

East Tennessee State University

## Digital Commons @ East Tennessee State University

---

ENGR 1110: Engineering Graphics

---

2022

### Module 05: Mirrors and Fillet

Leendert Craig

*East Tennessee State University*

Follow this and additional works at: <https://dc.etsu.edu/engr-1110-oer>



Part of the [Engineering Education Commons](#)

---

#### Recommended Citation

Craig, Leendert. 2022. Module 05: Mirrors and Fillet. *ENGR 1110: Engineering Graphics*.  
<https://dc.etsu.edu/engr-1110-oer/6>

This Instructional Materials is brought to you for free and open access by Digital Commons @ East Tennessee State University. It has been accepted for inclusion in ENGR 1110: Engineering Graphics by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact [digilib@etsu.edu](mailto:digilib@etsu.edu).

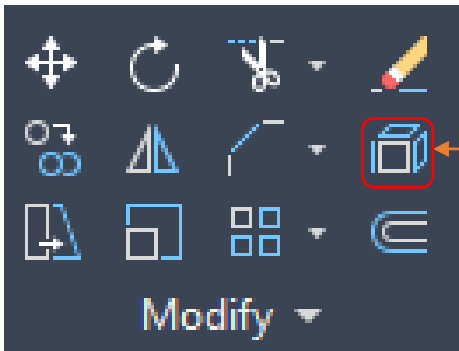
# Mirrors



The presentation and images by East Tennessee State University are licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless noted otherwise.

# Modifying

Objects such as Polylines, rectangles, polygons, arrays, and other single piece objects, must first be exploded into the sections that make up the part.



To use the explode tool: first select the tool, or type Explode on the command line then the object and press enter.

Tools will typically appear for selection after typing the first letter or two of the name.

Fillet and Chamfer are modifications to a part.

# Fillets and Chamfers

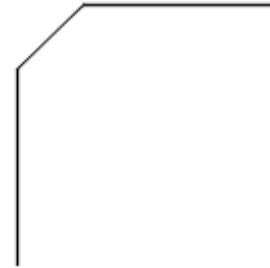
Edge



Fillet



Chamfer



Fillets are rounded corners.

Chamfers are cuts at edges to allow edges to slope gently instead of remaining pointed.

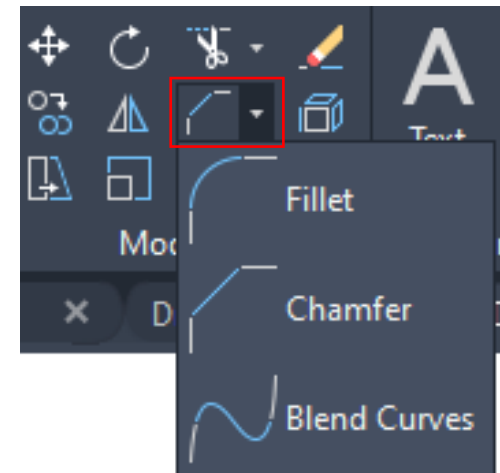
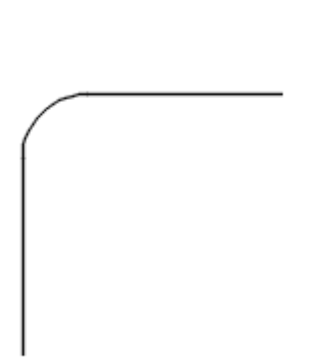
They are used to remove sharp edges, which are prone to breaking, and allow things to nest together easier.

# Filletlets

To create a Fillet, pick the Fillet tool from the Modify tab or type Fillet in the Command line.

Type > R. Press enter. Type > size of Fillet radius.(ex.25) Press enter.

Select edges to be Filleted.



# Chamfers

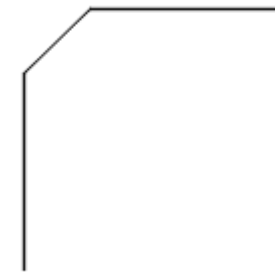
To create a Chamfer, select from the tool pallet or type Chamfer in the command line.

Type > D. Press enter. Specify Chamfer's first size. Press enter.

Specify Chamfer's second size. Press enter.

Select adjacent lines to apply Chamfer to.

Chamfer's require 2 dimensions: 1 is the horizontal setback distance from the corner and the 2<sup>nd</sup> is the vertical set back distance from the corner.



# Offsets

The Offset tool allows precise placement and replication of an object.

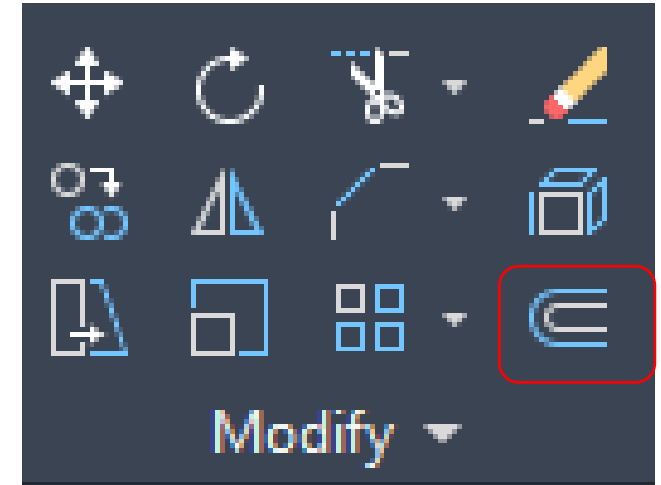
To use the tool we select it, or begin to type offset into the command line.

Next type in the distance to offset.

Select the object.

Move the cursor to the side of the object you want the offset to appear on.

This maintains a specified edge distance.



# Symmetry and Geometric relationships



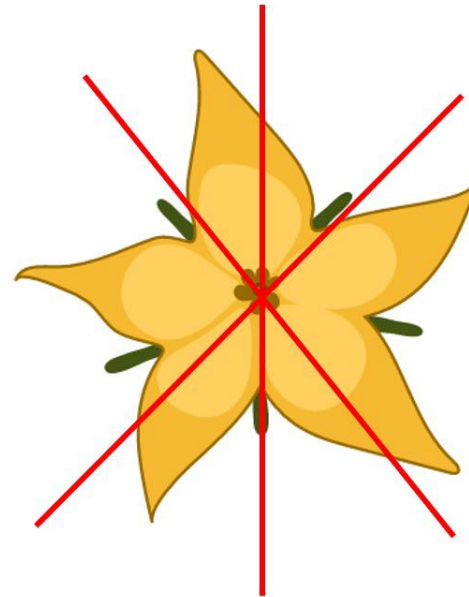
Title: Symmetry of the Nature  
Author: Uchurappa Mala  
Source: [Wikimedia Commons](#)  
License: [CC BY 4.0](#)

**Bilateral  
symmetry**



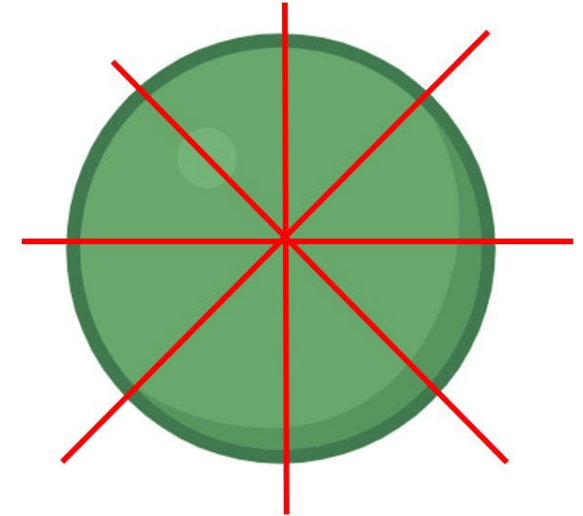
*Drosophila* (fruit fly)

**Radial  
symmetry**



Actinomorphic flower  
e.g. lilies

**Spherical  
symmetry**



Coccus bacteria e.g.  
*Streptococcus*

Title: Diagram comparing bilateral, radial, and spherical symmetry  
Author: [Charl Hutchings](#)  
Source: [Wikimedia Commons](#)  
License: [CC BY 4.0](#)



# Symmetry and Geometric relationships

Many objects contain symmetric or geometric relationships along one or more axes.

These relationships make it possible to draw a portion of the object, then replicate it to complete it.

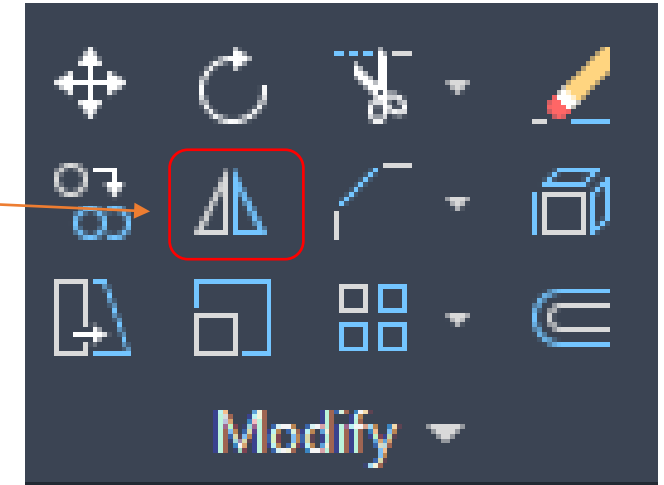
It also permits completion with missing dimensions.

# Mirror

The Mirror tool allows replication of parts or entire objects.

Mirror also allows completion of objects.

Mirror can be created along a line or around a point.



# Mirror along a line

Select the tool or type Mirror in the command line.

Select all of the geometry to be Mirrored. Press enter.

Select the first point along the mirror line.

Select the second point.

The object will mirror across the line the 2 points are on.

The software will ask if you would like to delete the source object.

Select appropriate answer.

# Mirror around a point

Select the tool or type Mirror in the command line.

Select all of the geometry to be Mirrored. Press enter.

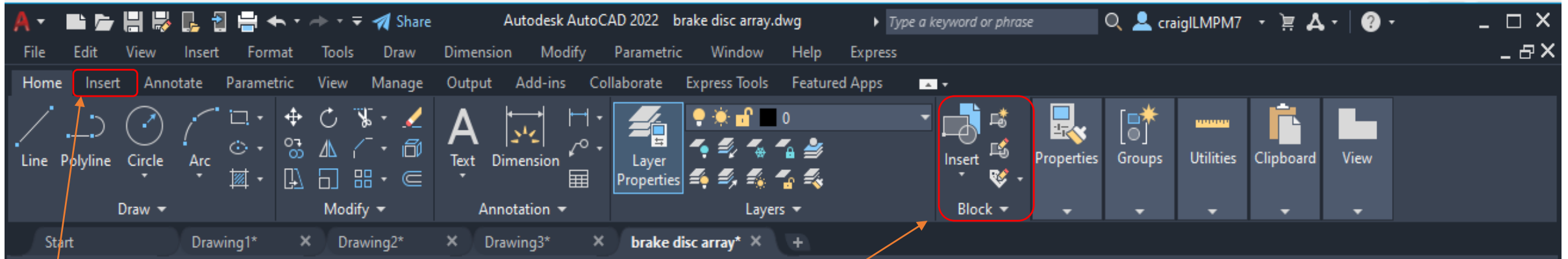
Select the point to mirror around.

Move the mouse to set the correct orientation of the mirror,  
then left click.

The software will ask if you would like to delete the source object.

Select appropriate answer.

# Blocks



Blocks are accessed from the block section on the home tab, on the insert tab, or typing block into the command line.

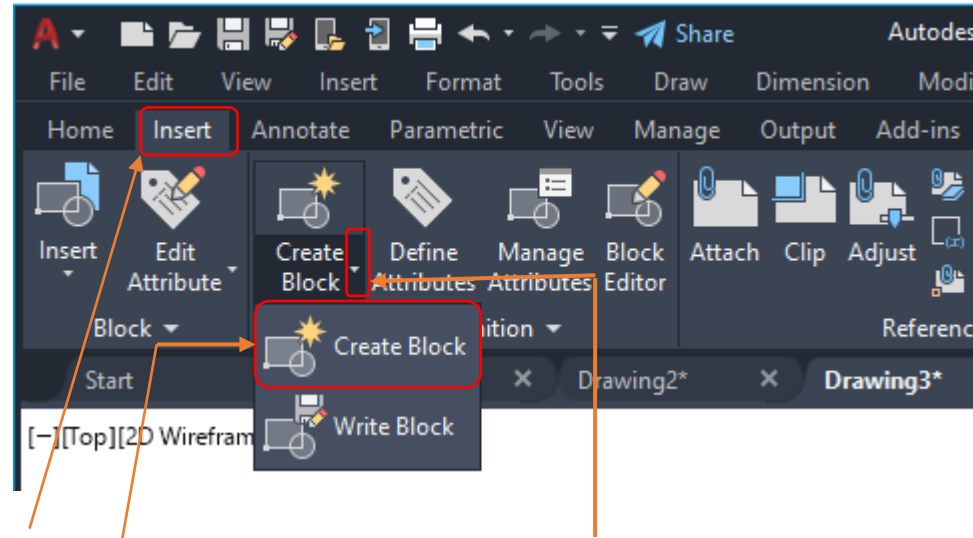
# Blocks

Blocks creates a single object from multiple objects that can be moved and scaled as one or separately.

Blocks imports .dwg files into current projects.

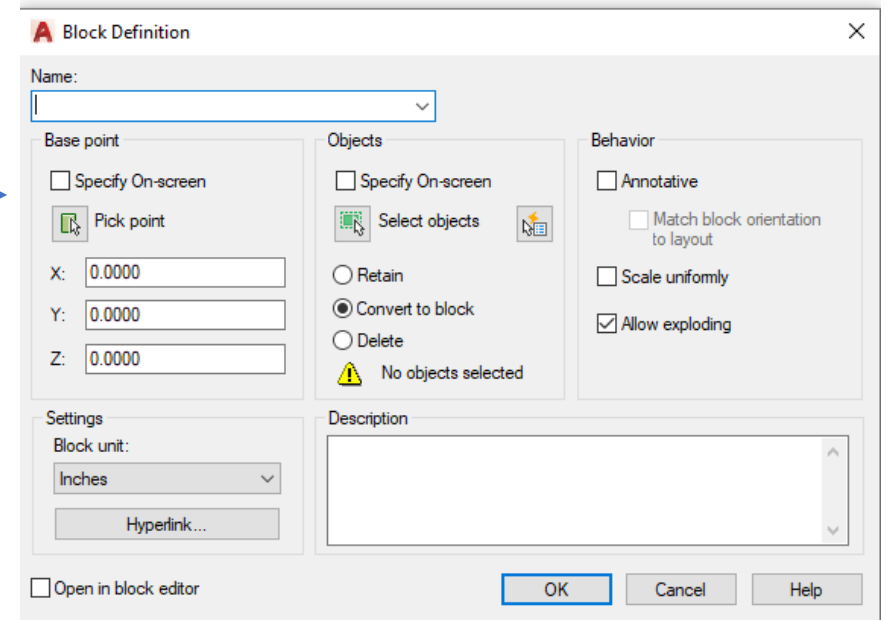
Simplifies inserting, replicating, and scaling large quantities of objects.

# Creating Blocks



Select the insert Tab, select Create Block dropdown arrow, select Create Block, or type Block.

The Block Definition window opens.



# Blocks

Name the block

Choose insertion method. Onscreen

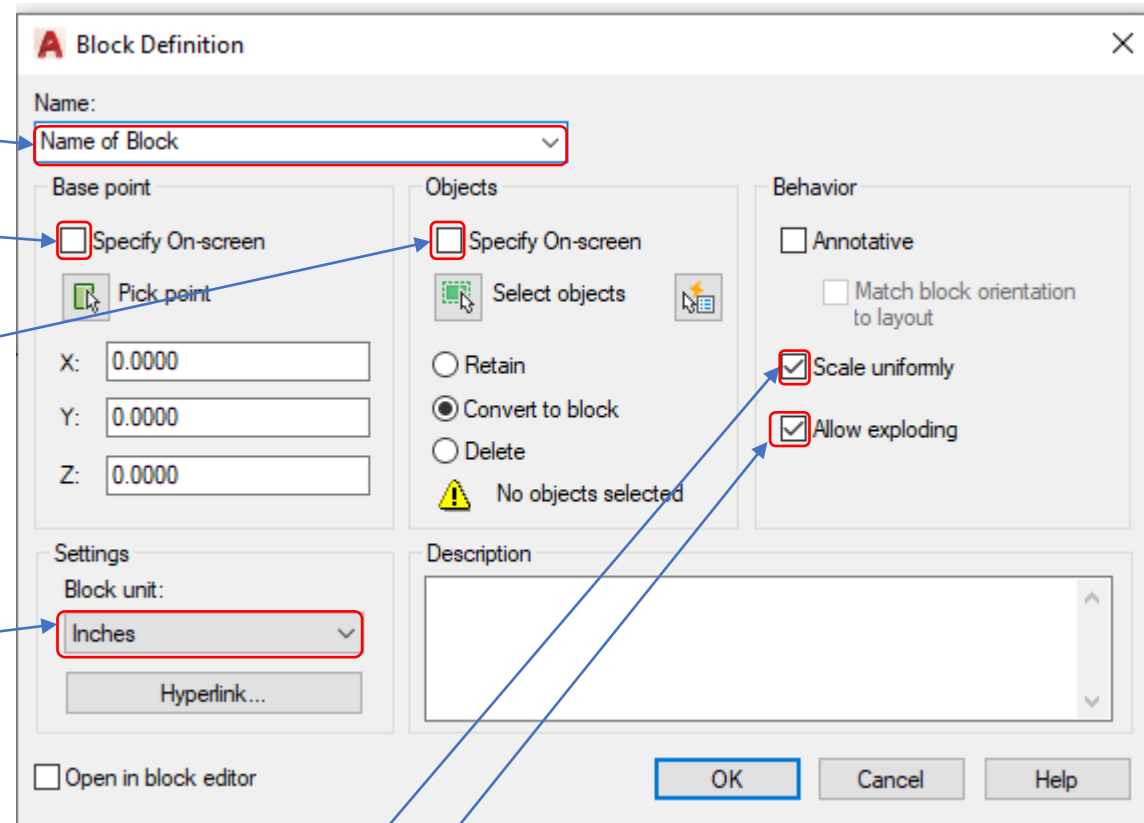
Selection normally.

Choose Selection method. Onscreen

Selection normally.

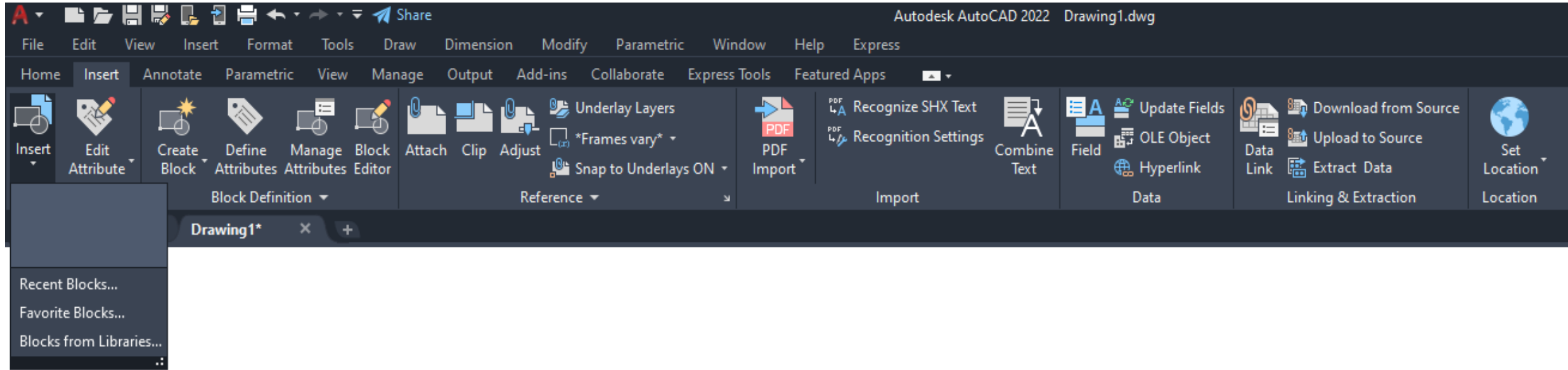
Choose units.

Select Scale uniformly and Allow exploding.





# Blocks



To insert a block:

Select the insert tab. Click the insert dropdown, then

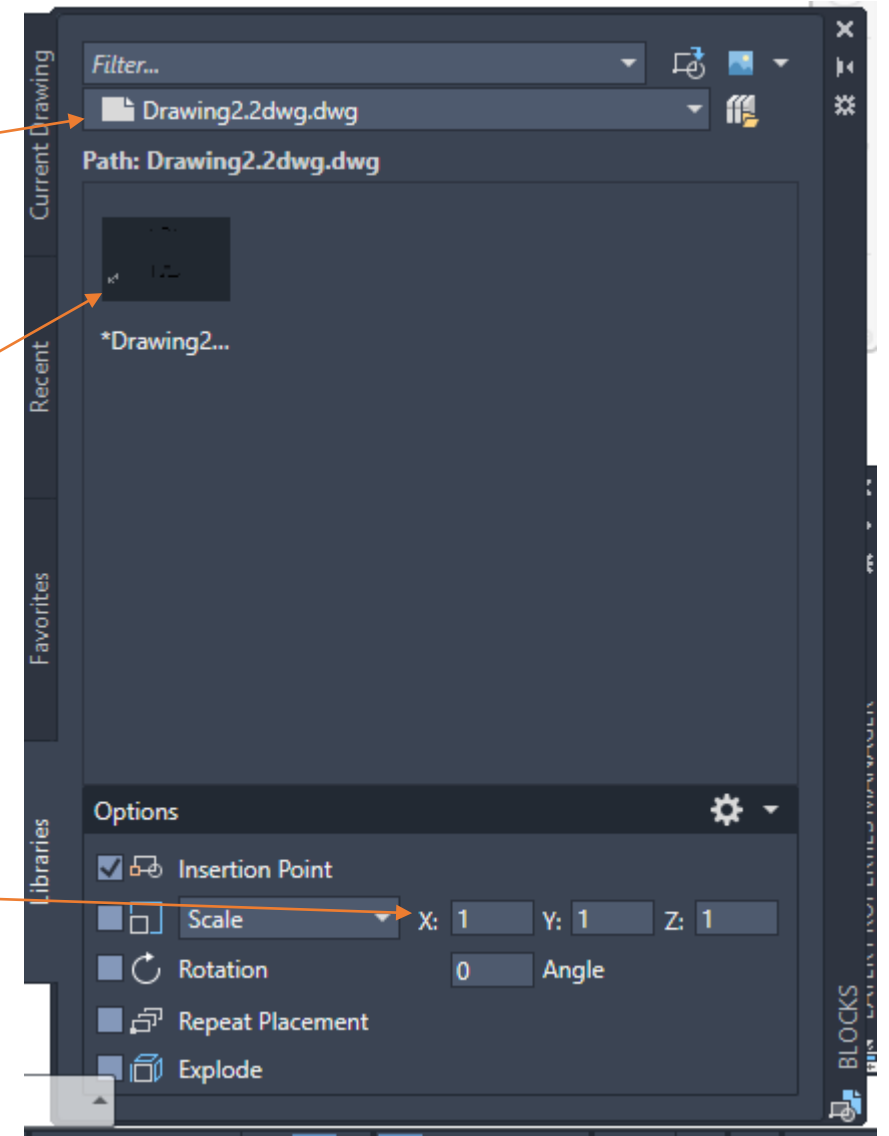
pick from the 3 choices that allow insertion of the block.

# Blocks

Once the Block tool opens a block can be selected a block from the dropdown.

Selected Block will appear here and can them be dragged to the appropriate location.

The dimensions of the block can be manipulated from here, prior to placement.



# Blocks

Once the block has been dragged to the correct position you can left click the mouse to place it.

To edit or modify anything contained in the block you must explode it first.