

# Make your own

# Trebuchet



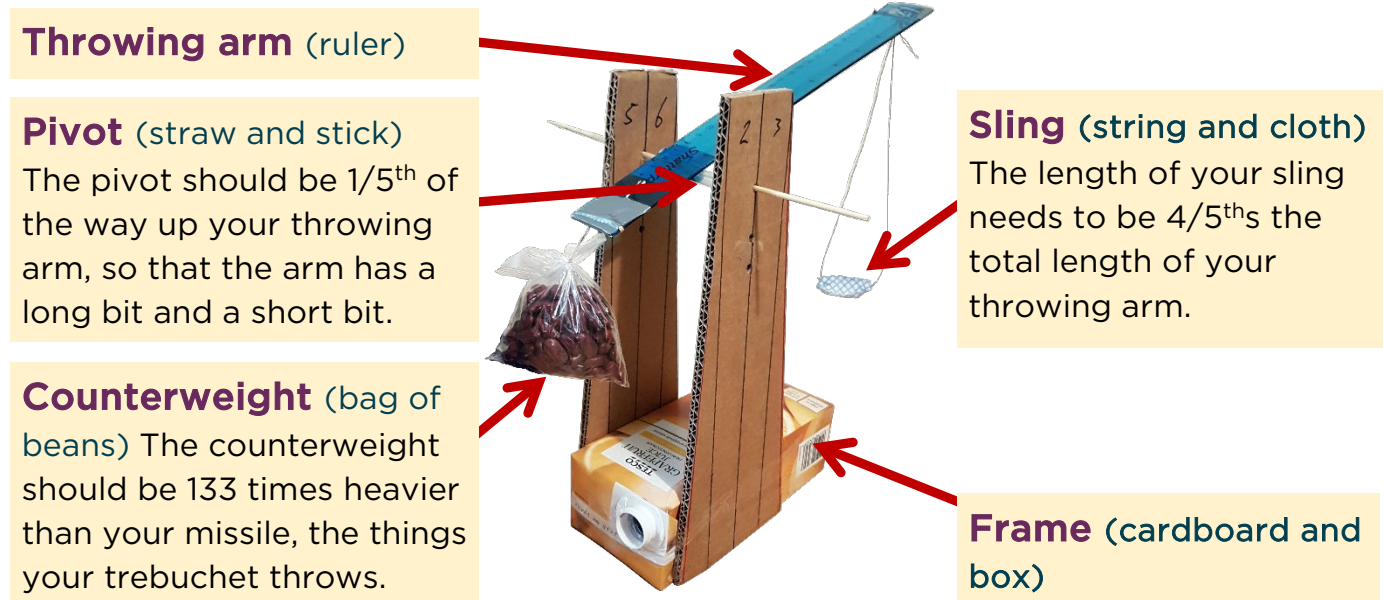
A trebuchet is a special type of catapult. Trebuchets were powerful siege engines and were used in Scotland for attacking castles between the 1200s and the 1300s.

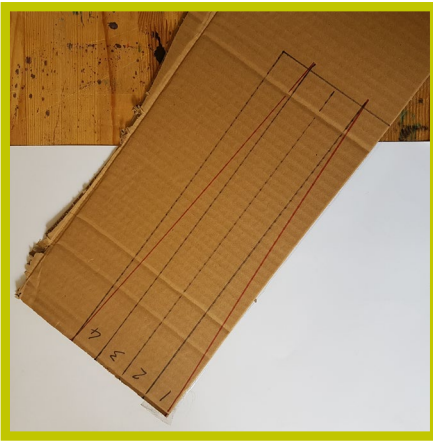
## You will need:

- Something long and straight like a ruler to be the throwing arm
- A straw
- A BBQ skewer or some other kind of thin, straight stick which can fit through the straw
- Sticky tape (duck tape is great because it's so strong but normal tape works too)
- A sharp pencil and blu-tac
- A ruler and a pen
- Thin string and a needle
- Thick, strong cardboard
- Something flexible and light to make your sling (a small piece of a cleaning cloth works well)
- A paperclip
- A box (we found a 1l fruit juice carton works well).
- A small plastic bag or a sock
- Small missiles to throw (e.g. dried beans or small sweets)
- Scissors

## Medieval maths

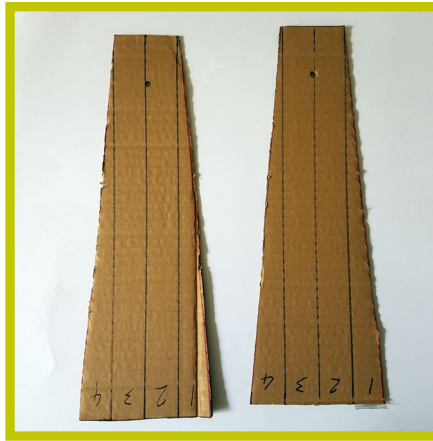
A trebuchet needs some careful measurements for it to be able to work properly.





### Make your frame

1. Use your ruler and pen to mark out 4 lines on your cardboard. Number them. Draw a diagonal line from the bottom to the top corner of 1 and from the top to the bottom corners of 4. Do this twice and cut them out.



2. These are your side pieces. Stack them together and use your sharp pencil to make a hole through both on the centre line near the top.



3. Draw a straight line across your box (it must be at a right angle).



4. Line up the centre lines of your side pieces with the line on the box, and then tape them securely in place to the sides of the box.

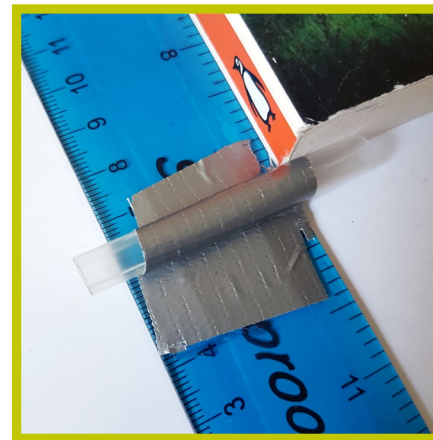


### Make your throwing arm

5. Measure the length of your throwing arm stick then divide it by 5 (if you're using a ruler as the stick that makes things easier!).



6. Make a mark  $\frac{1}{5}$ <sup>th</sup> of the way up your throwing arm stick (e.g. if it's 30cm long, make a mark at 6cm, if it's 15cm long, mark it at 3 cm).



7. Cut a piece of straw and tape it to the mark so that it's at a right angle (90°) to the throwing arm. You can use the corner of a book to check the angle.



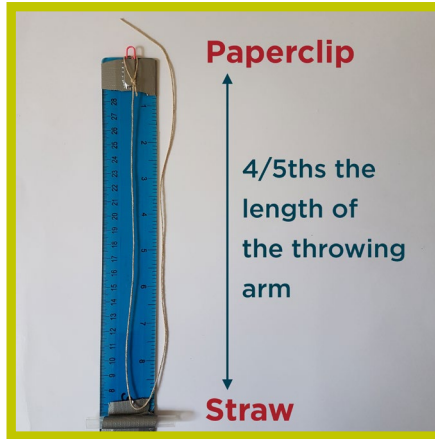
8. Tape a paperclip to the end of the arm furthest away from the straw.





**Make your sling**

9. Tie a small loop in the end of your string.



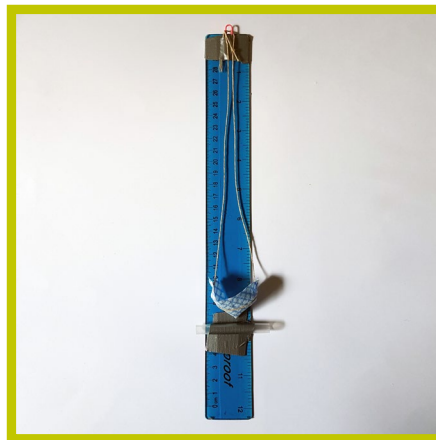
10. Measure and cut the string so that it reaches from the paperclip to the straw and back again.



11. Cut a small rectangle of material roughly 3cm x 5cm. Make 2 small cuts in the top and the bottom.



12. Use your needle to thread the sling onto the string so that it's got a slightly rounded shape.



13. Tie the end of the string to the paperclip, adjust the sling so that it's in the centre, and place the small loop over the paperclip.



**Make your counterweight**

14 a. The most efficient counterweight is 133 times heavier than the missiles. A very easy way to calculate this is to put 133 of your missiles in a bag.



14 b. Another way is to weigh 1 of your missiles, multiply this by 133, and then use kitchen scales to weigh out small heavy things like pebbles or coins.



15. Put the things you're using in a small bag (or a sock) and tie it to a small loop of string. Tape the loop to the short end of the throwing arm so that it can swing freely.



**Assemble your trebuchet**

16. Slide your BBQ skewer through the holes in the side pieces and the straw pivot on your throwing arm.

## Firing your trebuchet

- Load one of your missiles into the sling.
- Pull the sling back along the top of the box so that it's sitting directly under the counterweight which will be raised up.
- Let go!

### Be careful!

Never aim your trebuchet at someone and don't use any missiles heavier or larger than a bean.

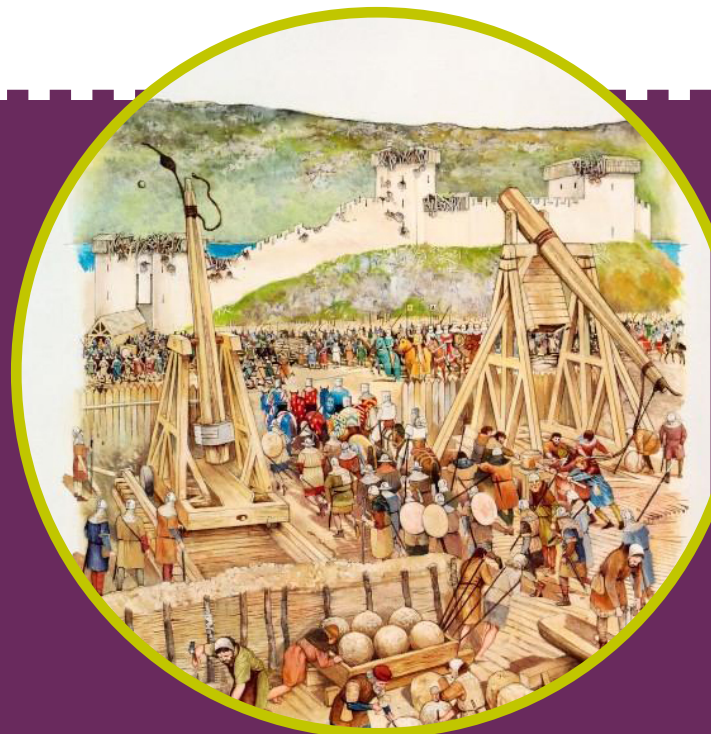
### Top tip

Trebuchets can be tricky and require a bit of perseverance. If yours doesn't work at first try adjusting bits like the length of the sling and the heaviness of the counterweight. Make sure your counterweight can dangle from the end of you throwing arm but doesn't hit the box you're using for your frame.



Several Scottish castles were attacked with trebuchets during medieval times including Caerlaverock Castle in 1300, Stirling Castle in 1304, and St Andrews Castle in 1337.

Trebuchets were often given names by the armies which used them. The one used to attack St Andrews Castle was called Buster, while the one used to attack Stirling was called Warwolf.



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