

Readiness report — Micro Pressure Sensor Model and the Wheatstone Bridge (SCME)

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Readiness: Micro Pressure Sensor Model and the Wheatstone Bridge (SCME)

Verdict: Ready · 2026-07-19 · est. parts cost \$50-\$120

This is a cold check for the Micro Pressure Sensor Model lab; no previous readiness report exists. All required materials are currently available from major retail and electronics distributors. The primary cost driver is the specialty 3M conductive tape, though acceptable lower-cost substitutes have been identified. The lab remains implementable as long as the SCME Instructor Guide stencil is available to the instructor.

Action required

None — all checked parts are sourceable.

Parts

Sensed Materials and Active Components

Part	Spec/Package	Status	Stock	Price	Source
Pencil Lead (Graphite)	0.9 mm HB	Active	High	\$5.99	Walmart
Rubber Cement	Solvent-based	Active	High	\$2.84	Walmart
Copper Foil Tape	3M 1181, 1/4 inch	Active	1,016	\$33.32	DigiKey
Batteries	1.5 V AAA	Active	High	\$7.99	Harbor Freight
Battery Holder	2xAAA with leads	Active	High	\$1.85	DigiKey

Structural Components and Housing

Part	Spec/Package	Status	Stock	Price	Source
Paint Cans	1-quart metal	Active	High	\$1.25	Best Containers
Balloons	12-inch latex	Active	High	\$1.00	Walmart
Plastic Syringes	3 cc (3 mL)	Active	High	\$0.26	VitalityMedical

Tools and Instrumentation

Part	Spec/Package	Status	Stock	Price	Source
Multimeter	DMM (mV/Ω range)	Active	High	\$19.96	Walmart
Alligator Clip Leads	Standard pair	Active	High	\$3.49	Harbor Freight
Mortar and Pestle	Lab/Kitchen grade	Active	High	\$4.50	Home Science Tools
Calibration Weights	50 gram	Active	High	\$6.86	Walmart

Consumables and Shop Supplies

Part	Spec/Package	Status	Stock	Price	Source
Painter's Tape	1 inch wide	Active	High	\$1.75	DPCIwholesale
Cardstock	For stencils	not checked	—	—	—
Paperclips	Large	not checked	—	—	—
Ice Pick or Nail	For punching metal	not checked	—	—	—
Protective Gear	Gloves/Glasses	not checked	—	—	—

Substitutes

For part	Substitute	Differences	Judgment
3M 1181 Tape	Micro Center Copper Tape	Generic; significantly lower cost (\$7.99 vs \$33.32).	Acceptable; dual-conductive requirement met.
3M 1181 Tape	Lowe's Double-Sided Tape	Generic; retail available (\$10.99).	Acceptable; dual-conductive requirement met.
Calibration Weights	Large steel washers	Commodity hardware; weight is approximate.	Acceptable per snapshot guidelines.

Verify any substitute against its datasheet before ordering.

Other dependencies

- **SCME Instructor Guide (p. 27):** Necessary for the bridge pattern stencil sized for 1-quart cans; not checked (assumed provided with lab).
- **Graphite/Rubber Cement Mixture:** Success depends on viscosity (aim for "toothpaste" consistency). Procedural dependency.
- **Airtight Seal:** Procedural requirement for the syringe-to-can interface; may require additional sealant if "snug fit" fails.

Watch list

- **Balloon Fatigue:** Latex loses elasticity over repeated pressure tests; ensure ample stock of 12-inch balloons is available for replacement.
- **Copper Tape Pricing:** 3M 1181 is a high-cost item; instructors should monitor the availability of generic dual-conductive substitutes to manage budget.
- **Syringe-to-Can Interface:** Monitor for air leaks at the reference port, as this will prevent successful calibration.