Learning scenario: Building a smart lamp with Arduino

*school subject: technology*

*related digital skill: programming*
How does a smart lamp work?

Smart lamps help protecting the environment by saving energy.

**Arduino** is an open-source electronics platform based on easy-to-use hardware and software. It's intended for anyone making interactive projects.

Arduino is an *open-source project, with a worldwide community*

Using Arduino helps to avoid the “blackbox effect”
How does a smart lamp work?

Learning objectives

- Understand the basics of programming with Pix
- Understand how to light a lamp with Arduino
- Use a program to build a smart lamp
Understand the basics of programing

Programing is just a game!

Ready to play?

Step 1:
Pix question on programming

When the program is run, the pen draws two stair steps.
Complete the program to trace all the steps.
Run the program.
Understand the basics of programming

Programing is just a game!

Ready to play?

Step 2:
Pix question on programming

The pen must draw a rectangle 100 pixels long and 50 pixels wide.
Complete the program and then run it.

The commands available are: moveUpward, moveDownward, moveForward, moveBackward.
Understand the basics of Arduino programming

What is Arduino?

Arduino senses the environment by receiving inputs from many sensors, and affects its surroundings by controlling lights, motors...

Make a simple LED program
Understand how to light a lamp with Arduino

**LED Blink Code**  Arduino

Copy and paste this code into your Arduino IDE or Web Editor

```cpp
int led = 13;  // the pin the LED is connected to
void setup() {
    pinMode(led, OUTPUT)  // Declare the LED as an output
}

void loop() {
    digitalWrite(led, HIGH)  // Turn the LED on
    delay(1000)  // Wait for 1000 milliseconds (1 second)
    digitalWrite(led, LOW)  // Turn the LED off
}
```

[Video on Arduino](https://example.com/arduino-video)
Using a program, build a smart lamp

```cpp
void handleGesture() {
    if (apds.isGestureAvailable()) {
        switch (apds.readGesture()) {
        case DIR_RIGHT:
            Serial.println("RIGHT");
            if(light_state == true){
                hand_swiped = true;
                digitalWrite(relay_pin,HIGH);
                light_state = false;
            }
            Serial.println(\"light state false\");
            break;
        else if(light_state==false){
            hand_swiped=true;
            digitalWrite(relay_pin,LOW);
            light_state = true;
        }
            Serial.println(\"light state true\");
            break;
        case DIR_LEFT:
        ```

Arduino Smart Lamp © GPL3+

An Arduino-controlled lamp that turns on automatically when it gets dark. Turn it off or back on with the swipe of your hand!
Related Pix digital skill: programming