Constellation Miniatures

by Alexandre Karadimas

Make your own 1:64 miniatures with common household tools and materials

Terrain I

3 sizes of trees, including one with a platform for a miniature
Can be dissassembled into components less than 6 cm tall



Battle mat | 6 different road elements | Easily stowable with minimal space requirements

Houses and sheds: 8 sizes of walls from 18 mm to 210 mm, using the A4 paper system: the longer wall in one size is the smaller one in the next size



A10
37 x 26 mm



A9
52 x 37 mm



All houses but the smallest (A11, telephone booth sized) are **foldable**, taking a minimal amount of space when stowed, and easy to protect from dust.

A8 - 74 x 52 mm

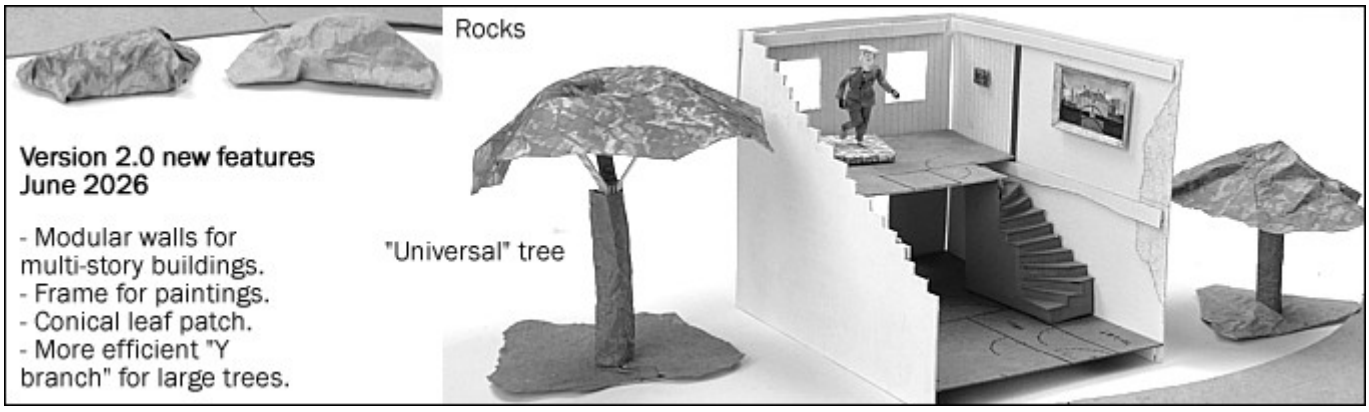


Stackable

A7 - 105 x 74 mm



Customizeable



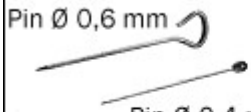
Download this booklet and others for free from **http://www.constellation-miniatures.com**
Visit the Youtube channel: https://www.youtube.com/@ConstellationMiniatures

Booklet 05 – Terrain_I Version 2.0 – June 2026

Tooling, Materials and Production aspects

T01

Tools required for all Constellation Miniatures designs

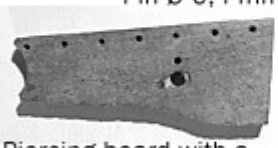












Piercing board with a Ø 4 mm hole drilled through it, larger holes are useful

(1) Mechanical pencil Ø 0,7 mm or less (2) Roller pen (even a depleted one) to draw folding lines.



(*) Use a toothpick to apply glue to parts

(3) Set square in metric (4) Stationery hinge clips (5) Household glue, in liquid or gel form (*)

Always cut downwards on a <u>cutting board</u> and never towards any part of your body.

Please don't cut yourself.

Cutting board: a flat piece of wood, MDF, thick plastic or any other suitable material

M01

Cardboard used in packaging is technically called "thin cardboard". We will distinguish between :

- "very thin" cardboard, as can be found for instance in biscuits packaging;
- "regular" **0,4 mm** cardboard found for instance in tissue boxes;
- "thicker" **0,5 mm** cardboard found in sturdier breakfast cereal boxes.

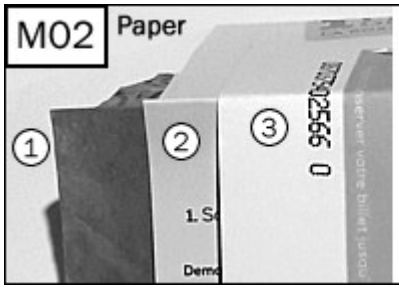
Glue works better on the **porous** side of cardboard packaging.
The smooth, printed side is better suited to be painted over.
Glueing two smooth sides together doesn't work well.



Accumulate several layers to measure the thickness. Here, the difference between regular and very thin cardboard is quite visible.

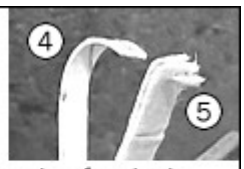
M02

Paper



(1) **Thin Kraft paper** can be found in paper bags for fruits & vegetables. (2) You can use enveloppes for **regular paper**. (3) **Rigid Paper** can be found for instance in train tickets and magazine covers, it can retain its shape when folded.



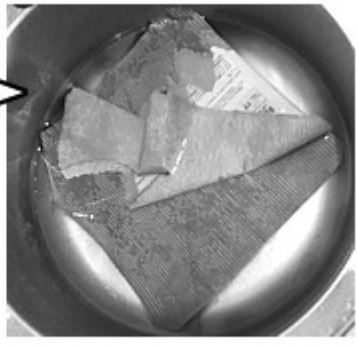


Rigid Paper is made of a single layer (4) whereas cardboard (5) is made of several layers that come apart when bent.

M03

How to make miniature sheets of corrugated metal from corrugated cardboard

Soak corrugated cardboard completely into water. After a few minutes, the layers come loose. Carefully peel off the other layers.

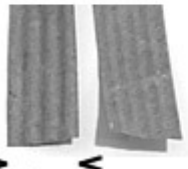




Let the corrugated sheet dry on a flatsurface.



Slimmer cardboard has narrower corrugations

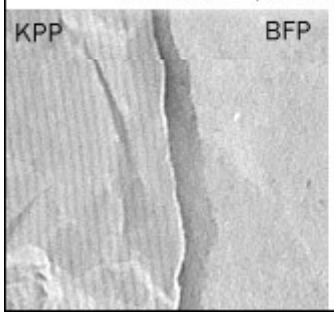


14 mm



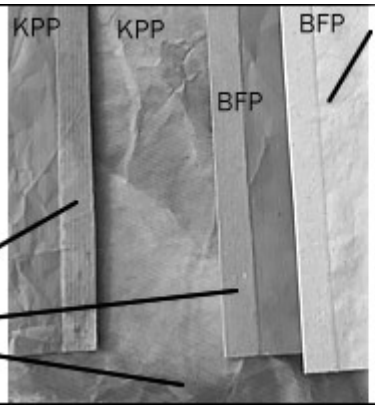
Sheets of corrugated metal are commonly 900 mm wide. At a scale of 1:64 this translates to 14 mm. Working with these 14 mm sheets leads to more realistic results.

M04 Two common sources of large pieces of **brown paper** are Kraft packing paper (here named KPP) and brown filling paper (BFP).



You can use either for the tree leaf patches.

The same colour, Pale Green (see A10 below), has been applied to:
- a road made of KPP
- a road made of BFP
- a battle mat made of KPP



Natural BFP looks like sand in its colour and texture.

The same Pale Green colour appears lighter and homogenous on BFP, darker and uneven on KPP.
It is recommended to use the same material for the road parts and the battle mat.

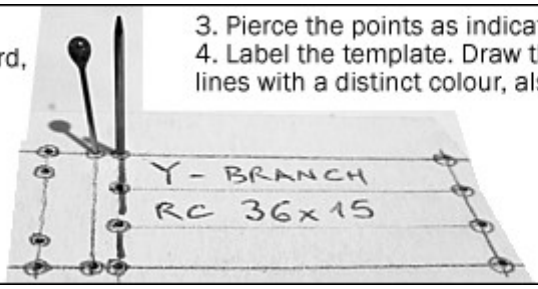
Some parts have a simple design and are best draw in batches, using a ruler. Severals examples are shown in the Steps illustrations.

Other parts have a complex design, which would be too time-consuming to draw from scratch. In these cases we will first make a **template**, a piece of cardboard with all the markings needed to replicate these parts, as well as indications to modify and position them precisely afterwards.

P01 **How to make templates**

1. On a white piece of cardboard, draw a rectangular frame and write the measures on all sides.

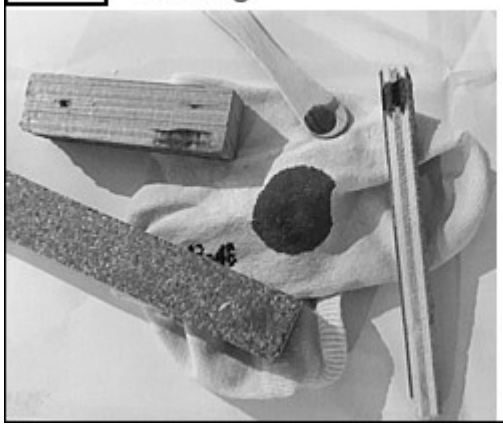
2. Use these marks as a grid to position points of the template. Draw the template.



3. Pierce the points as indicated then cut to shape.
4. Label the template. Draw the location of the folding lines with a distinct colour, also mark "special" dots.

First pierce with the Ø 0,4 mm pin then use the Ø 0,6 mm pin and wiggle it so the Ø 0,7 mm graphite tip of the mechanical pencil can get through.

P02 **Food colouring** is used in this design



- The leaf patches on the trees are crumpled, the battle mat is rolled together for storage : this would make regular paint chip off, whereas food colouring gets inside the paper itself.

- Food colouring is very bright on white paper, but gives more natural colours on brown paper.

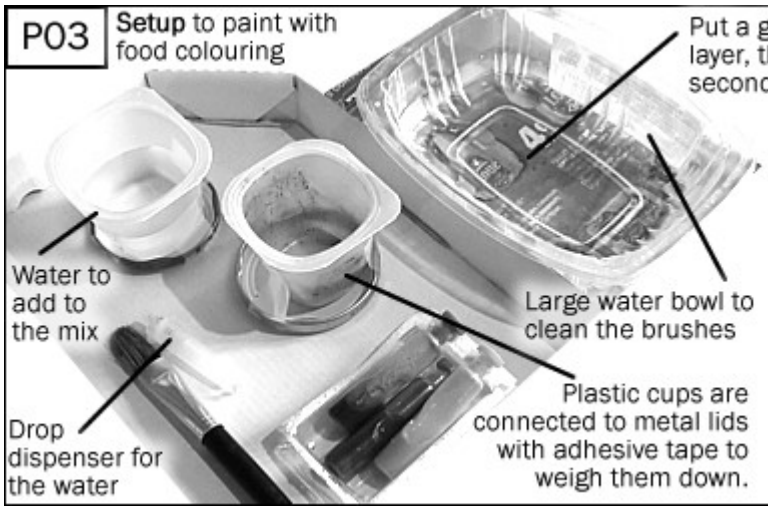


Food colouring will **stain** most materials it gets in contact with: textile, wood, even the cement between bathroom tiles.



Food colouring is also very economical and easy to procure, this set costs 2€ at the local supermarket.

P03 **Setup** to paint with food colouring



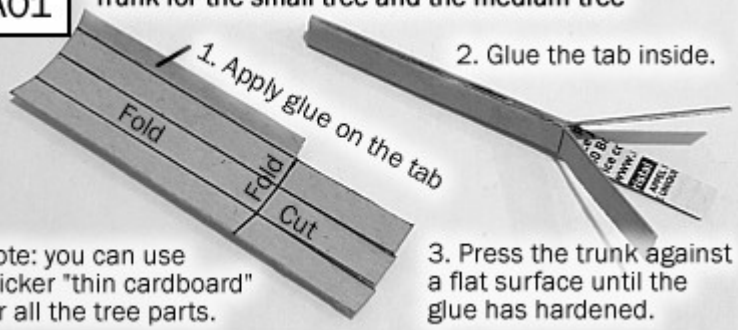
Put a garbage bag on your table as a first protective layer, then newspapers or supermarket adverts as a second layer.

In this design, you can make trees and battle mats for the **temperate** climate environment and the **desertic** or **semi-arid** climate environment.

This can be achieved using the brown paper's natural colour and two **colour mixes:**
Pale Green: 1 part blue, 1 part yellow, 2 parts water.
Intense Green: 2 parts blue, 1 part yellow, no water.

Part A - Trees

A01 Trunk for the small tree and the medium tree

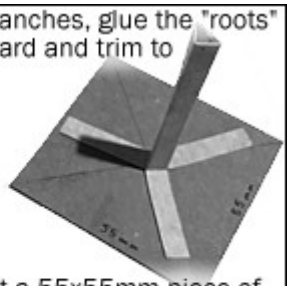


Note: you can use thicker "thin cardboard" for all the tree parts.

3. Press the trunk against a flat surface until the glue has hardened.

The small tree has no branches, glue the "roots" to a piece of thin cardboard and trim to a triangular shape.



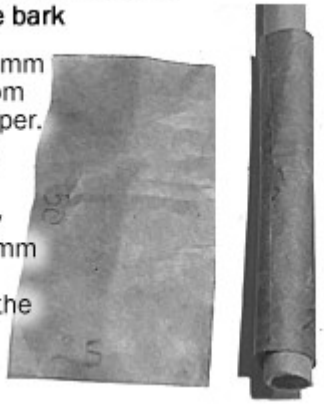


For the medium tree, cut a 55x55mm piece of thin cardboard. Lines to opposing corners intersect in the center, glue the stem over it.

A02 Small and medium tree bark

Cut a 50x25mm rectangle from thin kraft paper.

Roll it into a cylindrical shape, apply glue on a 1 mm strip on the edge, close the cylinder.



When the glue has dried, crumple the cylinder, then straighten it back into shape (using for instance the stem of a Q-tip). The crumples give it a bark-like texture.

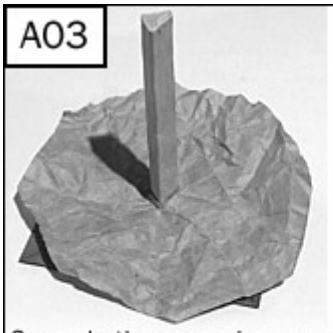




Base cover for the small and medium trees: cut pieces of brown paper using the "small leaf patch" template. Fold it twice, then cut out a 3x3mm corner as pictured, to let the trunk through.

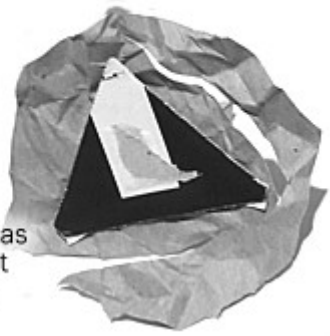


A03

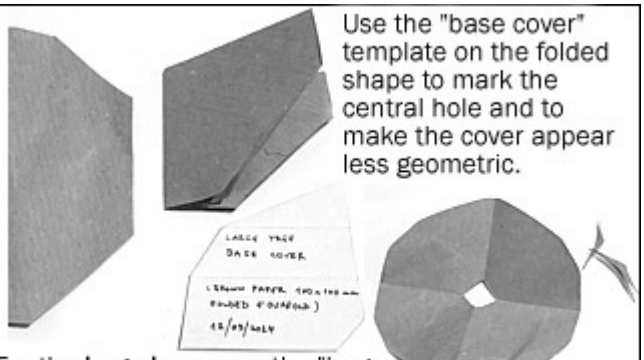


Crumple the paper base cover as well, to give it more texture. Cut away the parts of the "medium tree" base that protrude.

For the small trees, cut the base cover sides to match roughly the shape of the base.



Use the "base cover" template on the folded shape to mark the central hole and to make the cover appear less geometric.

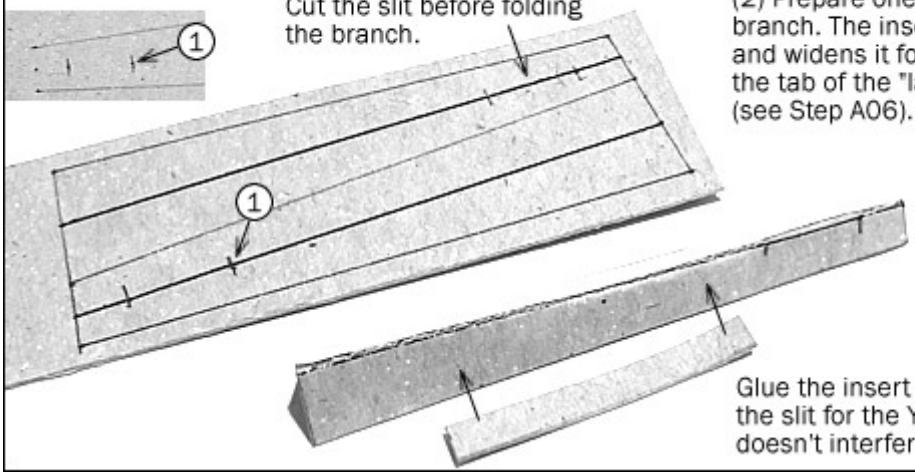


For the **large base**, use the "large leaf patch" template to get a piece of brown paper and fold it twice.

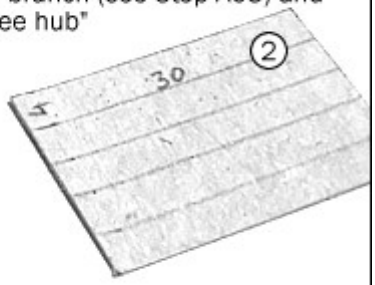
A04 Large branch

(1) Draw small segments where these dots are, so you can see where to cut the slit after the ballpen rolled over the fold line.

Cut the slit before folding the branch.



(2) Prepare one 30x4 mm cardboard **insert** per large branch. The insert improves the branche's rigidity and widens it for the Y-branch (see Step A05) and the tab of the "large tree hub" (see Step A06).



Glue the insert **inside the fold** of the branch, next to the slit for the Y-branch. This ensure the insert doesn't interfere with the tab of the "large tree hub"

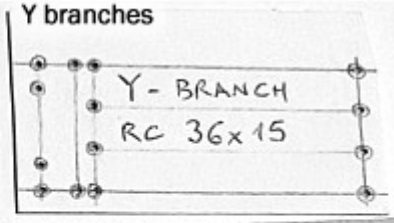
A05

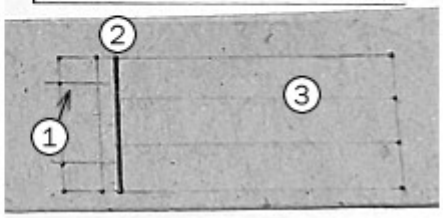
Insert the bark cylinder before glueing the branches.

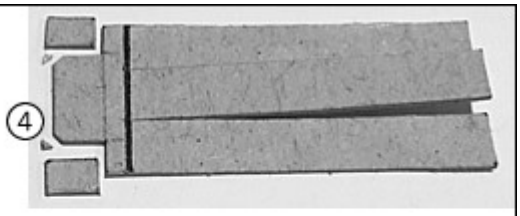


When glueing the branches to the trunk, you may want to also glue them one to another at their base.

Y branches



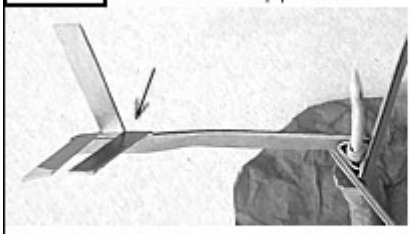




(1) Draw these lines parallel to the border.
(2) This is a fold line.
(3) Cut these lines.
(4) Cut the corners off for easier insertion, trim the tab if it's too wide.

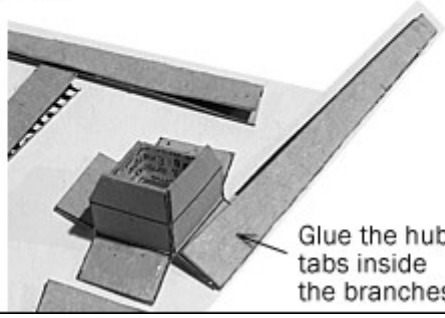
A06

Slide the Y-branch in the node's upper slit.



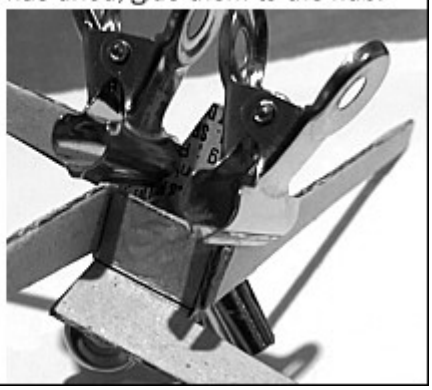
For the medium tree, it is possible to create an upper trunk by wrapping a toothpick in paper until it can be inserted in the trunk's hole.

The large tree is made of three removeable elements: the trunk&base, the **hub** and the upper trunk (see Step A07).



Glue the hub tabs inside the branches.

Once the glue in the four branches has dried, glue them to the hub.



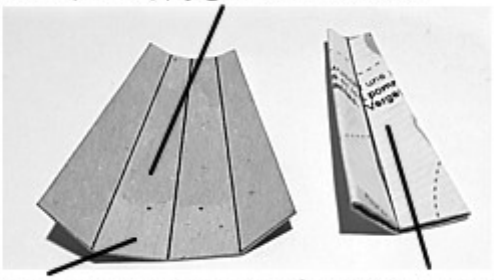
A07

Glue the **platform** to the top of the hub.



The plaform prevents the hub to slide down the trunk, it also allows a trooper-sized miniature to be positioned on it.

Cut and draw folding lines on the **upper trunk** part. Apply glue over the dots.



Leave everything under the dots without glue.

Close the shape and let the glue harden.

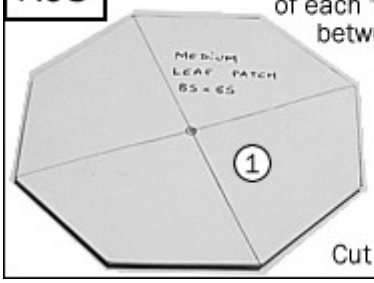
The upper trunk can be inserted on the hub corner tab, you can use the same type of bark on it as for the large trunks.



(Both not fully inserted here)

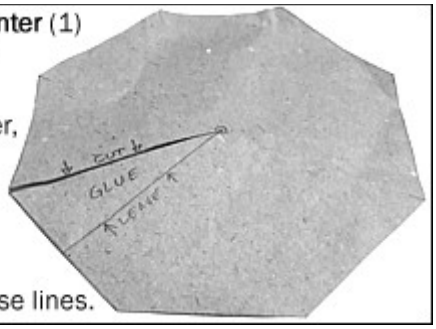
A08

Not shown on page 6 (to save space): pierce a dot located on the **center** (1) of each "leaf patch" **template**. Locate it by drawing lines between opposite corners.



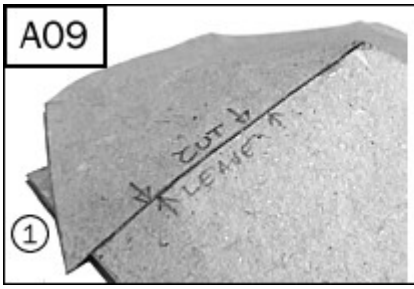
Use the **leaf patch** templates on brown paper, mark the center then cut out the shape.

Draw one line to the middle of a side and another to one of the corners of this side, as depicted.



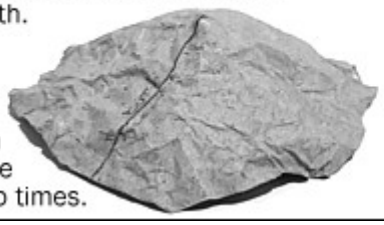
Cut one of these lines then apply glue between those lines.

A09

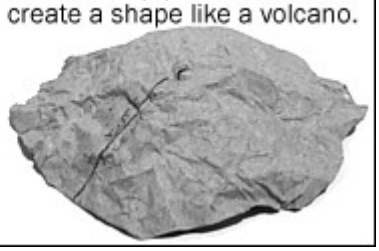


Glue one side over the area with glue, make sure the seam between the two lines is smooth.
Trim the excess (1).

Crumple then uncrumple the leaf patch two times.

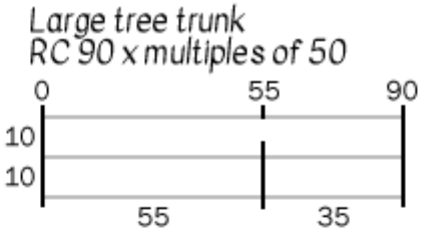


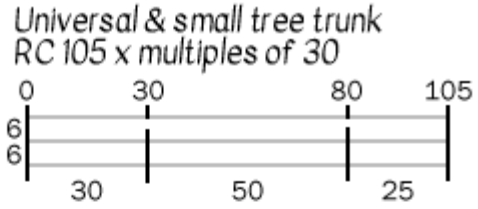
Push the top part down, to create a shape like a volcano.

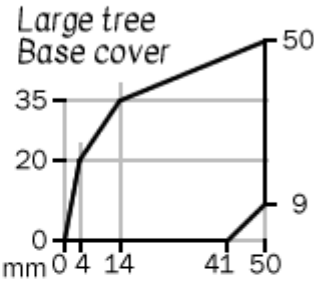


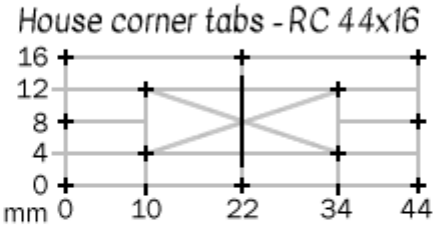
Terrain_I
Templates
Scale 1:64
Page 1/2

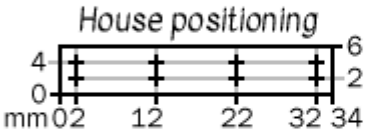
+ Pierce for 0,7mm
Folding line

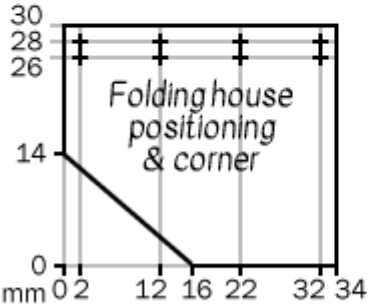


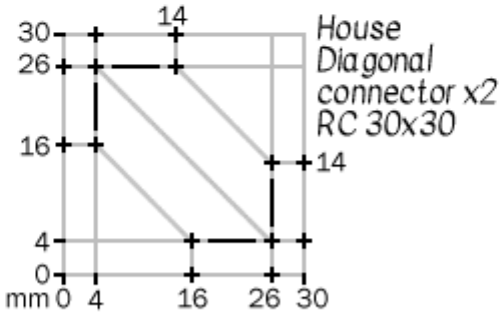


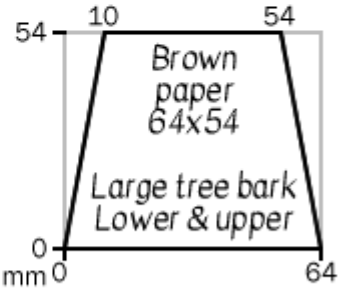


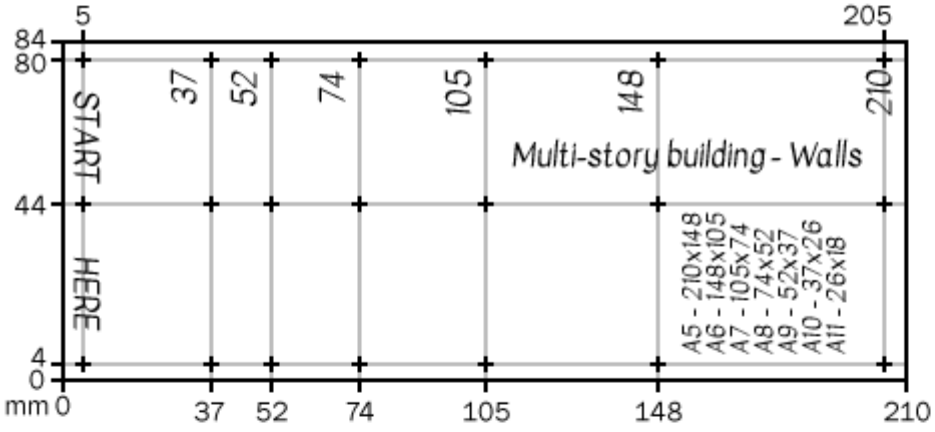


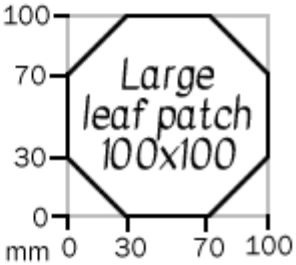


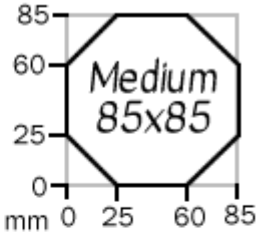


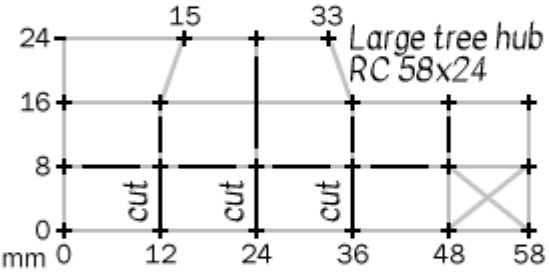


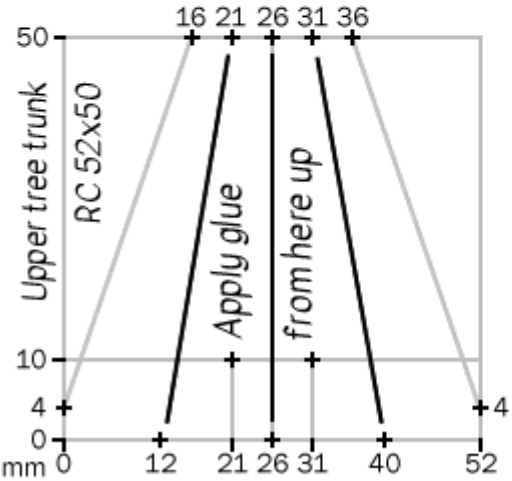


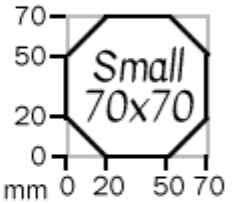


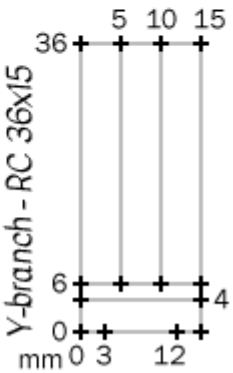


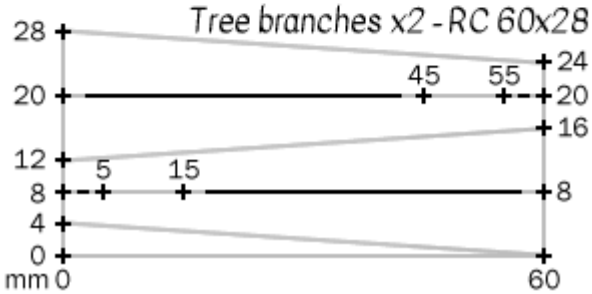






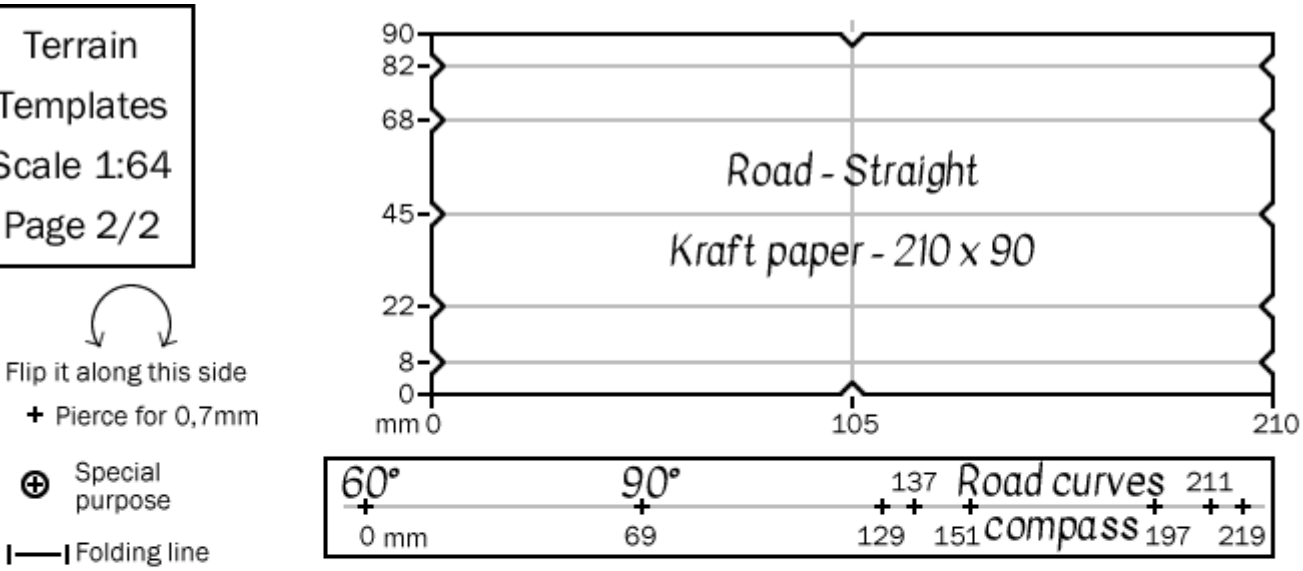


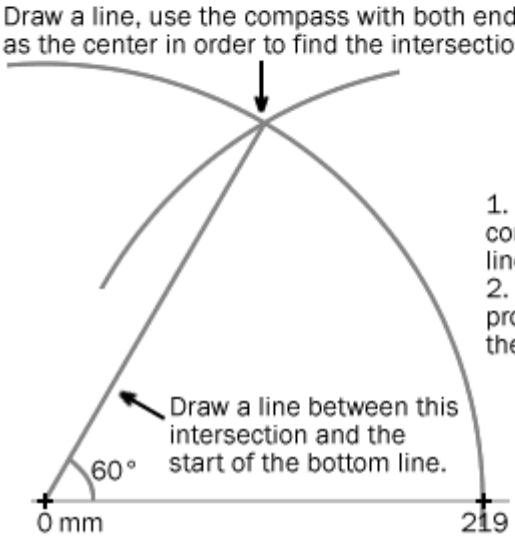


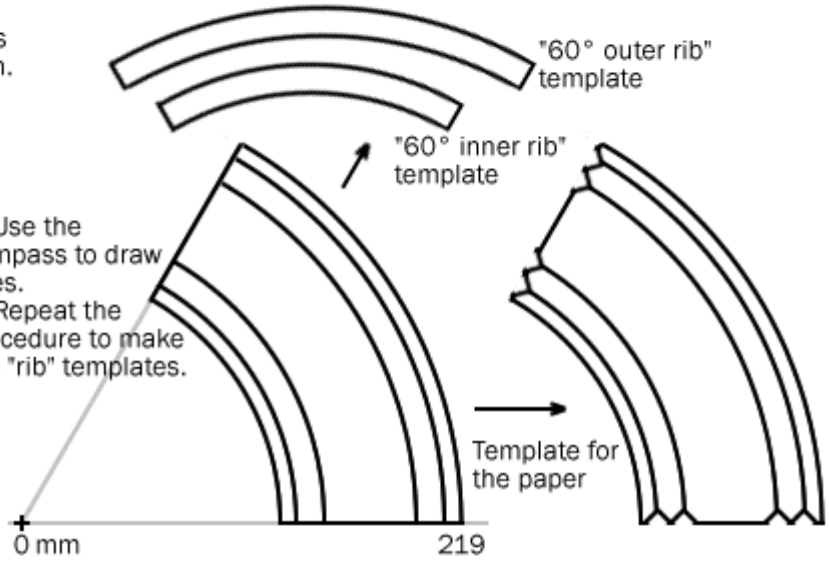


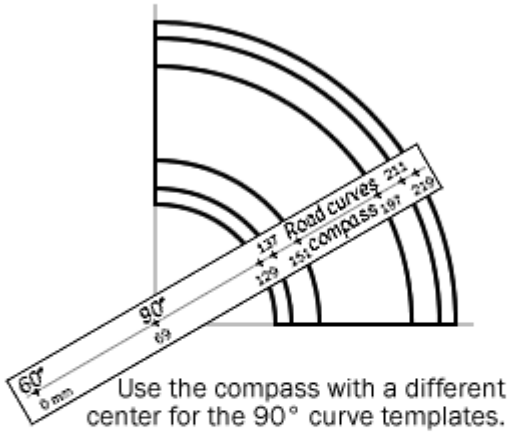
Diagrams on this page are not all at the same scale

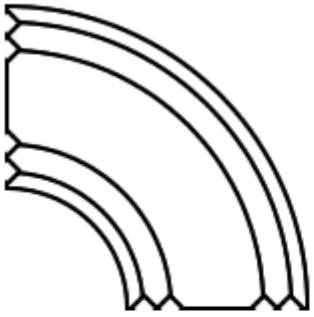
Terrain Templates
Scale 1:64
Page 2/2

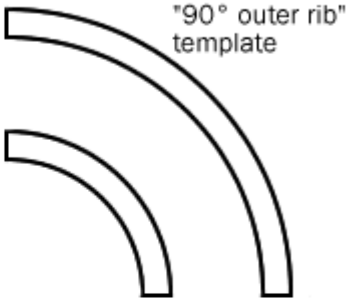


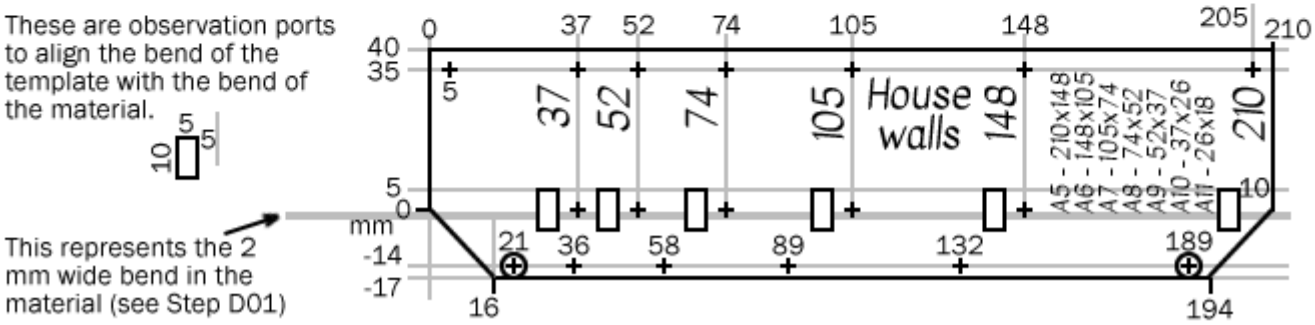







"90° paper" template

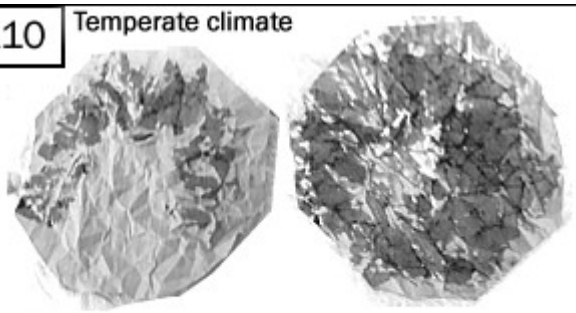




Diagrams on this page are not all at the same scale

A10

Temperate climate



First layer: apply the Pale Green colour (See Step P03 p.4) from a central "donut" (in order not to saturate the center) to the border. This way, most of the surface is covered but some natural brown remains.

The second layer of Intense Green is almost drybrushing: let very little colour on your brush and use its side, lightly, so that only the raised parts get some colour.

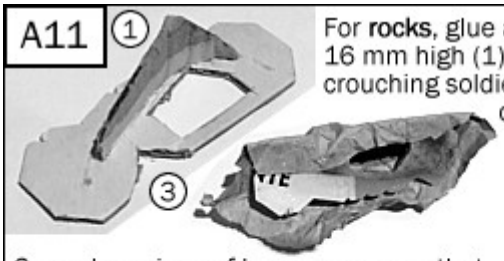


Semi-arid climate



Use the "drybrushing" technique with only Pale Green, so that a large part of the surface remains in its natural brown colour.

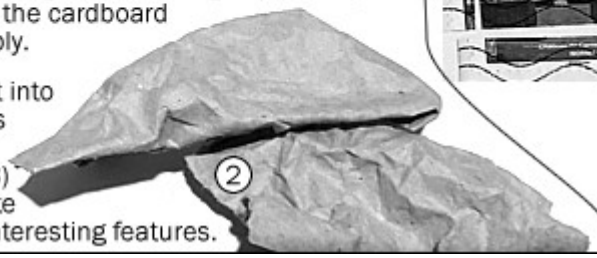
A11



For **rocks**, glue a piece of cardboard 16 mm high (1) (so a kneeling / crouching soldier can shoot over it) as depicted.

Crumple a piece of brown paper, so that it keeps large & sharp edges (2). Wrap it around the cardboard assembly.

Insert it into notches on the base (3) to create more interesting features.

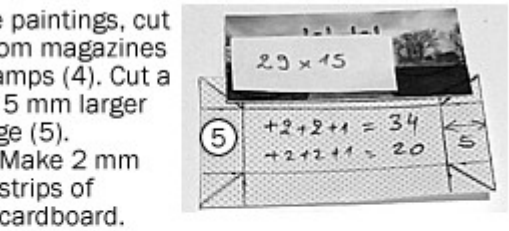


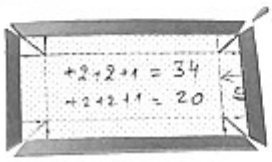
Frames for paintings (*inserted here to optimise space, continued on Step D09 page 11*).

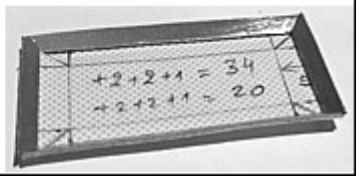
For large paintings, cut images from magazines or postal stamps (4). Cut a piece of paper that is 5 mm larger and higher than the image (5).



Make 2 mm strips of cardboard.





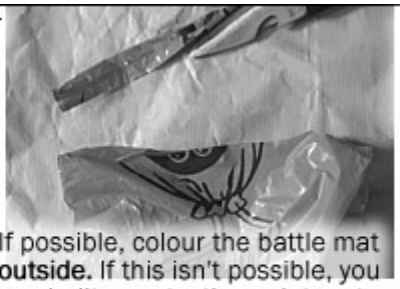


Part C: battle mats

C01

To built a **battle mat** to your specifications, assemble paper strips using glue or adhesive tape.





If possible, colour the battle mat **outside.** If this isn't possible, you can built a protective paint mat from large garbage liners (50 liters or larger): 1. take two liners and cut away the bottom.

2. Cut one side and unfold. Connect the two unfolded liners using packing tape.
3. Add any intermediate layer you can between this mat and the rest of the room.



C02

Don't saturate the brush and paint slowly to avoid spraying colour.

6ml of blue, 6ml of yellow and 12ml of water provides enough colour to cover more than 0,5 square meter.





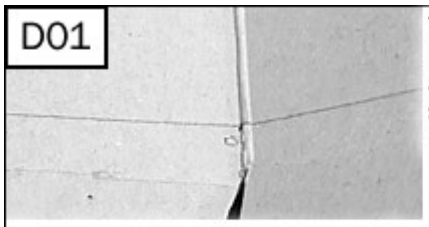
Roll the finished part onto itself. The colour dries in less than an hour. Wipe off any colour drops using cleaning alcohol.

Roll battle mats to store them. Roads (and road templates) can be stored in A5 enveloppes.

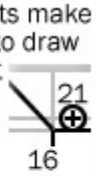


Part D: Houses and sheds

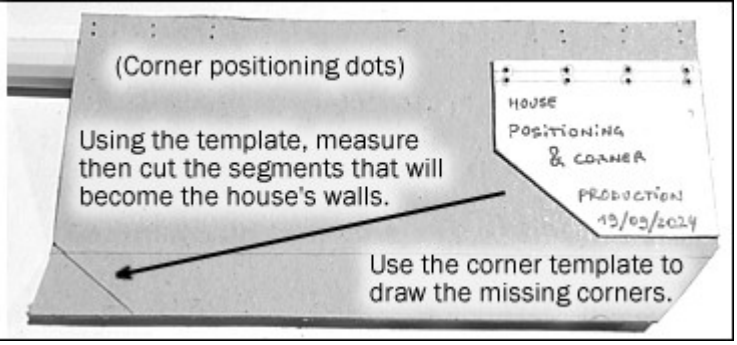
D01



These dots make it easier to draw a straight segment bottom.

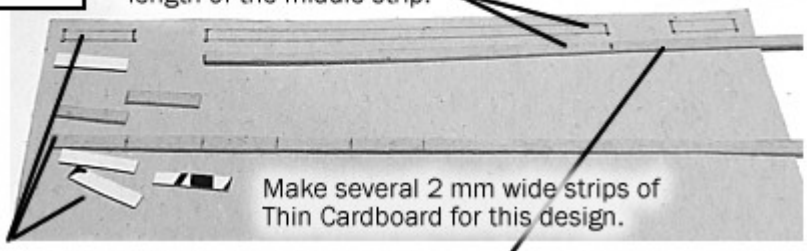


The design for the houses uses the packaging's own folding line. To start building the template, place the zero where the folding line intersects with the flat surface.



D02

Use the positiong dots to adjust the length of the middle strip.

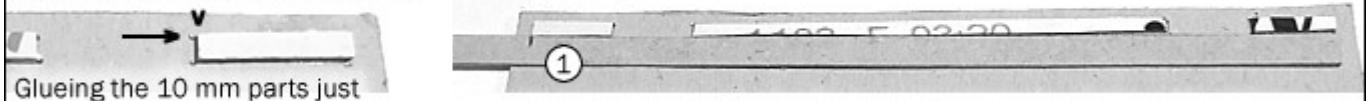




Use a toothpick to apply glue precisely. Glue the porous side of the part against the wall part.

(2) Glue the 4 mm strip to the 2 mm parts so that its top side is a the same level than the wall part.

These 10 x 2 mm parts are standard. Make a dozen of them first, then convert leftover cuts into them afterwards.

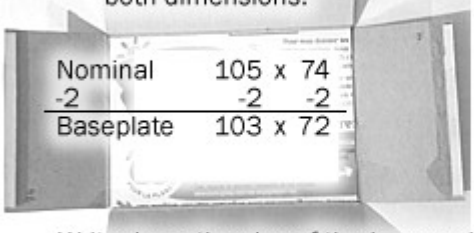


Glueing the 10 mm parts just besides the dots creates leeway for the connectors to slide in.

(1) Adjust the length of a **4 mm** wide strip to the limits of the 10 mm parts, leaving 2 mm free on both sides.

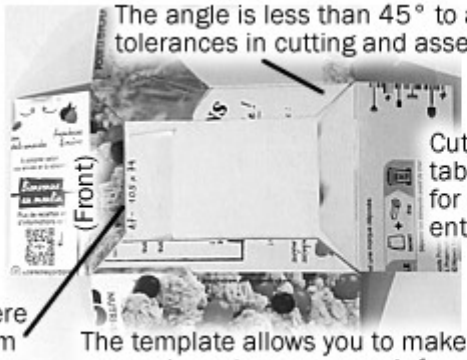
D03

Glue the walls to the baseplate, which is smaller by 2 mm on both dimensions.

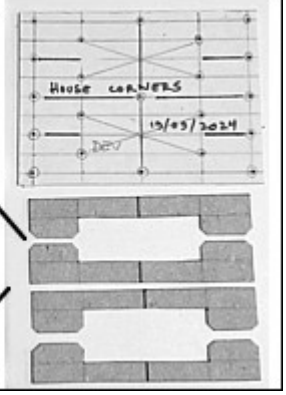


Nominal	105 x	74
-2	-2	-2
Baseplate	103 x	72

The angle is less than 45° to allow for tolerances in cutting and assembly.



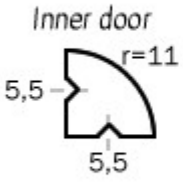
Cut off the tab corners for easier entry.

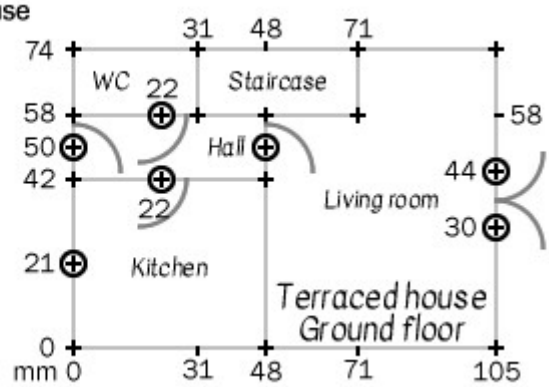


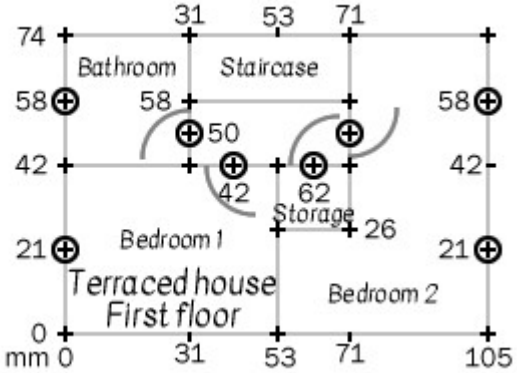
Write down the size of the house where the front side is. Protect the label from paint with adhesive tape.

The template allows you to make four connectors at once, enough for one floor.

Floor plans - A7 house

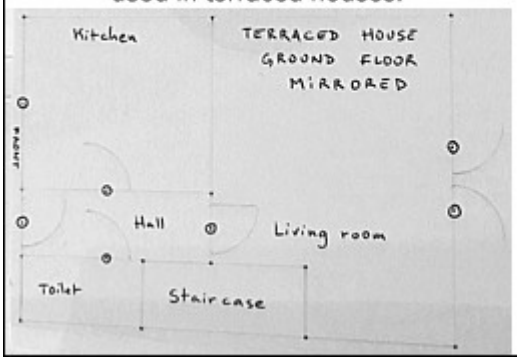






D04

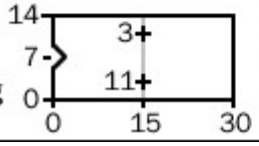
For **floor templates**, use cardboard which is white on both side. This way the backside can be made into a mirror floor plan, like those used in terraced houses.

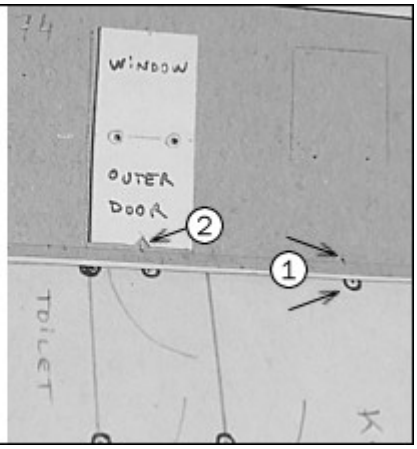


(1) Use the floor plan to mark the dot on the wall where the door & window positioning jig will be centered (2).

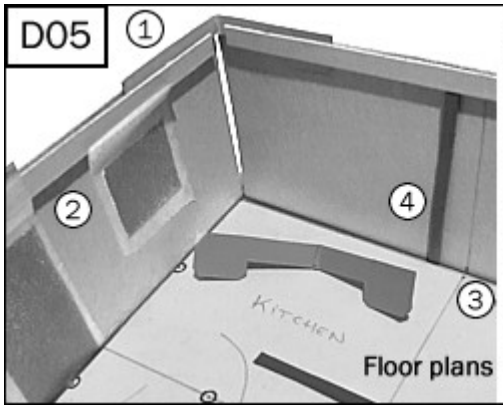
Doors and windows have to be cut out from the walls before painting.

Door & window positioning jig





D05



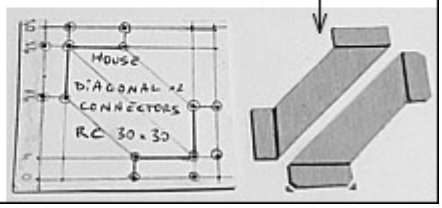
(1) The removeable connectors allow the design to be **foldable** and stored flat.

(2) You can spray colours on the flattened house. Protect the openings with adhesive tape from the inside so that their sides have the same colour as the outside.

(3) If you wish to decorate the walls, you can use the floor plan to draw the limit between the rooms.

4) A 2 mm strip painted in a brick colour or grey can be used to materialise this limit.

The **multi-story house** (see from Step D08 on) requires "diagonal" connectors.

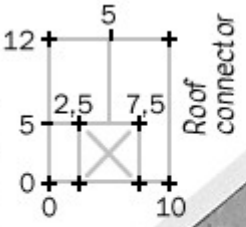


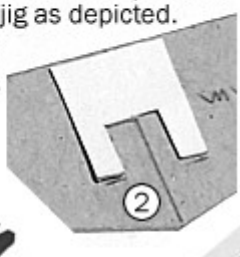
D06

With the **roof connector template** you can make a **positioning jig** (1) and the roof connector **part**.

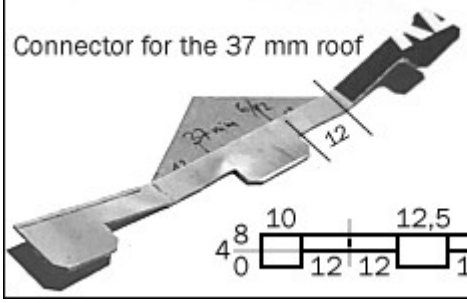
(1) Align the jig's central line with the gable's central line. Position the jig so the gable's peak meets the top od the jig's notch. Draw two lines below the jig as depicted.

(2) These are positioning lines to use when glueing the roof connector part to the gable part.

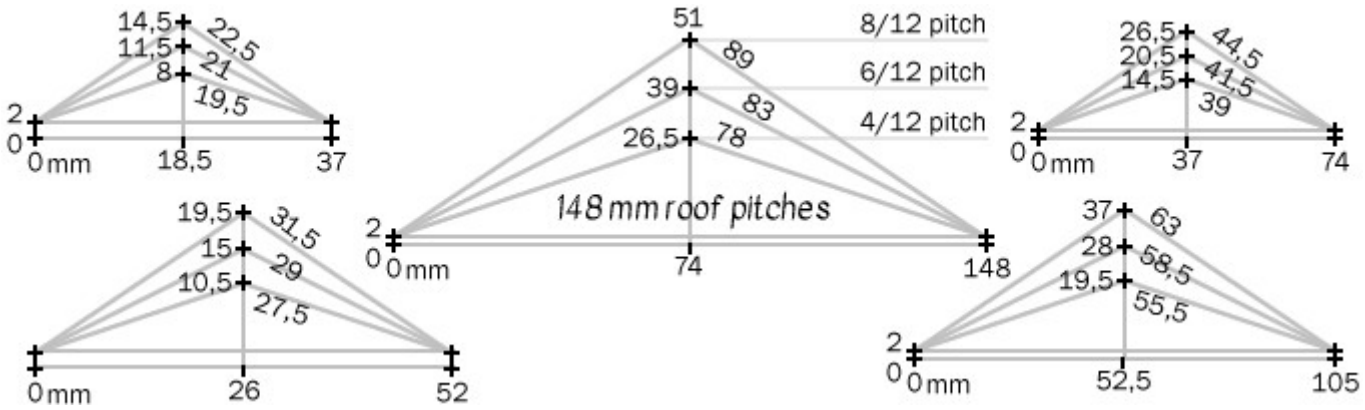




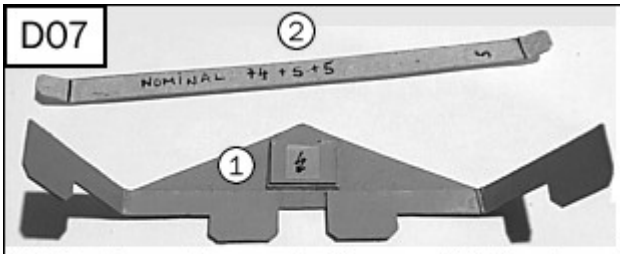
Connector for the 37 mm roof



(3) Use the corner template on the lower corners of the gable part. (4) Glue the corner connectors on the lower set of dots.



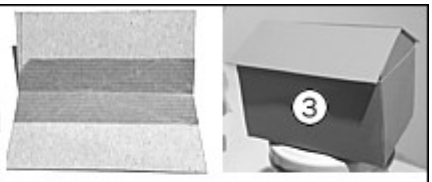
D07



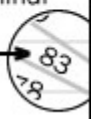
(1) Trim the roof connector's base until it fits, then glue it in place. Glue a 8 mm wide cover piece over it, here it is used as an electric junction box.
(2) The **beam** is a 5 mm wide strip of nominal length with two 5 mm long, slightly V-shaped tabs.



By connecting both gable ends with this beam, the side remain at a constant distance. This allows to simply place the roof over the house (3).



The roof is made of two panels, each 2 mm longer than nominal and 2 mm longer than the hypothenuse (Step A06).
Draw a folding line on a piece of kraft paper and glue each panel to it.



D08

The **multi-story house** has separate walls.



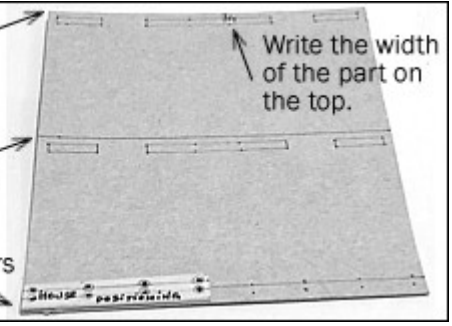
Notice that you draw the outline of the wall around the template.

Use straight corners & sides if possible.

Align "house positioning" jig to top corners

Align to line from below and to sides

Align to bottom corners



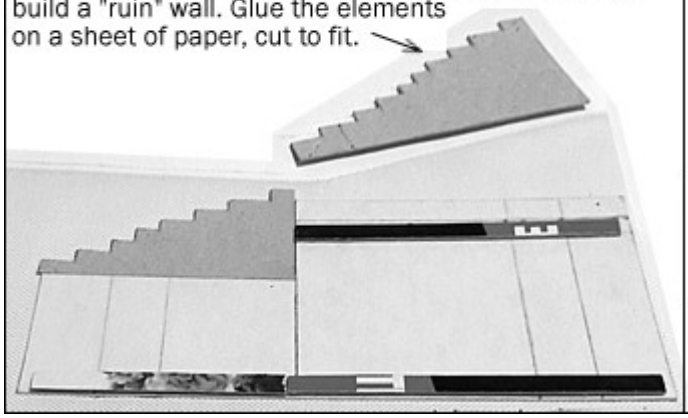
Write the width of the part on the top.

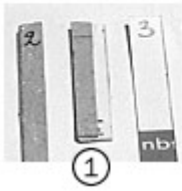
D09

Modular wall decoration: you can make hooks and attachement points to hang paintings or maps to the walls. (1) Glue 2 mm strips of cardbaord to 3 mm strips of rigid paper, align to one of the sides.



You can use snippets from the staircase (Step D11) to build a "ruin" wall. Glue the elements on a sheet of paper, cut to fit.

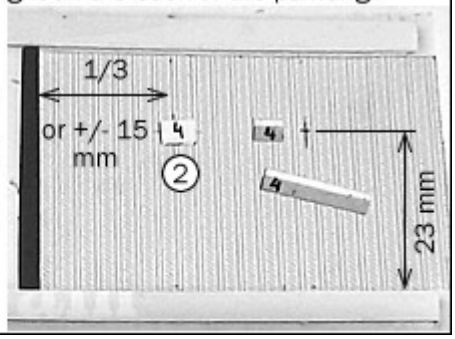




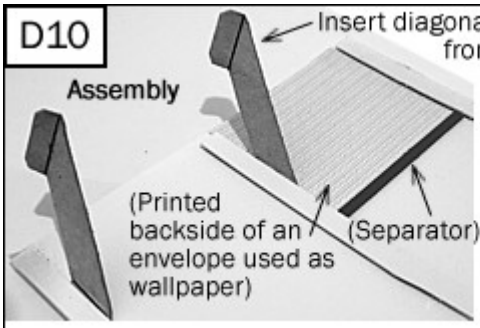
(2) Cut 4 mm segments as hooks, glue as depicted.
(3) Cut a long segment & glue at middle height on the back of the painting.



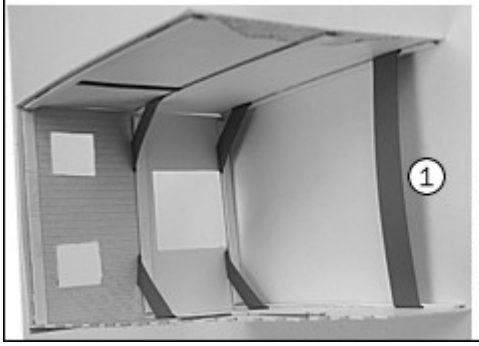




D10

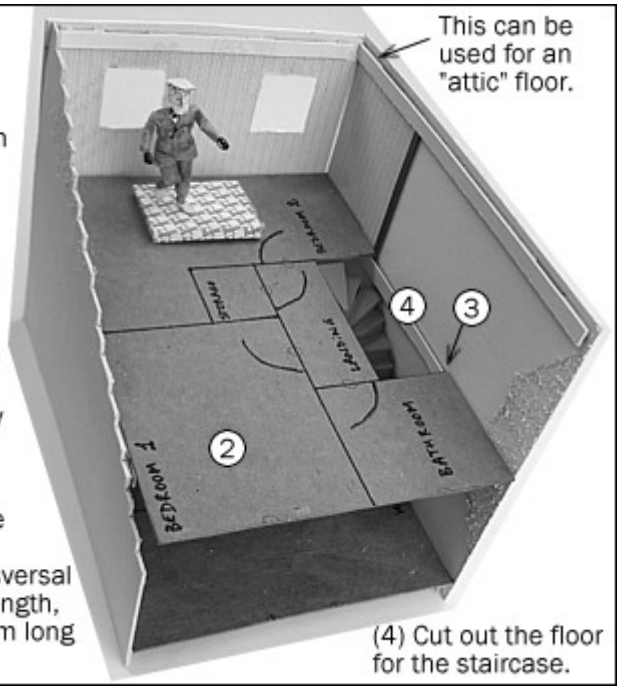


(2) Draw the floor plan on a sheet of cardboard, it can be useful for close quarters combat situations or tabletop roleplaying games.



(3) Note that the floor sheet also rests on the sides and not only on the diagonal connectors.

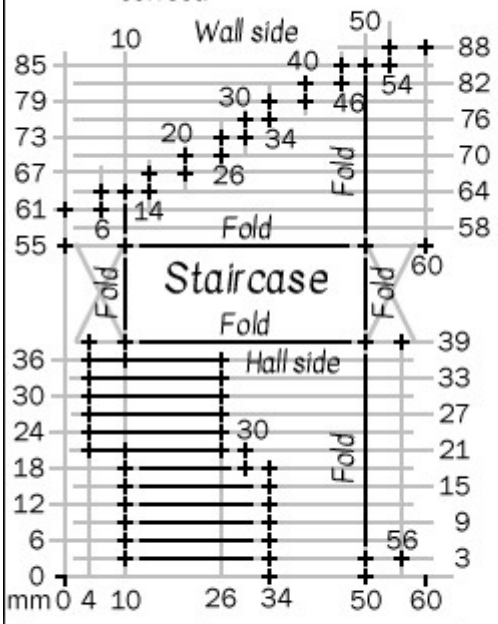
If you plan to assemble only three walls (like a dollhouse), use a transversal beam (1) at nominal length, 10 mm wide, with 4 mm long tabs at both ends



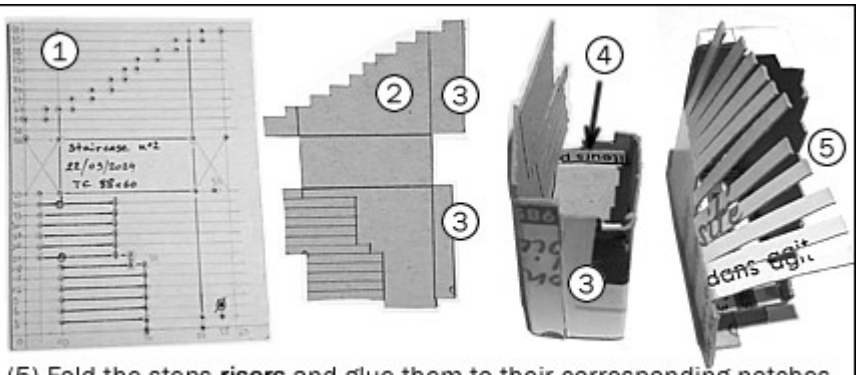
(4) Cut out the floor for the staircase.

D11

Use images (1) and (2) to see if your templates and part are correct.

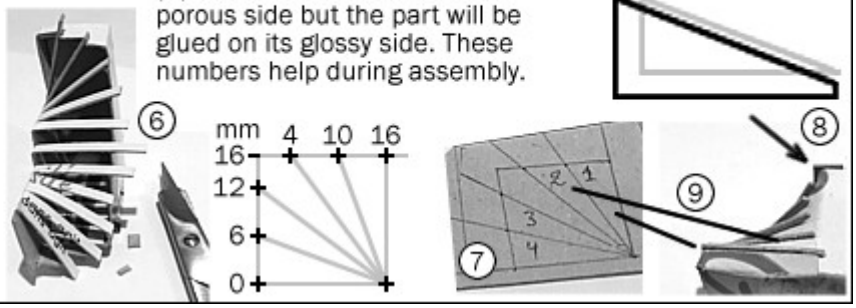


(3) Notice the "front" and "rear" side of the box are not symetrical.
(4) Use pieces of cardboard to glue these sides together.



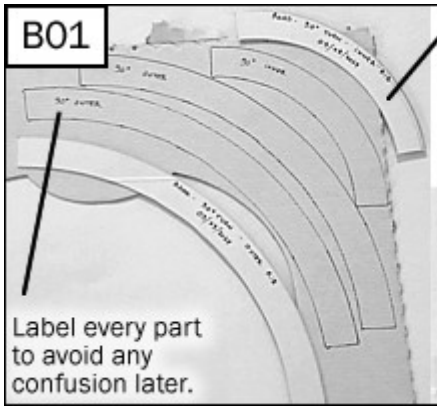
(5) Fold the steps **risers** and glue them to their corresponding notches on the other side. (6) Trim the excess with nail scissors.
(7) Use the template to draw the lines for the **treads** but prolong the lines. Cut off the pointy end. The larger tread parts will allow you to offset them relatively to the risers (8), creating a bullnose.

(9) The lines are drawn on the porous side but the part will be glued on its glossy side. These numbers help during assembly.



Part B: roads

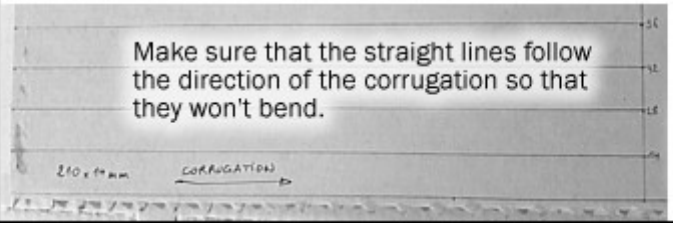
B01



Label every part to avoid any confusion later.

Use the templates to mark and cut the "ribs" parts of the **roads** from corrugated cardboard. It is recommended to use cardboard of the same thickness for all these parts.

Draw the straight parts directly on the cardboard.





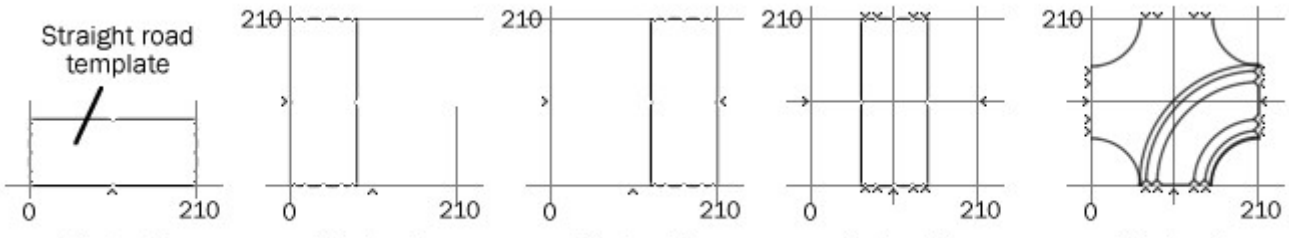
Glue the ribs with the white side to the paper.

B02

The templates for the paper can be used for the more complex shapes as well (T-, X- and Y-intersections).



Y: step 1 Y: step 2 Y: step 3 T: step 1 T: step 2



X: step 1 X: step 2 X: step 3 X: step 3 X: step 4