

# Homework 6: A night light

a remix of the 5 LED bike light and the light sensor of circuit 6.

## The catch:

Your solution must use arrays as described in circuit 4. For example, your code should have something like:

```
int ledPins[] = [3, 5, 6, 9, 10];
```

## The behavior:

Your nightlight will have three modes. Like the bike light, when you press the button you change mode.

**MODE OFF.** All the LEDs are off.

**MODE DIM.** All the LEDs are 'on' and have the same level of brightness. When the level of light in the room is high (for example, if you shine a flashlight on the light sensor) all the LEDs will be off. The brightness of the LEDs will increase as you cover the light sensor with your hand. The LEDs will be of maximum brightness when you completely cover the sensor.

**MODE GAUGE.** The level of light in the room will determine how many LEDs are on. When you shine a flashlight at your circuit, no LEDs should be on. As room light diminishes, more and more LEDs are turned on. When the sensor is covered with your hand, all LEDs should be on.

## Hacker edition extra:

NightWave night light. This is inspired by the [Nightwave](#) product (the word Nightwave is a link). Pick a nice relaxing color for the multicolor LED. Once the room gets sufficiently dark the multicolor LED will slowly pulse from off to bright around 15 pulses per minute (an average adult breathing rate). Over 5 minutes the pulse rate should gradually slow to 12 pulses per minute.

This circuit needs to be separate from the above one, since we would run out of pwm pins. Your code should include a comment showing the math of how you calculated slowing the pulse rate.

Some videos of related projects include:

- <http://www.youtube.com/watch?v=Pwd6uiLXwM8>
- <http://www.youtube.com/watch?v=LzYAH7Gf7sM>

## **XP, demo, and submission.**

For full credit (50XP), the regular edition needs to be demoed during the first 15 minutes of the next class. The hacker extra (25xp) needs to be demoed in class and the code email to submit.o.bot at gmail.