

# Global Goal 11 Sustainable Cities & Communities

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Responsible Exterior Lighting

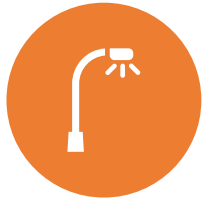


Responsible Outdoor Lighting  
Accent, Ambient, Natural, and  
Task Lighting

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Photos provided through Power Point Bing Creative Commons

# Ideas for Micro:bits and Light



Light sensor or magnetic sensor to turn on and off attached LED lights



Motion sensor to turn on lights as pedestrian nears light fixtures



Pause blocks to create timers for light cycles and light patterns



Radio signal to tell other Micro:bit lights to turn on/off as pedestrian approaches or moves away from an area



Considering placement, direction, brightness, colour, and shielding of lights to enhance public safety, provide aesthetic lighting and respect environment



# Outdoor lighting

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- Provide public safety
  - Minimize impact on wildlife
  - Use of sustainable materials and energy sources
  - Reduce light pollution
  - Enhance the environment
  - Minimize impact on migration and nesting patterns
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- Adapted from [Vancouver Outdoor Lighting Strategy](#) pg.3

# Global Goal 11

[Coding Change Session 5 Light – Lesson, Resources & PowerPoint](#)

[UN Goal 11 – Make cities inclusive, safe, resilient, & sustainable](#)

[World's Largest Lesson Goal 11](#)

# Goal 11 Targets

- **11.1** By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
- **11.2** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
- **11.3** By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
- **11.4** Strengthen efforts to protect and safeguard the world's cultural and natural heritage
- **11.5** By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
- **11.6** By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
- **11.7** By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities
- **11.A** Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
- **11.B** By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels
- **11.C** Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

- [International Dark Sky Association](#)
- [Vancouver Outdoor Lighting Brochure](#)
- [Vancouver Responsible Outdoor Lighting](#)
- [FLAP Canada – Keeping birds safe at night](#)
- [Scholastic Stepping Up With Literacy Place – Environmental Choices Lighting The Night Sky](#)
- [City of Brampton Street Lighting](#)
- [Dark Sky Lighting – Bruce Peninsula](#)
- [Forebes – Northern Lights](#)
- [Safe Wings](#)
- [Turtle Friendly Lighting in Cities](#)
- [Keeping Sea Turtles Dark](#)
- [Exterior Lighting Standards for an elementary school pg. 4](#)

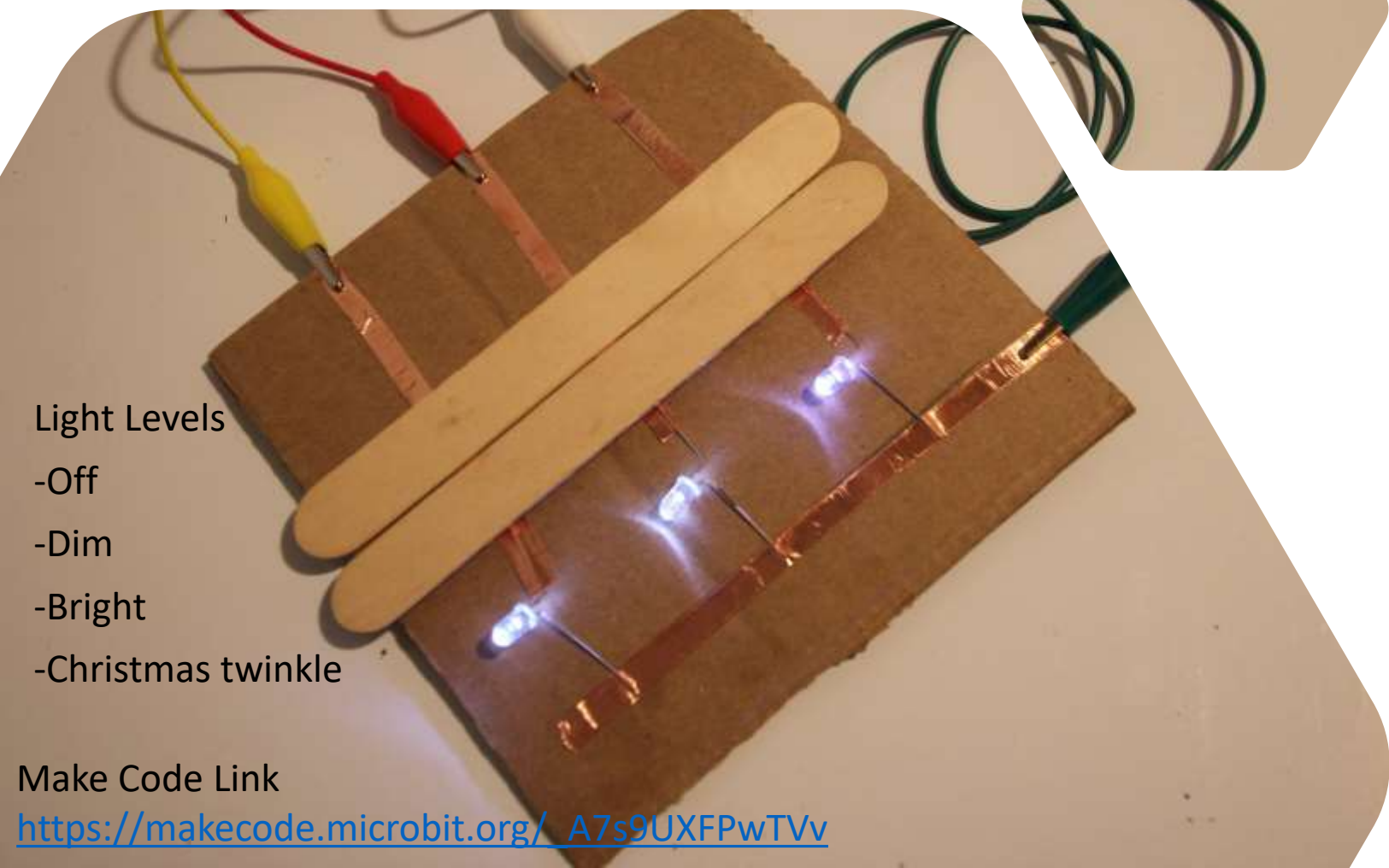


Outdoor Light  
can be  
Dark Sky Friendly



# Sidewalk lighting with ground level LEDs

- Design considerations
- lights close to sidewalk
- LED for low energy use
- pointed away from ocean
- lights turn off when sunlight is bright
- wooden boardwalk/sidewalk
  
- Next time
- add on light covers
- minimize blue & white spectrum to protect wildlife
- longer wavelength such as amber or orange



Light Levels  
-Off  
-Dim  
-Bright  
-Christmas twinkle

Make Code Link  
[https://makecode.microbit.org/\\_A7s9UXFPwTVv](https://makecode.microbit.org/_A7s9UXFPwTVv)



# Sidewalk lighting

The code is organized into several event-driven blocks:

- on start:** A blue block that triggers the program when the Microbit is powered on.
- if the sun is bright, turn off the sidewalk lights to save electricity:** A yellow block that checks the light level. If it is greater than 150, it sets all three pins (P0, P1, P2) to 0 and pauses for 200ms between each pin write.
- forever loop:** A blue loop that contains the "if the sun is bright" block, ensuring it runs continuously.
- on button A pressed:** A purple block that sets all three pins (P0, P1, P2) to 250 and pauses for 200ms between each pin write.
- on button B pressed:** A purple block that sets pins P0 and P1 to 350, and P2 to 350, with 200ms pauses between writes.
- on button A+B pressed:** A purple block that triggers a "Christmas pattern" sequence. It repeats 10 times, alternating between two states: (P0: 250, P1: 100, P2: 250) and (P0: 100, P1: 250, P2: 100), with a 500ms pause between the two states.

Make Code Link

<https://makecode.microbit.org/A7s9UXFPwTVv>