



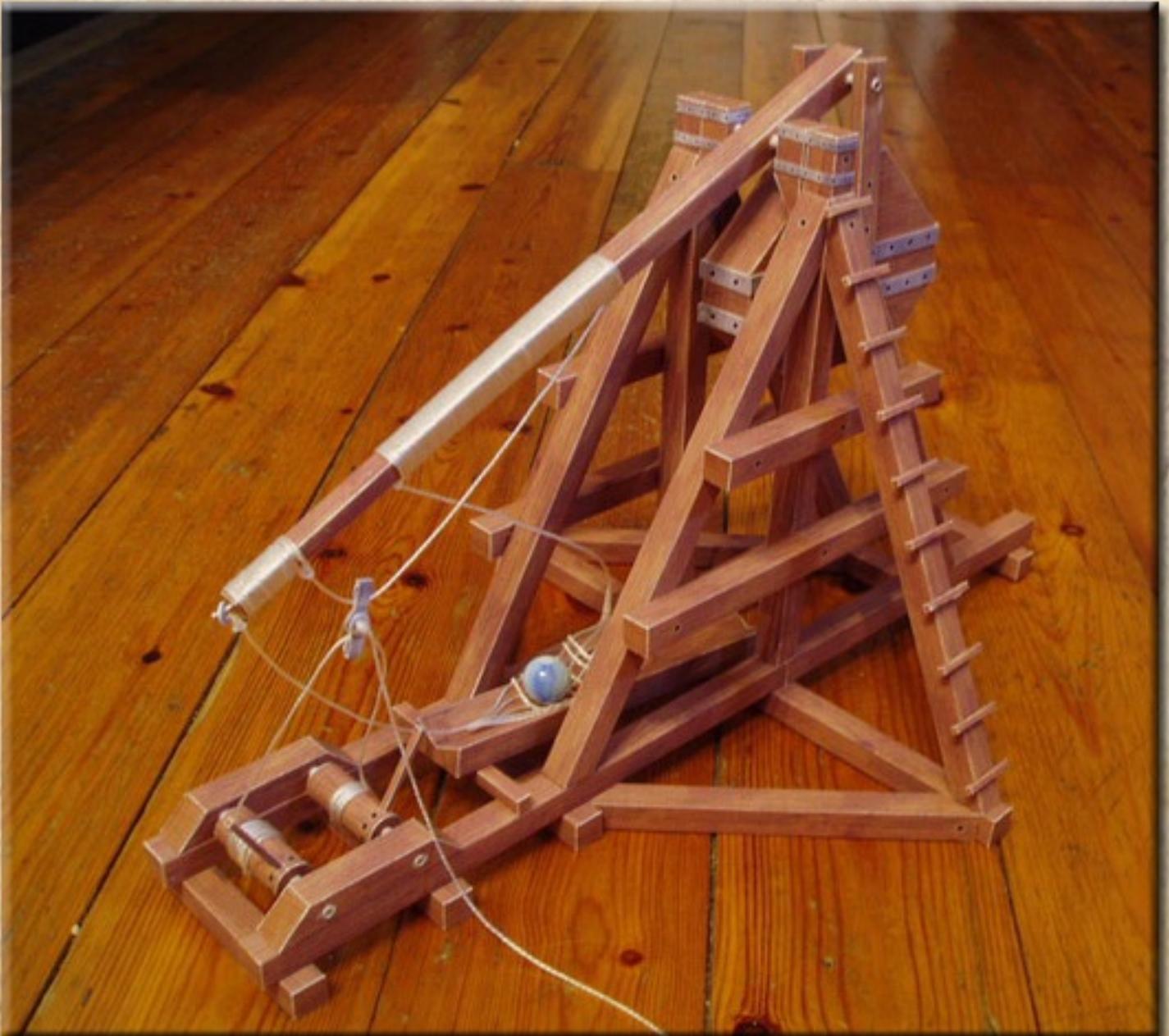
SHEILA'S  
PAPERMODELS

FREE!

# MEDIEVAL TREBUCHET

designed by Sheila Mertens

scale 1 : 25 - instructions included



<http://members.home.nl/papermodels>

## The Trebuchet

- Read the instructions entirely before assembly. Get to know the different parts of the model. Study the photographs before you proceed. Dry-fit every part prior to glueing it into position.

- Scoringlines have been drawn **on the outside** of every piece of the model (they are the dotted lines), thus keeping the visible surface of the model 'clean'. Also note that all gluetabs have textures on them too, thus eliminating the risk of 'white edges' after glueing pieces in place. **ALWAYS SCORE EVERY PIECE PRIOR TO CUTTING IT OUT.**

- For rope or thread, kite-lines were used for the model on the photographs.

- Although this model was designed to have a rotating arm and moveable counterweight, it is NOT meant to be a fully functional apparatus. Paper simply isn't strong enough to cope with the forces involved when 'firing' the model more than a few times (and believe me, I've tried!). Nonetheless, the mechanics of the machine and it's firing mechanism were taken from 'real world' models.

Have fun!

Model created by **Sheila Mertens** 2006

*--- assembly instructions ---*

NOTE: the parts labeled -X- are not used.

1. Print all sheets on 160-180 grams A4 paper (or equivalent). The two floorplan pages can safely be printed on plain paper (they're to be discarded after completion of the model).

2. Glue the two white floorplan pieces together - see image 4. You will need it as a guideline during construction of the base of the trebuchet. **DO NOT GLUE THE PIECES DIRECTLY TO THIS FLOORPLAN.** When the model is completed, the abundant floorplan can be discarded.

NOTE: your printer might not have printed the outer edges of the floorplan, this is not a problem.

3. First score, then cut out the pieces -A- to -D- and -E1- to -E4-. Assemble them as shown in images 1 to 3.

4. Assemble the base of the trebuchet as shown in images 4 to 6. Note that there are different lengths of bars; be sure you glue the correct ones to one another - use the floorplan as a guide.

5. Assemble the upper structure of the trebuchet with the pieces -F- to -J- as shown in images 7 to 9. First glue the long vertical bar -F- into position (the small black dot, or nail, faces outward), then attach two 'legs' -G- to the left and right, then the long lateral one -H- (one -H- has a ladder on it). Do the same on the other side of the trebuchet.

6. Assemble parts -I- and -J-. Glue them to the upper structure - check the image of the finished trebuchet where to glue these parts, using the black dots (nailheads) as guides.

7. Assemble the two parts -K- as shown in images 10 and 11. **DO NOT GLUE THEM IN POSITION YET.**

8. Now, assemble the arm of the trebuchet, piece -L-. Strengthening the arm (with an extra layer of paper on the inside) where the axis-holes will be cut out, is recommended if you don't do the second optional step described below.

OPTIONAL: you can use the two long silver strips to create an 'inner support' for the arm - just slide them

into one another, glue them together, and place this long, 'cross shaped' structure INSIDE the arm before you close it.

OPTIONAL: there are two tiny parts on the same sheet as piece -L- that will roll into two small cylinders, just like you created in step 7. You can use these to strengthen the inside of the arm where the two axis-holes are.

Seal the open ends of the arm with the two small brown squares.

The 'hook' at the end of the arm consists of 5 layers of paper, glued together. You might want to make a small hole at the end of the arm before glueing the hook into position.

**9.** Roll piece -S- into a tight, massive axis (don't glue it yet). CHECK THE ORIENTATION, ROLL FROM LEFT TO RIGHT (or the axis will become too long). The axis should fit through the holes in the arm. If the axis is too thick, don't force it through, but remove a bit of paper, roll again and try again until it fits smoothly. Finally roll and glue the axis.

OPTIONAL: you may just roll a small cylinder instead of a massive axis, and strengthen it with a toothpick, matchstick, kebabstick, or similar.

**10.** Glue the axis -S- in one piece -K- (from step 7). Push the axis THROUGH THE CENTERMOST HOLE of the arm, then glue it into the other part -K-. Make absolutely sure the two parts -K- are well aligned, and do NOT glue the axis to the arm.

OPTIONAL: You may wind the ropes around the arm at this stage, instead of doing it later when the arm is already glued in position (see images 16 and 17). The other 'loose' ropes will be attached later anyway.

**11.** Slide the construction of step 10 between the two vertical structures of the trebuchet and glue it into position, as shown in image 12. Glue the 'metal strips' (the ones on the sheet with parts -J- etc.) into position; they are long enough, you might want to cut them somewhat shorter.

**12.** Assemble the counterweight using pieces -M- and -N- as shown in images 13 to 15. Use piece -R- for making an axis (just like you did in step 9). Slide the complete counterweight over the end of the arm, aligning the holes, then push the axis through. Glue the axis to parts -M-, but NOT to the arm.

OPTIONAL: You can glue a little weight inside the counterweight, here some small metal rings were used.

NOTE: The metal strips around the counterweight are all double layers of paper.

**13.** Assemble the winding drums -O- and -P-, as shown on image 18. Use pieces -T- and -U- for the two axes. The two handles can be glue'd in position, or just pushed into their holes without glue. Whether you want to make these winding drums rotateable or glue everything fixed into position, is entirely up to you. Glueing everything down now might work better later when attaching the 'ropes'.

**14.** Assemble the gutter -Q-. Glue it together with the somewhat smaller plank on the base of the trebuchet as shown on image 18 and the picture of the completed model.

**15.** Assemble two pulleys out of pieces -V- (see How-to drawing).

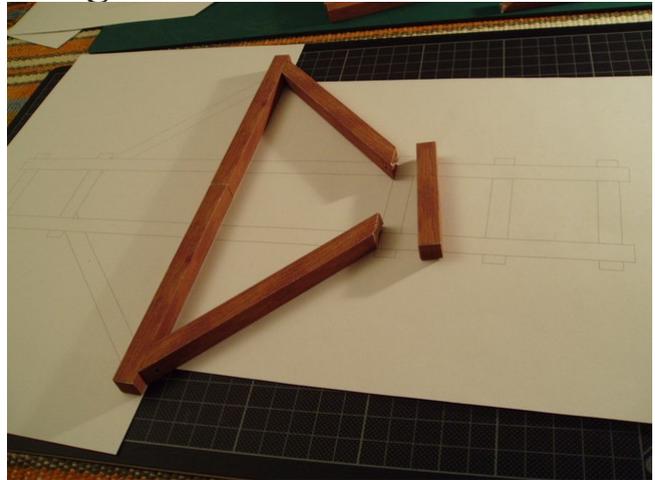
**16.** Make a small net with help of piece -W- as shown in images 19 to 21. Attach one 'metal ring' to the rope at one end of the net; this ring goes over the 'hook' at the end of the arm. Attach the rope at the other end of the net to the arm as shown on the image of the completed model.

17. Finish the model by adding two more ropes: one rope goes from the tip of the arm to roughly half-way the arm, and one rope is attached to the winding drums. DON'T FORGET TO LEAD THE ROPES THROUGH THEIR PULLEYS \*BEFORE\* GLUEING OR TIEING THE ROPES INTO POSITION. Roll a small axis from the small silver square to the left of part -V-. Attach a rope to it, and push the axis through the rings of the two pulleys. This is the trigger mechanism of the trebuchet. Pull the rope, and the weapon will fire!

**image 1**



**image 4**



**image 2**



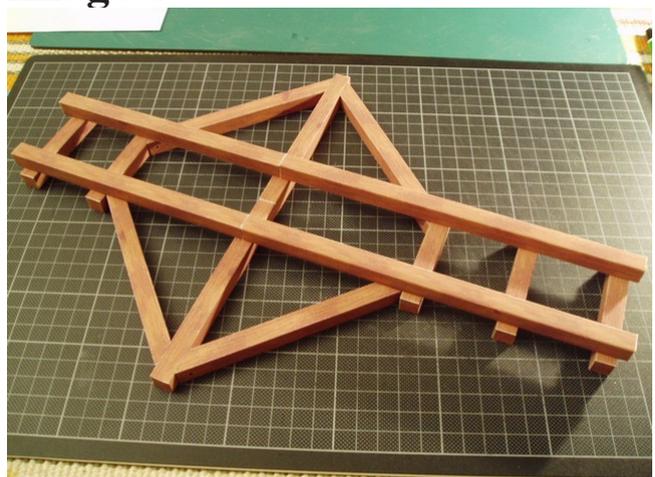
**image 5**



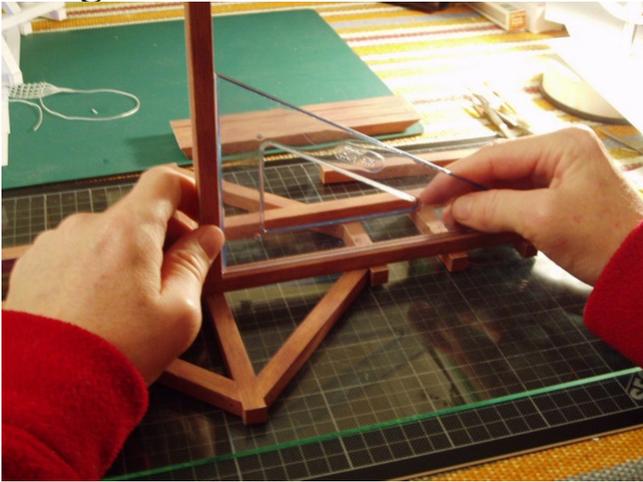
**image 3**



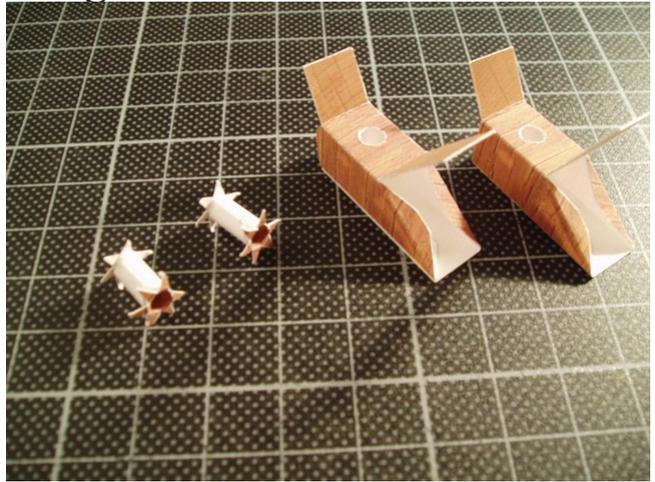
**image 6**



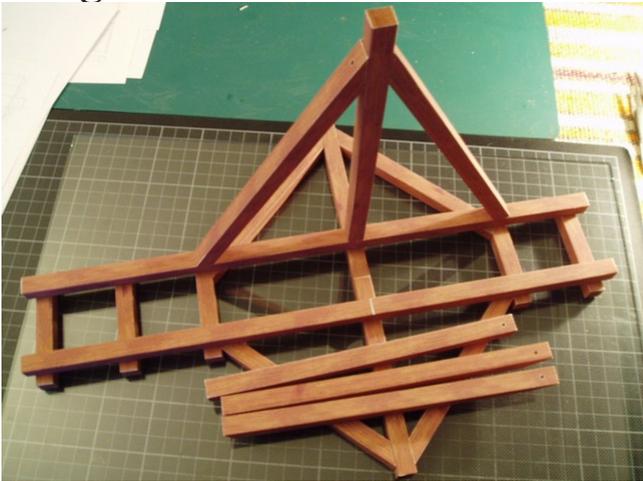
**image 7**



**image 10**



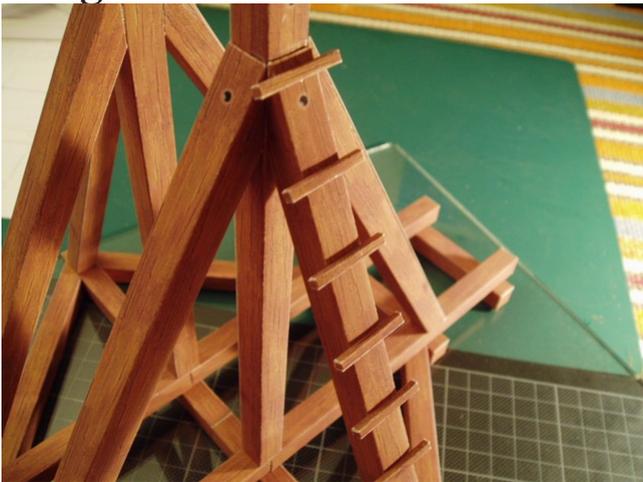
**image 8**



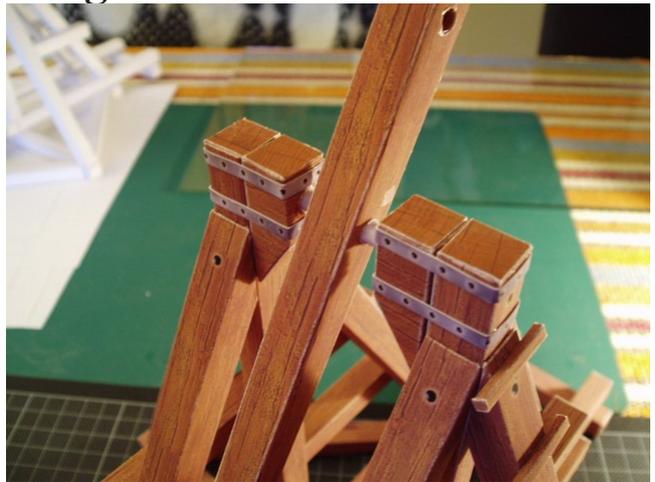
**image 11**



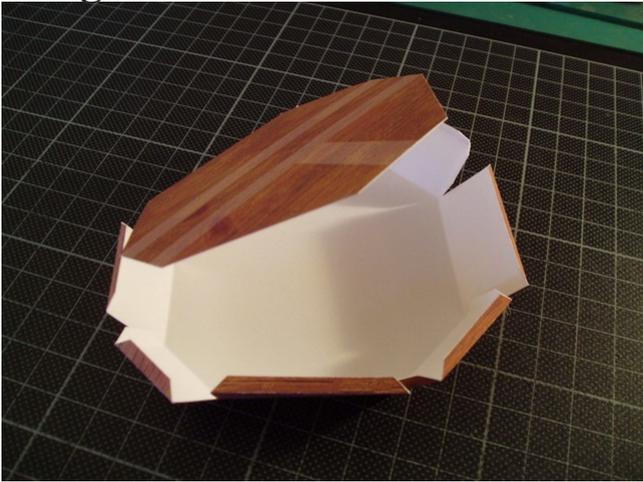
**image 9**



**image 12**



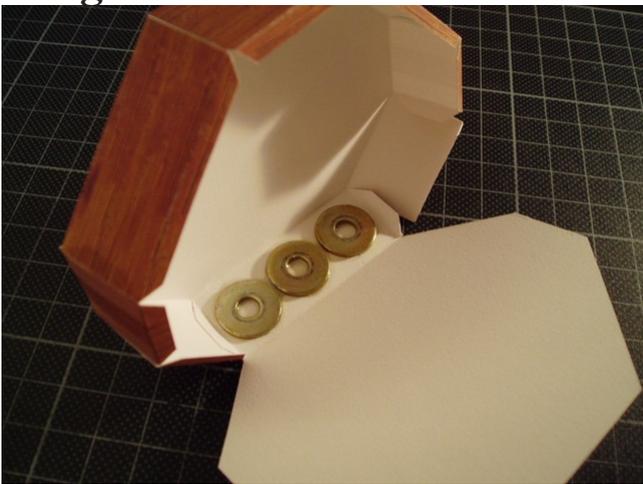
**image 13**



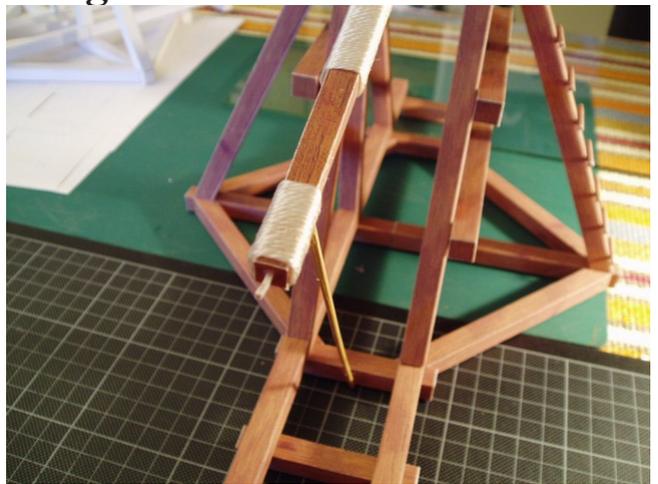
**image 16**



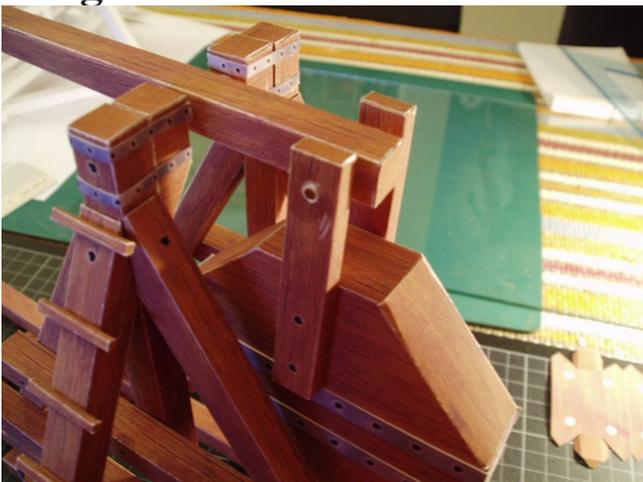
**image 14**



**image 17**



**image 15**



**image 18**



image 19

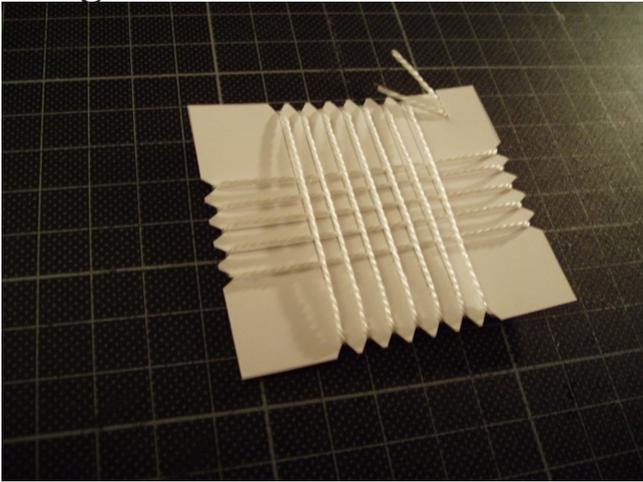


image 21

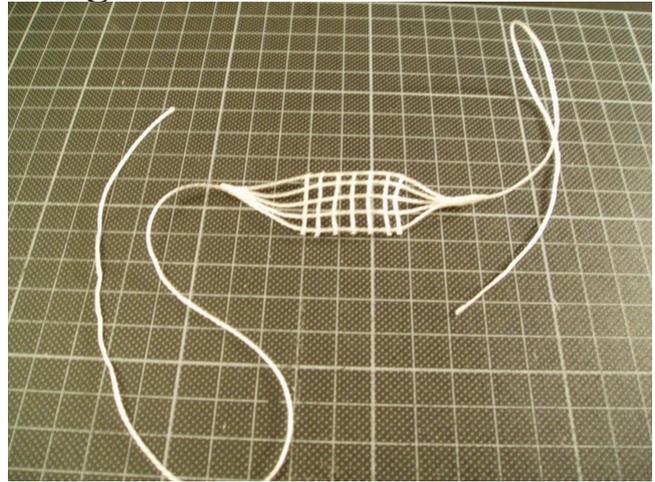
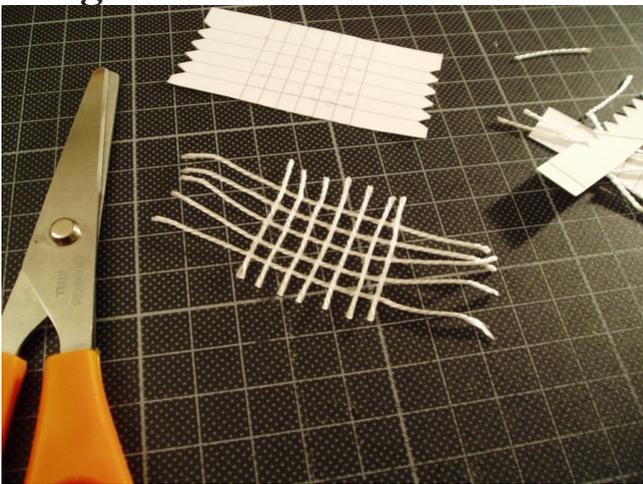
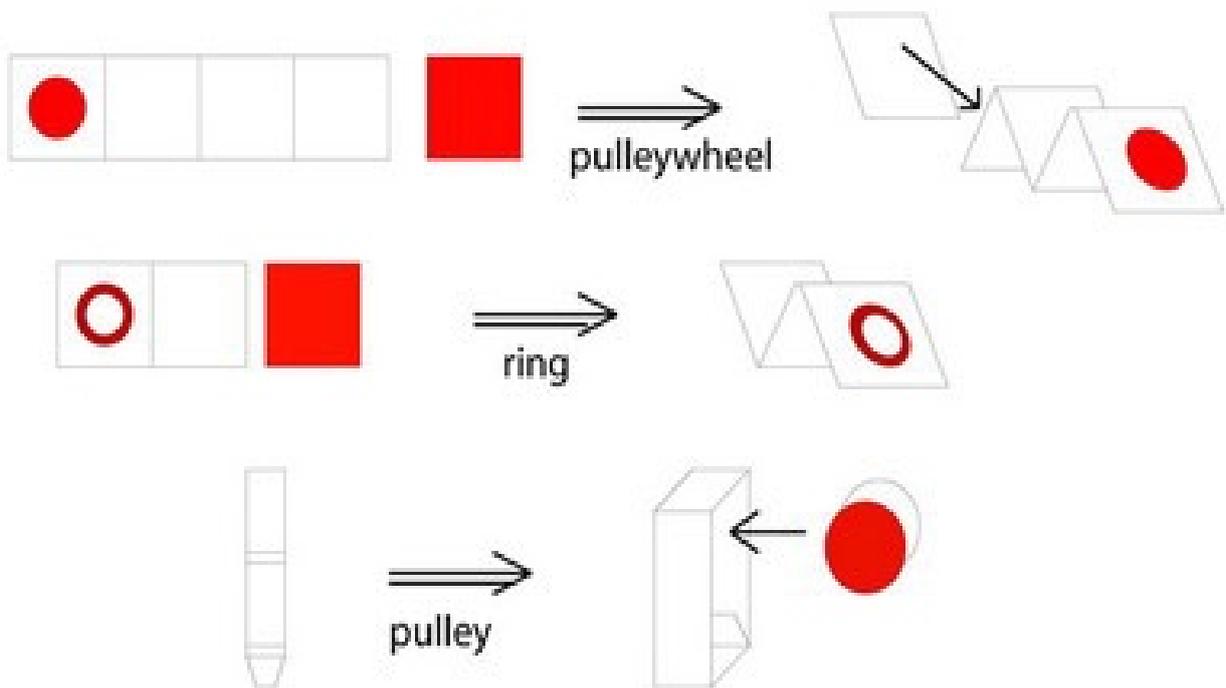


image 20

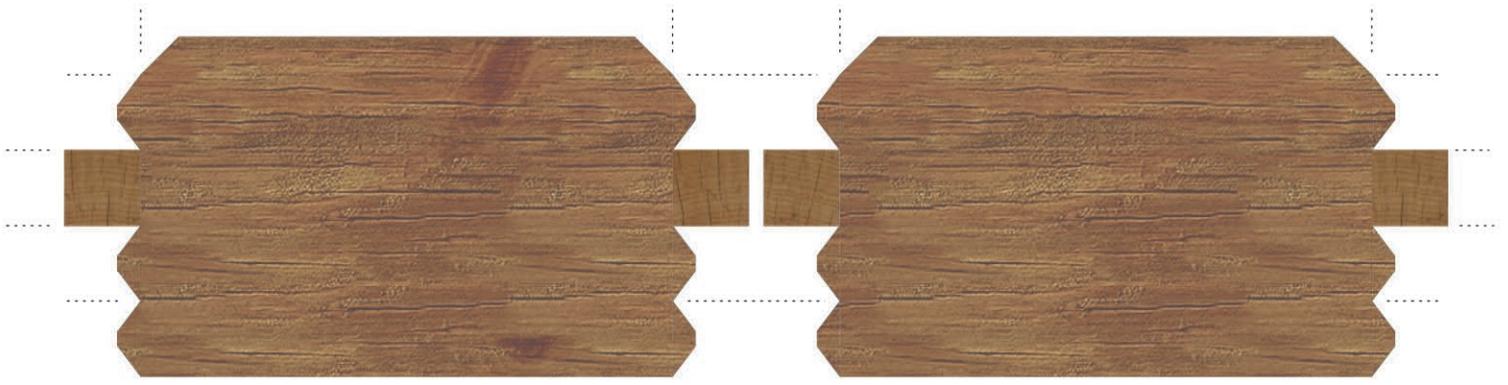


### How-to drawing

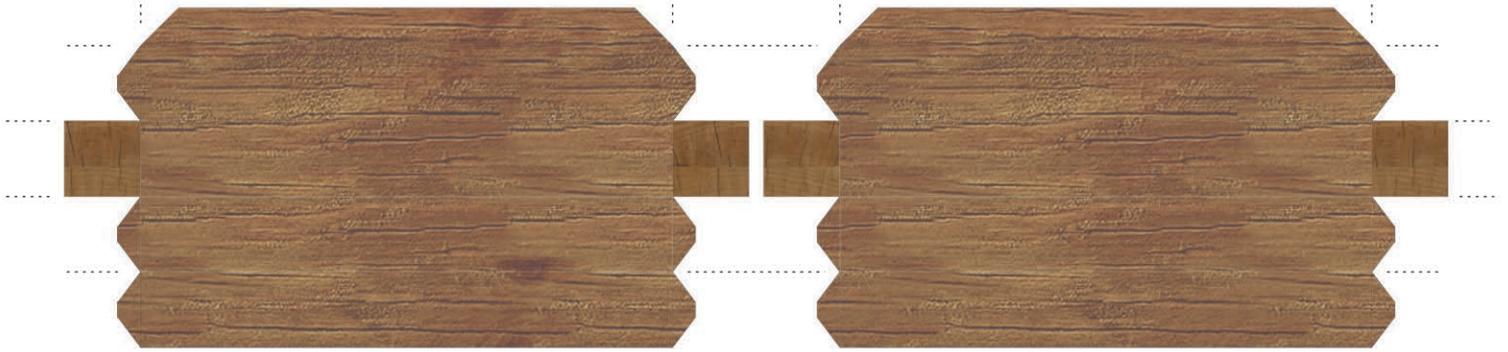








-A-



-A-



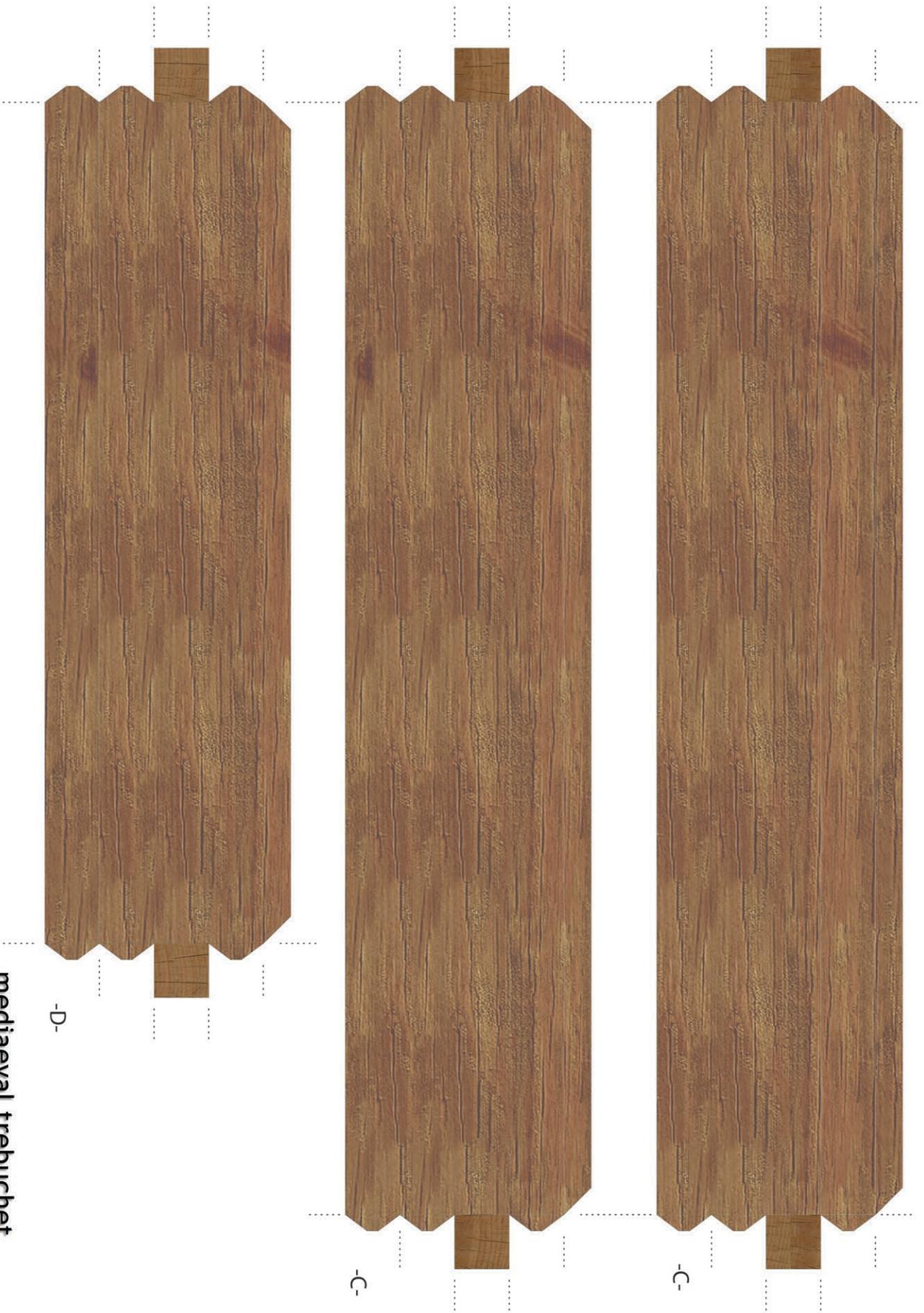
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-B-



-B-

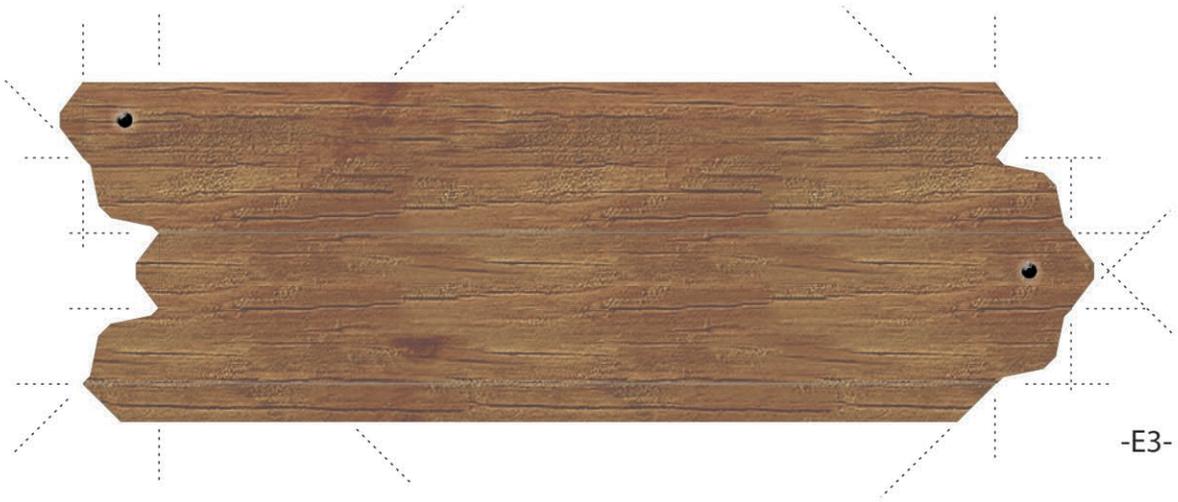


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-E3-

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-E4-

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-G-



-F-



-F-

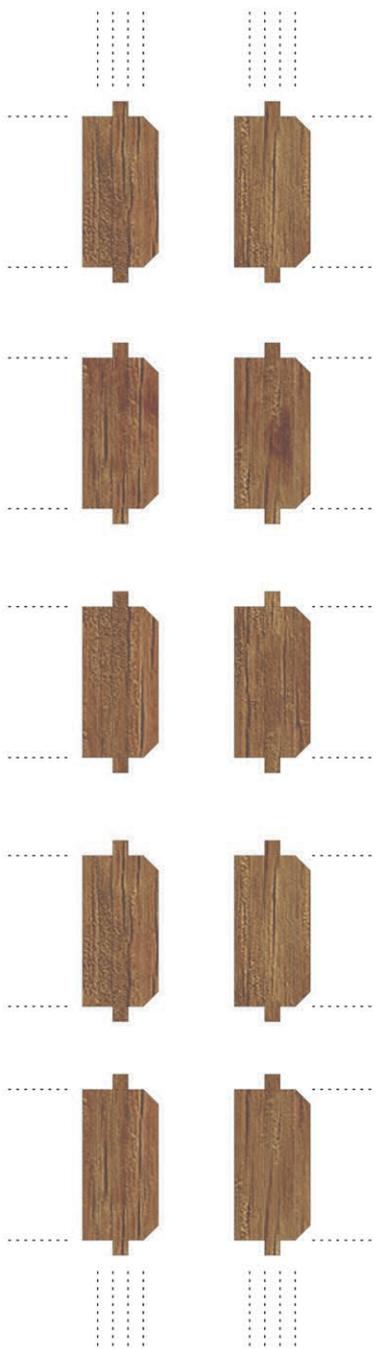


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-G-

-G-

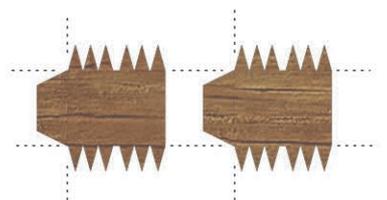
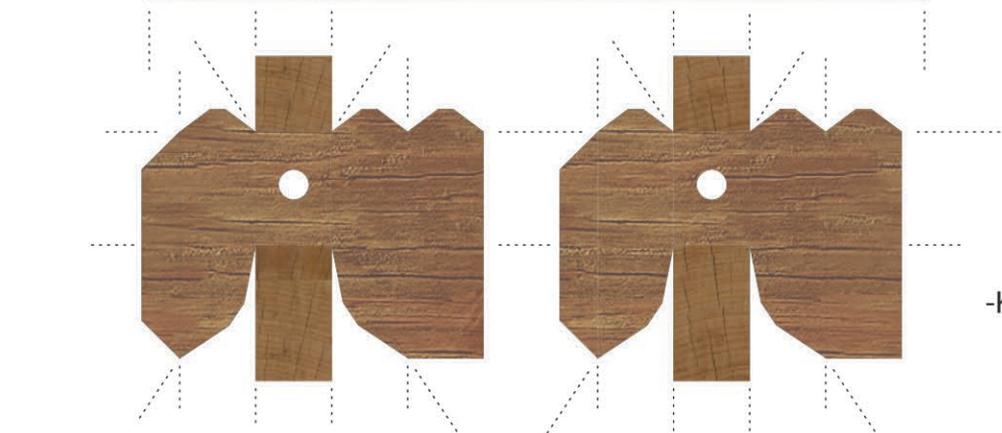
-G-



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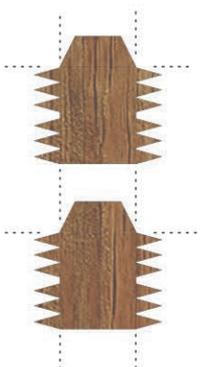
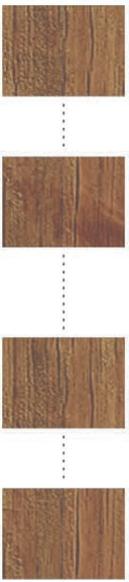
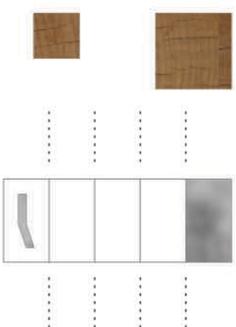


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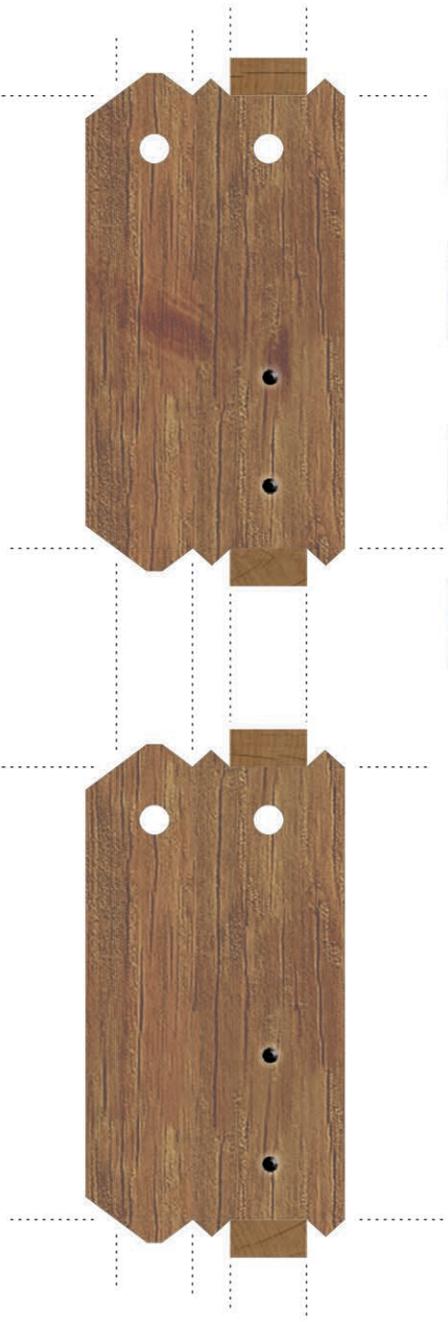




-L-



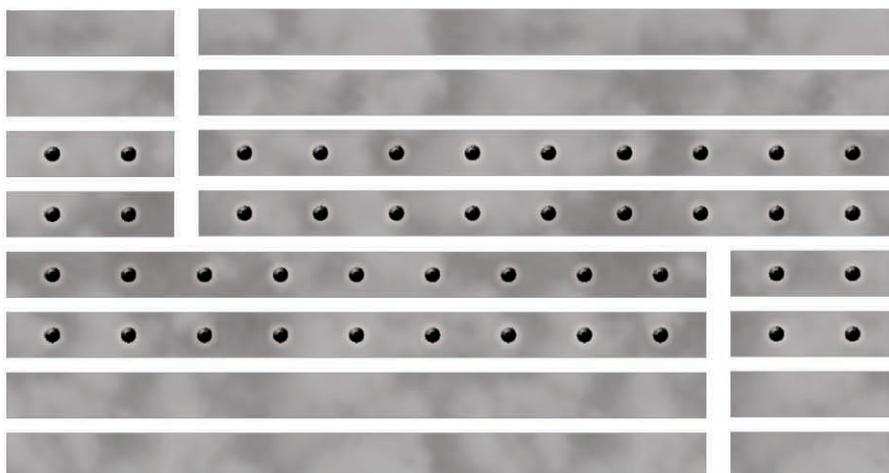
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-W-

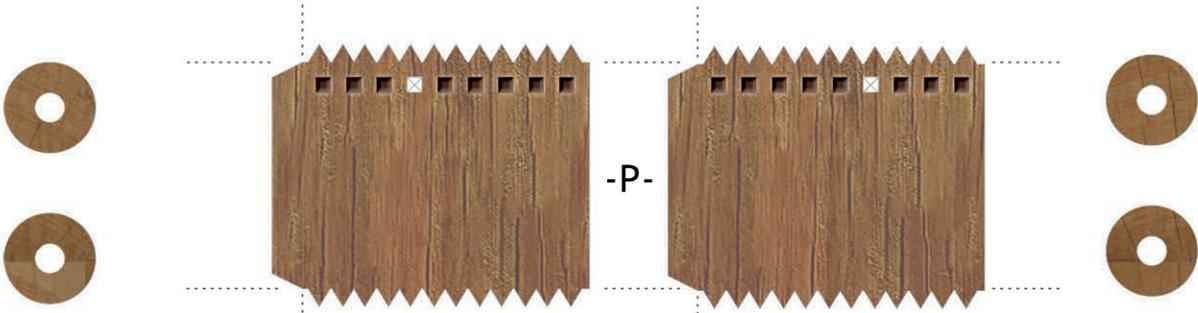


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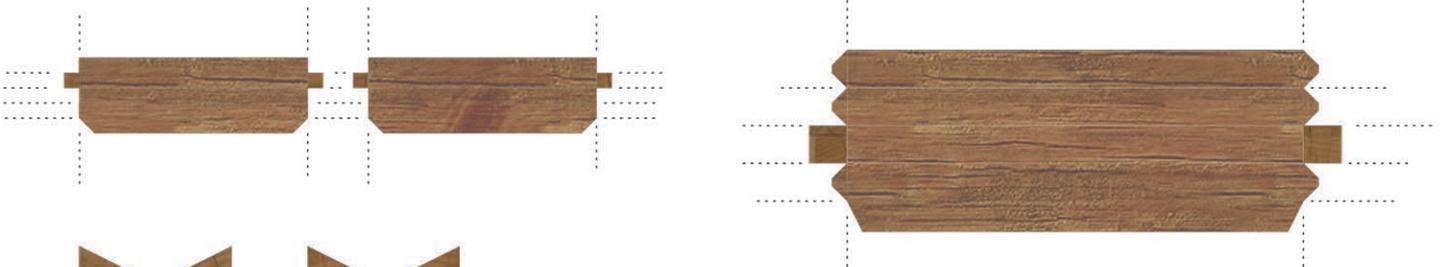




-O-

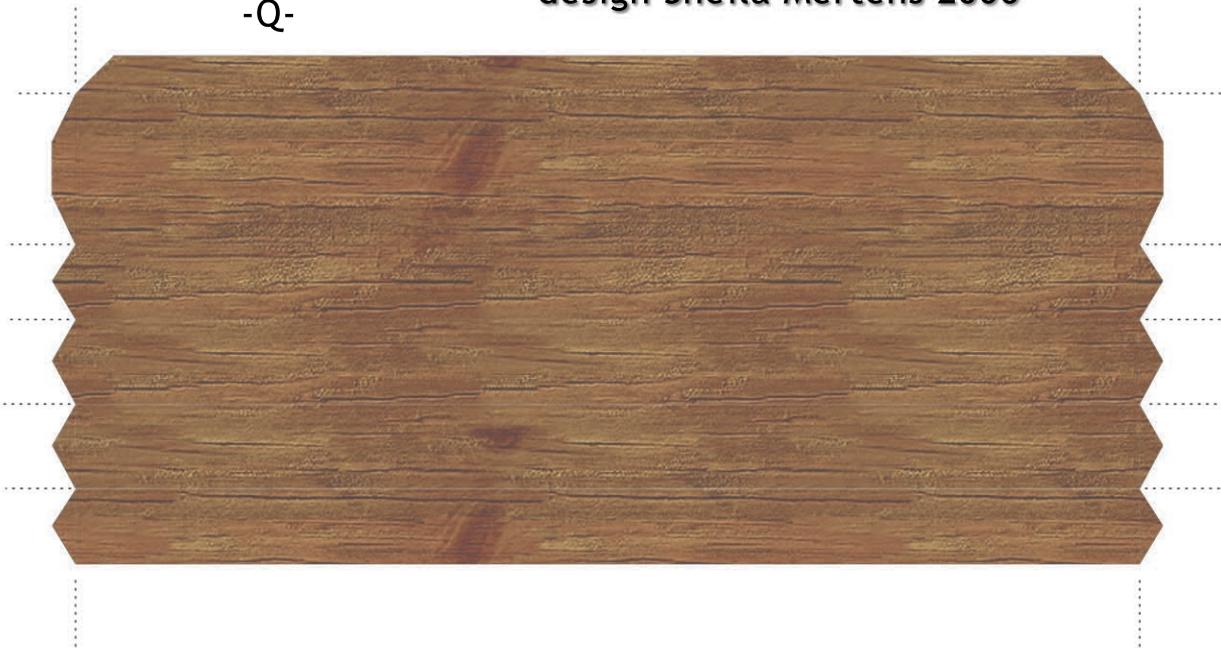


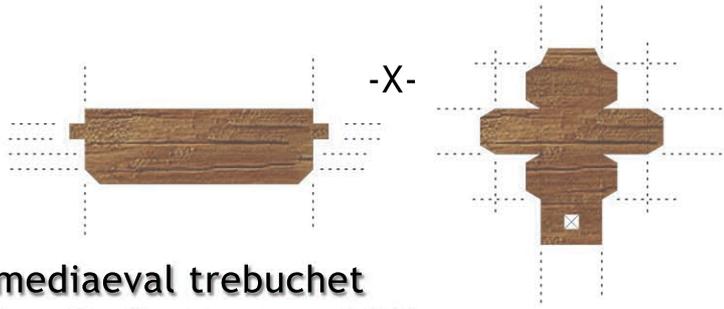
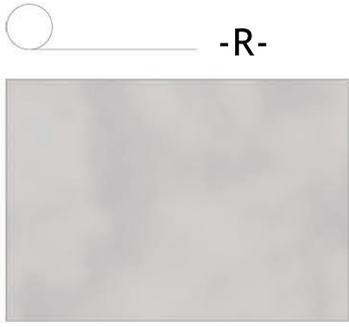
-P-



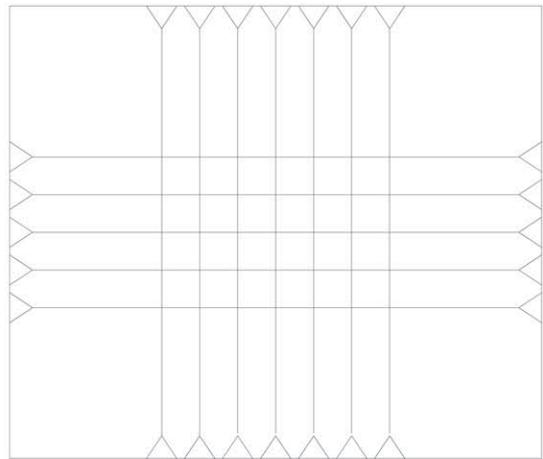
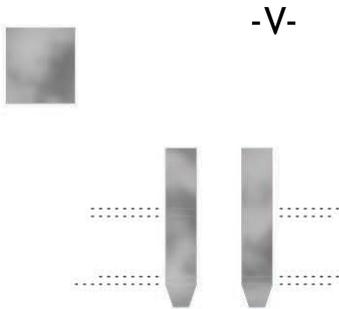
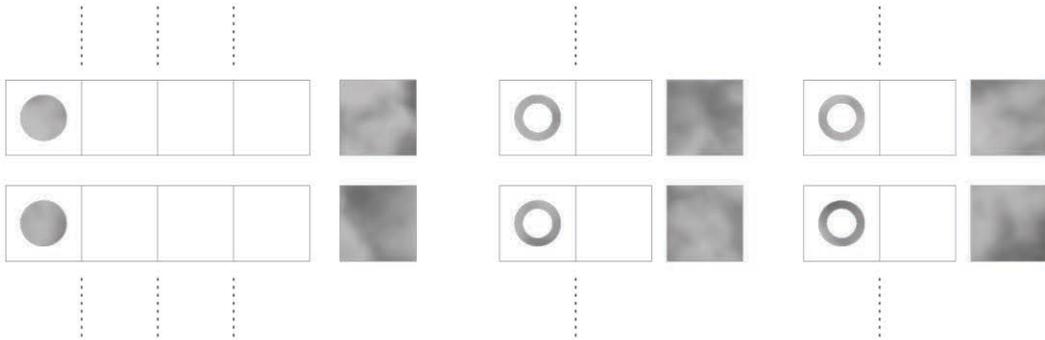
-Q-

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-W-