

Knucklebone Dice

Name of the object	Knucklebone Dice
Recommended ages	Starting from 10 years old
Thematic areas combined (STEAM)	Science, Engineering, Mathematics
Materials needed	3D Printer PLA
Instructions step by step	<p>Step 1. Setting up all the materials and looking at the instructions and models.</p> <p>Step 2. Making the knucklebones.</p> <p>Total duration: 1h40</p>

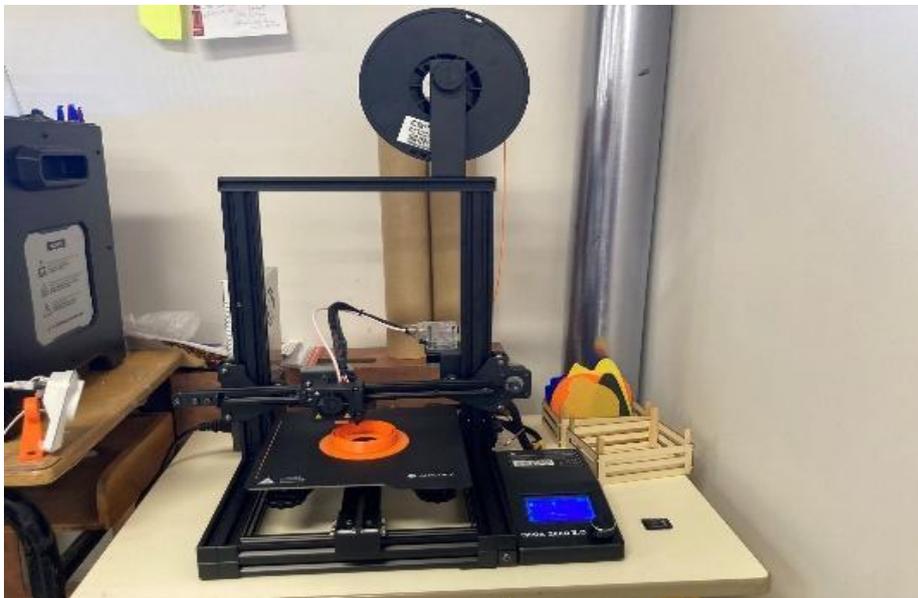


Step by step: how to build the knucklebones

Step 1. Setting up all the materials and looking at the instructions and models

Time needed: 10 minutes

Set up all the materials and look at the instructions.



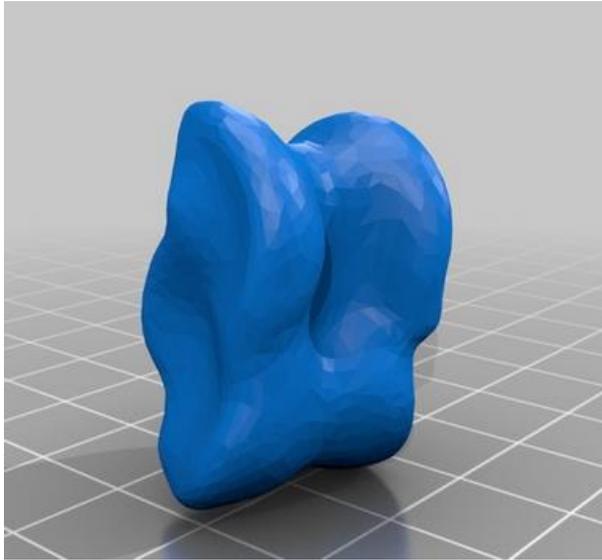
All the pieces ready to use.

Step 2. Making the knucklebones

Time needed: 1h30

First, make these plastic knucklebones using a 3D printer by downloading the file from this website:

<https://www.thingiverse.com/thing:1036458>



Play!

A knucklebone is a small bone. The talus is a joint bone found in the tarsus of the carpus (wrist skeleton) of the hind legs of sheep or goats.



In Antiquity, the Greeks and Romans used these knucklebones for dice games, trying to achieve certain combinations.

A knucklebone has four different faces:

- Of the two wider sides, one is convex, the other concave.
- Of the two narrower faces, one is flat, the other sinuous

The faces were assigned values and bets were made on the sums of the numbers of the resulting faces:

The sinuous face "tortuosum" is worth 6.

The flat face "planum" is worth 1,

The concave (hollow) face "Supinum" is worth 3,

The convex face (bump) "pronum" is worth 4.



The modern game is quite different. It consists of 5 metal or plastic knuckles, one of which is painted red, called the father.

In the old game, four knucklebones were usually thrown simultaneously or one after the other.

Named Venus by the Romans, the most favourable configuration of knucklebone was when all four knucklebones were on different sides; in the worst, named Canis (Latin for dog), they were all on the narrow flat side (the vulture side).

Example of a game:

The game ends when a player has no more tokens.

- Each player takes many tokens (for example, 30)
- They take turns throwing four knucklebones simultaneously

- If a player gets a Venus shot, i.e. the configuration where the four jacks were on different sides, the player takes the common pot
- If not, he pours into the common pot the equivalent of the sum of the numbers equivalent to the faces obtained (Tortuosum = 6, Pronum = 4, Supinum = 3, Planum = 1)

Who is going to win?!

Resources

<https://scientificsentence.net/Equations/Maths2/probabilites/index.php>

<http://vivienfrederic.free.fr/probas/Lesosselets.pdf>

https://museedujeu.ch/wp-content/uploads/2016/09/01_Osselets_dossier.pdf