Materials Overview

Ordering materials for your e-textiles classes can seem a bit overwhelming at first, but we have broken it down into two different steps for you.

1. **Table & Classroom Materials (Tools).** These will be reused every year, so you only need to order them once! This includes things like scissors, needles, rulers, colored pencils, and so forth. More details below.
2. **Student & Classroom Materials (Consumables).** These need to be ordered every year, though a few could be reused if you spend the time to take apart a prior year's projects. More details below.

Note that the links for materials are suggestions. We calculated these as of Summer 2018, but prices and supplies change.

Materials Timeline:

- 6+ months before the unit: Submit the purchase order to your school.
- 3+ months before the unit: Order supplies with the electronics sellers (Adafruit, Sparkfun, and Kitronik). They need time to manufacture the unusually large orders for classrooms.
    - Contact Teddy Papas (teddy@adafruit.com) directly if there are not enough supplies in stock. He helped us put together the classroom and student kits! Explain that you are working on the ECS Electronic Textiles Unit.
- 2+ months before the unit: Order supplies from Amazon or similar sellers. Note that some things listed as available might not be available in the quantities that you need. Double check the shipping times to make sure things will arrive on time!

Table & Classroom Materials—TOOLS

These are materials you only need to order *once* that can be reused every year. You may have some of these already in your school or your classroom, but these are the ones we strongly recommend.

We have subdivided these into two categories: (1) supplies for the classroom as a whole and (2) table supplies.

1. **Whole Class Supplies:** These are items for which you really only need one or two per class. They are shared by all students at certain times during the unit.

2. **Table Supplies (i.e., tools in craft boxes):** We recommend one craft box (a lidded box easy to take to tables and put back into closet space) per 4-6 students. Our supply list assumes 6 students maximum per craft box. You will need to calculate how many craft boxes you need based on how your classroom is organized.
   a. We recommend ordering for the maximum number of students you may have in a single class now or in the future, as these are supplies that will be used every year.
   b. Note how many tables of students you have. If you like, you can insert formulas in the Tools materials guide to calculate your supply needs.

Student & Classroom Materials—CONSUMABLES

These are materials that should be ordered *every year*.

1. **Whole Class Consumables:** These come in bulk and are shared by the entire class. You probably only need one package (i.e., copy paper, embroidery thread, aluminum foil).

2. **Student Consumables:** These are ordered by student and the amount you need depends on the number of students you have.

Note: You may be able to supplement some of these if you recycle parts by taking apart student projects. Always take an inventory or prior year materials before you order again. You may not need to order everything (i.e., if you have enough tracing paper from the prior year, no need to order additional).

Cost Saving Tips:

Everyone wants to save money. The costs for this unit run about $300 to set up your classroom and $40-45/student after that.

Re-use old projects: This will not be possible during the first year, but if you have projects (like the mural project) from prior years, you can collect them and take them apart to re-use the supplies. Big cost savings!

*   **Pro Tip: One teacher we worked with requires that her students show their final (human sensor) project to a teacher or friend at school and a family member (she requires a simple signature as proof) before they can take it home and keep it. If they don't bother to show it, then maybe they shouldn't keep it. Plus, it promotes a sense of audience!*

Use school supplies where possible: Some of the things required are as simple as scotch tape and paperclips. If your school already provides these, then there is no need to order more.

Order in bulk: The more you order, the less it costs. Adafruit lowers costs after you reach orders of 10+ or 100+. Sparkfun and Kitronik have similar cost-savings for certain products. If you are ordering for multiple classes or multiple years at a time, you can save.

If you're really pinching pennies:

Use some alternate materials. For instance, with a little effort you can **sew your own coin cell battery holder** (useful for wristband project) —see a Kitronik tutorial here and an Instructables one here. Note that you don't need conductive fabric. Just sew enough thread to embroider a solid patch. This might save you ~$1.50-2.00 per student.

You could also **use wired LEDs** in place of the sewable LEDs we use with the help of some pliers (Instructables tutorial here). In fact, we used to use wired LEDs for the wristband, but it was less time consuming to just use the ones with pre-made holes that are included in our Student Kit. This might save you a few dollars per student as well if you purchase the wired LEDs in bulk.

A note on Electronics Manufacturers:

There are multiple manufacturers of e-textiles microcontrollers and related supplies. For this unit we have chosen to use the Circuit Playground (developed by Adafruit) because it has an amazing number of sensors and switches installed on board the controller that do not require extra sewing. Also, Adafruit was willing to work together with us to ma ke e-textile student and class kits that allow for easier (and for the most part cheaper) ordering.

- **Note:** This is the Circuit Playground Classic **not** the Circuit Playground Express. The latter works with the free coding platform Make:Code but is also a bit more expensive.

However, you can certainly use other microcontrollers such as the LilyPad line developed by Sparkfun. The BBC Microbit may also be utilized, though it is not as easily transferable to the project in this e-textiles unit.

Conductive thread by Adafruit, Sparkfun, Kitronik, Digikey and other sellers will probably all work. Each has its own advantages and disadvantages: one might be super fuzzy leading to unintentional knots, another might be smoother but harder to hold in place. After over a decade of working with e-textiles, we have learned there is no perfect conductive thread but many are useful.