

## DIGITAL MEDIA | CMU SoA PRECOLLEGE 2019 | WEEK TWO

0708\_ASYMMETRY: There's a long history in architecture of using tools of orthographic projection to create abstract representations of space, as a way of mapping and describing spatial qualities and relationships. Together, multiple views (e.g. a plan and section) can start to talk about the spatial qualities of a composition. Reference your sketches to draw in 2 (lines and polylines) of the 2D views your most current iteration of your 3D spatial composition. Use Extrude to begin to occupy the full 5" cubic space. We will go over the process of creating a true plan oblique axonometric in Rhino (not perspective, not isometric); the final should be scaled 1:1 and printed to PDF.

1. Use "Line" and "Rectangle" to draw your plan and section in 2D. Take advantage of orthographic and project[ion] snaps. You may need to use "Scale" and "Scale1D", or "Trim" and "Split" and "Join" tools when drafting your composition in 2D. "Move" may also come in handy when making adjustments to the positioning of your lines. Make sure all lines are closed polylines (not open). These should be using the "plan\_CL" and "section\_CL" layers in the "ASYMMETRY" layer group.
2. Use "Extrude" (on "ASYMMETRY" > "extrusions" layer), solid, to extend these lines perpendicularly across the extent of the bounding box.
3. Select everything on your "ASYMMETRY" > "plan\_CL", "section\_CL", and "extrusions" layers and "Copy" from one bounding box to the other (we recommend you use your endpoint snaps). One bounding box is going to be used as a visual reference and will not be altered, so we will select it and everything within it and "Lock" ("Unlock" will unlock); the other will be distorted so we can create a to-scale plan oblique axonometric (with the angles we will be using, this is also known as a military projection).
4. Select everything within and including the other (not locked) bounding box, we next need to "Rotate" in Top or 3D view 45 degrees. In our Front view, we should now see text indicating that we are viewing what was originally the front and the right side of the cube.
5. With everything still selected, we next "Shear" within the Right view (start at the origin 0,0; reference point will be 10 to the right of the origin point, angle +45 degrees). We should now see the original top, front, and right sides of the cube in the Front view panel.
6. If we look in our 3D view, we can see the object itself has been distorted - but our locked duplicate should be untouched and we can reference this later if we need to.
7. We can hide the layer "orienting\_text" for now and "DupEdge" all edges of the bounding box cube. We can "Hide" the original object after duplicating the edges ("Show" will show).
8. Selecting everything on the "extrusions" layer, we use the "Intersect" command to create lines where our extrusions from the plan intersect those from the section - by default, Rhino doesn't really care or notice these intersections, so if we want them to appear in the drawing, we need to generate them.
9. Selecting everything on "extrusions" and "bounding\_box", we next "Make2D" in the Front view. The layout should be the "Current view" and we want to "Show hidden lines" and "Maintain source layers" - we can use the default layer settings.
10. Move the result off to the side in Top view so it is not overlapping with anything. We can also "SelLast" and "Group" to make these lines easier to manage.
11. We will repeat this operation with the plan/section lines. "Group" and align ("Move" with snaps") with the other Make2D group.
12. Draw another "Rectangle" 11x17Inches and position it so the axonometric composition you just created is in the center of this layout.
13. Important printing settings:
  - Paper Size Tabloid (portrait)
  - View Top
  - Set Window (should align with your 11x17 rectangle)
  - Vector output
  - Match pattern definition
  - Scale by 1
  - Default line width .5mm
  - Print to PDF

WHAT: The final output for this assignment consists of one pdf, sheet size 11x17". File name to contain your last name (sample file name for this assignment: wk2\_perry\_asymmetry.pdf).

WHEN: Digital submission due at 8pm, July 8. Physical copies to be printed for studio, July 9.

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0710\_TRANSFORMATIONS: Follow demo (and/or [Youtube tutorial](#)) and explore some suggested transformations from the rectangular solid. Choose up to four transformations to execute cumulatively. Each step should be assigned to its own layer, and the solids should sit in the same plane (so you may need to toggle layers on and off). "Hide" all other objects in the file (can also do this using your layer settings). Set the view to the isometric direction that shows the most about your transformations. Important printing settings can match ASYMMETRY, but page orientation may depend on your design.

WHAT: The final output for this assignment consists of one pdf, sheet size 11x17". File name to contain your last name (sample file name for this assignment: wk2\_perry\_transformation.pdf). Be sure to save .3dm file for use in next week's assignment.

WHEN: Digital submission due at 8pm, July 10.

0710\_DEFORMATIONS: With your contour drawings as inspiration for an imaginary landscape, compose views with lighting to create a dramatic scene. Try to work with the original drawing, emphasizing denser areas as peaks for example. Three views, with adjustments to the lighting, should be rendered and brought into Photoshop; consider introducing figure(s) to suggest scale and how one traverses this new landscape.

1. Hide any layers not part of "DEFORMATIONS".
2. Draw a "Plane" 3x4inches on "DEFORMATIONS" > "originalSRF" layer.
3. Set one view to Perspective and Rendered.
4. Assign texture. Adjust offset and tiling of texture so your drawing takes up most of the sheet.
5. Duplicate onto "rebuiltSRF" layer.
6. "Rebuild" with the duplicate surface selected.  
Point Count U10 V12 (may have to swap depending on the orientation of your original plane - should form close to a square grid)  
Degree U3 V3  
Delete input  
ReTrim
7. "PointsOn" to display the new control points ("PointsOff" when necessary to turn off - if you want to select the whole object).
8. Toggle on Gumball and use the z axis to move points up and down to create a topography that responds to the drawing.
9. Reposition camera and use "SetSpotlightToView" to add some light to the scene, on the "lights" layer.
10. Toggle "PointsOn" and "PointsOff" and use "Move" or Gumball to refine placement and size of spotlight in Plan view.
11. Use the Properties panel to adjust the intensity and color of the spotlight.
12. Repeat as you see fit.
13. Save views using the Named Views Panel
14. Document Properties > Rhino Render  
Ambient light color change to dark grey  
Background solid color change  
Resolution: Custom inches 5x10 @ 150 dpi
15. "Render"  
When finished, save as jpg and open all in Photoshop.

WHAT: Final jpg at 11x17, consisting of three 5x10 images on one layout, sample file name wk2\_perry\_deformations.jpg, 150dpi.

WHEN: Digital submission due at 8pm, July 10.

OPTION TO RESUBMIT: If you choose to resubmit ASYMMETRY, DEFORMATIONS, or TRANSFORMATIONS, this deadline for revisions is due 8pm on Friday, July 12. Final evaluation will reflect both original and revised work. File names should add "rev" suffix to the end of the file name and not overwrite the original file.