

Activity:

Interactive electronic learning board



01

What does this activity involve?

The learning board is an educational tool with pictograms that supports learning through play.

It consists of six compartments where different pictograms can be inserted, depending on the task to be practised. Once the pictograms are in place, the correct answers for the exercise are selected using a switch system.

The required task is then carried out by touching each compartment, which activates a visual response from the board.

02

What will be built?

The activity consists of **three main elements**:

A. Adapted pictograms

- Original design based on ARASAAC pictograms.
- They represent colours, letters, animals and weather phenomena.
- A total of 12 pictograms in laminated card format.

B. Board with six compartments

- Space to place up to 6 pictograms.
- Designed in LibreCAD.

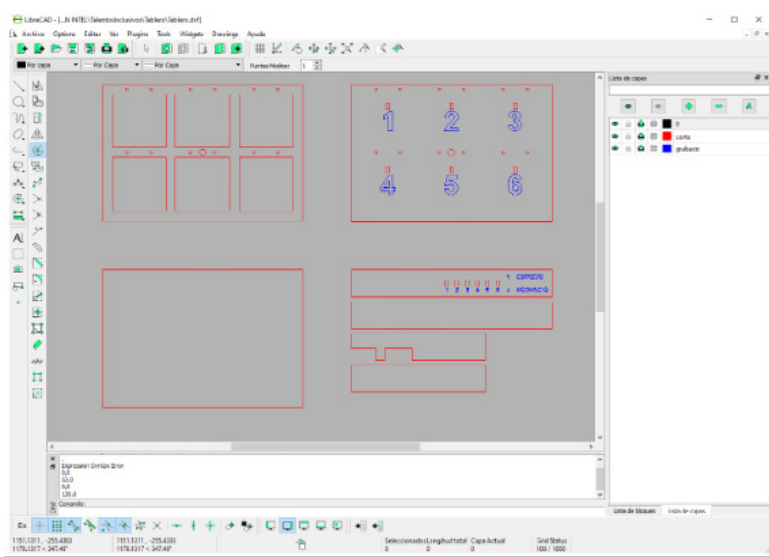
C. Electronics box

It contains the circuit that activates a visual response (a green or red light turns on depending on whether the identified pictogram is correct or incorrect).

03

Step-by-step activity

STEP 1: Board design in LibreCAD



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<https://edigit-project.eu/board01>

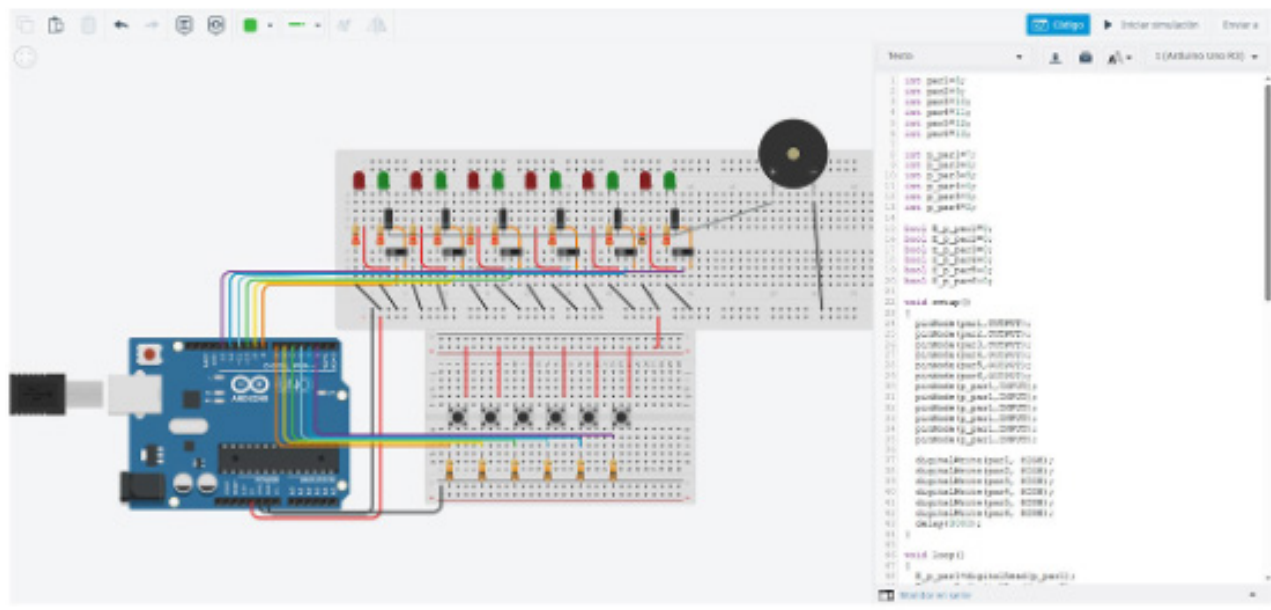
<https://edigit-project.eu/board02>

<https://edigit-project.eu/board03>

<https://edigit-project.eu/board04>



STEP 2: Circuit design, programming and simulation



Circuit code:

```
int par1=13;
int par2=12;
int par3=11;
int par4=10;
int par5=9;
int par6=8;

int p_par1=4;
int p_par2=3;
int p_par3=2;
int p_par4=7;
int p_par5=6;
int p_par6=5;

bool E_p_par1=0;
bool E_p_par2=0;
bool E_p_par3=0;
bool E_p_par4=0;

bool E_p_par5=0;
bool E_p_par6=0;

void setup()
{
  pinMode(par1,OUTPUT);
  pinMode(par2,OUTPUT);
  pinMode(par3,OUTPUT);
  pinMode(par4,OUTPUT);
  pinMode(par5,OUTPUT);
  pinMode(par6,OUTPUT);
  pinMode(p_par1,INPUT);
  pinMode(p_par1,INPUT);
  pinMode(p_par1,INPUT);
  pinMode(p_par1,INPUT);
  pinMode(p_par1,INPUT);
  pinMode(p_par1,INPUT);
}

digitalWrite(par1, HIGH);
digitalWrite(par2, HIGH);
digitalWrite(par3, HIGH);
digitalWrite(par4, HIGH);
digitalWrite(par5, HIGH);
digitalWrite(par6, HIGH);
delay(3000);

void loop()
{
  E_p_par1=digitalRead(p_par1);
  E_p_par2=digitalRead(p_par2);
  E_p_par3=digitalRead(p_par3);
  E_p_par4=digitalRead(p_par4);
  E_p_par5=digitalRead(p_par5);
  E_p_par6=digitalRead(p_par6);

  digitalWrite(par1, LOW);
  digitalWrite(par2, LOW);
  digitalWrite(par3, LOW);
  digitalWrite(par4, LOW);
  digitalWrite(par5, LOW);
  digitalWrite(par6, LOW);
  if(E_p_par1==1)
  {
    digitalWrite(par1,HIGH);
    while(E_p_par1==1)
    {
      E_p_
      par1=digitalRead(p_par1);
    }
  }
}
```

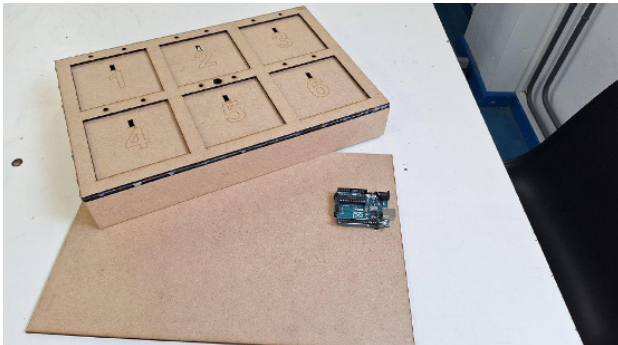
STEP 3: Laser cutting of the wooden board pieces



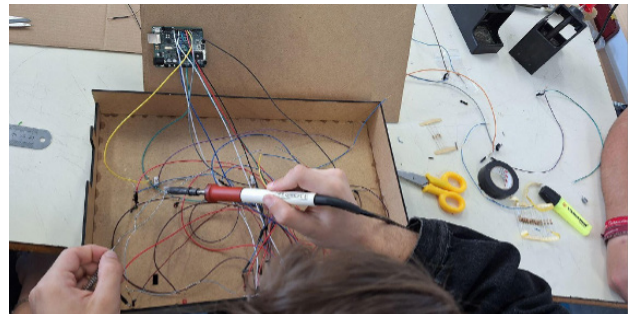
STEP 4: Assembly of the board pieces



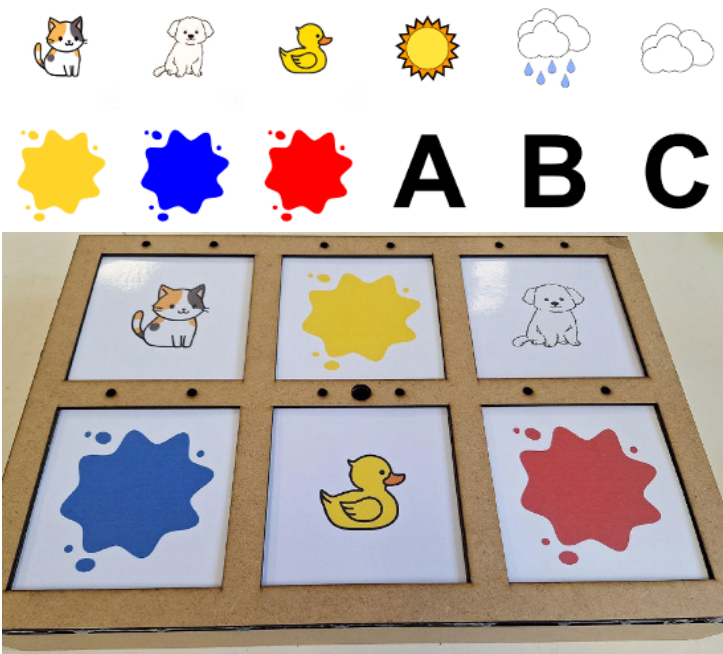
STEP 5: Installing the Arduino board on the learning board



STEP 6: Installing the electronic circuit on the board and uploading the program to the Arduino board



STEP 7: Design, printing and laminating of the pictograms. Adding the pictograms to the board



Download links

<https://edigit-project.eu/pictograma>
<https://edigit-project.eu/pictogramb>
<https://edigit-project.eu/pictogramc>
<https://edigit-project.eu/pictogramblue>
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<https://edigit-project.eu/pictogramrain>
<https://edigit-project.eu/pictogramred>
<https://edigit-project.eu/pictogramsun>
<https://edigit-project.eu/pictogramyellow>

04

Materials needed

Natural MDF board

Red and green LEDs

220 Ω and 10 k Ω resistors

Lever limit switches

Two-position, 3-pin slide switches

Rectifier diodes (1N4001)

Passive buzzer

Wiring

Glue, soldering iron and screws/fixing hardware

Arduino UNO board with power supply and battery/cell power option