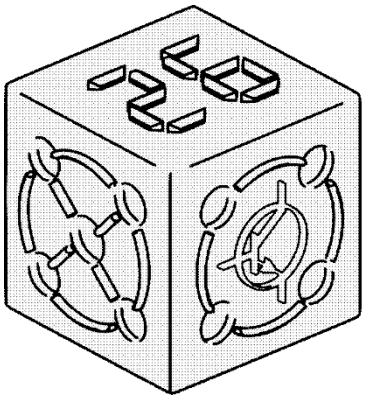


# THE AVALANCHE ROLL

Created by:
@dabecart

## User Guide

**1st Edition**

10th of November, 2024

github.com/dabecart/TheAvalancheRoll

# What's **THE AVALANCHE ROLL**?

The Avalanche Roll is the latest (*useless*) invention of @dabecart.

It's a space-graded truly-random and up to **D32** electronic dice that operates on a quantum operated phenomenon called **avalanche effect**!

Yes, you've heard it right, avalanche! That's where the name of this hunk of plastic and electronic comes... Genius, Daniel... Genius.

So, the avalanche effect happens when a N-P junction gets *reverse* polarized, that is, when you try to force current over a diode on the opposite direction, from negative to positive. That, over a long period of time, causes a degrading of the diode, but in this case, we're looking for the exact point where the effect **starts** occurring.

You see, a diode generates a big voltage potential over its two ends when reverse polarized. Electrons cannot jump from one end to the other due to this potential; at least, not according to classical physics. Here comes the quantum part: there's an effect called **quantum tunneling** that actually allows the electrons to "appear" at the other side of the barrier, even though it's supposed to be impossible!

These jumps or magical apparitions are **truly random!** There's no way to calculate when the electrons are going to take the jump, and this is what makes this dice **really** random!

OK. And what about the **space-graded** part?

Well... This dice operates **without any microcontroller!** It's all analogic components and logic gates, meaning that this dice can go to outer space! (I think?) It's one of the requisites, but yeah, it could go to space (I think????).

Oh, and you can select the number of "faces" of the dice! Meaning you can ditch all your boring dices, because you've got one to rule over all!

"But @dabecart, going to space? If it's battery operated, how are you going to charge it?"

Glad you've asked it. It's got a **solar panel**. Yeah... It can also be charged using **USB-C**!

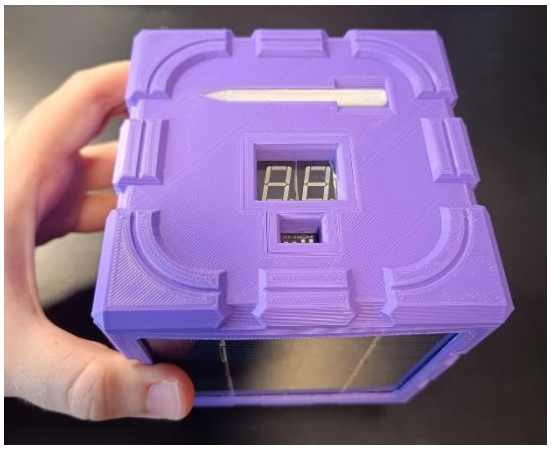
Useless. Over-engineered. Dubious quality. All seals of @dabecart work!

Hope you enjoy it!

# How to use

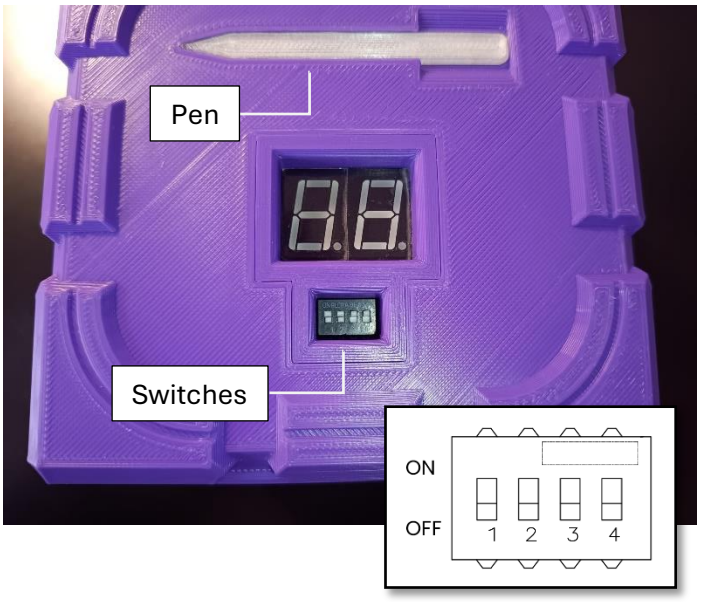
## **Step 1.** Powering on the dice.

Tilt the dice more than 90º degrees for 2 seconds until the digits light up.



## **Step 2.** Selecting the number of faces of the dice.

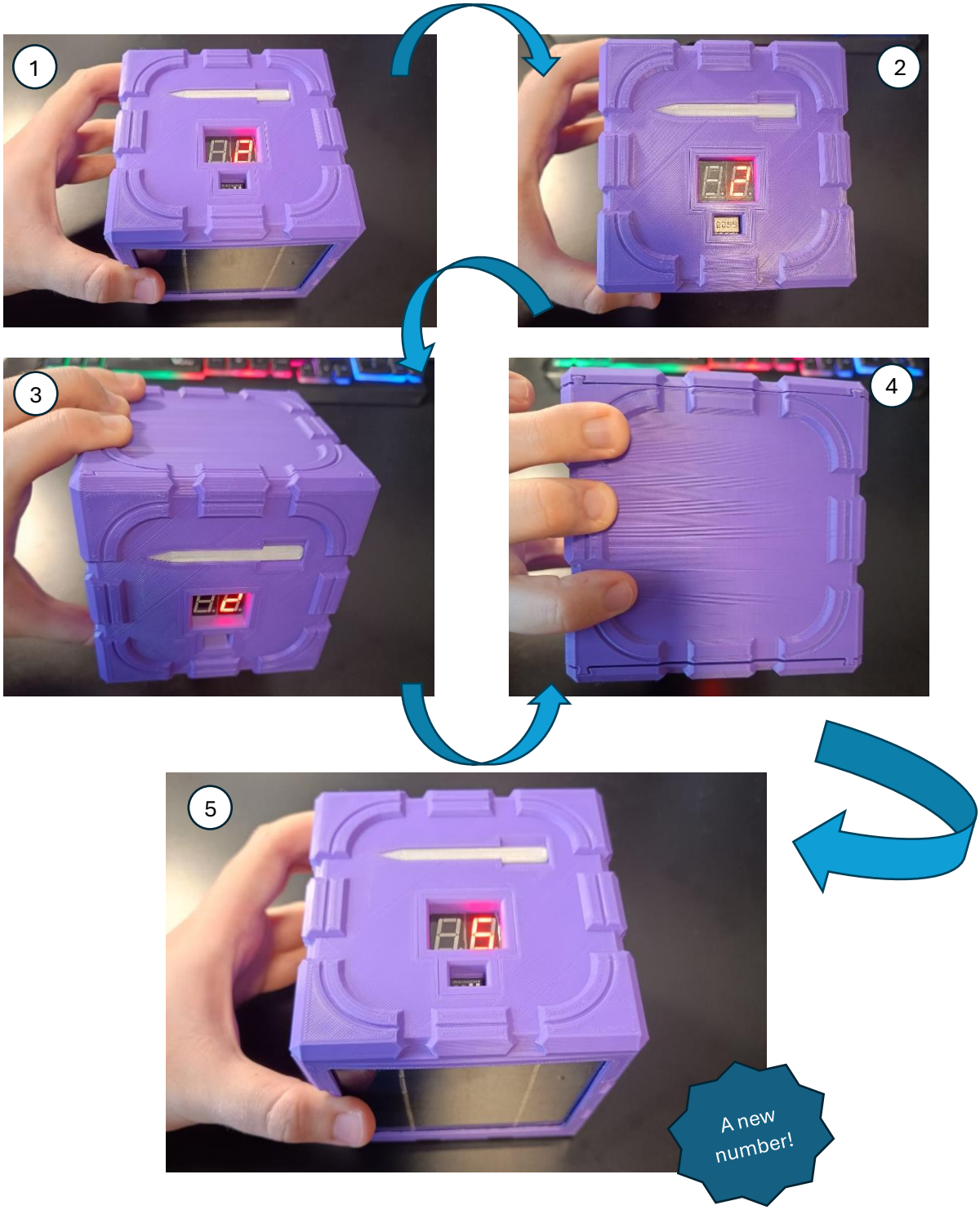
Use the pen to select the number of faces (the maximum number) of the dice using by positioning the individual switches. Use the following table to set the number:




| S1 | S2 | S3 | S4 | Faces |
|---|---|---|---|---|
| OFF | OFF | OFF | OFF | 32 |
| OFF | OFF | OFF | ON | 2 |
| OFF | OFF | ON | OFF | 4 |
| OFF | OFF | ON | ON | 6 |
| OFF | ON | OFF | OFF | 8 |
| OFF | ON | OFF | ON | 10 |
| OFF | ON | ON | OFF | 12 |
| OFF | ON | ON | ON | 14 |
| ON | OFF | OFF | OFF | 16 |
| ON | OFF | OFF | ON | 18 |
| ON | OFF | ON | OFF | 20 |
| ON | OFF | ON | ON | 22 |
| ON | ON | OFF | OFF | 24 |
| ON | ON | OFF | ON | 26 |
| ON | ON | ON | OFF | 28 |
| ON | ON | ON | ON | 30 |

### **Step 3.** Rolling the dice!

Turn the dice at least 90 degrees, you can even shake it! The more you shake it, the more rounds the numbers will do! Try to guess on which number the dice will stop!




### **Step 4.** Turning off the dice.

The dice will automatically shut down after two minutes without movement.

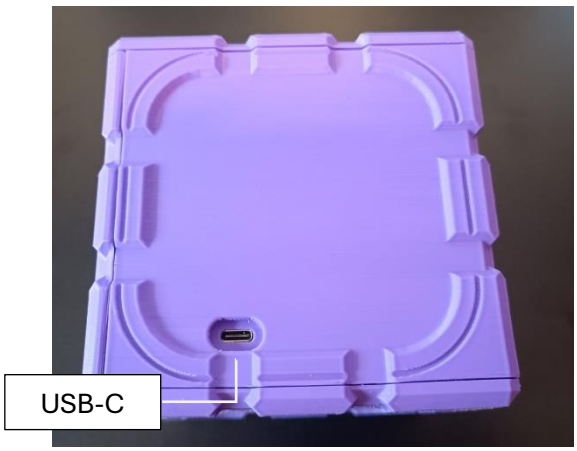
### **Step 5.** Charging the Avalanche Roll.

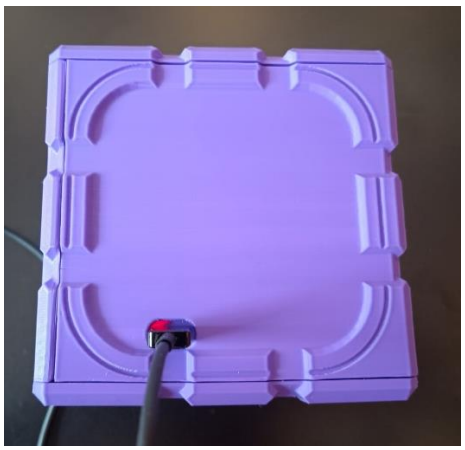
There are two methods of charging the dice:

#### 5.1 Using the USB C charging point.

The red light will tell you that the dice is charging. When the battery is charged, the dice will turn off this light.

**Estimated charging time**: 2 hours.



**Please note that the dice does not support fast charging and most of the common mobile phone chargers won't work with the dice. Try using an older charger!**

#### 5.2 Using the solar panel.

**Important!** Do not put under direct sunlight over long periods of time.

The solar panel integrated on the dice will automatically charge the dice so don't worry if you don't have a charger at hand!

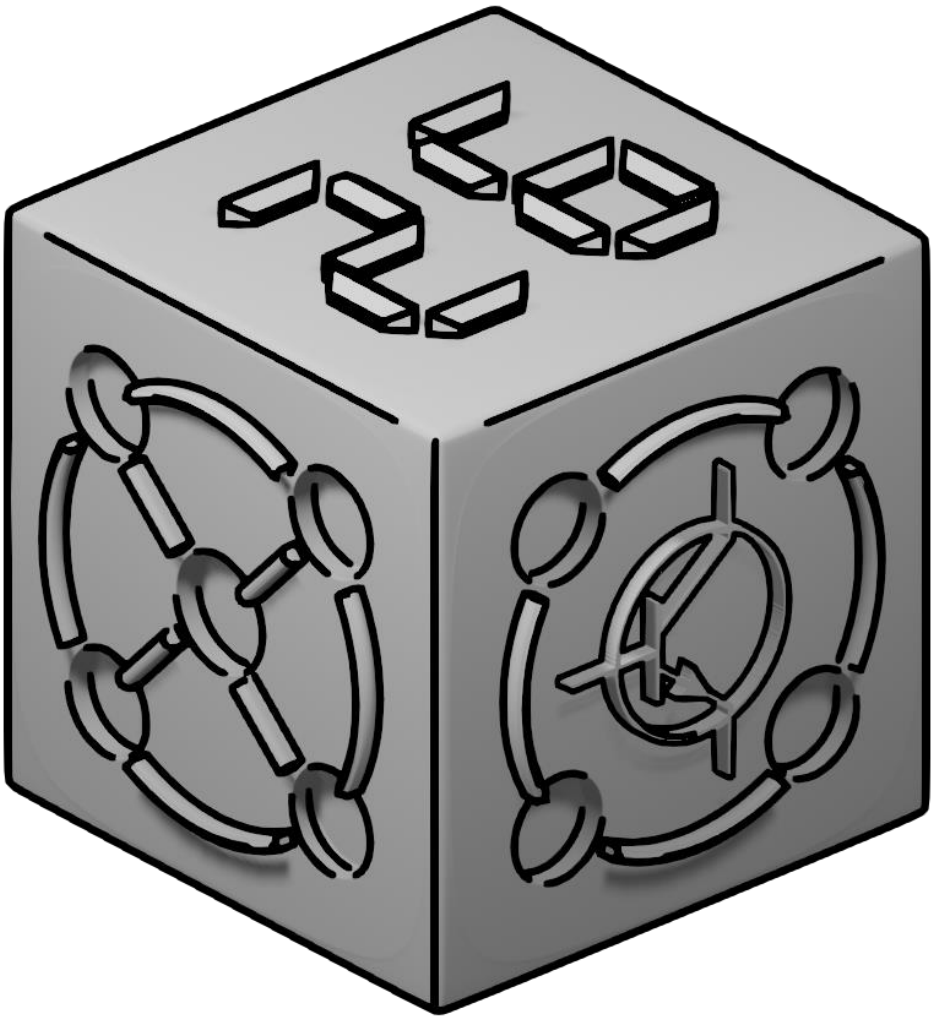
**Estimated charging time**: 2 hours on sunny days, 5 hours on cloudier days.

#### 5.3 Using both methods at the same time.

Although not recommended, it is safe to charge it both with the solar panel and an USB-C charger.

## Safety warnings

- If you want to change the battery, bear in mind if the polarity! If the battery is wrongly positioned, ehm... fire :3
- Do not eat. If eaten, you have my utmost admiration.
- I think the dice is sturdy enough to resist some impacts, but please, do not test it if you want to keep the device's integrity.



@dabecart, 2024