

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

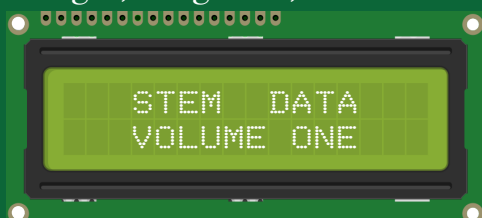
- Excel™, Google® Sheets, & SD Cards
- Photo and Video
- C / C++ Programming
- Digital Prototyping

Free with Website Registration

- Project Updates
- Community Ideas
- Project Submissions

Premium Website Membership

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



Data

Time (in minutes)	Temperature
0	65
5	65
10	65
15	70
20	75
25	79
30	82
35	83
40	83
45	79
50	77
55	75
60	70

C / C++ Programming

```

#include <Arduino.h>
void setup() {
  Serial.begin(9600); //Start serial
  pinMode(LED_BUILTIN, OUTPUT); //Define the led pin
  pinMode(ANALOG_IN, INPUT); //Define sensor as input
  pinMode(LED_BUILTIN, OUTPUT); // Define destination as output
}
void loop() {
  digitalWrite(LED_BUILTIN, HIGH); //Turn on the LED
  Serial.println("Powering up to *");
  digitalWrite(LED_BUILTIN, LOW); //Turn off the LED
  delay(1000);
  int sensorValue = analogRead(ANALOG_IN);
  Serial.println(sensorValue);
  delay(1000);
}

```

Digital Design and Prototyping

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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	No.	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		1:30 / 1:00	Intermediate	✓			✓	✓	✓		✓
	Water Quality	2		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Counter	3		1:30 / 1:00	Intermediate		✓		✓	✓	✓		✓
	Soil Moisture	4		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Ozone	5		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
Section 2 Spread-sheets	Lightning Detector	6		1:30 / 1:30	Intermediate	✓	✓		✓	✓	✓		✓
	Classroom Attendance	7		2:00 / 1:00	Advanced				✓	✓	✓		✓
	pH	8		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Heartbeat and Blood Oxygen	9		1:30 / 1:30	Intermediate		✓	✓	✓	✓	✓		✓
	EMG	10		1:30 / 1:00	Intermediate		✓		✓	✓	✓		✓
	Seismometer	11		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
	Color Sorter	12		1:30 / 1:30	Intermediate		✓	✓	✓	✓	✓	✓	✓
	Weight	13		1:30 / 1:00	Intermediate		✓	✓	✓	✓	✓		✓
	UV	14		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓	✓	✓
	Solar Tracker	15		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓		✓
	Greenhouse	16		2:00 / 1:00	Advanced	✓	✓	✓	✓	✓	✓		✓
Section 3 Serial Wi-Fi Terminal	Flow Sensor	17		1:30 / 1:00	Intermediate	✓	✓	✓	✓	✓	✓		✓
	Fire Alarm	18		1:30 / 1:00	Advanced	✓	✓	✓	✓	✓	✓		✓
	Flex Sensor	19		1:30 / 1:30	Advanced		✓		✓	✓	✓	✓	✓
Section 4 Live Web Graphs	BMP 280	20		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
	Sound	21		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
	Earthquakes	22		1:30 / 1:00	Intermediate	✓	✓		✓	✓	✓		✓
Section 5 Images and Video	Photos	23		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓	✓	✓
	Video Streaming	24		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓	✓	✓
	Home Monitoring	25		2:00 / 1:00	Advanced	✓	✓		✓	✓	✓	✓	✓

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