

Christmas Engineers

How are products and decorations manufactured?



LO: we are learning how products are manufactured

Success criteria:

- ▶ I can describe how a product can be made from flat materials.
- ▶ I can make a product using those methods.
- ▶ I can identify the advantages and disadvantages of this type of manufacturing.

Manufactured Products

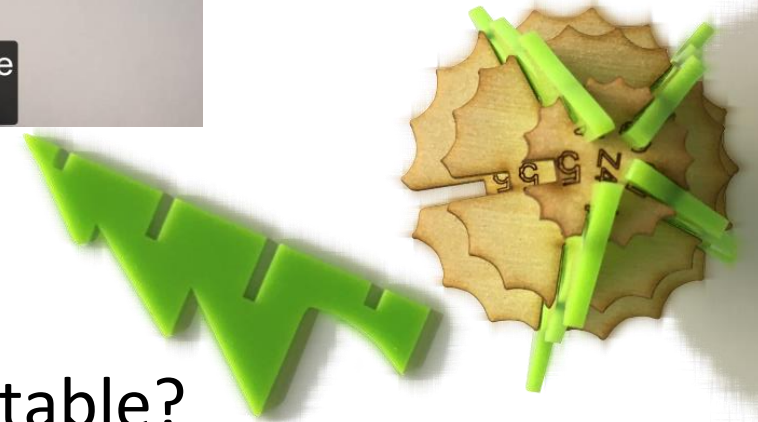
1. Watch the video of the Christmas tree.

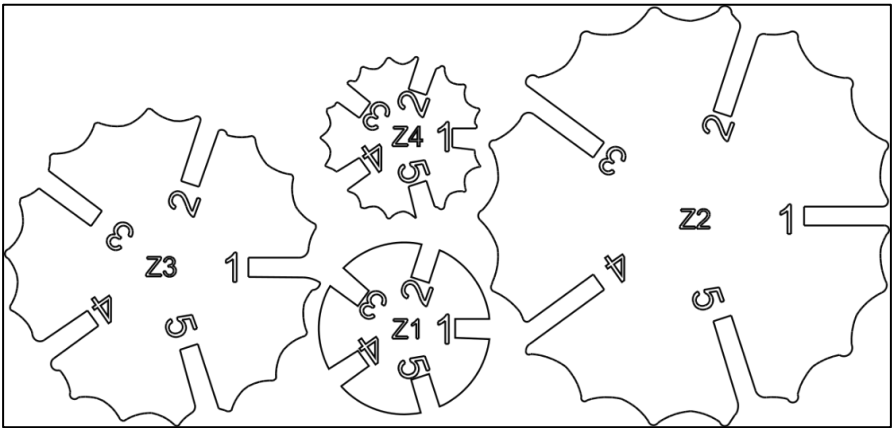


2. Discuss:

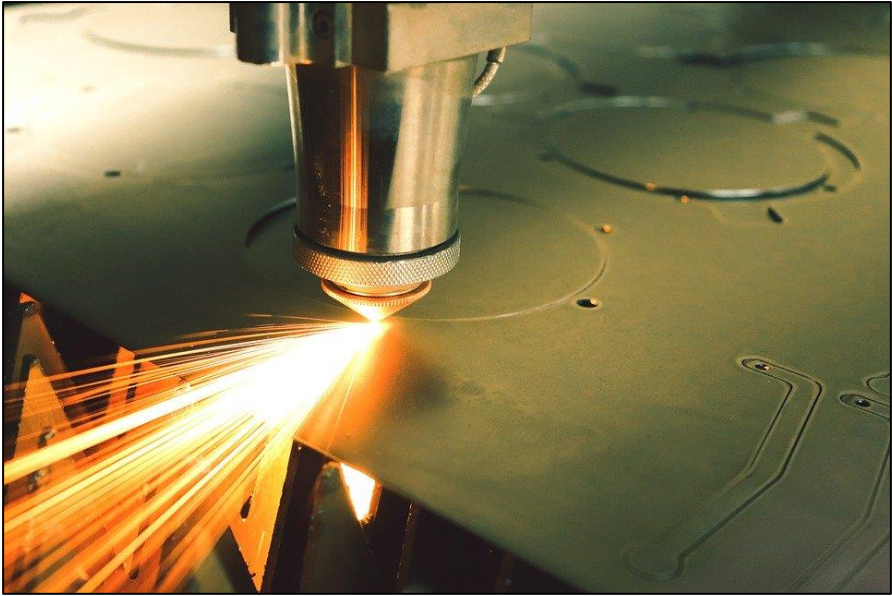


- ▶ What material is it made of?
- ▶ How do the pieces join together?
- ▶ What features make the product stable?
- ▶ How were the pieces made?

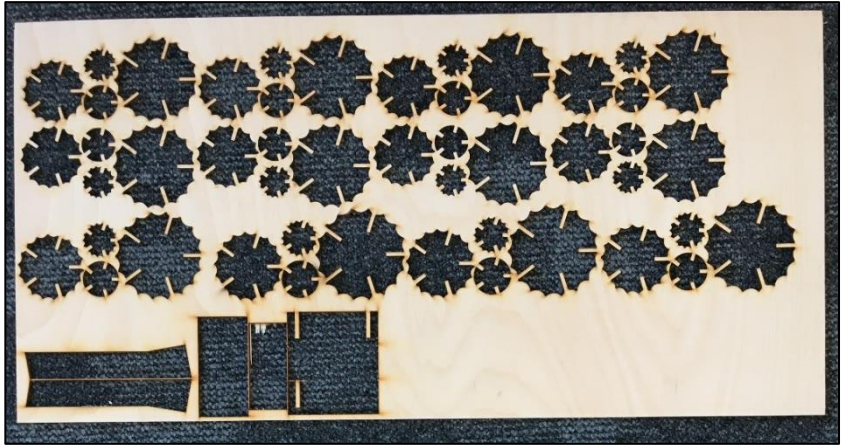




Laser cutting

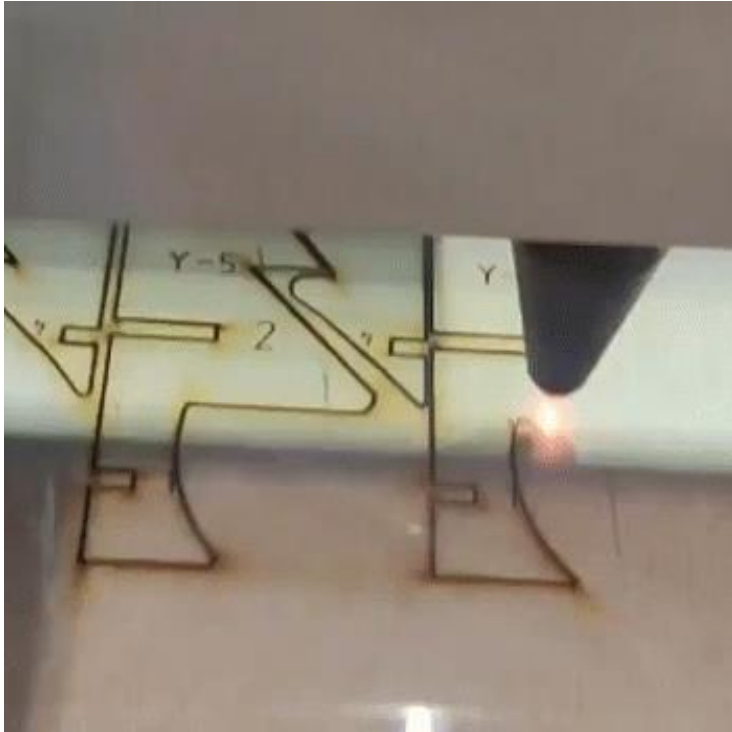


What are the advantages and disadvantages of laser cutting?



Laser cutting – in action!

A laser is an incredibly bright beam of light that cuts through wood because of how hot it is!



Beth tells the computer what shapes she wants the laser to cut out and then just clicks "Go"!





Where have you seen products flat-packed before?

What products can you think of that are bought like this?



Ecobulk is an international project in which scientists, engineers and designers are working together to turn large, bulky waste materials that would normally be thrown away into useful new materials.

Why could this be good for the environment?





This furniture is one example of an Ecobulk project. It is made with recycled wood from other furniture that was going to be thrown away.

The glue that holds the recycled wood together, to make it into large pieces of wood, does not contain chemicals that are bad for the environment or the people that build them.

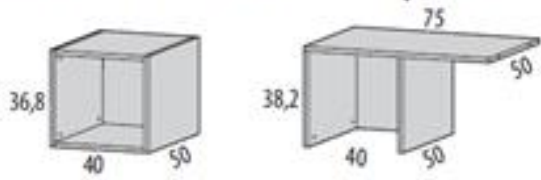




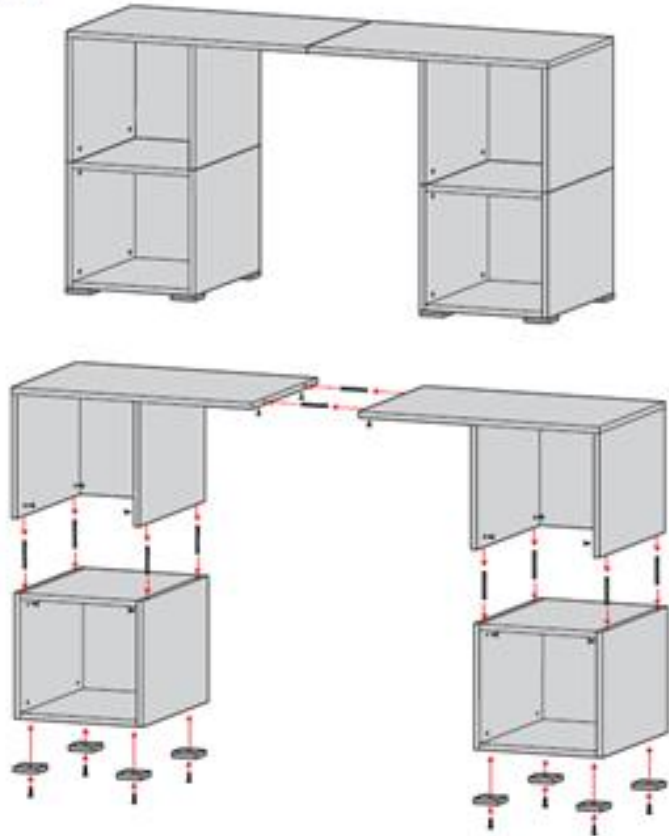
All of the pieces are flat packed, and the same pieces can be used to make different items, such as desks, shelves, chairs, bedside tables and even beds!



Elementi Ecobulk 2020 - prof. 50



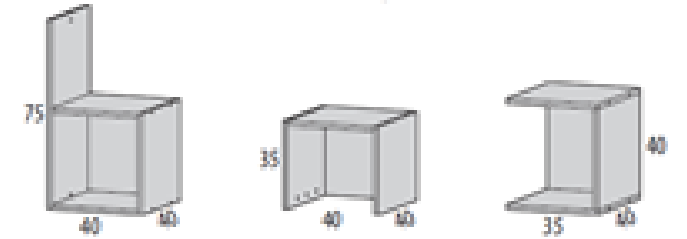
Scrivania



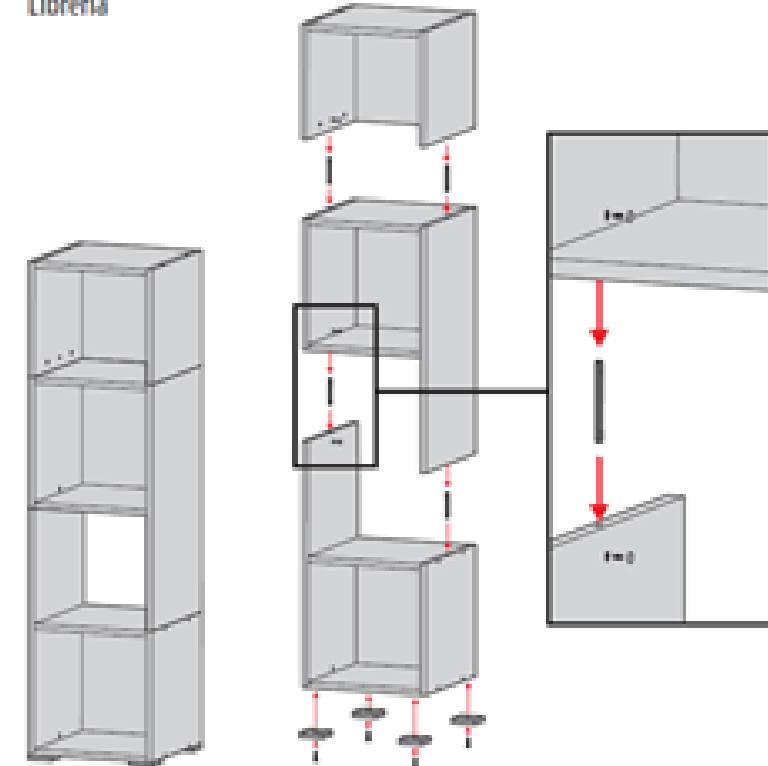
Can you see the same pieces being used in different ways?

Can you work out how the pieces are held together?

Elementi Ecobulk 2020 - prof. 40



Libreria



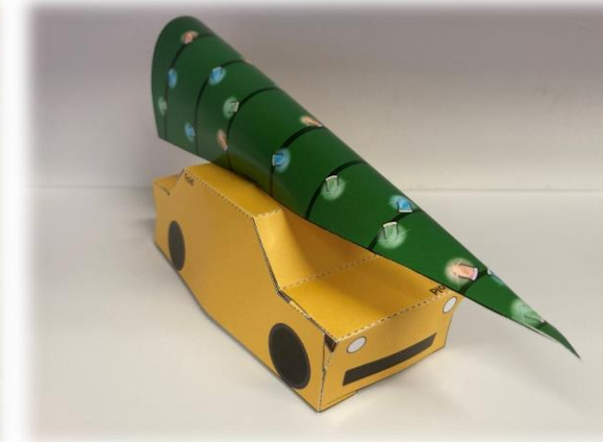
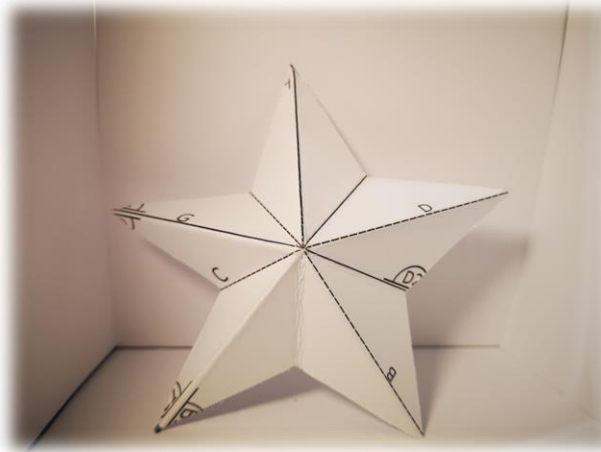
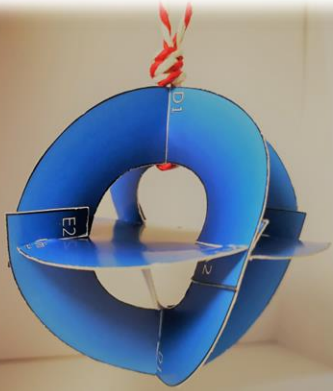
What are the advantages of flat-packing products instead of sending them to the user ready-made?

What are the disadvantages?

Think about the manufacturer and the user.



Practise making a 3D shape

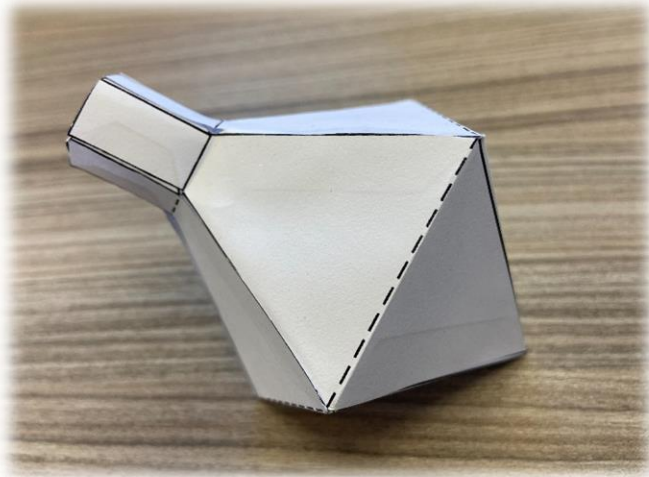


Follow the steps on your template.

Think about how the flat sheet turns into a 3D object!



Practise making a 3D shape



Sometimes flatpacks have tabs that will be glued for assembly.

The idea of the paper lantern is that everyone in the class can make one.

Link to video:

https://warwick.ac.uk/fac/sci/wmg/about/outreach/resources/flatpack/paper_lantern.mp4

If they choose to make them in different colours, they could be strung together to create a festive decoration in the classroom



EXTENSION: You could combine some electronics and make them light up



Now that you have practised making 3D objects out of card, you are going to work in a group to design and make your own idea to create a winter scene, using the stand provided as a base.

Have a look at the examples [here](#) for inspiration [external website].



As a group:

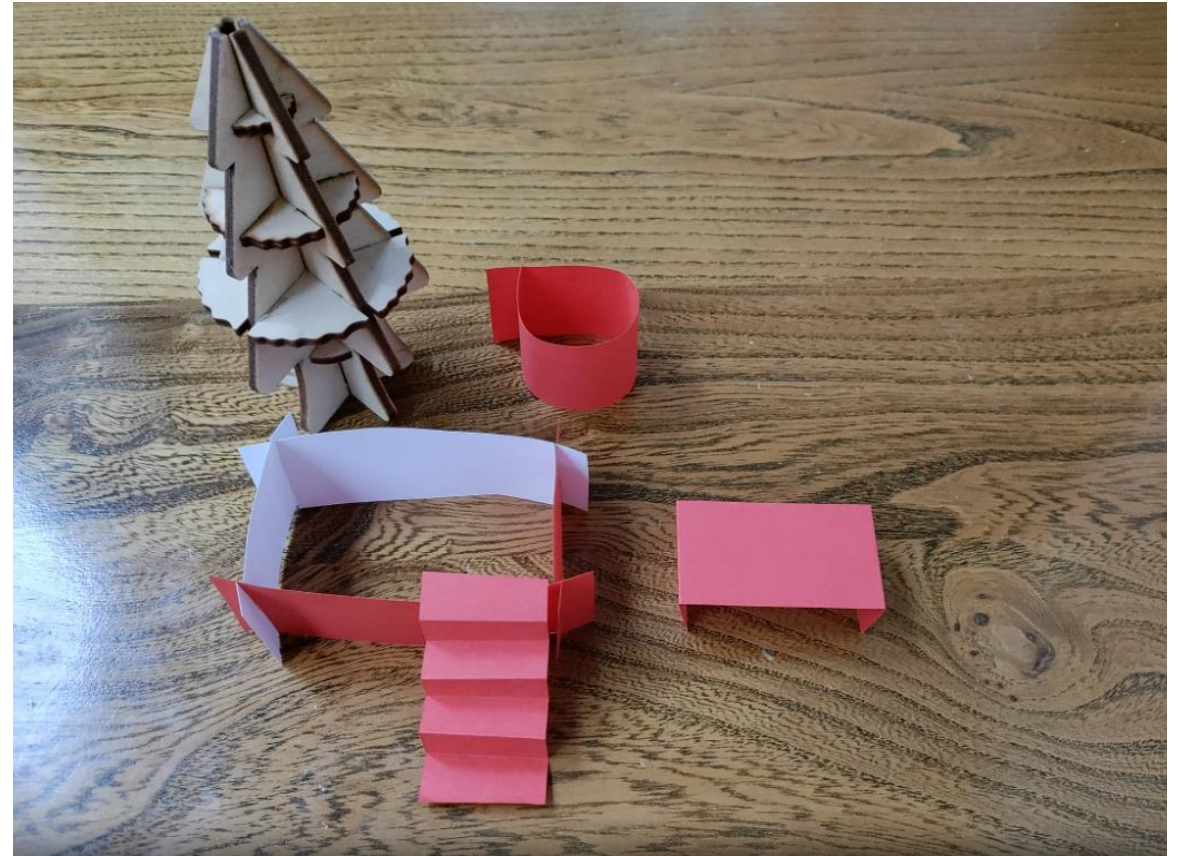
- agree on what type of winter scene you will make (e.g. woodland, fairy tale, mountains).
- agree what figure or object each person will make (e.g. a tree, a robin).



Construction techniques

Watch the video about paper construction techniques you could use: bends, folds, slots.

Video link: [WMG outreach - primary schools - flat pack resource box \(warwick.ac.uk\)](https://www.warwick.ac.uk/wmg/outreach/primary-schools-flat-pack-resource-box)

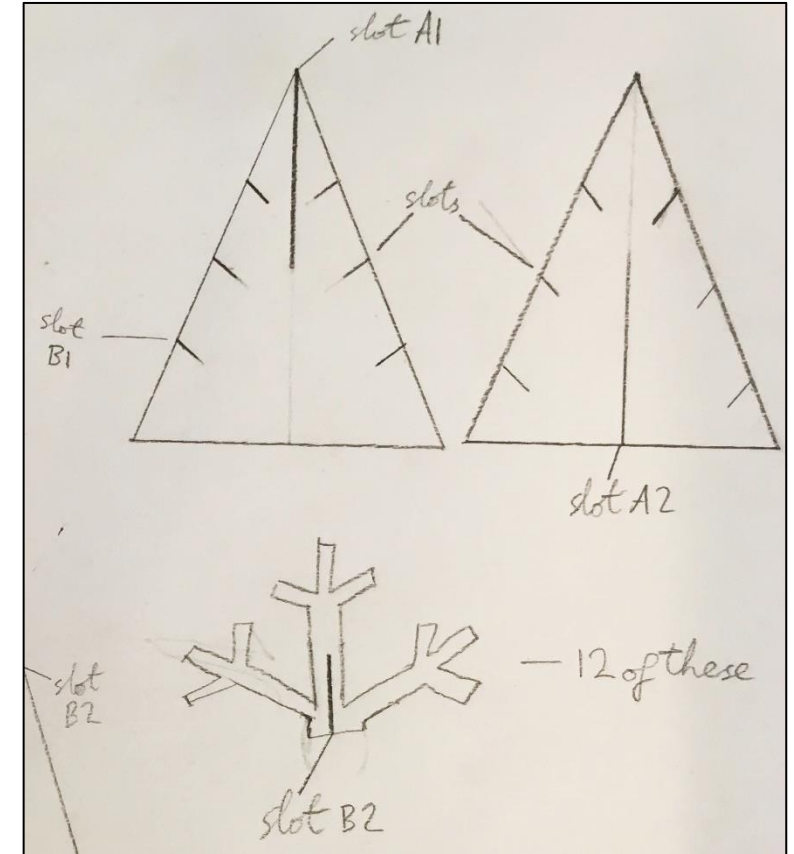
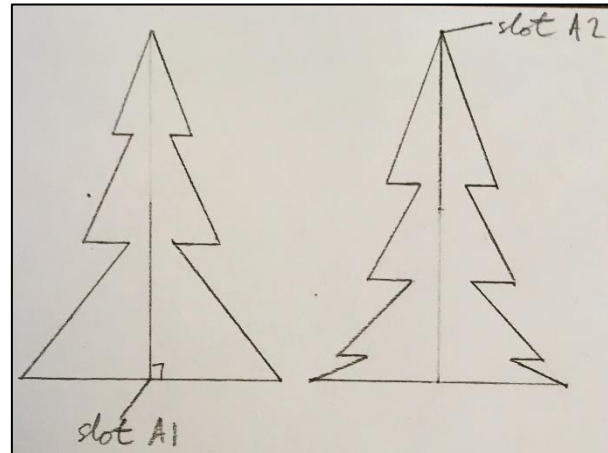
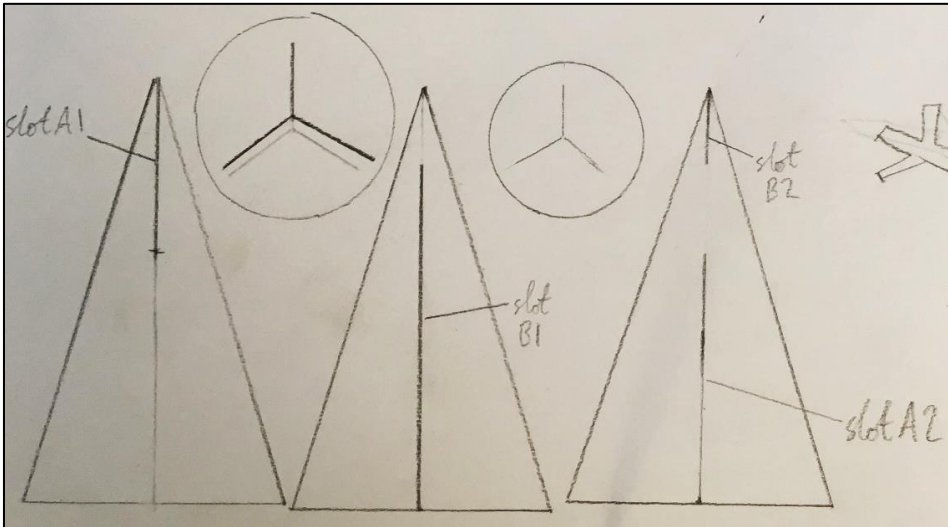


Designing your own figure

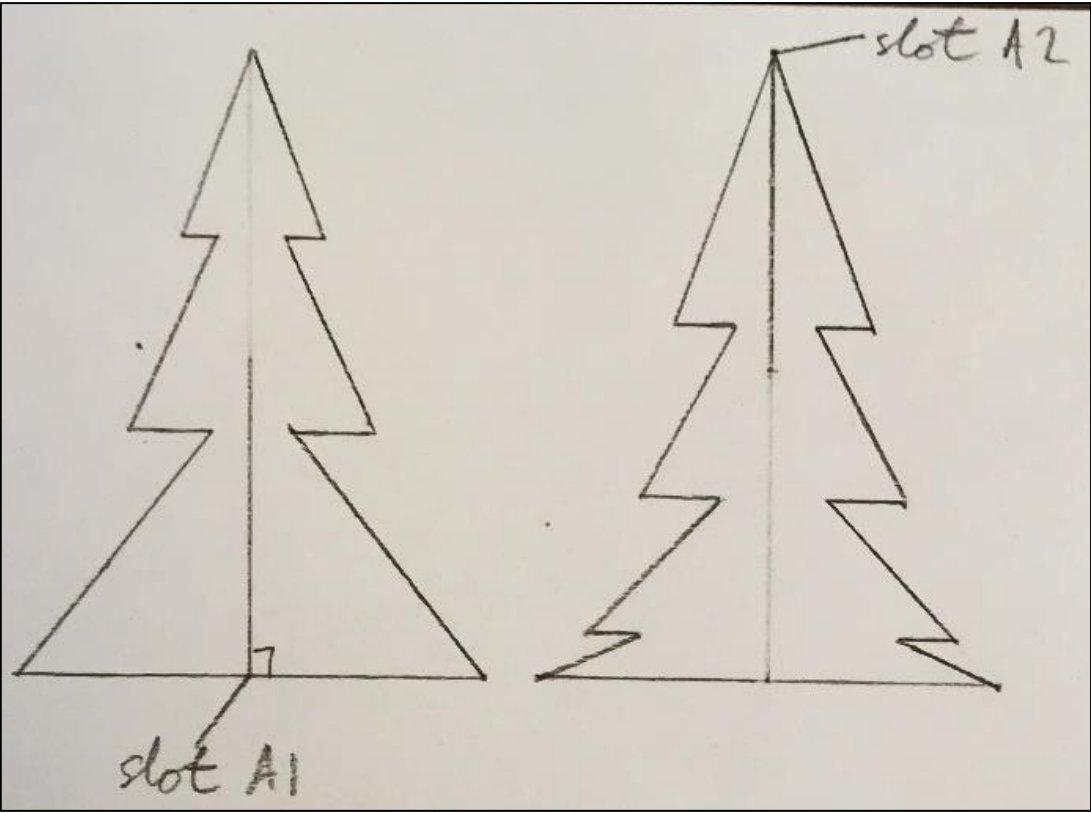
How will your design join together without glue or tape?

How will you make it stable?

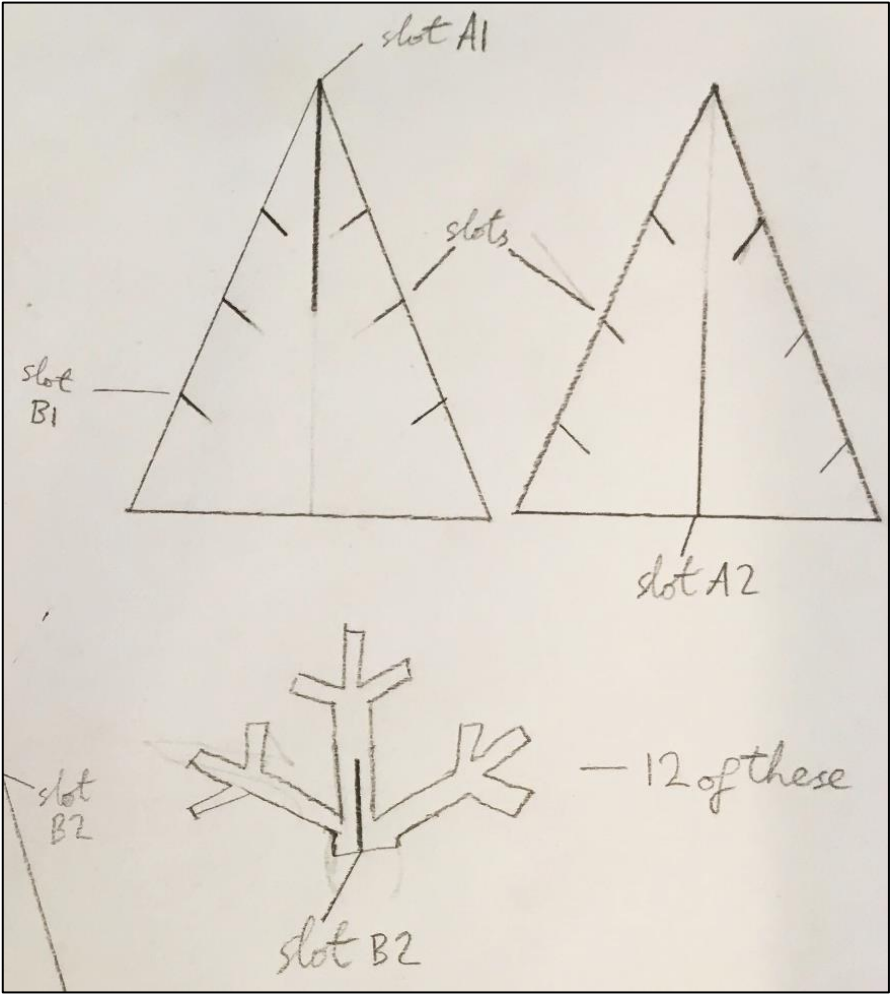
How can you use measurements to help you?



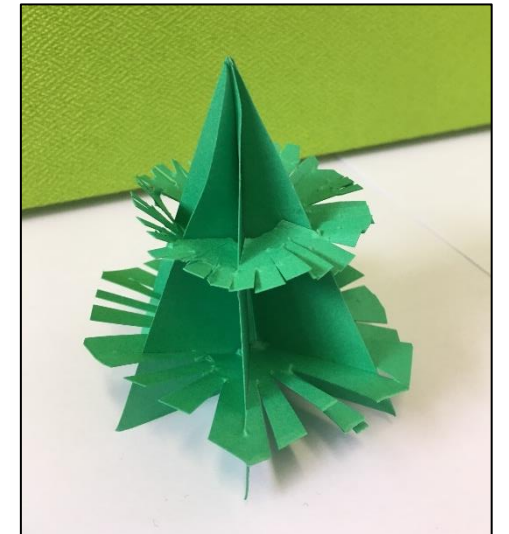
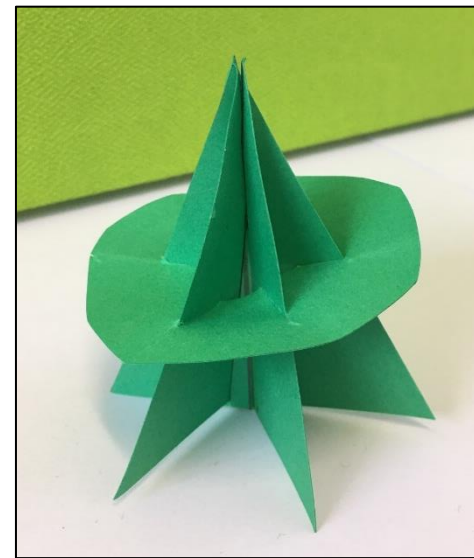
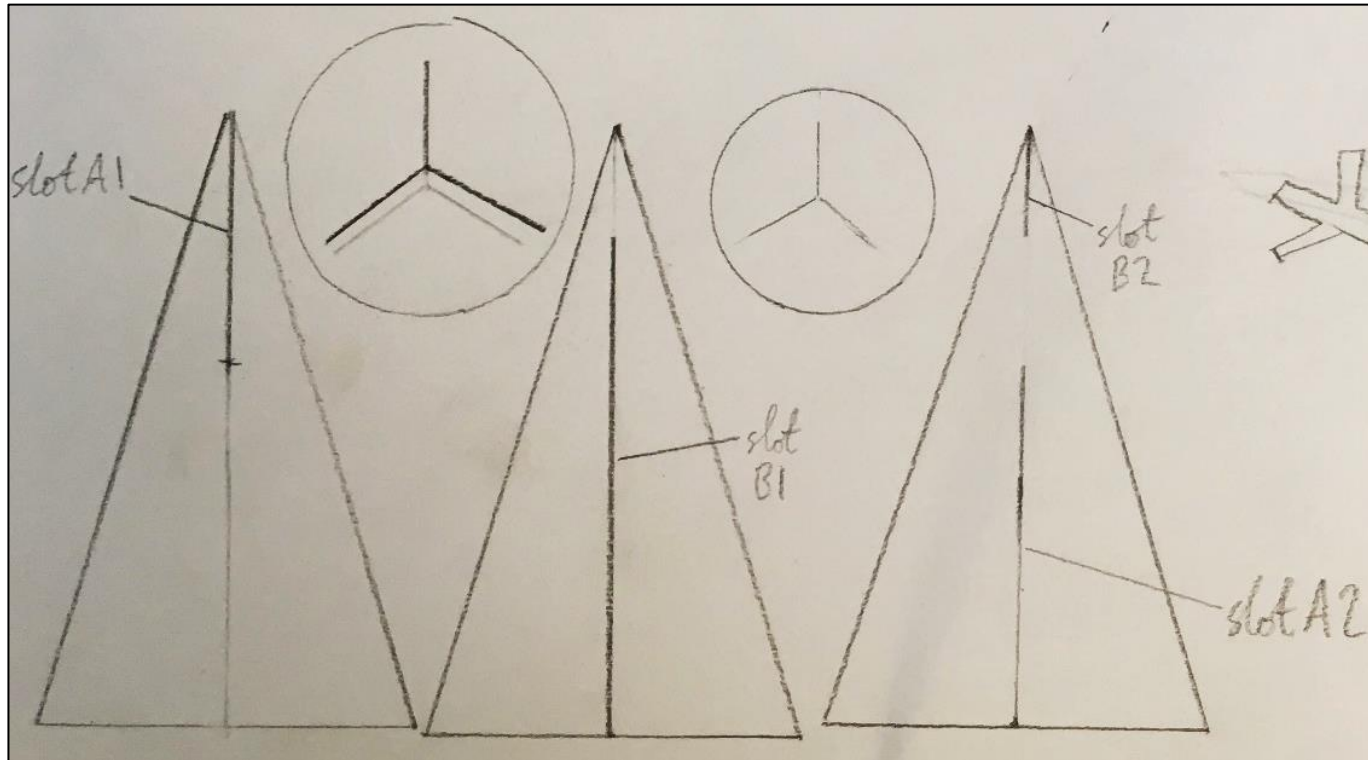
Example design



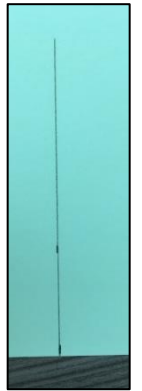
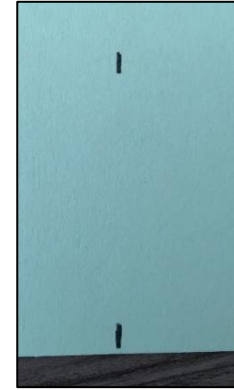
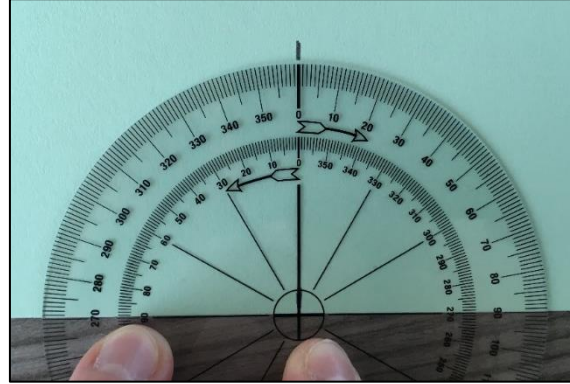
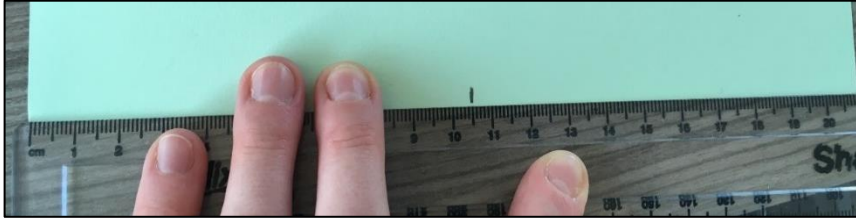
Example design



Example design



Making and testing your product



Is it stable? Is it simple to assemble?

How can you make it easier to assemble?

Does it need labels or instructions? (If so, make some.)



- Design and make your figure and slot it into the stand.
- Work together in your group to decorate the stand and add extra pieces if you have time.



Swap your products and try to assemble someone else's.

What is successful about their design?

What improvements could they make?

Share your photos of the class's designs on Twitter:

@wmgwarwick #WMGoutreach

