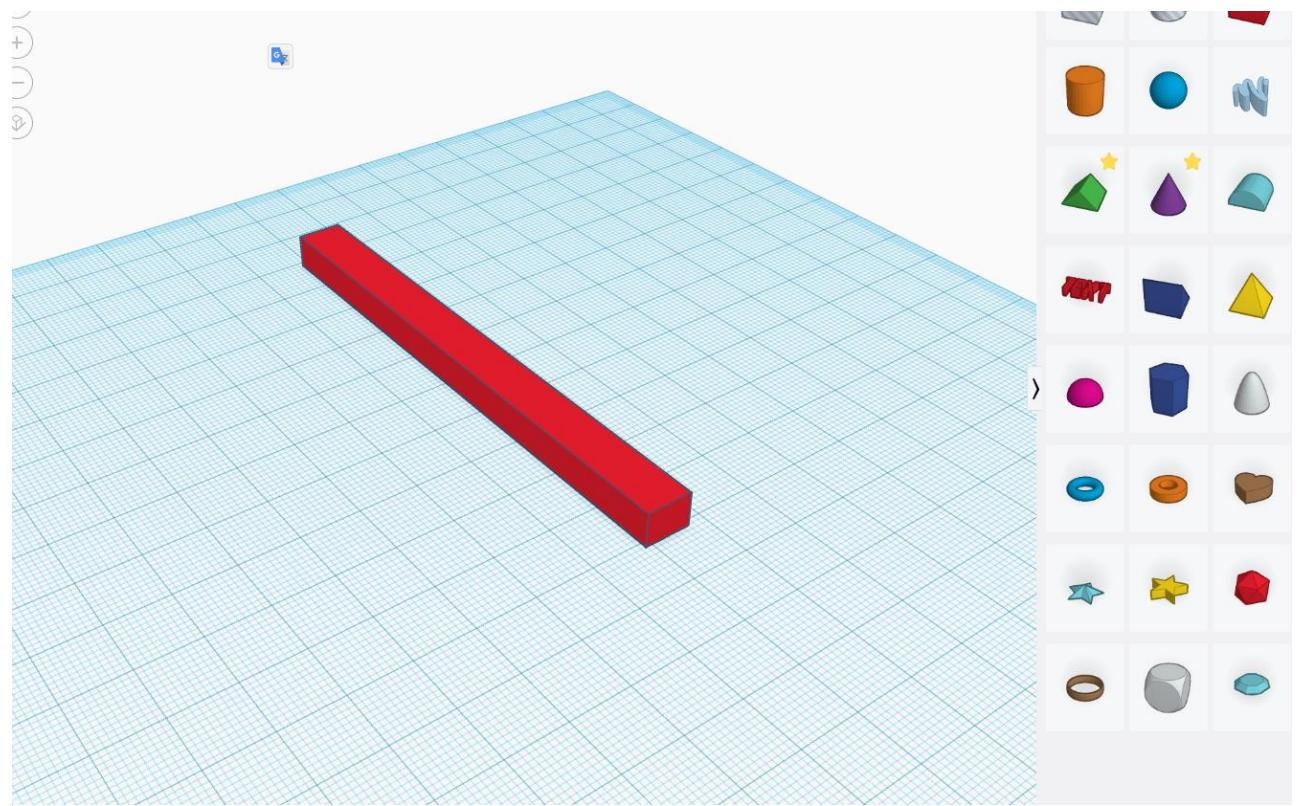
Build a wrench – Step 1

- Click and grab a cube and give it a colour of your choice:



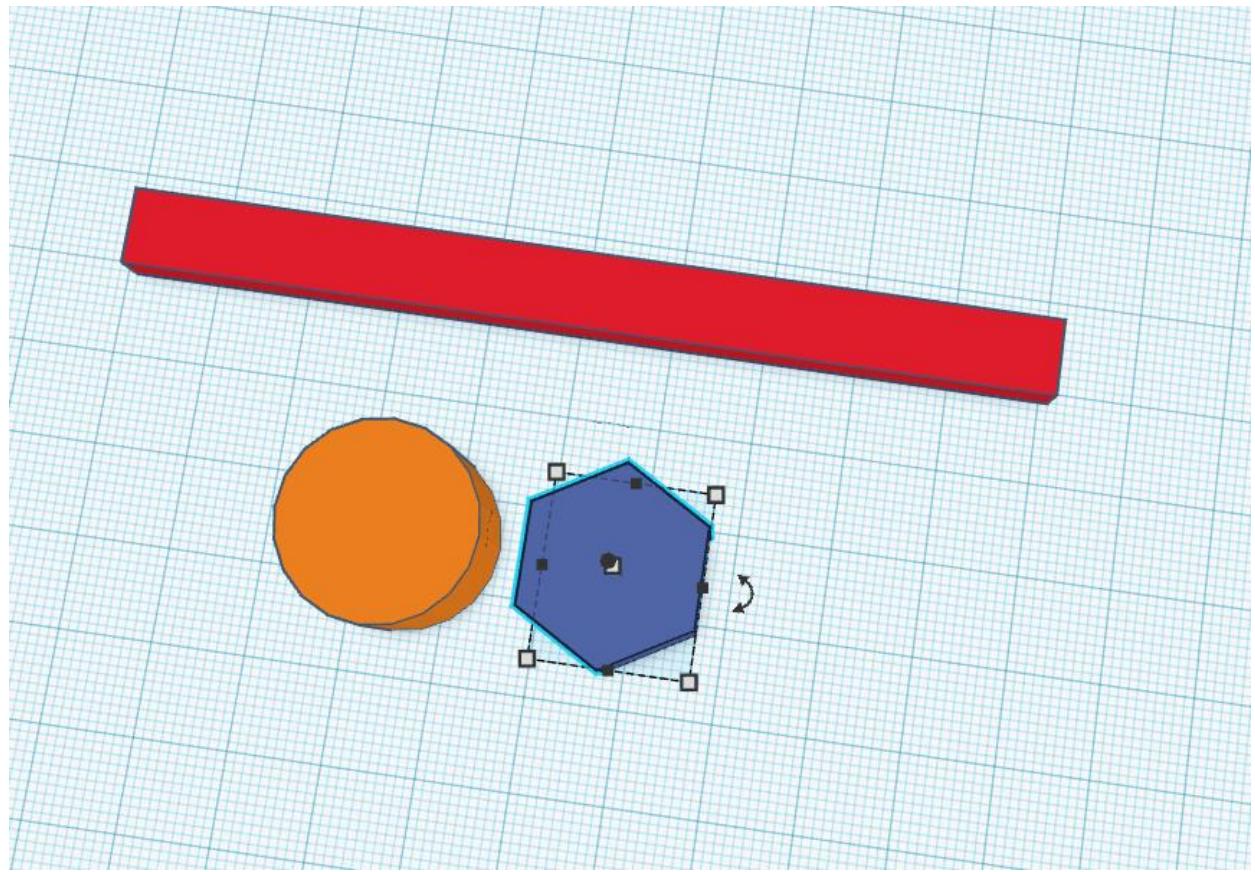
Build a wrench – step 2

- Use the white cubes on corners to drag and increase the width and height of the shape until it looks like a wrench's body.



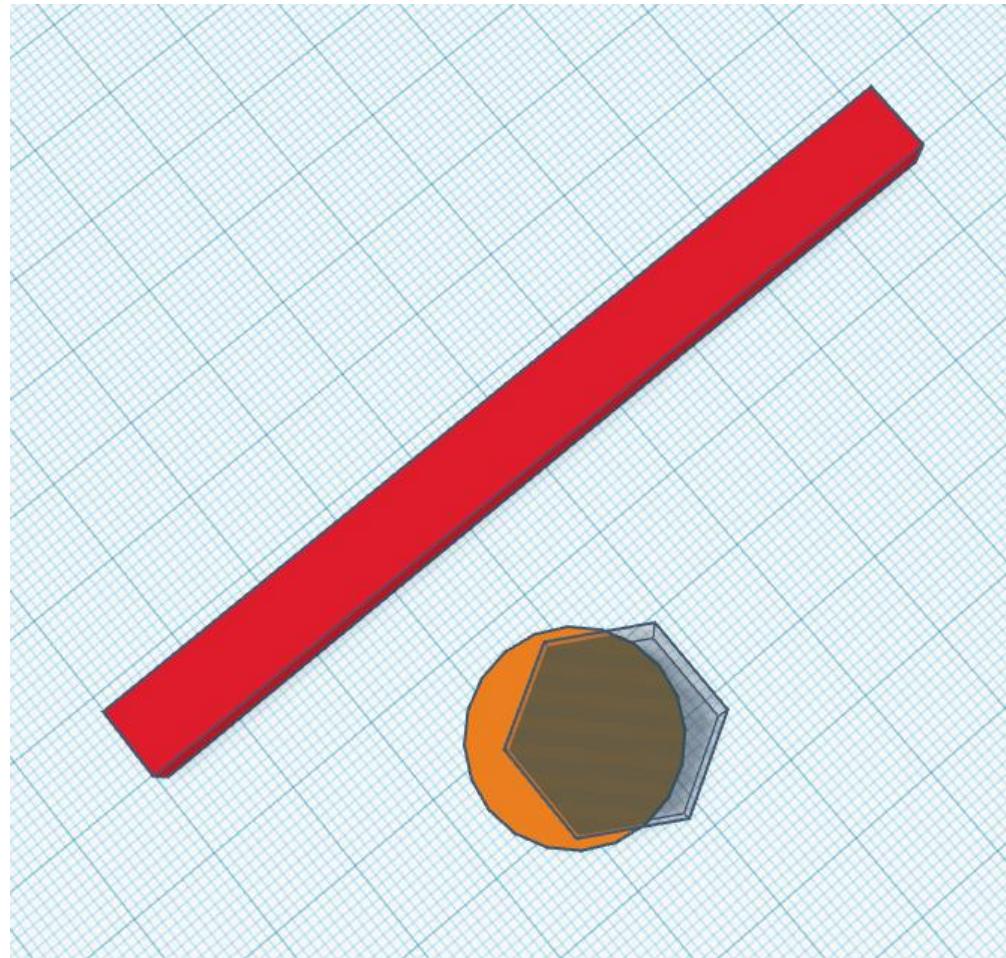
Build a wrench – step 3

- Now grab a cylinder and a hollow hexagon



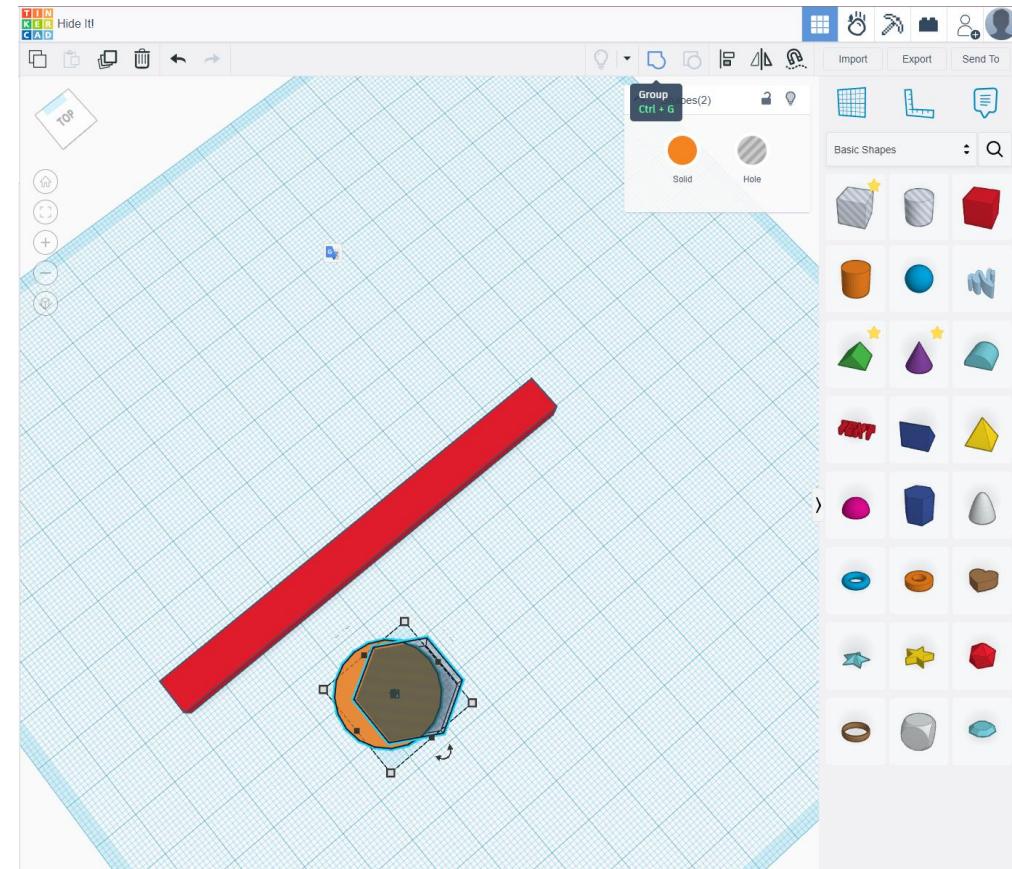
Build a wrench – step 4

- Place the hexagon inside the cylinder to remove the space and make it look like the wrench's head part.
- Make sure the hexagon is hollow.



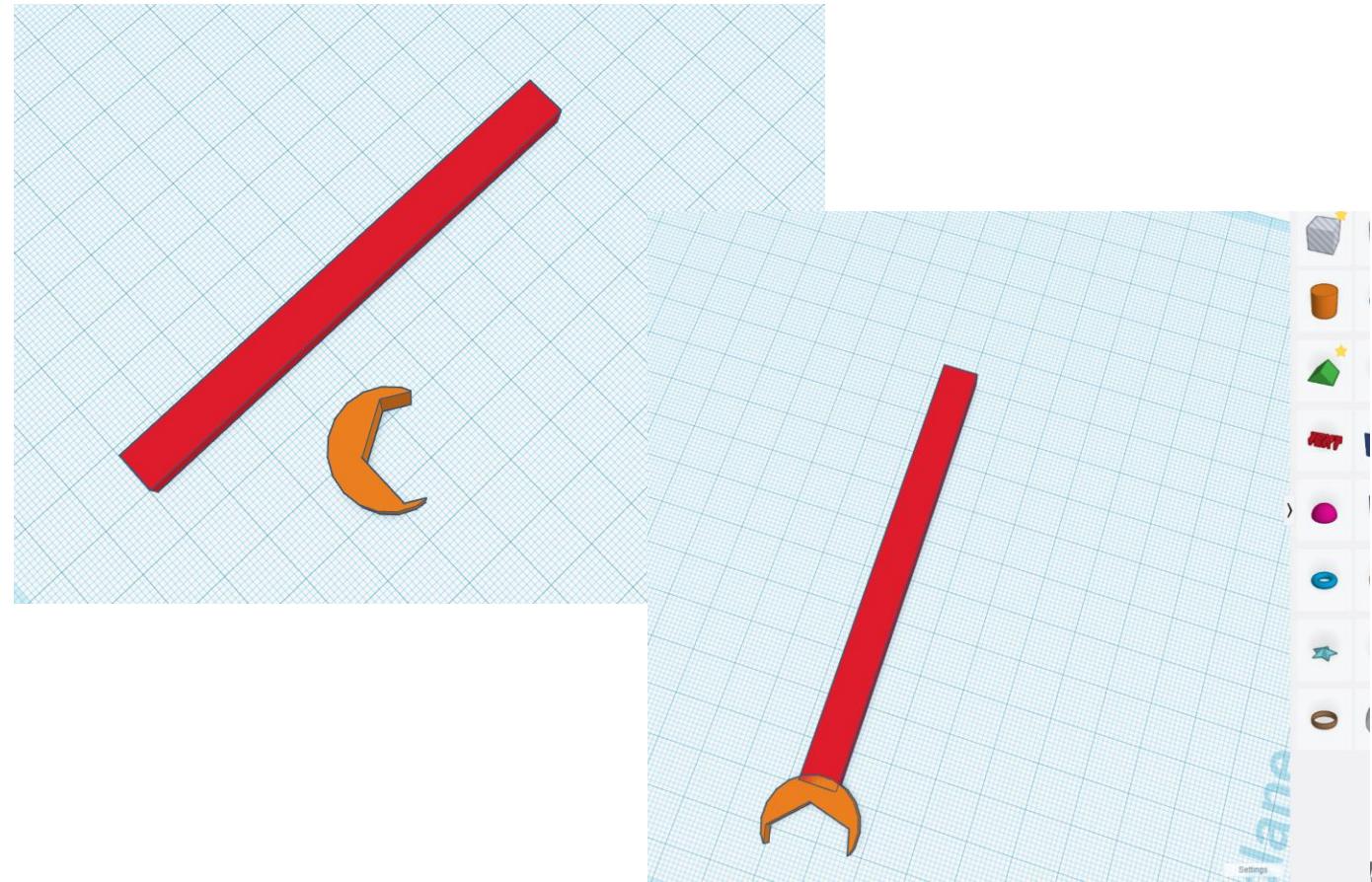
Build a wrench – step 5

- Select both cylinder and hexagon and click the group button.
- Note: you can select both items by clicking and dragging your mouse over them.



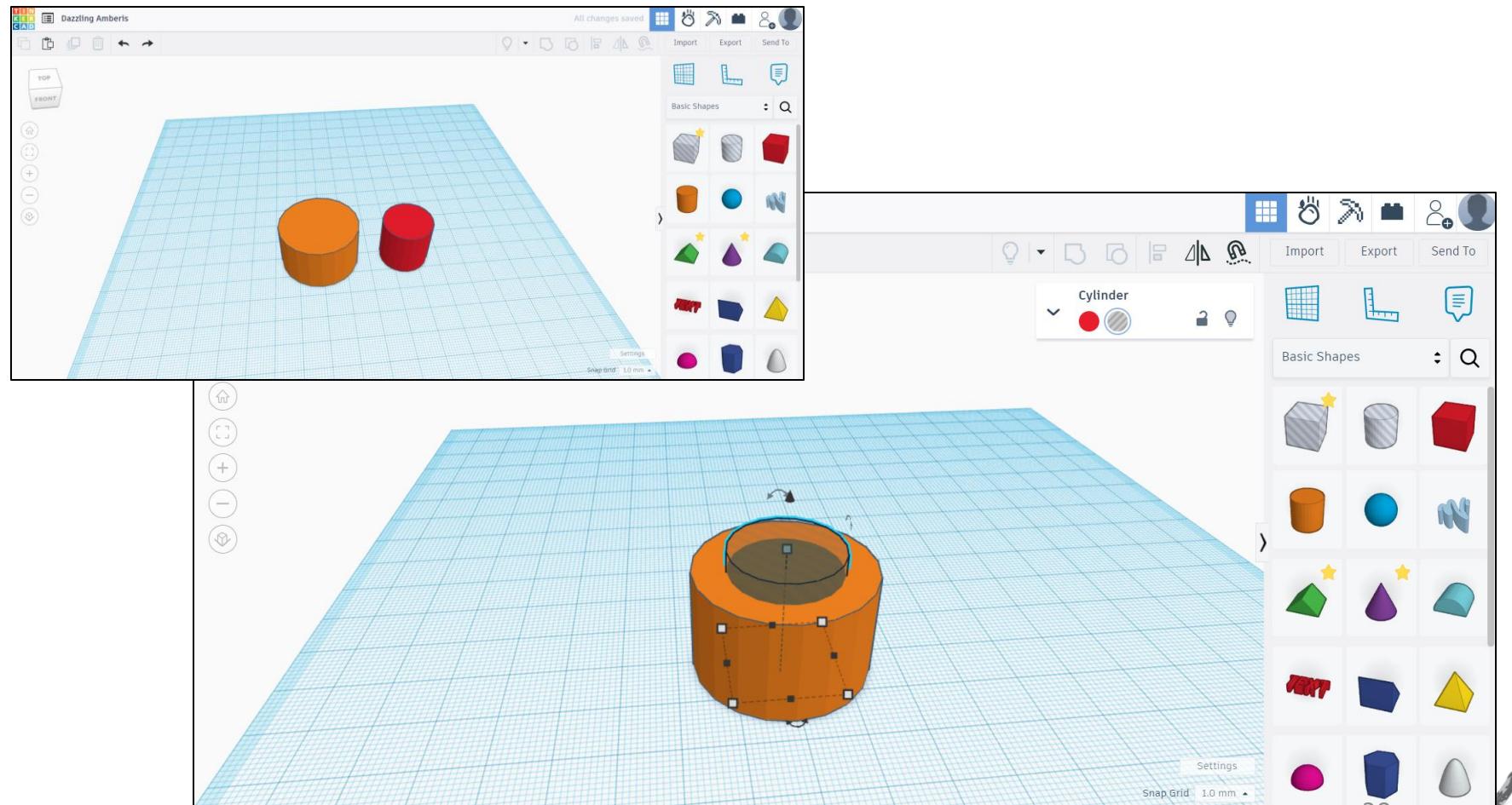
Build a wrench – step 6

- Now your head part should look like this.
- Adjust the height to match the handle, then place it where you see fit on the body.



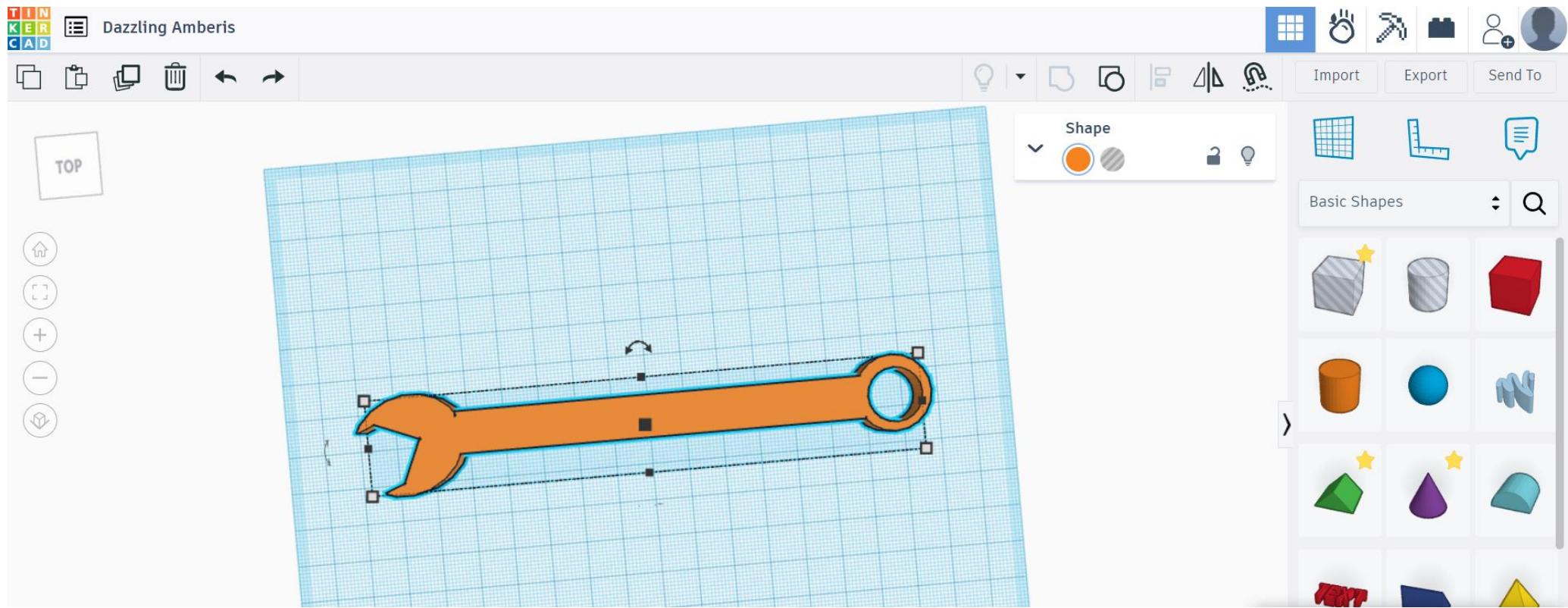
Build a wrench – step 7

- Bring in 2 more cylinders, then create a ring by making the inner one smaller and hollow.
- Group them, then add this to the opposite end of your wrench.



Build a wrench – step 8

- Select all the wrench parts with your mouse and make it a single object using the group function.



Build a wrench – step 9 – complete

Congrats, you completed your wrench in Tinkercad!

Other things to try creating!

- Your dream house
 - Incorporate eco-friendly features like solar panels and green roofs.
 - Design specialized rooms like a home theater or a rooftop garden.
 - Include home automation (e.g., voice-controlled appliances).
- Your dream car
 - Create a futuristic design with electric or hybrid engines.
 - Add unique features like retractable wheels or a glass roof.
 - Design a luxurious interior with high-tech controls and displays.
- Another tool or a toolbox
 - Invent a multi-tool that combines various functions in one.
 - Design a modular toolbox with adjustable compartments.
 - Focus on ergonomic features for comfort and ease of use.

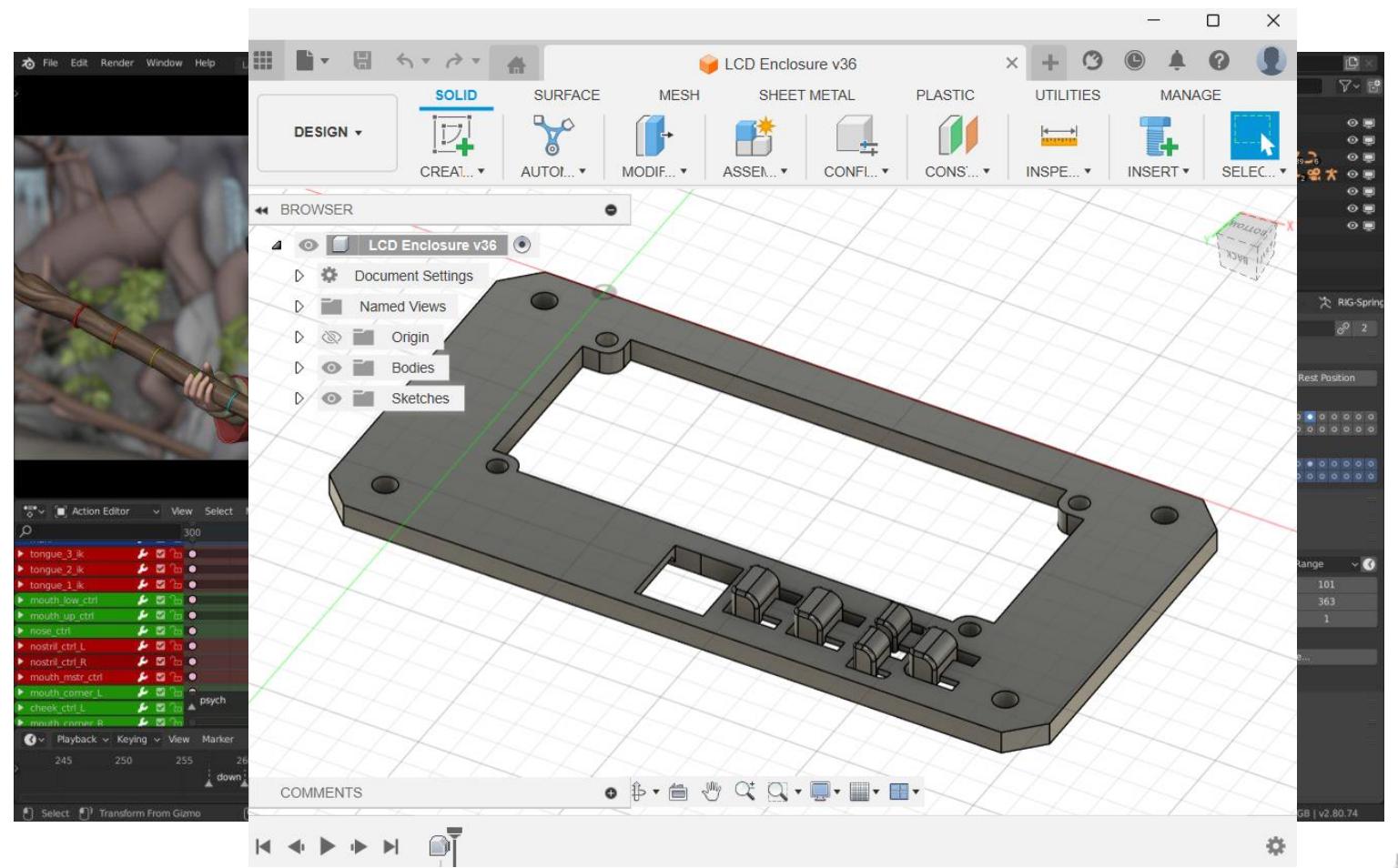


Other 3D modelling applications

- AutoCAD
 - Used by engineers, architects, and product designers

- Blender
 - Animation, visual effects, art

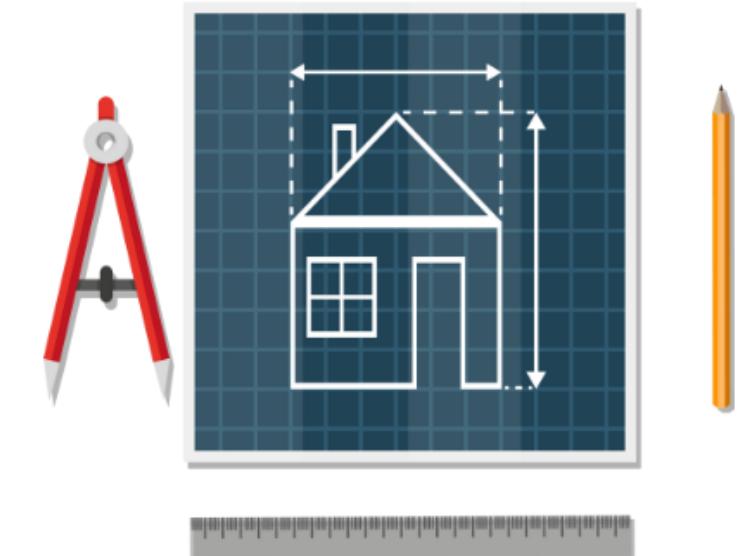
- Fusion360
 - 3D design to manufacturing



Careers and applications

Architecture

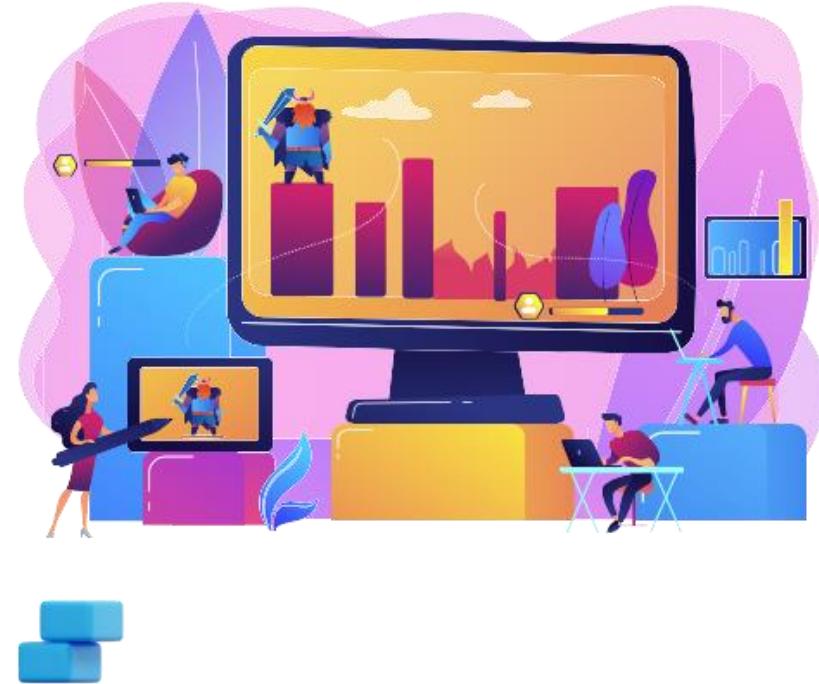
- Architects design buildings and structures, from homes to skyscrapers, ensuring they are functional, safe, and aesthetically pleasing.
- Learn to create models of your dream home or innovative buildings, understanding how every angle and wall fits together.



Careers and applications

Animation and Video Game Design

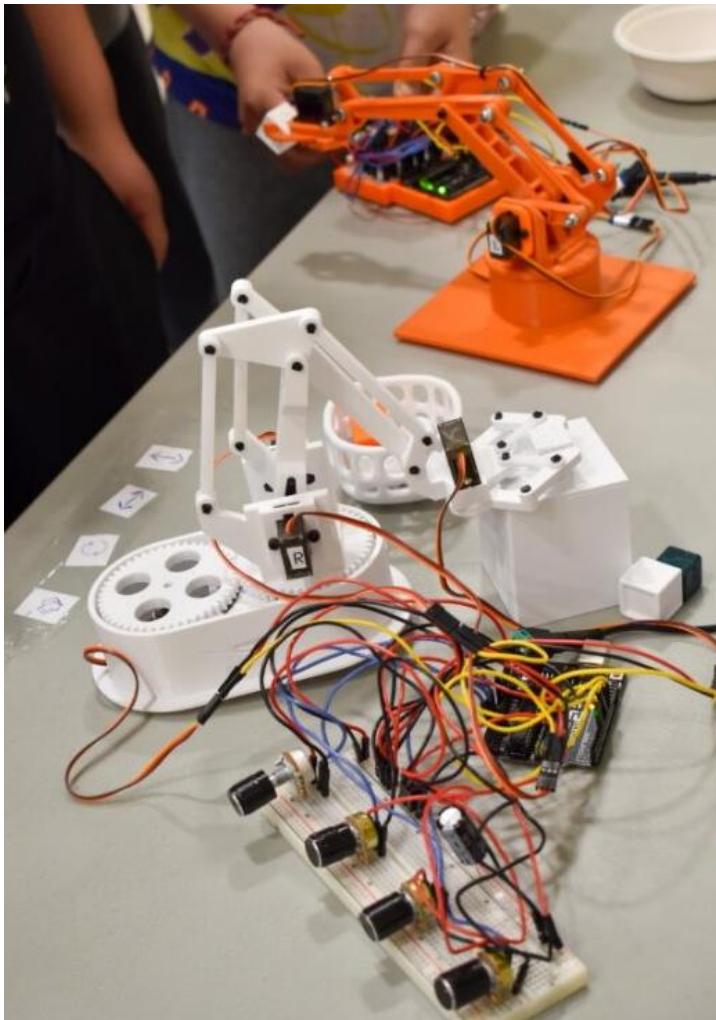
- Animators and game designers create visual stories and interactive experiences, ranging from animated movies to immersive video games.
- You can design your own characters or game environment and create your own world using the 3D modelling and animation tools out there.



Careers and applications

Ulnooweg Education Centre!

- Our staff use 3D modelling and printing to create cool programs to bring to students like you.
- We also design parts used in various robotics and equipment.



SUMMER CAMPS

From hands-on STEAM workshops to outdoor adventures and cultural immersion, our summer programs provide a unique blend of learning, fun, and personal growth tailored for Indigenous youth.

- Join our Pre-Collegiate Camp and explore university life while diving into STEAM career pathways.
- Experience the wonders of nature at our Oceans Camp, where you'll snorkel, hike, and learn about marine ecosystems.
- Immerse yourself in land-based education at Mlkiknewawti camps, connecting with Indigenous culture and STEAM concepts in Asitu'lisk and Unamaki.

ulnoowegeduation.ca > Events & Camps

Oceans Camp



Mlkiknewawti



Pre-Collegiate Camp



OUR WORKSHOPS

We offer more fun and engaging educational workshops in STEAM - book us today!

Math with Dash

Use fun and interactive dash robots to learn math concepts!

Grades pre-K-6

Prosthetic hand

Assemble a functional prosthetic hand, using 3D printed parts and string while learning principles of biomechanical engineering. *Grades 7-12*

Robotic arm

Wire, code, and operate a small robotic arm. *Grades 7-12*

Remote Operating Vehicle (ROV)

Build a remote controlled underwater vehicle by soldering your own motors and control, and creating a frame with PVC pipes. *Grades 9-12*

3D Modelling

Design tools, buildings, and anything else you can imagine using TinkerCAD 3D modelling software! *Grades 4-12*

Animation

Create your own moving picture using a variety of simple animation techniques. *Grades 4-6*

Micro:bit

Get introduced to coding using the simple Micro:bit device for anything you can imagine. *Grades 1-8*

For more information or to book a session, contact us at:

uecadmin@ulnooweg.ca

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SCHOLARSHIPS AND BURSARIES

The Ulnooweg Indigenous Communities Foundation is an Indigenous-led ...

What they offer...

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CONTACT US

Website: www.ulnoowegeducation.ca

Phone: 1-902-406-0979

Address: 5121 Sackville St, Halifax NS, B3J 1K1

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uecadmin@ulnooweg.ca



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