

## GOALS



Water is not inexhaustible, but most of the human beings still insist on using it in an unbridled way, or even not using it, just wasting.

Studies prove that if we continue and/or increase this wasting there will be an unsustainable situation in a near future, where water shortages will happen everywhere. In this perspective, it is intended, with this project, to save potable water, since it is increasingly necessary and urgent.

## INTRODUCTION



In this project, we developed a toilet flush which uses potable water, previously wasted in the washbasin, in a way that we can save it by using it on unnecessary places. In this scope, we will produce a single piece, that consists in a "L" shape. In this, you can find yourself a washbasin, at the top, and a flush toilet, at the bottom. Besides that, inside the piece there will be all the usual mechanism of a toilet flush, but in the place of a floater we will put a water sensor.

This water sensor is connected to a arduino, correctly programmed for its goal in this project. The arduino will also be connected to a solenoid valve that will do the separation between two tubes, one that will conduct water to the deposit and the other that will directly conduct into the sewer and another that will guide the water from the deposit to the toilet bowl.

We will also use a button/sensor of movement to do the discharge. This last case will only happen when the water sensor transmits the information that the deposit is full.

# WATER REUSE

## PROCEDURE



WaterReuse brings together a set of technologies that had being programmed for its purpose, but haven't been brought together to one material. The use of all of this techniques takes us to an environmentally sustainable product.

The overuse of water wasted on the toilet flush ends up on a huge and unnecessary waste of potable water, which is getting smaller at worldwide levels. From our constructive point of view (mechanic), the set of materials will result on a final product that will bring down the water waste at the health level. Besides that, it doesn't oblige energy waste or big changes on the equipment.

In Portugal, the production of an equivalent product of ours is not a current practice and not very common. The use of the Arduino connected to the others parts, early referenced (water sensor, electrovalve), it's an innovation because it replaces the common floater used in normal flushes, guaranteeing, a good operation.

For the production of a flush with the same features, it is necessary to go through the following phases:

- 1) Brought together, prepare and mark the necessary material: arduino, 2 electrovalves, water sensor, movement sensor/button, wood, recipients that works as a washbasin, toilet and deposit, tubes;
- 2) Program the arduino for its purposes;
- 3) Build the structure of the piece;
- 4) Experiment the final product;
- 5) Evaluate the environment gains: reduce the water waste.

## ARDUINO CODE

```
#define Sensor 8
#define Valvula2S 9
#define Botao 10
#define Valvula1S 11

void Setup () {
  pinMode (Sensor, INPUT);
  pinMode (Valvula2S, OUTPUT);
  pinMode (Botao, INPUT);
  pinMode (Valvula1S, OUTPUT);
}

void Loop () {

  if (digitalRead(Sensor) == HIGH) {
    digitalWrite(Valvula2S, HIGH);
  } else {
    digitalWrite(Valvula2S, LOW);
  }

  if (digitalRead(Botao) == LOW) {
    digitalWrite(Valvula1S, HIGH);
  } else {
    digitalWrite(Valvula1S, LOW);
  }
}
```

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### Partnerships

