


MAYA ARCHITECTURE: Model workshop

CONSTRUCTION METHODS

Construction methods in 5 steps:

(1) Plan. First, draw a plan of the building you want to build showing the face, side, and floor to have a general view. Then, determine the number of pieces required for construction as if it was a puzzle. Draw the pieces on paper to get a template. The model will be built of a series of pieces to assemble.

 **Advice:** A squared sheet of paper makes drawing easier by avoiding many measurements.

(2) Measurements. Now, choose the dimensions of your model: length, width, height. You will need a ruler, a note pad and maybe a calculator.

- If you want a small size model, you can transpose the measurements of the drawing directly on the material to cut by redrawing each piece on the material. The model will thus be the same size as the drawing.

- If you want a large size model (larger than the drawing), you must use a conversion scale by multiplying all dimensions of the drawing by a common factor. Example: If you want your model to be 5 times larger than the drawing, multiply each measurement of the drawing by five: $7 \text{ cm} \times 5 = 35 \text{ cm}$.

- If you are using the plans of a building whose measurements are in meters or feet, you must use the opposite method by dividing the dimensions of the plan by a scale allowing to reduce them to model size. Example: If you want your model to be 100 times smaller than the real building, divide each measurement of the drawing by a hundred: $35 \text{ m} = 3500 \text{ cm} / 100 = 35 \text{ cm}$.

 **Advice:**

*It is important to multiply or divide all measurements by the same factor to preserve proportions.

*If the model has a large quantity of pieces, it is preferable to number them and compile de measurements in a table (length, width, thickness). Example: No. 1: $22 \text{ cm} \times 30 \text{ cm} \times 7 \text{ cm}$.

*An easy method to convert real dimensions in model dimensions is to transform meters in centimeters and feet in inches. Example: $35 \text{ m} = 35 \text{ cm}$.

*Don't forget to account for the thickness of the material in your calculations.

(3) Cutting. The cutting is done with knives and rulers. First, you must draw the pieces on the material with a cut-out template or a table of measurements. For Styrofoam, a felt pen is ideal while for Foamcore a pencil is preferable. A square ruler will allow you to draw right angles while a metal ruler will allow you to cut straight. The width of the blade to use depends on the thickness of the material to cut; the thicker the material is, the larger the blade must be as a larger blade is also stiffer. To sculpt details, a small blade is preferable. To get a angled cut, tilt the blade while cutting. Make sure of always using a sharp blade for a clean cut.

 **Advice:**

- *Greasing the blade with oil or petroleum jelly makes cutting easier by reducing friction.
- *Styrofoam can also be cut with a hot wire.
- *To avoid leaving pen traces on the pieces, you can mark them with dots.
- *You must be careful to hold the knife straight to have straight edges for the assembly.

(4) Assembly. The assembly of the pieces can be permanent or temporary. If the model is bulky and must be moved frequently, it is preferable to have a temporary assembly where the pieces hold together with toothpicks for Styrofoam or pins for Foamcore. For a strong and permanent model, liquid white glue is ideal for porous and absorbent materials like foam and cardboard. You can use a spatula to spread the glue on wide surfaces and you must always apply pressure while drying to avoid air bubbles.

 **Advice:**

- *Some adhesives can damage surfaces. Strong glue can melt Styrofoam and tape can tear Foamcore.
- *Foamcore can be bent to form angles by making an incision in one of the cardboard surfaces which reduces considerably the work of assembly.

(5) Finishing. During the finish, you must prepare the surface of the material. At this point you can apply paint to cover imperfections or to add color or texture. A base coat is necessary for porous or colored Styrofoam but a single coat is sufficient for Foamcore. For Styrofoam, latex paint as a good adhesion but is costly while for Foamcore many types of paint work well such as acrylic paint which is more affordable.

 **Advice:**

- *To even porous surfaces or fill holes and cracks, silicone is ideal and some types can be painted.
- *You can even dense materials with sand paper and a sanding bloc, especially for joints.
- *You can sand Styrofoam lightly to increase the adhesion of paint.
- *To hide exposed foam surfaces (Foamcore), you can stick cardboard strips.