

ESP32 classroom lab pack

Lesson-plan wrapper around the free [ESP32 Starter Kit](#) for STEM clubs and intro maker courses.

Learning outcomes

- Flash and run a first ESP32 sketch safely
- Wire a button, LED, and one sensor with a labeled diagram
- Document expected vs actual output (IT-grade honesty)
- Optional: publish telemetry to a classroom MQTT broker (advanced period)

Suggested schedule (5 × 50 min)

Session	Focus	Done when
1	Toolchain + blink	Board enumerates; LED blinks from student sketch
2	Input (button)	Debounced input changes serial output
3	Sensor	Stable readings with units written down
4	Actuator (low-V relay/LED load)	Safe load toggles; no mains work
5	Show & post-mortem	One-page lab report: goal, result, what broke

Classroom BOM (example ×10 stations)

Item	×10	Notes
ESP32 DevKit	10	USB data cables (not charge-only)
Breadboard + jumpers	10	Labeled spare bag per table
LEDs + resistors pack	10	Current-limit resistors required

Item	×10	Notes
Pushbuttons	20	Extras fail first
DHT22 or BME280	10	Pick one sensor family for the term
Opto relay (low-V practice)	5-10	No mains in class

Standards alignment notes (flexible)

Map locally to your state's CTE / computer science / engineering strands. This pack supports: computational thinking, systems troubleshooting, data measurement, and safe lab practice. Not a certified curriculum product — adapt freely.

Safety non-negotiables

- No mains voltage projects in K-12 labs without qualified supervision and policy
- USB power only for core labs
- Eye protection when clipping/soldering if your lab allows solder

Student deliverable template

1. Goal (one sentence)
2. Wiring photo or sketch
3. Code link / paste
4. Expected output
5. Actual output
6. What broke / what you'd change

Companion: [Start here](#) · [ESP32 hub](#) · Free kit HTML/PDF on the shop page.