Grand parts list for "Part 1: Electricity & Electronics, Robotics - learn by building"

This list is intended to be a convenience for the students. I have no affiliation whatsoever with any of the people or companies that I link to here, I only provide the links as a suggestion of what / where parts you can get online. In many cases, I was unable to find a listing to buy one part. The parts were usually still in the dollar range, and most of the time you can't have too many of the component in question anyway! So I provided links I could find for the supplies.

Tools needed:

Multimeter. Any kind will do, available in most hardware stores. Here's one on amazon:
https://www.amazon.com/Etekcity-Multimeter-MSR-R500-Electronic-Multimeters/dp/B01N9QW620/ref=sr_1_4?s=lamps-light&ie=UTF8&qid=1543427371&sr=1-4&keywords=multimeter

Pencil Soldering iron & fine electronics solder.
Solder sucker /solder removal tool (mechanical ones are best, bulb ones do work though)
Here's a surprisingly cheap kit which includes a nice 60 watt soldering iron, solder, soldering iron holder with sponge, small tools and a solder removal tool:
https://www.amazon.com/Sywon-Soldering-Adjustable-Temperature-Desoldering-x/dp/B01E1ISGH0/ref=sr_1_6?s=hi&ie=UTF8&qid=1543427461&sr=1-6&keywords=pencil+soldering+iron

safety glasses
precision wire snippers (side cutters), precision needle nose pliers, precision screwdrivers (just slot and phillips screwdrivers is fine) Here's a nice precision toolset: https://www.ebay.com/itm/8-pcs-Precision-Tool-Kit-Hobbies-Crafts-Tork-Screwdrivers-Cutters-Pliers/151690954940?epid=2283088496&hash=item23517c48bc:g:1r8AAOSwBahVYIDj:rk:36:pf:0

fine, **solid** wire like telephone wire or ethernet wire. 22 to 24 gauge, 10 feet or so should be lots. Again, available in most hardware stores, usually only in 50 or 100 foot rolls. https://www.ebay.com/itm/Monster-Cable-Telephone-Station-4-Conductor-Wire-24-Ga-4-Conductor-100-Carded/272664457254?hash=item3f7c117026:g:jTkAAOSwLNxb7wFk:rk:7:pf:0

solderable breadboard or printed circuit board. Search for "solder breadboard" and it'll usually give you several hits. You want to avoid the boards that have copper circles only, and try to get boards with copper traces which connect several holes together in rows, similar to this one:
https://www.amazon.ca/Busboard-Protot-Breadboard-Tie-Point-Breadboards/dp/B01KHWGLJ4?SubscriptionId=AKIAILSHYYTFIVPWUY6Q&tag=duc12-20&linkCode=xm2&camp=2025&creative=165953&creativeASIN=B01KHWGLJ4

Electronic parts:

A solder**less** breadboard. Just about any size will do, though a larger one is better (for larger circuits). Bonus if you can get one with clear plastic like this one: https://www.ebay.com/itm/MB-102-Transparent-Material-830Point-Solderless-PCB-Bread-Board-Test-Develop-DIY/141976503326?epid=1444865922&hash=item210e75841e:g:7g4AAOSwZd1VcmP5:rk:4:pf:0

Jumper wires for breadboarding. You can get a kit (listed below) or just make your own jumper wires using your fancy telephone wire and wire cutters/strippers you got up above.
https://www.ebay.com/itm/140pcs-Solderless-Breadboard-Jumper-Cable-Wire-Kit-Box-DIY-For-Arduino/221919038105?hash=item33ab67ca99:g:hnwAAOSw5VFWJuMr:rk:9:pf:0

Resistors - just get a variety pack. I used precision resistors in the course, but they can be standard resistors. Radio Shack in the US had a variety pack, but here's a set on ebay: https://www.ebay.com/itm/300PCS-30-Values-1-4W-1-Metal-Film-Resistors-Resistance-Assortment-Kit-Set-Hot/301936778206?epid=27025616571&hash=item464cd59bde:g:PY4AAOSw5IJWe5He:rk:1:pf:0

Capacitors - again, just get a variety pack of large (1uf - 100 uf) and small (10pf to 0.1 uf). Large variety: https://www.ebay.com/itm/210Pcs-25-Value-0-1uF-220uF-Electrolytic-Capacitors-condenser-Assortment-Kit-Set/401206644592?hash=item5d69c78f70:g:ifQAAOSwPCVYAPCD:rk:5:pf:0
Small variety: https://www.ebay.com/itm/1000pcs-50-Values-50V-Ceramic-Capacitor-Assorted-kit-Assortment-Set-Hot-Sale/151128848522?hash=item232ffb388a:g:TK8AAOSwSkxbOZ5D:rk:4:pf:0

2 variable resistors/potentiometers. Get one 10k ohm and a large one like 500k ohm. Linear taper is fine, here's a supplier that lets you order singles of your choice: https://www.ebay.com/itm/Variable-Resistor-Adjustable-Resistance-Linear-Taper-Potentiometer-B1K-to-B1M/372450752661?hash=item56b7cb7895:m:mENfi6_D39rBw9wQQ4R8LWQ:rk:8:pf:0

LED's through hole type, *not* the surface mount kind. You'll want several colours, preferably two or more of each colour, here's a variety pack with 5 colours: https://www.ebay.com/itm/25pcs-Variety-5-of-each-Red-Blue-Green-White-Yellow-3mm-Clear-Round-Lens-LED/182003475268?hash=item2a6040a344:g:TBMAAOSwqrtWpw0V:rk:25:pf:0

1 RGB LED, common cathode. I can't find a listing to buy a single LED, but they're cheap anyway. Here's a 15 pack: https://www.ebay.com/itm/15Pcs-LED-RGB-common-cathode-4-PINS-F5-5MM-Super-Bright-Bulb-Lamp-new/261916320699?hash=item3cfb6de3bb:g:pwAAAOSwQiRUpmiU:rk:9:pf:0

1 to 4 Germanium diodes. Again, they are so cheap I can't find them available to puchase as singles, so here's a 10 pack: https://www.ebay.com/itm/10-PCS-GERMANIUM-DIODE-1N34A-DO-7-1N34-IN34A/112416739517?hash=item1a2c8f50bd:g:-kUAAOSww7RbMeDl:rk:4:pf:0

4 silicone diodes. Can't find a 4 pack, so here's a 100 pack, pick any of the kinds listed as they are all the same except for their tolerance for reverse voltage which we don't care about: https://www.ebay.com/itm/100x-Silicon-Rectifier-1A-Diode-1N4001-1N4002-1N4003-1N4004-1N4005-1N4006-DO-41/401361485516?hash=item5d73023ecc:m:mZZ3ex97w9GnLSo69Hq6QtQ:rk:1:pf:0

1 5 to 6 V relay. Preferably SRD-05VDC. I was unable to find singles, but here's a 5 pack for cheap: https://www.ebay.com/itm/5pcs-SRD-06VDC-SL-C-SRD-6VDC-SL-C-PCB-5PINS-6V-DC-Coil-Power-Relay/262355348571?hash=item3d1598ec5b:g:FD4AAOSwQjNW95AB:rk:1:pf:0

momentary and push-on/push-off pushbuttons. Both are optional, but one of each would be nice. Again, these are difficult to buy in singles, but bulk is cheap. Something like these:
Momentary: https://www.ebay.com/itm/50Pcs-6-Pin-Square-7mmx7mm-Momentary-DPDT-Mini-Push-Button-SwitchC-C/273558644386?hash=item3fb15da6a2:g:kTYAAOSwzHRbHdTK:rk:2:pf:0
Push-on/Push-off: https://www.ebay.com/itm/3-x-PUSH-BUTTON-SWITCH-MOMENTARY-ON-OFF-DPDT-0-5A-50VDC-8x8mm-FREE-SHIPPING/280930963340?hash=item4168ca4f8c:g:qqsAAOxy9bxRzJ-6:rk:13:pf:0

One 7805 voltage regulator: https://www.ebay.com/itm/New-10pcs-L7805CV-LM7805-7805-Voltage-Regulator-5V-1-5A-LDO-Power-supply-TO-220/382584677630?hash=item5913d2e4fe:g:1YMAAOSwjCVbuyDs:rk:2:pf:0

One IRFZ44N MOSFET power transistor (here's a 10 pack): https://www.ebay.com/itm/10Pcs-IRFZ44N-IRFZ44-N-Channel-49A-55V-Transistor-MOSFET/381375026221?hash=item58cbb9142d:g:TdMAAOxyfCBSCC18:rk:1:pf:0

two 2N2222 transistors and two 2N2907 transistors. Here's one seller that sells them in lots of 10 each: https://www.ebay.com/itm/10Pcs-Lot-2N2222-2N5551-2N-2907-3906-5172-5401-3904-NPN-Transistor-Triode-TO-92/192175617617?hash=item2cbe8f3651:m:mxZwQs-EI7FiQd-G-STQZqA:rk:9:pf:0

three NE555 timer microchips, in through hole DIP package, *not* surface mount! Like these: https://www.ebay.com/itm/New-20PCS-NE555P-NE555-DIP-8-SINGLE-BIPOLAR-TIMERS-IC-TOP-Quality/173020055879?hash=item2848cc8947:g:cCwAAOSwRbtaKQn5:rk:6:pf:0

One LM386 audio amplifier microchip in through hole DIP package. https://www.ebay.com/itm/10PCS-LM386-LM386N-DIP-8-Audio-Power-AMPLIFIER-IC-Great-Qualtiy-FBHN/323560921355?hash=item4b55bbd90b:g:wbIAAOSwk5FUrQBq:rk:3:pf:0

One TL074 Op Amp in a DIP package (*not* surface mount). Here's a 4 pack: https://www.ebay.com/itm/4-x-TL074CN-TL074-J-FET-Quad-Op-Amp-DIP-14/260516284175?hash=item3ca7fb070f:g:5CcAAMXQdGJRzEN6:rk:4:pf:0

A speaker, preferable 4-8 ohms but piezo speakers will work as well. Just be careful to get a *speaker* and not a *buzzer.* The buzzers look the same because it is a speaker, but it has an electronic circuit built into it which will block the signals from our circuits we build. You want a plain speaker, like this one: https://www.ebay.com/itm/B5AE-4ohm-5w-50mm-2inch-Full-Range-Bass-Mini-Speaker-Unit-Sound-Box/113320671894?hash=item1a62703a96:g:2wsAAOSwZPdbyvhv:rk:15:pf:0&LH_BIN=1

One small DC motor (*not* a brushless DC motor!). Like the 130 hobby motors: https://www.ebay.com/itm/3V-6V-DC-Hobby-Motor-Type-130-Micro-Motor-Toy-Motor-DC-Motor/192453553214?hash=item2ccf202c3e:g:xyIAAOSwPOhagHAA:rk:1:pf:0&LH_BIN=1

One hobby servo of any size, though smaller is generally cheaper. https://www.ebay.com/itm/1PCS-MG90S-Micro-Metal-Gear-9g-Servo-for-RC-Plane-Helicopter-Boat-Car-4-8V-6V/272756107212?hash=item3f8187e7cc:g:-SEAAOSwxxdZYvX0:rk:2:pf:0&LH_BIN=1

Two battery packs of 6 volts or more. This can be lantern batteries, or 4 X AA or 4 X AAA battery packs like these: https://www.ebay.com/itm/5x-4-AA-6V-Battery-Holder-Connector-Storage-Case-Box-ON-OFF-Switch-W-Lead-Wire/372024585579?hash=item569e64ad6b:g:3uEAAOSwA35ZeAed:rk:2:pf:0&LH_BIN=1
In shopping for these battery packs, a strong preference should be shown towards packs with built in on/off switches (like the one shown above). I've had bad luck with the packs out of China as the quality was very poor and the wires broke off far too easily, and far too often. I've since been getting my packs from Canada Robotix (excellent quality), but you may still have issues with shipping because they're in Canada. http://www.canadarobotix.com/battery-chargers/4-aa-battery-holder-enclosed-with-switch

Two 9 volt battery clips: https://www.ebay.com/itm/10-Pcs-Snap-9V-9-Volt-Battery-Clip-Connector-I-Type-Black-w-Cable-Black/112452055091?hash=item1a2eaa3033:g:ZfUAAOSwDrNZS16w:rk:1:pf:0&LH_BIN=1

One CDS photocell (photoresistor). Pretty much any CDS cell will do, but here's a 20 pack of the kind I used in the course: https://www.ebay.com/itm/20PCS-Photoresistor-LDR-CDS-5mm-Light-Dependent-Resistor-Sensor-GL5516-Arduino/401051315285?epid=25016520804&hash=item5d60856c55:g:03YAAOSwKytZL-uQ:rk:3:pf:0&LH_BIN=1

Two alligator clips. Here's a 10 pack, but you can never have too many of them anyway: https://www.ebay.com/itm/10pcs-Double-ended-Crocodile-Clips-Cable-Alligator-Clips-Wire-testing-wire/400985352399?hash=item5d5c96e8cf:g:zCgAAOSwBLIVBPl9:rk:2:pf:0&LH_BIN=1

One thermistor (temperature controlled variable resistor). Pretty much any kind of thermistor will do, I used a 100k ohm, NTC type thermistor in the course, but it does not matter what kind you get. with NTC types, the resistance goes down when the temperature goes up. With PTC types, the resistance goes up with the temperature goes up. We will simply use these thermistors in a demonstration circuit so it does not matter what kind you get. Here's a 10 pack of 100k, NTC type: https://www.ebay.com/itm/10pcs-100K-Ohm-NTC-3950-Thermistor-1-Temperature-Sensor-3D-Printer-MK2b-RepRap/323026250318?hash=item4b35dd6a4e:g:xsUAAOSwCLNbLlq-:rk:6:pf:0&LH_BIN=1