

Shopping List for Unit #14: Electronics

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This Unit is different. While normally, we try to stick to everyday items, this *advanced* electronics course requires a trip to Radio Shack or online electronics stores. We're going to need additional supplies to those used in [Unit 10](#). Keep both sets of electricity materials together (both from this Unit 14 and the previous Unit 10) until you need them, as there are lots of small parts! These two sets are the ones your kids will be using until they hit college and beyond.

Beginner (Grades K-4) For younger students, we do NOT recommend this unit. Instead, hop on over to a more appropriate Electricity course for your students here in Unit 10.

Intermediate (Grades 5-8): Lesson 1

For Lesson 1, you'll need the following parts that can be at your local Radio Shack or visit our website to order these parts from us (we'll also include a DVD and all the parts below except the 9V battery).

- Breadboard (2"x3", 400-hole) (Radio Shack [#276-003](#))
- Digital Multimeter (same one from Units 10, 11, and 12) (Radio Shack [MultiMeters](#))
- Hookup wire (AWG 22g, solid), 6 feet (RS [#278-1215](#))
- CdS Photocell (RS [#276-1657](#))
- 100-ohm resistor (1/4 W) (RS [#271-1311](#))
- 1K-ohm resistor (1/4 W) (RS [#271-1321](#))
- 4.7K-ohm resistor (1/4 W) (RS [#271-1330](#))
- 5.6K-ohm resistor (1/4 W) (RS [#271-1125](#))
- 10K-ohm resistor (1/4 W) (RS [#271-1335](#))
- 100K-ohm resistor (1/4 W) (RS [#271-1347](#))
- PN2222 or 2N3904 (NPN) transistor (RS [#276-1617](#))
- 2N3906 or 2N4403 (PNP) transistor (RS [#276-1604](#))
- 0.47 µf electrolytic capacitor (>10V) (Substitute: 1µf at RS [#272-996](#))
- 10 µf electrolytic capacitor (6V) (RS [#272-999](#))
- 0.01 µf capacitor (RS [#272-131](#)) [capacitor code: 103]
- Bi-polar red/green LED with 2 leads (RS [#276-012](#))
- 10 alligator clip wires (RS [#278-1157](#))
- Electric buzzer (3-6V) (RS [#273-053](#))
- 8-ohm speaker (RS [#273-092](#))
- AA battery case that holds 2 AA's (RS [#270-408](#))
- 9V battery snap (RS [#270-325](#))
- 9V battery (alkaline battery recommended)
- 2 AA's batteries (Cheap dollar-store brand recommended that say "Heavy Duty" - you want the cheapest ones they have. **Do NOT use alkaline batteries: NO Duracell or Energizer!**)

There are TWO books recommended (not required) for this unit. When your kids hound you for more projects, pick up these texts for further projects. Here they are:

- [Getting Started in Electronics](#) by Forrest Mims III (optional)
- [MAKE: Electronics](#) by Charles Pratt (optional)

Lessons 2 is for Grades 9-12, and advanced 5-8th graders:

For Lesson 2, you'll need (in addition to the materials for the Intermediate level above). Figure out which project you'd like to do, then order the kit listed below. Most projects take a few hours to complete. We recommend starting with the Police Siren first. (The parts for these projects are included in Science Mastery Diamond.)

- **Police Siren** This is the first kit you'll build to practice your soldering. The layout is larger than the rest, so it's easier to build.
- **Touch Door Alarm** An annoying alarm sounds when a person touches the knob!
- **Rolling clock** Build your own clock with date display. Be sure to pick up the wall transformer if you want your clock to plug into the wall and not just run on batteries.
- **FM Transmitter** Picks up sounds or voices in the room and transmits them to a nearby FM radio. This is the 'Bug' from our spy kit series.
- **Tools:** You'll need a soldering iron (with a stand and plenty of solder), wire strippers, needle-nose pliers, diagonal cutters, and [helping hands](#) to hold your board as you work.

For Lessons 3 & 4 is for grades 9-12 and advanced 5-8th graders:

- [Electronic Learning Lab](#) by *Radio Shack* This is the best learning lab we've found – it comes with tons of experiments that cover both basic and digital electronics projects! It includes everything you need for all the projects in these two lessons.

If you find your students are thirsty for more reading content that is provided in the project kit, then these are my three favorites. **There are THREE books recommended (not required) for this unit at the 9-12 grade level.** When your kids hound you for more projects, pick up these texts for further projects. Here they are:

- [Getting Started in Electronics](#) by *Forrest Mims III* (optional)
- [MAKE: Electronics](#) by *Charles Pratt* (optional)
- [Practical Electronics for Inventors](#) by *Paul Scherz* (optional)