DESIGN MODELLING

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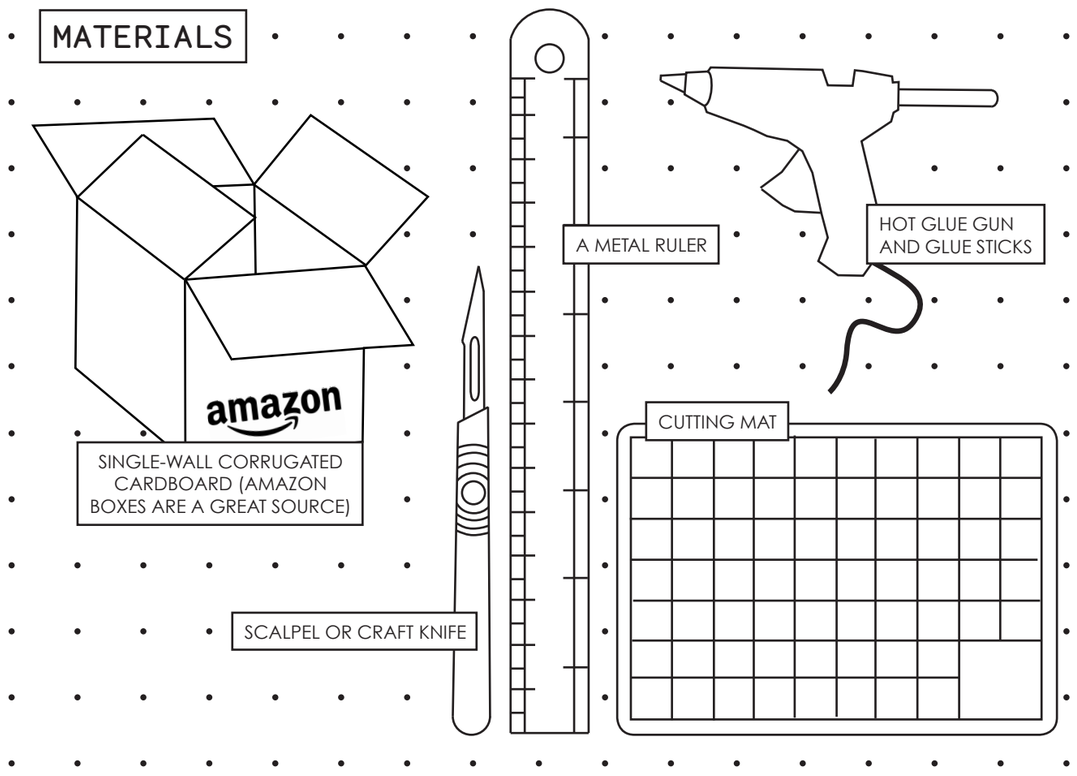
If an image is worth 1000 words, perhaps a model is worth 1000 images?

Cardboard is readily available and very cheap - especially if you use old boxes. The corrugated variety can not only make strong and elegant forms, but can even produce unlikely results - such as the cardboard gears shown here.

Here are a few key techniques that allow you to model quickly - to explore the essential form and function of your idea. This is not a replacement for CAD or 3D printing, but rather a way to be confident in your designs and share them with others, by making quick models.

MATERIALS



TECHNIQUES

HOW TO MAKE A SQUARE JOINT

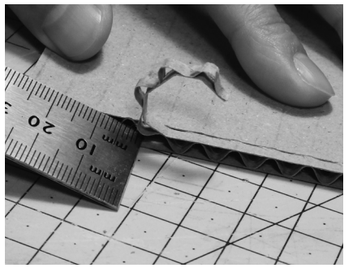
Cut a line as thick as the cardboard you want to join together. Cut through the top layer & the wavy (corrugated) parts only.

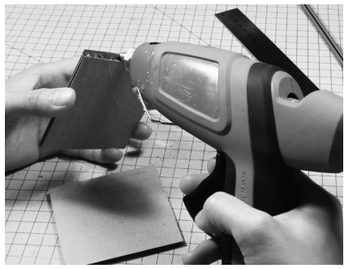
Slide the edge of the ruler under the wavy cardboard and push in a shuffling motion, to leave only the base layer.

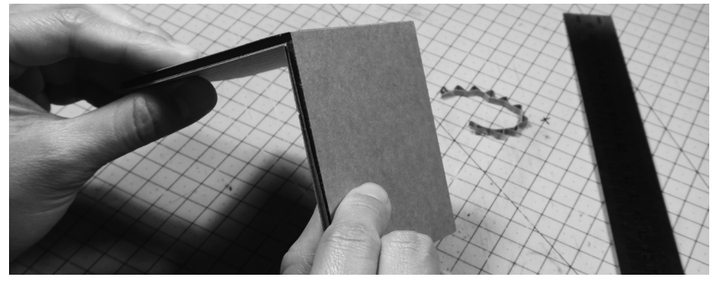
Check the fit of the normal cardboard in the seat you just made.

Apply (hot melt) glue in the seat of the card. Take care, as it can burn.

Join the two pieces together. Pull off any excess when dry and cool. Check the angle.





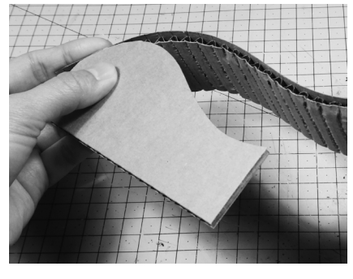


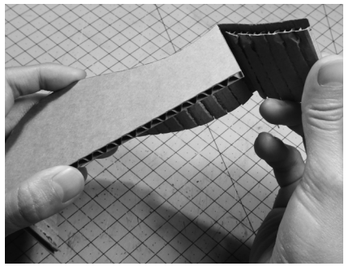
HOW TO MAKE A CURVED JOINT

Following the same idea as above to create a seat for the cardboard to sit in - next use a pencil to 'score' the corrugations.

Check the fit of the curved profile and flexible piece of card you just created.

Glue in place a section at a time, holding in position until dry and cool.





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HOW TO MAKE A BOX AND EVEN CARDBOARD GEARS!

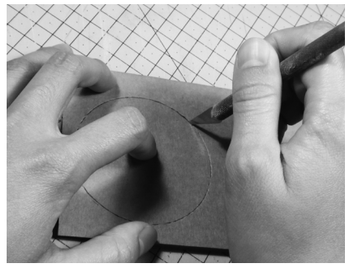
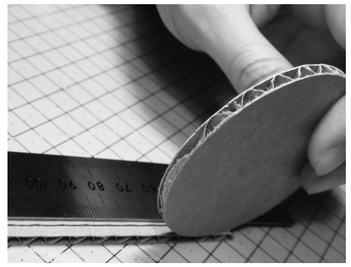
Cut a circle by first pricking the outline of the circle - then cutting all the way through, while rotating the card.

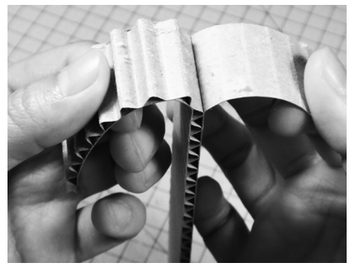
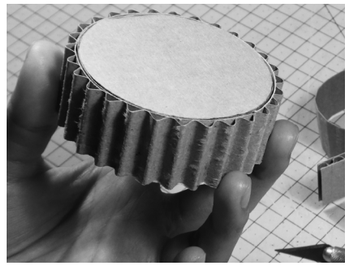
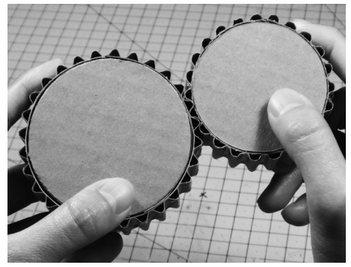
Mark the circle. Roll it 360° to see how long you need your strip to be. Leave a little extra for an overlapping tab.

As with a curved joint above, create scores and leave two seats for the top and bottom circles.

Optional: if you want to make gears, pull a strip of cardboard apart as shown.

Stick the wavy part to the cylinder you made, checking the teeth line up.

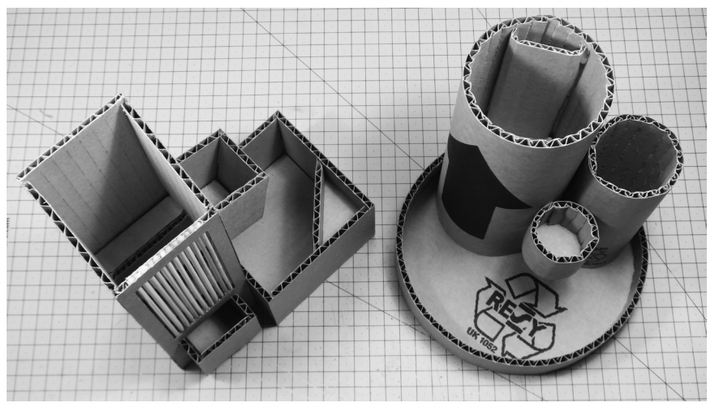




PROJECTS

DESK TIDY

These desk tidies are a good example of students exploring the different forms they can achieve - and even incorporating items like cocktail sticks into the forms, adding a different effect.

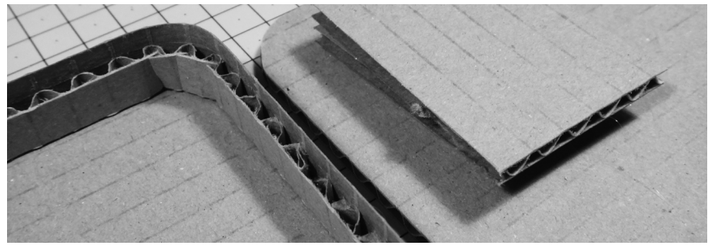
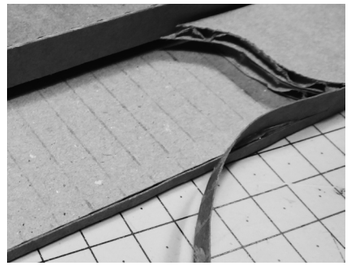
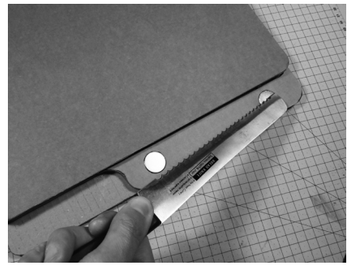
A desk tidy is not conceptually challenging (you know what items you need to organise), but it allows the modeller to become familiar with the process of building increasingly complex forms for a specific purpose.



BREAD BOARD PROTOTYPE

This is a prototype for a bread board - designed to house a bread knife in a recess underneath, held in place by magnets. Clearly cardboard is a terrible choice for cutting bread on, but this interaction is well understood already by most people. The prototype was useful to evaluate the fit of the knife, the number of magnets needed to hold the knife and of course to evaluate the look and proportions of the board.

Once happy with the design in card, we can make the real thing in wood, confident that we have explored most of the critical features cheaply and quickly in card.


WHAT NEXT?

Check out the Design Modelling website for loads of award-winning project ideas and video guides on techniques, tools and prototyping in various low-cost materials, such as ABS plastic and styrofoam - and of course cardboard.
www.judepullen.com/designmodelling

Jude Pullen is a design engineer and has to make a lot of models to prove concepts to himself and others.
He created the Design Modelling website, and runs workshops on design modelling all over the world.