

25 Classroom Projects

# STEM Data

# The STEAM+C Classroom

## Inside the Book

- 25 Tested Projects
- Large Data Set Collection and Analysis
- Science and Engineering Fair Ideas
- Standards Alignments
- 100+ Project Extensions
- Materials Lists
- Tested Code
- Technical Diagrams and Photos
- Assessments

## Integrates

- Excel™, Google® Sheets, & SD Cards
- Photo and Video
- C / C++ Programming
- Digital Prototyping

## Free with Website Registration

- Project Updates
- Community Ideas
- Project Submissions

### C / C++ Programming

```

// Arduino IDE
// File Edit Tools Help
// http://arduino.cc/en/Main/arduinoUno
void setup() {
  Serial.begin(115200); //Baud rate
  dht.begin();
  pinMode(gas_sensor, INPUT); //Gas sensor as input
  pinMode(ANALOGPIN, INPUT); //Gas sensor as input
  pinMode(fan, OUTPUT); // Fan connect
  delay(10);
  Serial.println("Connecting to ");
  Serial.print("Connecting.... ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.print("IP Address: ");
  Serial.println(WiFi.localIP());
  server.begin();
}

void loop() {
  float rzero = gasSensor.getRZero();
  delay(1000);
  Serial.print("MQ135 RZERO Calibration Value");
  Serial.println(rzero);
  float ppm = gasSensor.getPPM();
  }
  
```

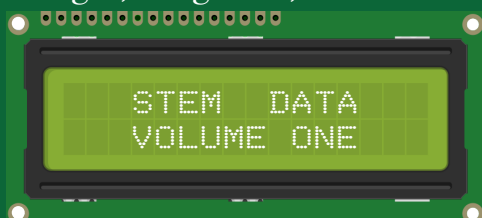
### Digital Design and Prototyping

María Isabel  
Mendiola Ramírez  
and  
Peter G. Haydock

[www.thearduinoclassroom.com](http://www.thearduinoclassroom.com)

## Premium Website Membership

- Videos of Projects
- Classroom Presentations
- Images, Diagrams, and Code



Microcontroller projects for  
science and engineering fairs  
and competitions.

Anticipated Fall 2021 Publication.  
 Projects, Time to Complete, Difficulty, and Alignments Subject to Change.

Projects Overview												
	Project	Page	Time to Complete (hr:min) Project / Extensions	Difficulty	Science				Technology	Engineering	Allied Arts	Math
					Earth	Life	Chemistry	Physics				
Section 1 SD Cards	Weather		1:30 / 1:00	Intermediate	✓			✓	✓	✓		✓
	Water Quality		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Counter		1:30 / 1:00	Intermediate		✓		✓	✓	✓		✓
	Soil Moisture		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Ozone		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
Section 2 Spreadsheets	Lightning Detector		1:30 / 1:30	Intermediate	✓	✓		✓	✓	✓		✓
	Classroom Attendance		2:00 / 1:00	Advanced				✓	✓	✓		✓
	pH		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Heartbeat and Blood Oxygen		1:30 / 1:30	Intermediate		✓	✓	✓	✓	✓		✓
	EMG		1:30 / 1:00	Intermediate		✓		✓	✓	✓		✓
	Seismometer		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
	Color Sorter		1:30 / 1:30	Intermediate		✓	✓	✓	✓	✓	✓	✓
	Weight		1:30 / 1:00	Intermediate		✓	✓	✓	✓	✓		✓
	UV		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓	✓	✓
	Solar Tracker		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓		✓
	Greenhouse		2:00 / 1:00	Advanced	✓	✓	✓	✓	✓	✓		✓
	Section 3 Serial Wi-Fi Terminal	Flow Sensor		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓	
Fire Alarm			1:30 / 1:00	Advanced	✓	✓	✓	✓	✓	✓		✓
Flex Sensor			1:30 / 1:30	Advanced		✓		✓	✓	✓	✓	✓
Section 4 Live Web Graphs	BMP 280		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
	Sound		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓	✓	✓
	Earthquakes		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
Section 5 Images and Video	Photos		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓	✓	✓
	Video Streaming		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓	✓	✓
	Home Monitoring		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓	✓	✓

✓ = Full match to standards   ✓ = Supports standards with extensions   ✓ = Supports standards with problem