

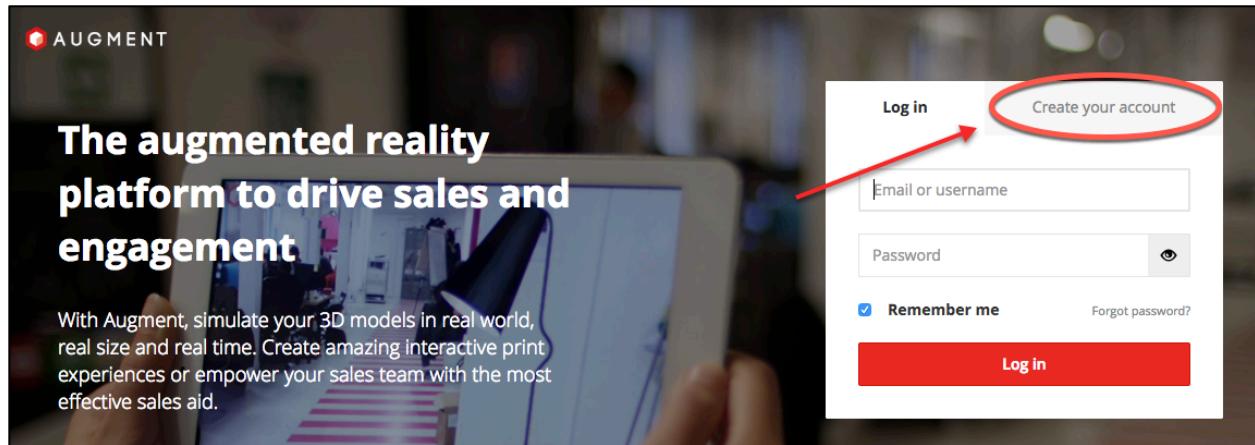
How to Create 3D objects and explore them through Augmented Reality using smart devices

Augmented Reality (AR) technology superimposes a computer-generated image on the user's view of the real world, providing a composite view that seeks to enhance perception of reality. Thus, facilitating students' learning of difficult concepts that involve 3D perception. This tutorial describes two use cases of augmented reality using free online software applications. The following instructions will help you to create 3D objects and visualize them through augmented reality using a free smartphone App.

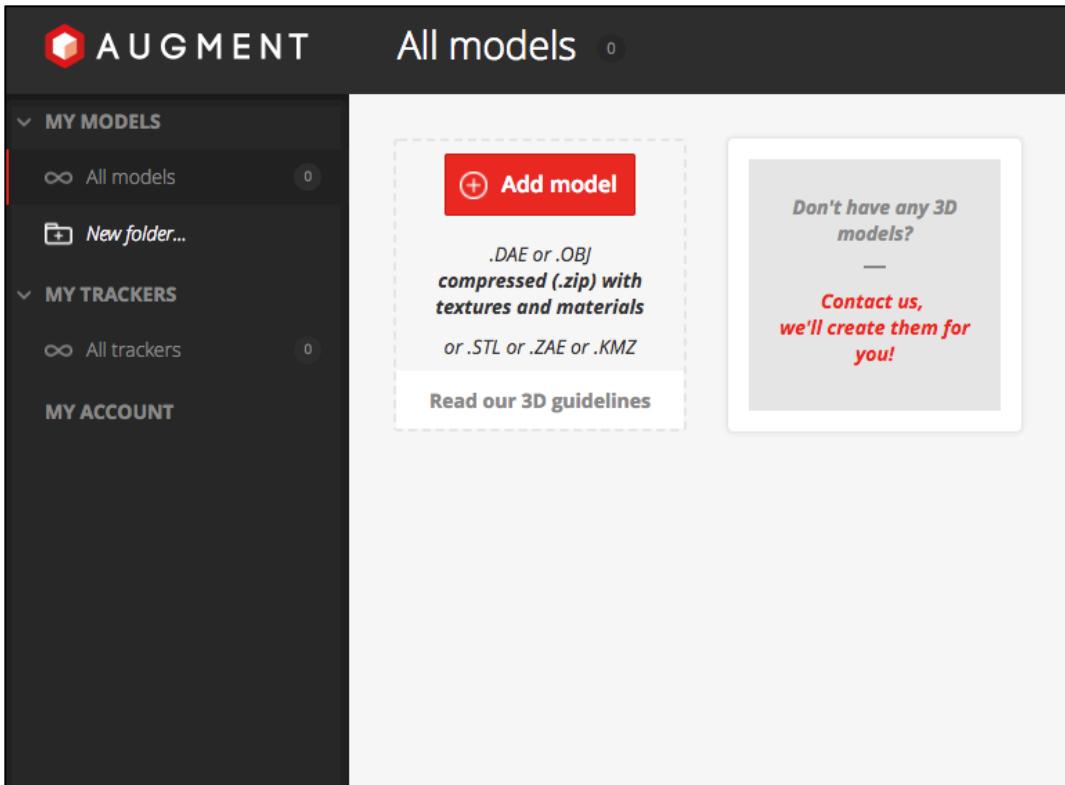
Download the Augment App:

[Augment app and platform](#) enables students and instructors to visualize 3D models in the real environment, in real time and at scale. Augment is a free app that runs on android and IOs. Check the [video](#) for instructions or follow steps 1 to 3.

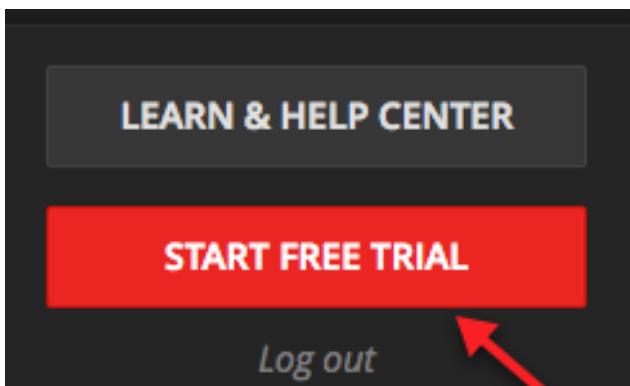
1. Install the **Augment** App in your smartphone or tablet.
2. Sign Up for an account at: https://manager.augment.com/en/users/sign_up



3. You will get an email asking to confirm your email address. When your login for the first time in Augment, you will see the following screen:



4. In order to upload your own models, you should upgrade your account to an [education account](#). By doing that, you will get access to all Augment education features. Click on the “Start Free Trial” button at the bottom. Then, choose “Education” and fill in the respective fields.



The screenshot shows the Augment website's main interface. On the left, there's a sidebar with options like 'MY MODELS', 'MY TRACKERS', and 'MY ACCOUNT'. At the top right, it says 'Start free trial'. The main area has a heading 'CHOOSE THE RIGHT SOLUTION FOR YOU'. Below it are two sections: 'BUSINESS' (with a person icon) and 'EDUCATION' (with a graduation cap icon). Each section has a '14 DAY FREE TRIAL' button. A red arrow points to the 'Start free trial' button in the 'EDUCATION' section, which is also circled in green.

- Fill out the fields and click on “Start Free Trial”. You will get a notification that your free trial has been activated and you are ready to start uploading your files.

This screenshot shows a confirmation page after a free trial sign-up. It features a green header bar with a checkmark and the text 'Thanks, your email is confirmed!'. Below is a form for 'Contact information' with fields for 'First name', 'Last name', 'School name', and 'Position'. Underneath, a section titled 'Included in Free Trial:' lists several benefits: 'Unlimited public and private 3D models', 'Unlimited Active Device', 'Unlimited Places', 'Share easily 3D models with your clients and team members', 'Teams: Manage shared folders and team members', and 'Offline access to your 3D model in Augment Sales App'. A red 'Start free trial' button is at the bottom.

The screenshot shows the Augment My account interface. The left sidebar has sections for MY MODELS (All models 0, Create a folder), MY TRACKERS, and MY ACCOUNT (selected). The main content area has tabs for My personal information and My subscriptions (selected). The My subscriptions section shows an Education plan with a FREE TRIAL (14 days left) and Unlimited public and private 3D models uploads. It also shows Unlimited devices, Active devices usage (0 active devices), and a Support link to the Help center. A red Upgrade plan button is located in the top right of this section.

The following instructions will help you create and upload a 3D object to Augment for two use cases:

- [Create a 3D shape](#)
- [Create a 3D molecule](#)



Create a 3D shape:

There are many different softwares to create 3D shapes. In this tutorial, we will use TinkerCAD, which is a free online software tool that allows to upload/modify/create 3D models that can be then exported to be used for augmented reality (.obj, .stl), 3D printing (.obj, .stl) and laser cutting (svg).

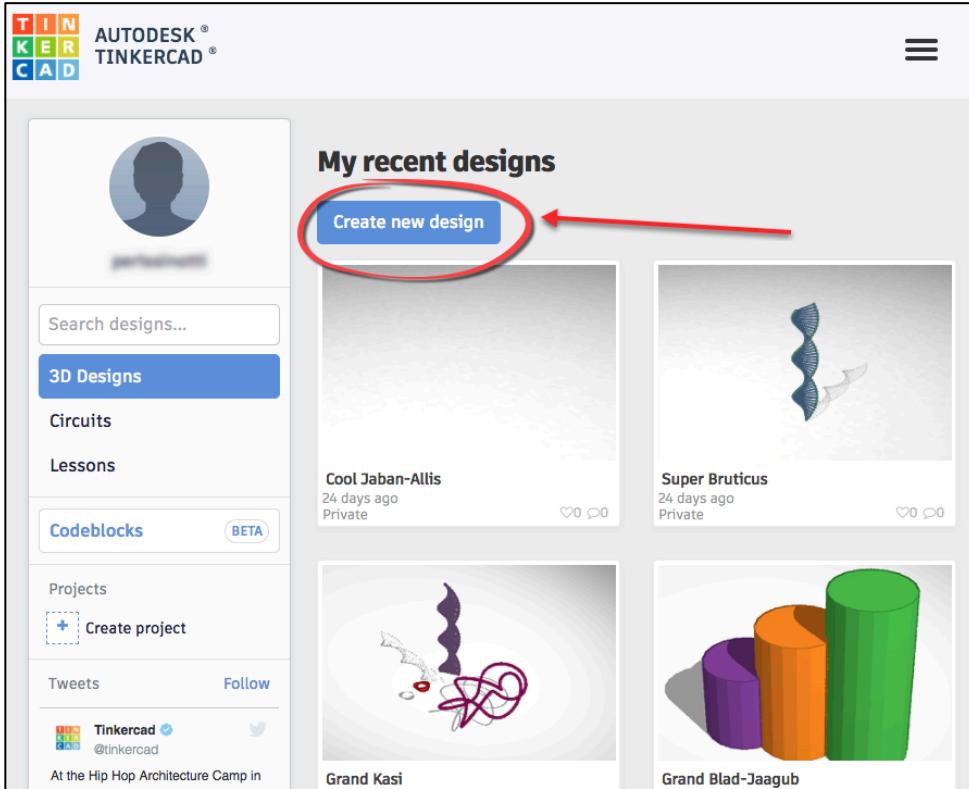
1. Sign Up for a free account at: <https://www.tinkercad.com/>



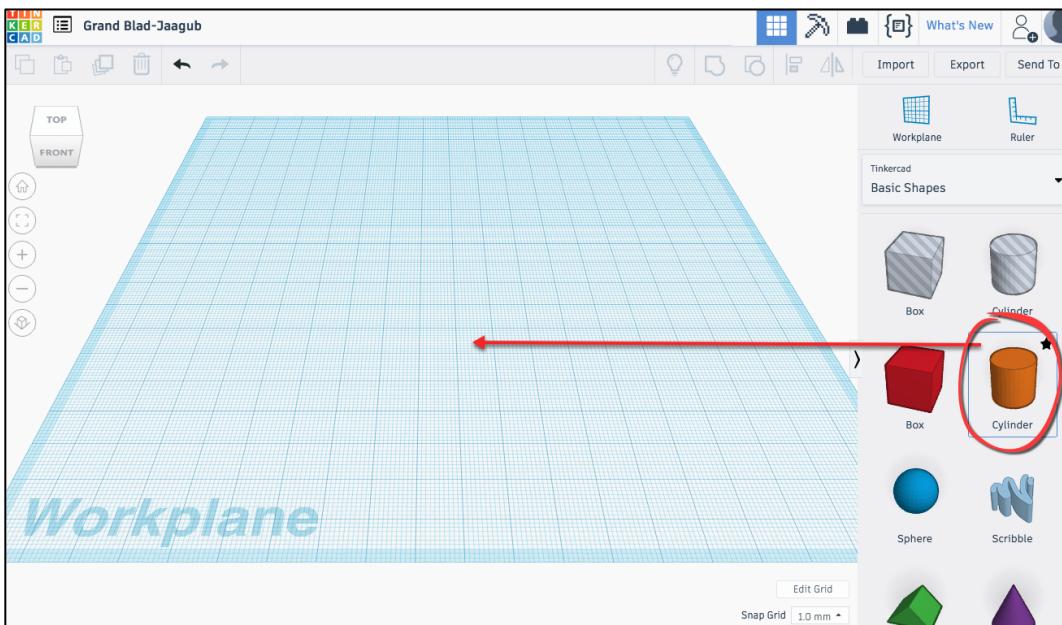
you will be redirected a new page to create your account:

The screenshot shows a "Create account" form. It includes fields for "Country, Territory, or Region" (set to "United States"), "Birthday" (with dropdown menus for Month, Day, and Year), and a large blue "NEXT" button. At the bottom, there is a link "ALREADY HAVE AN ACCOUNT? [SIGN IN](#)".

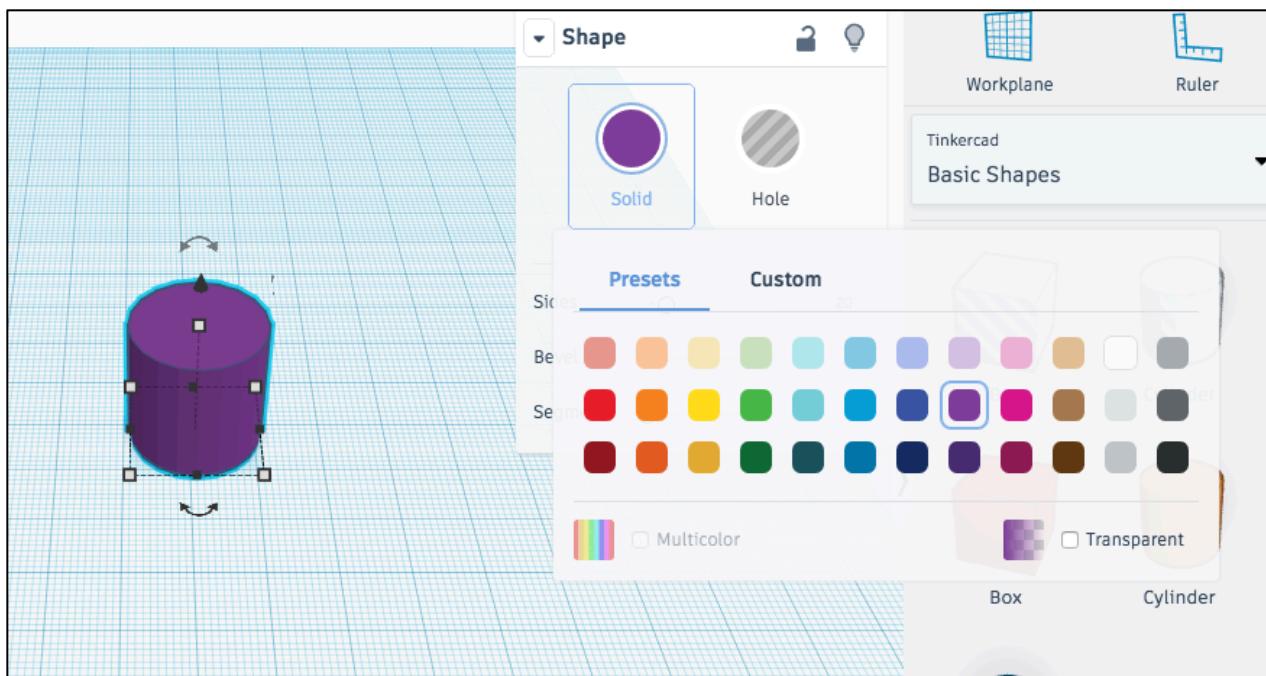
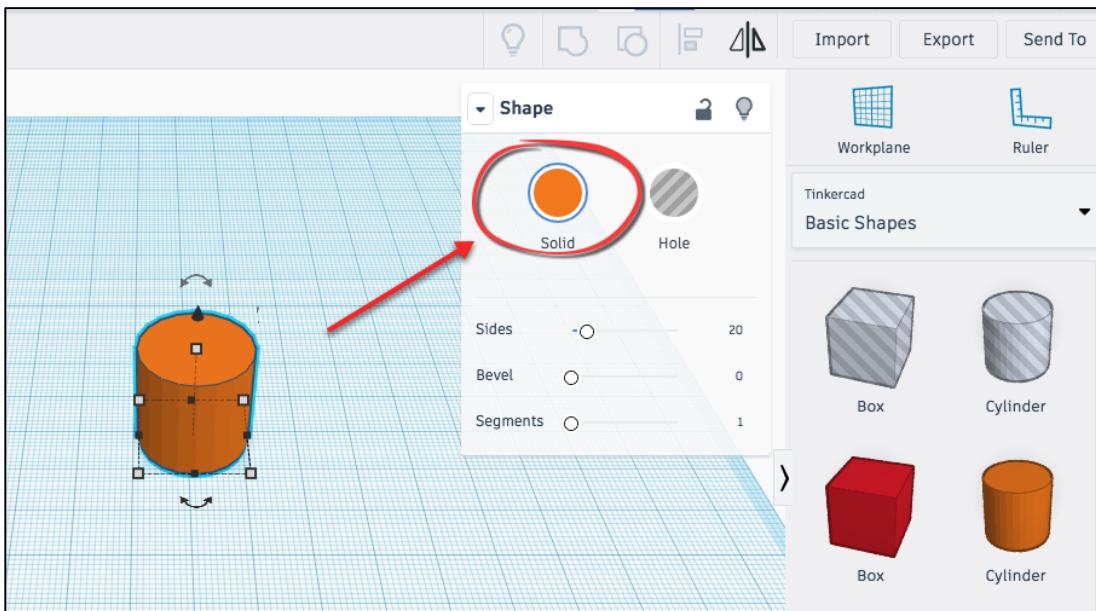
2. Once your account is created you will redirected to your new Tinker space. Click on “create new design” to start working on your 3D model.



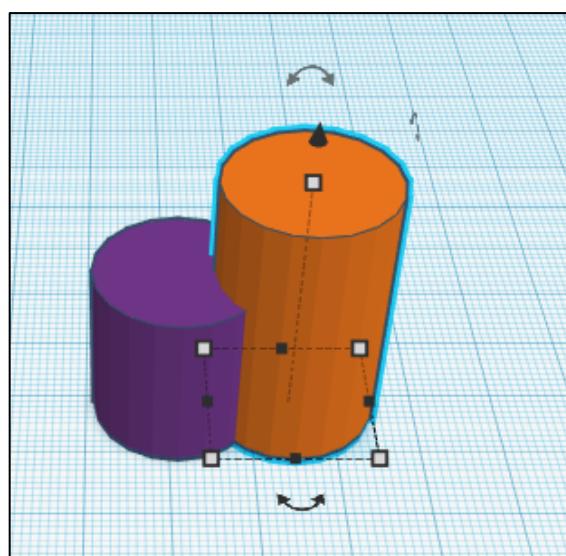
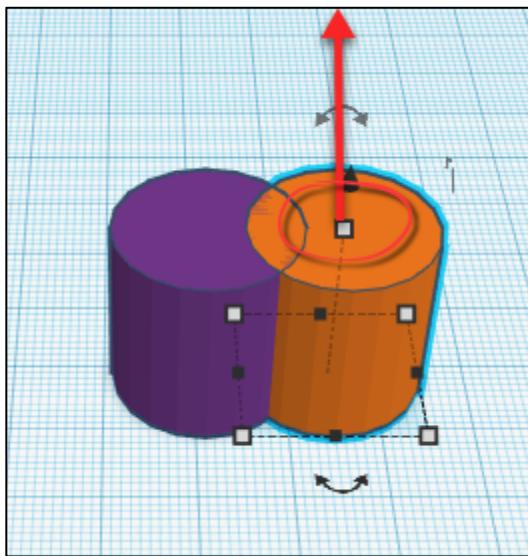
3. Select the cylinder on your right and drag it to the workplane.



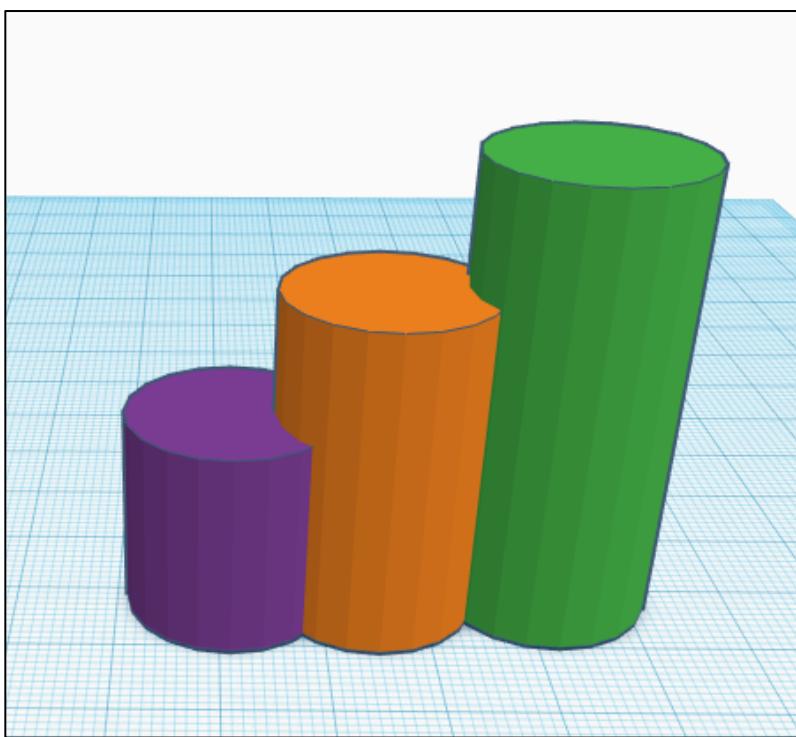
4. Click on the shape and change the color by clicking on the colored circle. A Pallete full of colors will open, choose to change to purple.



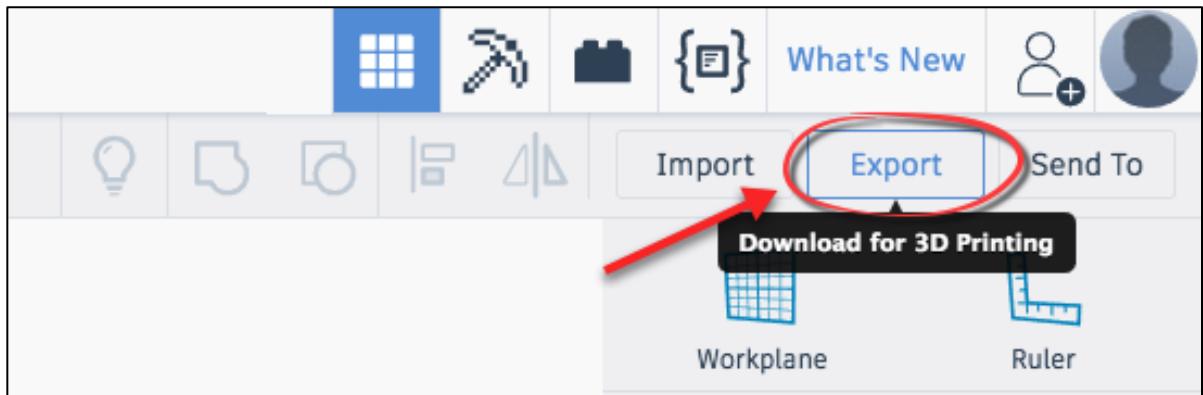
5. Insert a new cylinder by dragging it to the workplace. Click on the top white square and drag upwards to increase the height of the cylinder.



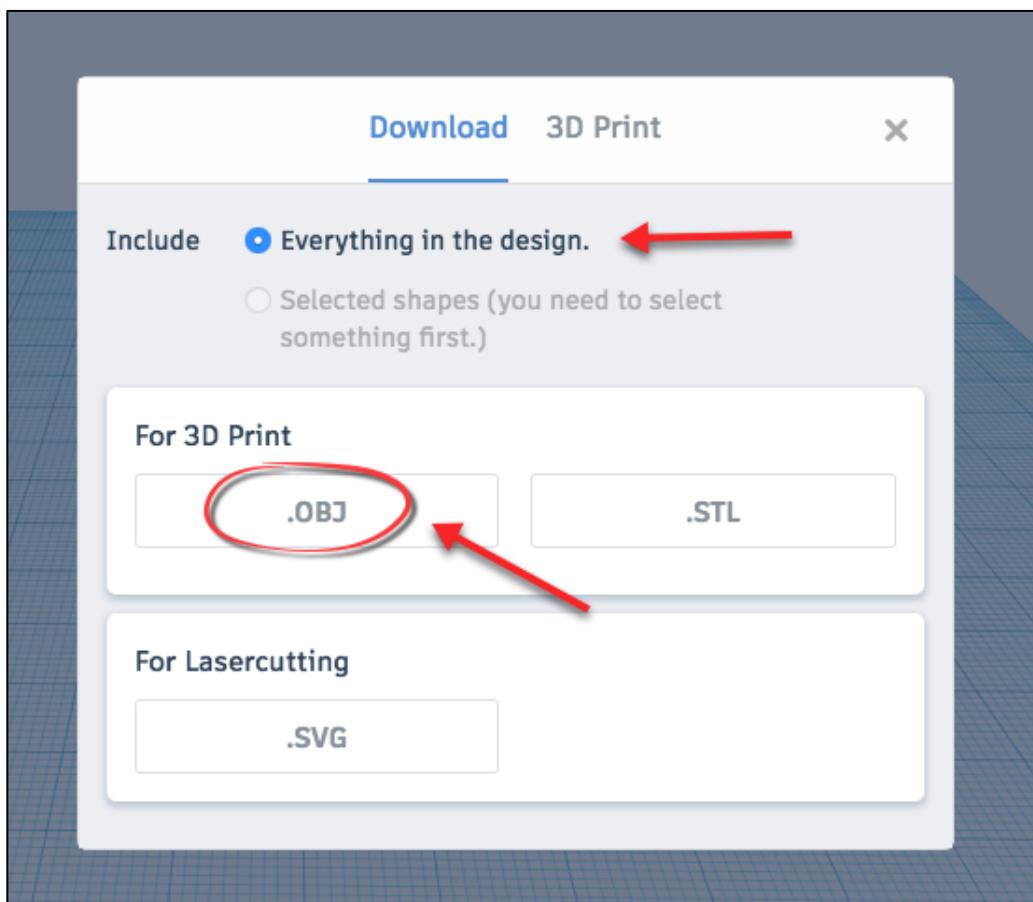
6. Repeat steps 4 and 5 to add a new cylinder, increase the size and change the color. Your final object should look like this:



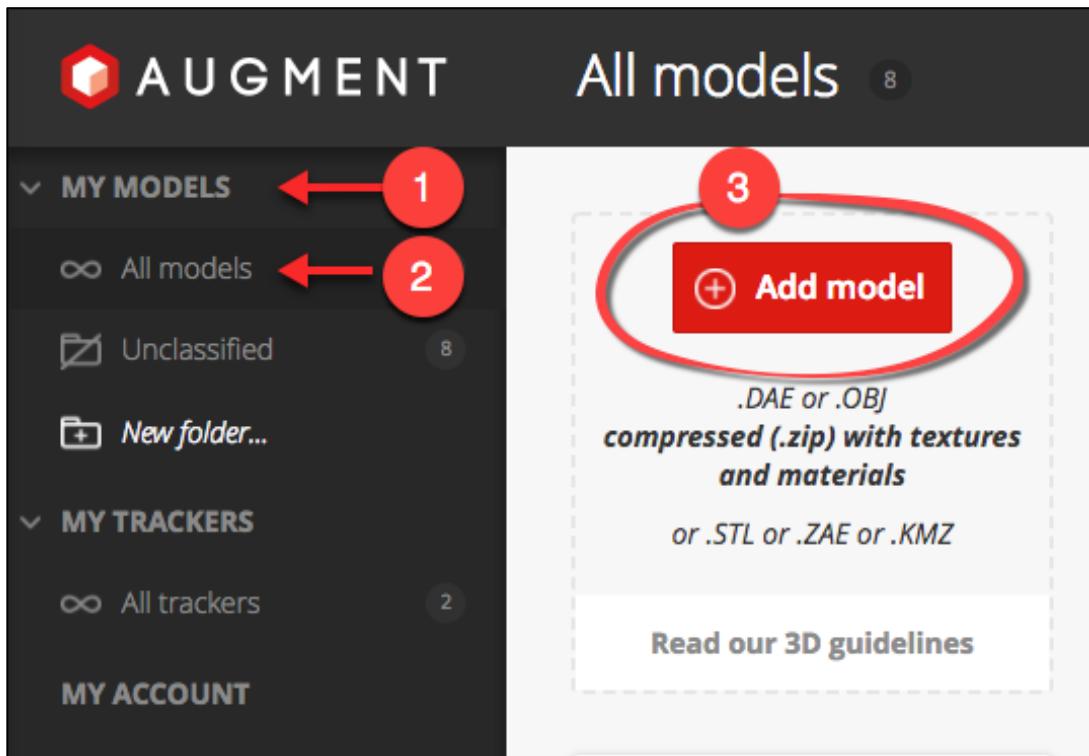
7. Click on “export” to download your object to your computer.



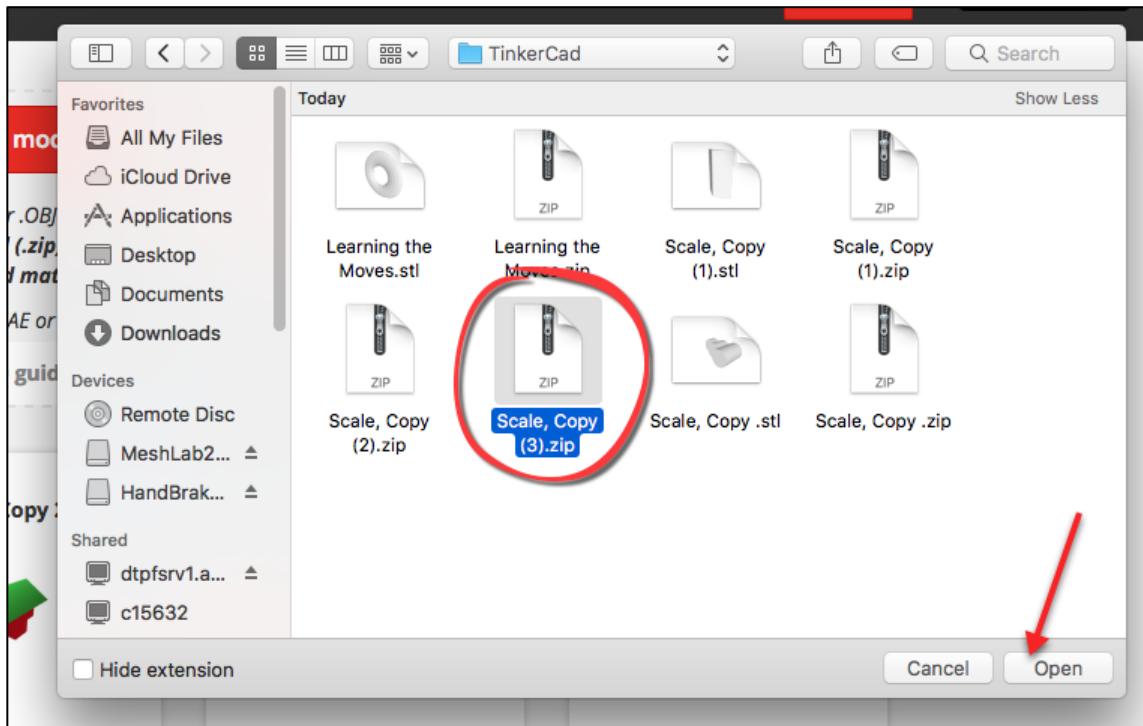
8. Check “Everything in the design” option and under 3D printing options click on “.OBJ” button.



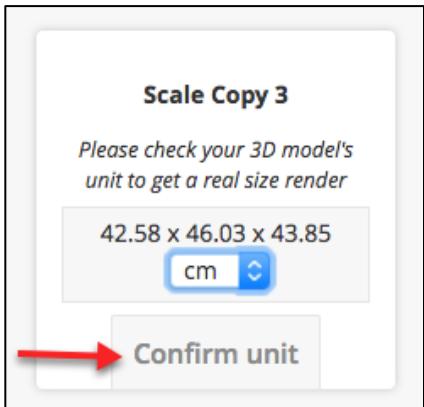
9. Go to your Augment web account > My Models > All Models and click on “Add Model”.



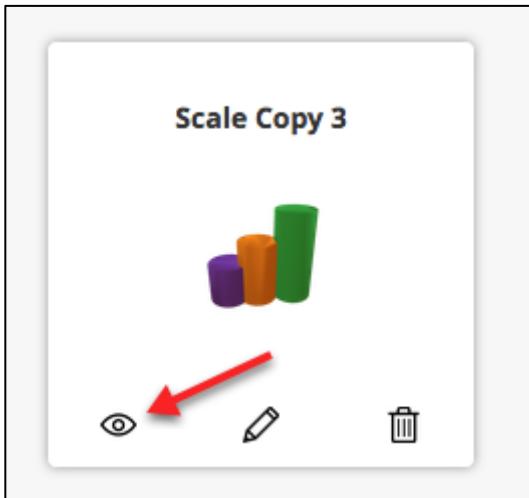
10. Open the .OBJ file that you downloaded in step 8.



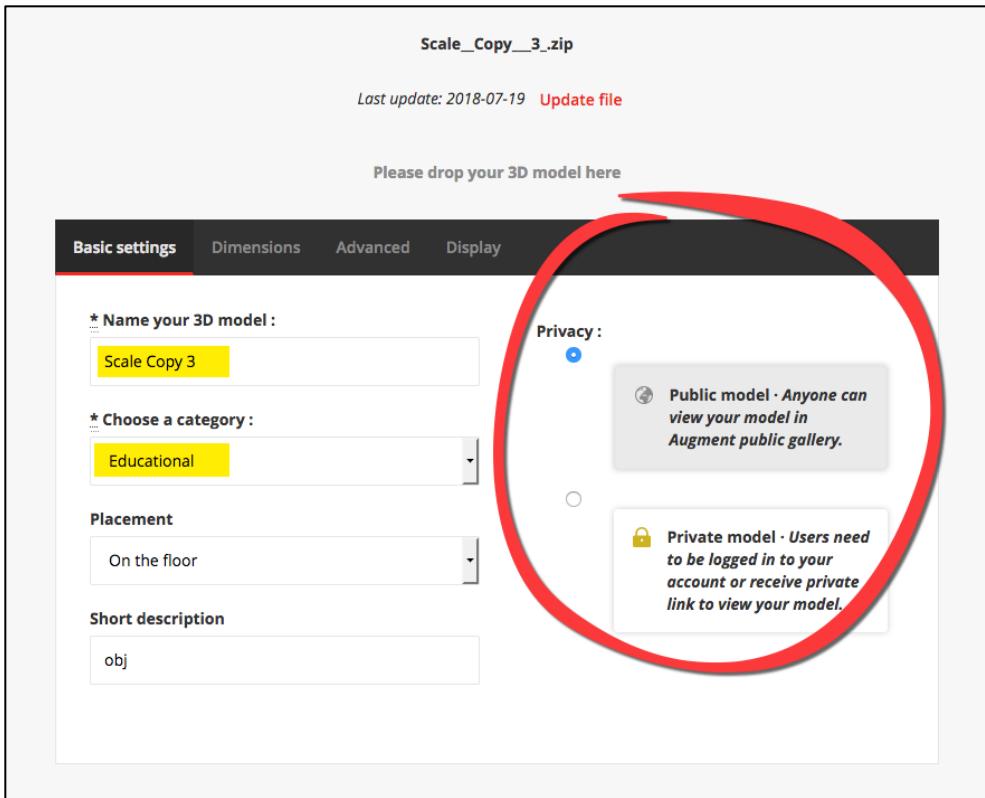
11. Here you can select the actual size of your model. Confirm Unit size and click on "Confirm unit"



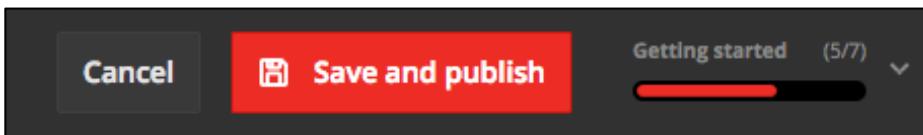
12. Click on the eye to access to your model.

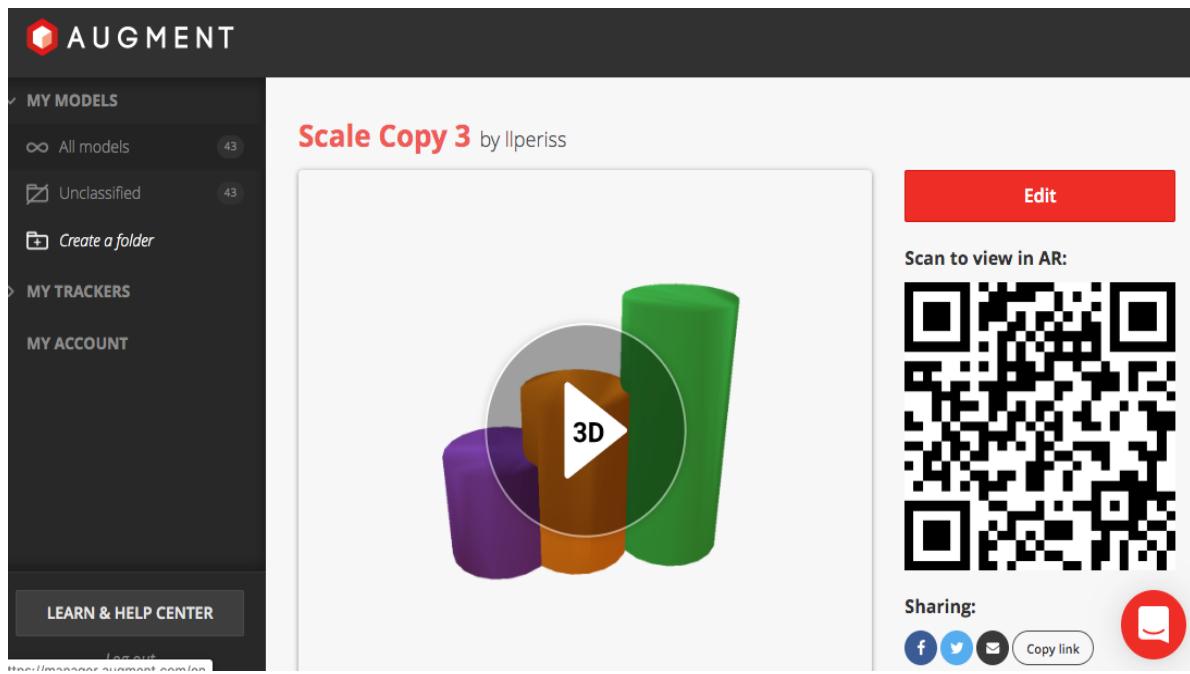


13. Give a name to your model, choose a category, check the privacy options.



14. Click on “Save and Publish”.





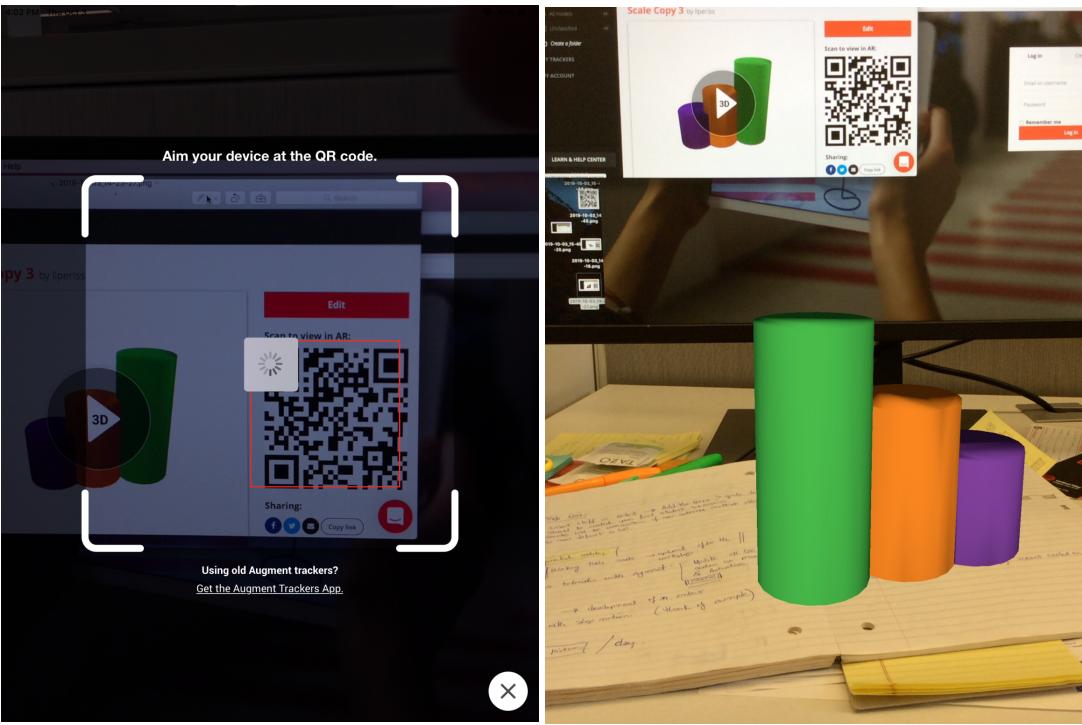
15. Open the App in your phone and scan the QR code.

Welcome!
Start visualizing 3D models
in augmented reality

[Explore Public Galleries](#)

Already have an account? [Login](#)

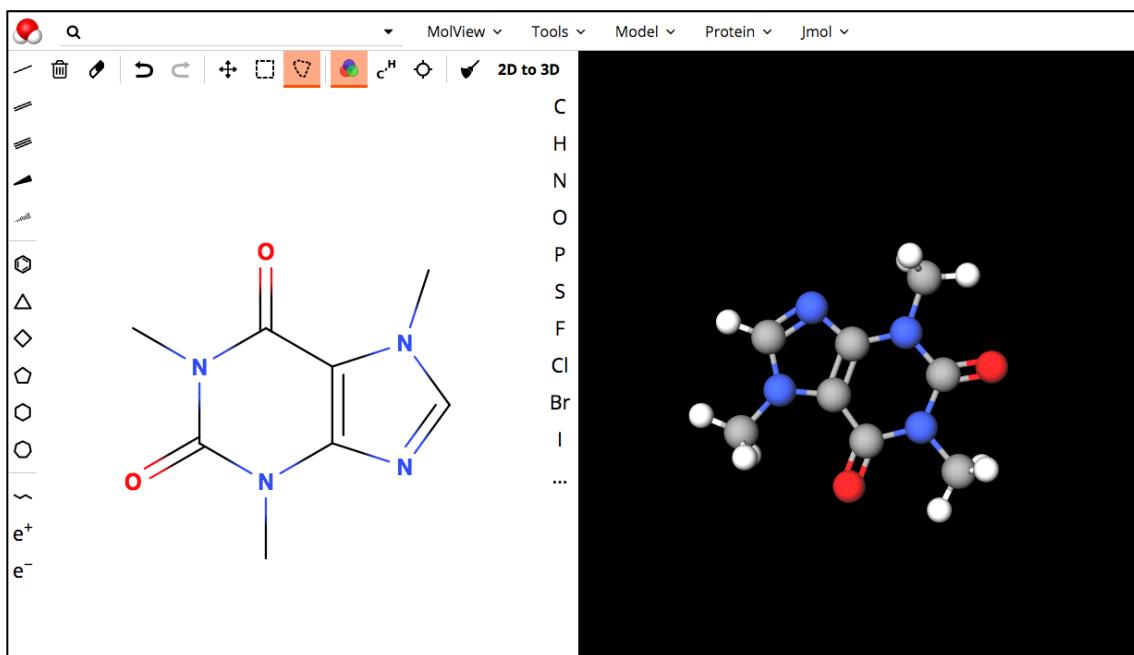




Create a 3D molecule:

There are many different softwares available to create 3D molecules. In this tutorial, we will use web base online tools that are available for free. None of them requires signing up for an account.

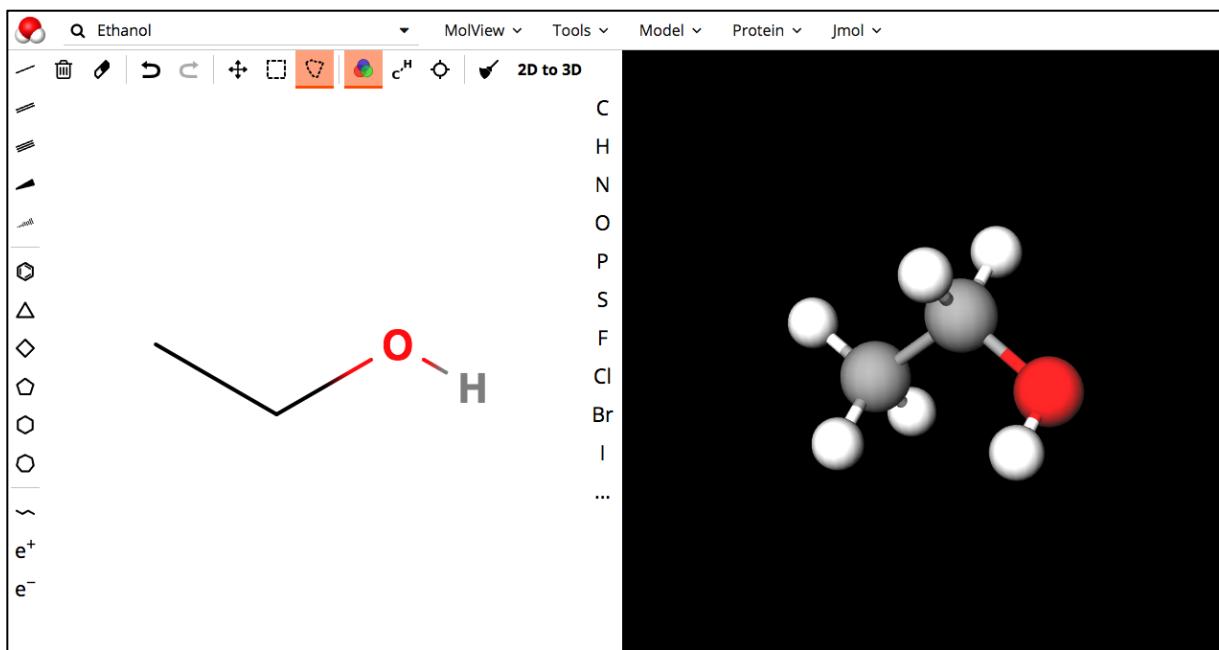
1. Go to [molView](#) website. MolView is an intuitive, **Open-Source Web-Application**. Is mainly intended as web-based data visualization platform. You can use MolView to create your own molecules, search through different scientific databases including compound databases, protein databases and spectral databases, and view records from these databases as interactive visualizations using WebGL and HTML5 technologies. MolView default view will look like this:



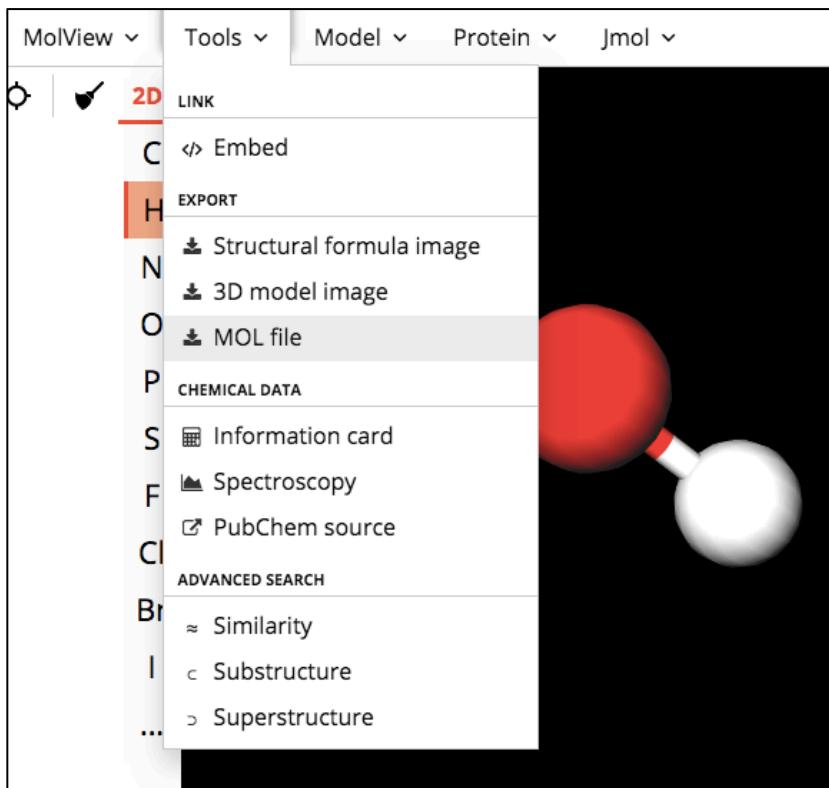
2. Write “ethanol” on the search field.



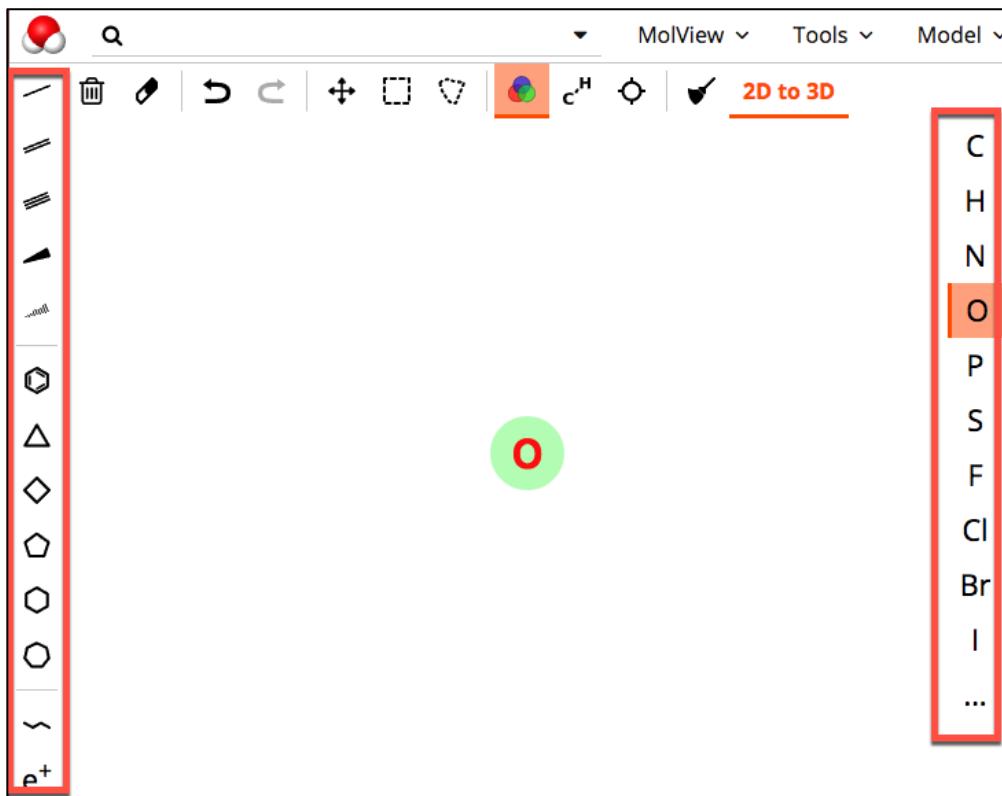
3. Check that you have the right molecule.



4. Export your molecule as a “MOL” file.



You can also create your own molecule using the editing tools on the top and side bars.



5. Go to [realityconvert](#) and upload the “.mol” file that you saved to your computer in step 4.

ABOUT REALITYCONVERT

RealityConvert is software tool, which allows users to easily convert molecular objects (stored as pdb or sdf files) to high quality 3D models directly compatible for Augmented and Virtual Reality (AR-VR) applications and for 3D printing. Models are generated in mtl/obj or stl formats including a tracker picture and a UV map to be used in large number of applications.

SOURCES **SUBMIT A JOB**

6. Check the input file format and and submit the job by clicking on submit.

SUBMIT YOUR MOLECULE

 **MolView.mol**

File have to include only one compound (size < 200 lines)

Notes: - be sure to have a correct 3D structure optimized
- RealityConvert is optimized to generate high quality model for small molecules.
- If your molecule exceed 100 atoms used the command line version (> 1hour).

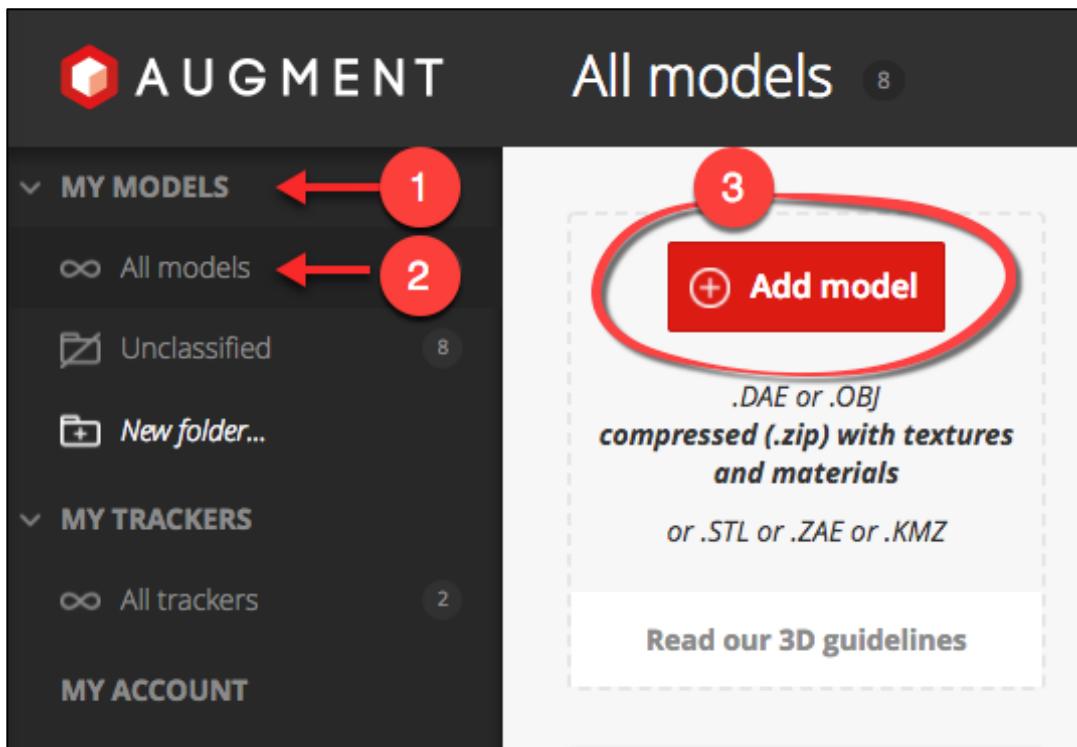
 Input format: .sdf, .mol or .pdb .wrl

7. Download your model (.OBJ).

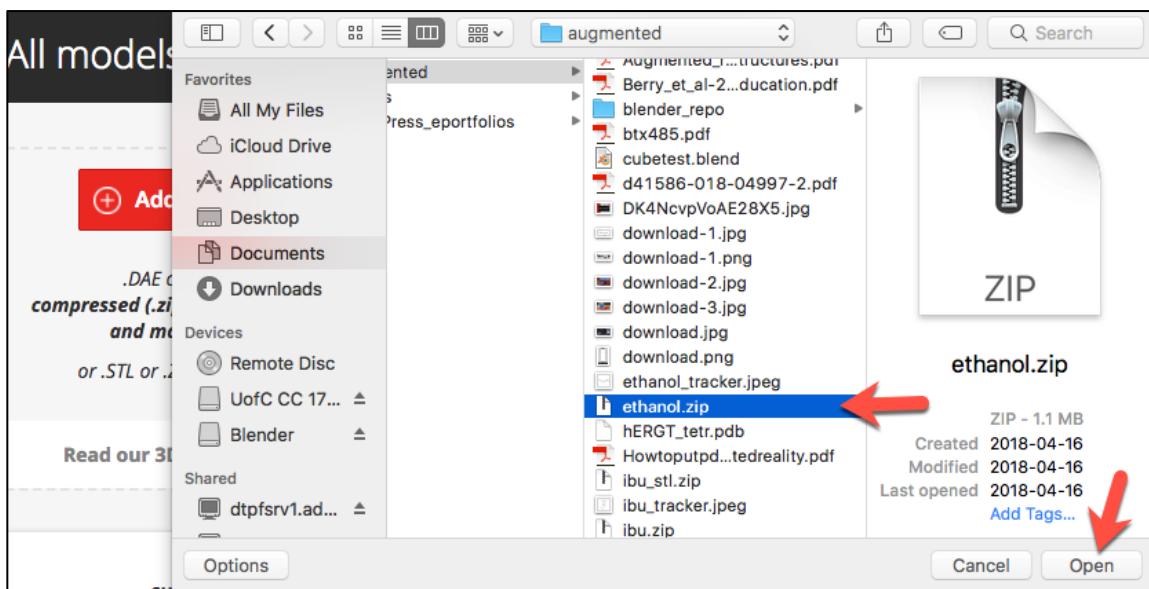
DOWNLOAD YOUR MODEL



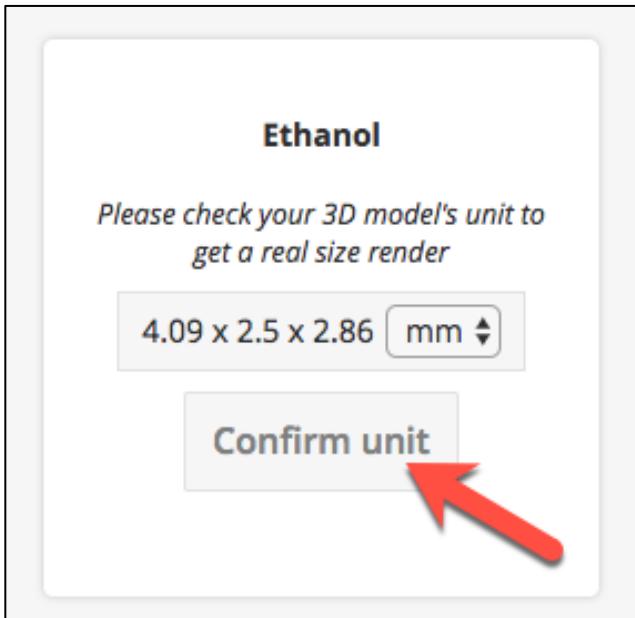
8. Go to your Augment web account > My Models > All Models and click on “Add Model”.



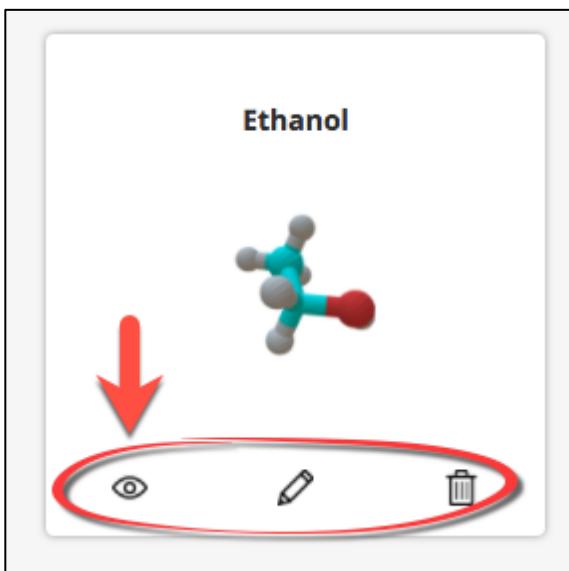
9. Open the .OBJ file that you downloaded in step 7.



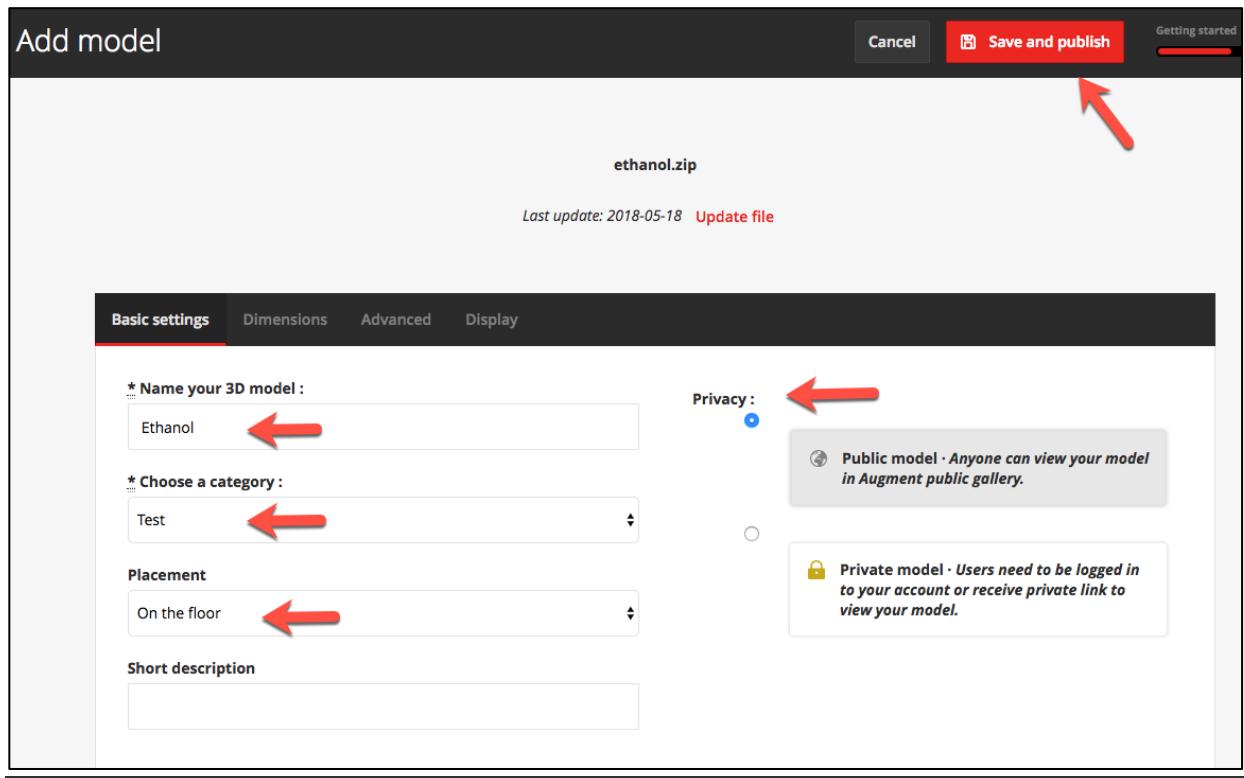
10. Check the model's size and click on "Confirm unit". This is to set up the actual size of your model.



11. Click on the eye to access to your model.

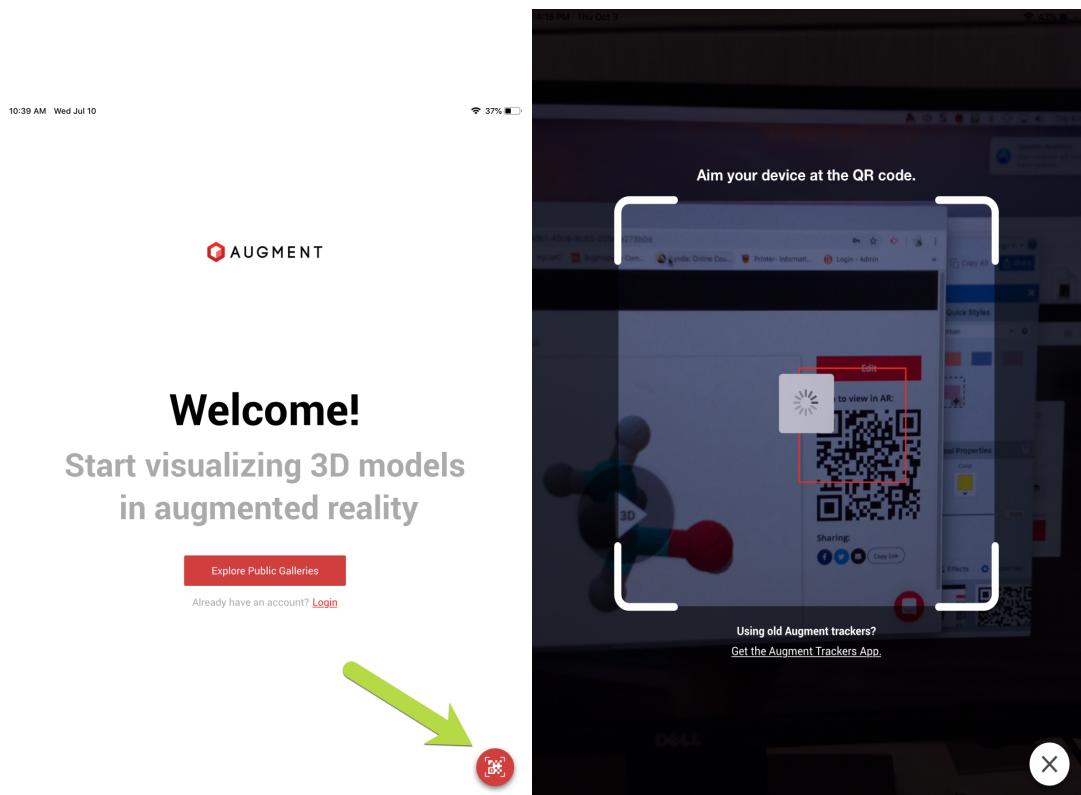


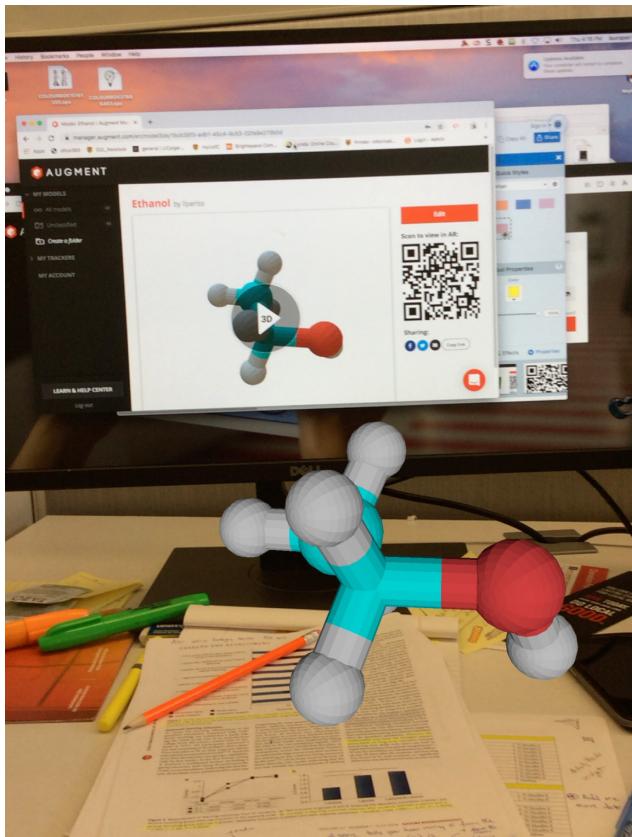
12. Give a name to your model, choose a category, check privacy options. Click on Save and Publish.



The screenshot shows the Augment app interface. On the left, there is a sidebar with navigation options: 'MY MODELS' (All models 43, Unclassified 43, Create a folder), 'MY TRACKERS', and 'MY ACCOUNT'. At the bottom of the sidebar are 'LEARN & HELP CENTER' and 'Log out'. The main area displays a 3D molecular model of ibuprofen (ibuprofens) by user llperiss. The model is shown in a 3D viewer with a play button icon. To the right of the viewer is an 'Edit' button. Below the viewer is a QR code labeled 'Scan to view in AR:'. At the bottom right are sharing options: Facebook, Twitter, Email, 'Copy link', and a red message icon.

13. Open the App in your phone and scan the QR code.





Check these additional resources for available 3D models and file formats.

Models' repositories:

- <https://sketchfab.com>
- <https://artsandculture.google.com/project/cyark>
- <https://poly.google.com/>
- <https://www.turbosquid.com/Search/3D-Models/free/blend>
- <https://www.blendernation.com/category/art/repositories/>
- <https://www.blendernation.com/2018/03/02/high-quality-skull-free-asset-download/>
- <https://3dprint.nih.gov/>

File Formats:

<http://www.augment.com/help/3d-file-format-guidelines/>