

# **Amazing Arduino Animations**

## **Gateway NMRA-X July 17, 2020**

### **David Ackmann, Gateway Division, NMRA**

What is an Arduino?

- Inexpensive (~\$7 to \$15), programmable, credit card sized microprocessor
- Has electronic pins to accept inputs and control devices (LEDs, sound, motors)
- Easily integrated into model railroad layouts
- Programmed using free Interactive Development Environment (IDE)  
(<http://arduino.cc/en/main/software>)
- Find sample programs (aka: "Sketches") at <http://daackm.github.io>

Where can we find Arduinos and components?

AMAZON.COM

Components the author uses (<http://daackm.github.io>)

How is a sketch created?

- Use IDE like word processor
- Program in a "C-like" language
- Lines are case-sensitive and end in semi-colons;
- Debug using "Serial.print" statements
- Braces { } needed in conditional and other functions
- Two major components: setup and loop functions
- Useful functions:
  - setMode(pinNumber, INPUT\_PULLUP or INPUT or OUTPUT)
  - digitalWrite(pinNumber, HIGH or LOW)
  - if
  - do..while

External Power Supplies useful

Author likes the Arduino "Nano" model

Projects Covered

- Blinking one or more LEDs
- Pulse Width Modulation for software dimming of LEDs
- Using a Light Dependent Resistor and Display for a Speedometer
- Randomly blinking LEDs through software timers in a building or waterfall
- MP3 Audio, amplifier and speaker in Waterfall, Lumberjack, Carousel
- Lumberjack felling tree using servo motors, push button switch
- Carousel using 12V motor, relay, multiple songs on SD card

Where can one find more technical information?

The "Amazing Arduino Animations" web site at <http://daackm.github.io>  
YouTube.com