

Electric Circuits

<i>Equipment</i>	<i>Quantity required for 20 students working:</i>		<i>Unit cost</i>	<i>Supplier and catalog number</i>	<i>Comments</i>	<i>First use</i>
	<i>together as a class</i>	<i>semi-self paced</i>				
Rechargeable batteries and charger: Batteries, D-cell NiCad rechargeable, 1.25 V, 1.600 A•h Battery recharger Holds 10 NiCad batteries: 9V, D, C, AA, AAA, or N	20 2	10 2	\$6.49/pk 2 \$29.99	Radio Shack 23-123 or local stores Radio Shack 23-134*	See also EC and EM. D-cells are preferred to C-cells. Note: For best results, completely discharge NiCad rechargeable before recharging. Model listed holds 10 NiCad batteries: 9V, D, C, AA, AAA, and N	
Batteries, D-cell alkaline, 1.5 V	16	16	\$7.99/pk 8 \$9.99/pk 12	Radio Shack 23-650* or local stores	Optional: Useful in case nicads are not fully charged. Also good to use in Experiment 8.5.	OPT
Assorted Tools: Wire cutters Needle-nose pliers Scissors	5 5 10	5 5 5		Local stores/stock Local stores/stock Local stores/stock		
Copper bus bar wire 16 gauge, 125 ft, 1 lb. spool	1 spool	1 spool	\$6.75	NASCO SB10509M		
Miniature lamps 1. miniature drycell, threaded base, #14 bright blue ceramic, 2.5 V 2. miniature drycell, threaded base #13 green ceramic, 3.8 V	10 pk 10 2 pk10	10 pk 10 2 pk10	\$4.65/pk 10 \$4.65/pk10	Frey 15563636 Frey 15563594	See also EM, L&C. Used throughout module. Used only in Section 12.	1.1 12.1
PVC covered copper connecting wire, white pvc, 22 gauge, 100 ft. roll	1 roll	1 roll	\$4.10	NASCO SB10520M		1.1
Flashlight, plastic (2 D cell type)	10	5		Local stores	Also can be used to discharge Nicad batteries.	1.3
Objects made of various materials: copper, paper, iron, porcelain, plastic, glass, aluminum, rubber, and pencil lead (some samples of wide gauge are recommended).	10 sets	5 sets		Local stock or stores	Students will have objects made of many of these materials (pennies, plastic combs, etc.)	1.6
Alligator connector cords 12", covered wire, clips at both ends	15 pks 6	15 pks 6	\$7.50/pk 6 (3 red, 3 black)	NASCO SB13984M	Optional depending on the type of miniature lamp receptacles used.	OPT 1.8
Hand magnifier 3X, 4.5 cm diameter and 6X, 1.7 cm diameter	20	10	\$0.62-0.70 ea	NASCO SB18031M		1.8
Broken light bulbs	10	5		Local stock	Filaments should be intact. These can be large or miniature bulbs.	1.8

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Miniature bulb sockets: Use one of the following: (A) plastic screw base (B) white plastic w/mounting holes (C) masonite base with Fahnstock clips	20 20 20	20 20 20	\$15.15/pk 12 \$22.99/pk 12 \$0.75/ea	Sargent-Welch CP33008K Sargent-Welch CP84165-70A NASCO SB17079M	See also EM. Also listed in catalogs as "miniature lamp receptacles"	1.9
Fahnstock clips 0.75"L x 0.31"W with screw hole, pk of 100	1 pk 100	1 pk 100	\$15.20	NASCO SB19192M	To supplement clips for choice (C) above.	1.9
Battery holders (D cell) Use one of the following: (A) steel, single cell (B) plastic, single cell with male and female button snaps on ends to permit connection without using wire (C) plastic, with electrical clip set. Includes: 8 holders, 16 clips per set	15 10 4 sets	15 10 4 sets	\$1.45 \$0.75 each for 10 or more \$9.95/set	NASCO SB10831M NASCO SB19023M Delta WW-020-1530		1.9
Electrical Clips	1 pk 20	1 pk 20	\$6.95	Delta WW-030-5030	To supplement lost clips for choice 3 above.	1.9
Knife switches 1. plastic SPST, 1.5"L x 1"W 2. rated at 5A, SPDT 2.2 x 5.7 cm	3 pk 10 30	3 pk 10 30	\$14.50/pk 10 \$2.50 ea	NASCO SB09736M Sargent-Welch WLS-31155-B		1.9 4.12
Bare nichrome (nickel chromium) wire 28 gauge (550 ft)	1 spool	1 spool	\$27.85	Frey 15581070		5.2
DC Ammeter dual range: 0-1, 0-5 A, DC	10	10	\$15.95	Science Kit & Boreal 66094-00		5.1
DC Voltmeter dual range: 0-5, 0-15 V, DC	10	10	\$15.95	Science Kit & Boreal 66094-04		7.3
Digital Multimeter Use one of the following: (A) autopolarity, DC Volt, AC Volt, DC Current, AC Current, Resistance (B) autopolarity, DC Volt, AC Volt, DC Current, AC Current, Resistance	1 1	1 1	\$49.99 \$69.99	Radio Shack 22-811 Radio Shack 22-801	For instructor use only.	