

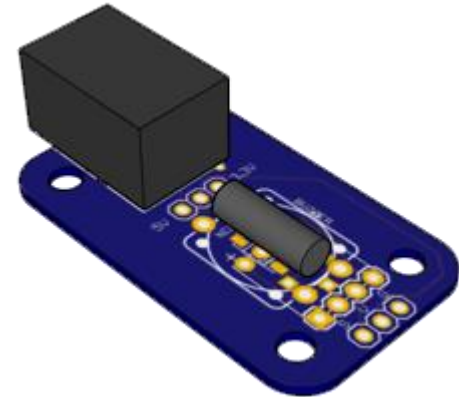
TScratch Basics

Coding with Arduino IDE (Software)

Learning Objective

In this lesson you will learn:

TScratch (TSense Tilt)



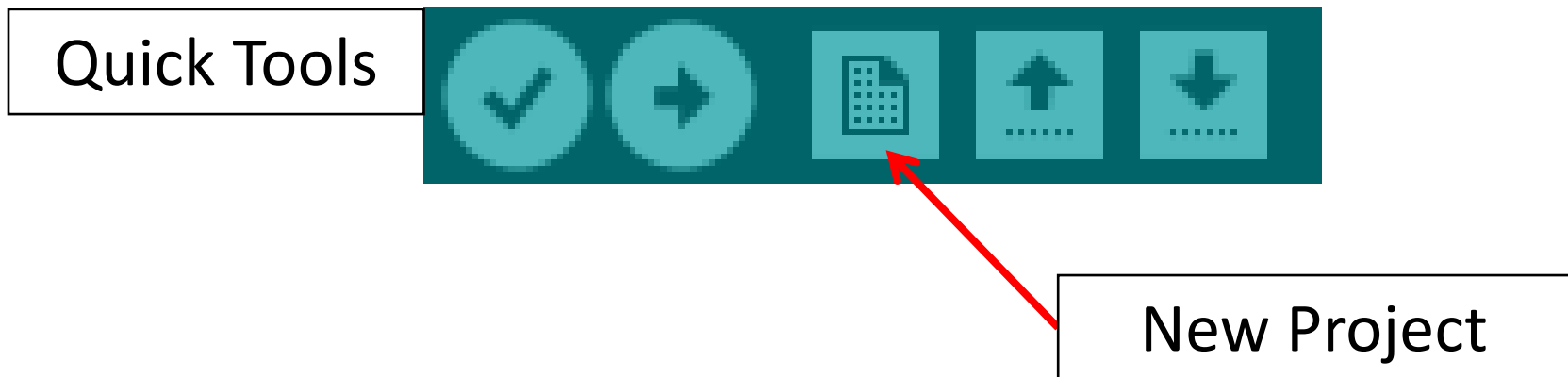
- Include a tilt-sensing input (eg. when shaking the sensor) into your project!
- Coding an Digital input with Arduino

Code TSense (Tilt)

Write your control program with TScratch!

In a simple step, connect the TScratch with TSense(LED) and TSense(Tilt) to PWM_6

- Since tilt is an input, we code using `digitalRead()`.
- Create a new project on the QUICK TOOLS



TSense (Tilt) programming

- Declare the following in the declaration space
 1. Define TILT as pin 6
 2. Define LED as pin 12
 3. A variable named “tiltstate” to store the state of the tilt sensor

Note: Comments appear after // or within /***/

```
TScratch4_Tilt
/**
 * Program name : TScratch4_Tilt
 * Description  : This program turns the led on when the tilt
 *               sensor is tilted in one direction.
 */
#define TILT_PIN 6
#define LED_PIN 12
int tiltstate = 0;           //Declares a integer variable to store the state of the tilt sensor
```

TSense (Tilt) programming

- Declare the input/output in the setup
 1. TILT → INPUT
 2. LED → OUTPUT

```
void setup() {  
  pinMode(TILT_PIN, INPUT);           //Initializes the tilt as an INPUT  
  pinMode(LED_PIN, OUTPUT);          //Initializes the led as an OUTPUT  
}
```

TSense (Tilt) programming

- Lastly, use conditional programming in the loop() function
if the tilt sensor is activated, the LED will turn on,
else it will switch off

```
void loop() {  
  tiltstate = digitalRead(TILT_PIN); // Reads tilt sensor and stores its state in the tiltstate variable  
  if (tiltstate == HIGH) {  
    digitalWrite(LED_PIN, HIGH); // Turns the led on  
  }  
  else {  
    digitalWrite(LED_PIN, LOW); // Turns the led off  
  }  
}
```

Complete Program

```
#define TILT_PIN 6
#define LED_PIN 12
int tiltstate = 0;           //Declares a integer variable to store the state of the tilt sensor

void setup() {
  pinMode(TILT_PIN, INPUT); //Initializes the tilt as an INPUT
  pinMode(LED_PIN, OUTPUT); //Initializes the led as an OUTPUT
}

void loop() {
  tiltstate = digitalRead(TILT_PIN); //Reads tilt sensor and stores its state in the tiltstate variable
  if (tiltstate == HIGH) {
    digitalWrite(LED_PIN, HIGH); //Turns the led on
  }
  else {
    digitalWrite(LED_PIN, LOW); //Turns the led off
  }
}
```

Try it yourself!

Use TSense(Tilt) to control both the buzzer and LED!

- Connect and declare TSense (buzzer).
- Use pin13 for buzzer
- Turn on the buzzer **and** LED when the sensor is tilted.

Solution – TSense(Tilt, Buzzer, LED)

```
#define TILT_PIN 6
#define LED_PIN 12
#define BUZZER_PIN 13
int tiltstate = 0;    //Declares a variable to store the state of the tilt sensor

void setup() {
  pinMode(TILT_PIN, INPUT);    // initialize button as an input
  pinMode(LED_PIN, OUTPUT);    // initialize led and buzzer as an output.
  pinMode(BUZZER_PIN, OUTPUT);
}

void loop() {
  tiltstate = digitalRead(TILT_PIN);
  if (tiltstate == HIGH) {
    digitalWrite(LED_PIN, HIGH);    // Turns the led on
    tone(BUZZER_PIN, 2000)          // turn the buzzer on
  }
  else {
    digitalWrite(LED_PIN, LOW);    // Turn the led off
    noTone(BUZZER_PIN);            // Turn the buzzer off
  }
}
```