**Chatfield Material List**

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| **Material** | **Details** | **Source** | **Notes** |
| Bold’s Basal Media – approx. 250 ml | Growth media for the Chlorella algae – solution provided by Nick Sweeney from NREL | solution mixed by NREL scientist | The recipe and composition is readily available.  [**http://www-cyanosite.bio.purdue.edu/media/table/bb.html**](http://www-cyanosite.bio.purdue.edu/media/table/bb.html)  Volume: 250 ml |
| Chlorella Vulgaris | Unmodified species | NREL | provided by NREL- 6 grams biomass |
| Tris-Acetate-Phosphate - sulfur | Media for Chlamydoomonas | solution mixed by NREL scientist | Volume: 250 ml |
| Chlamydomonas reinhardtii | Unmodified species | NREL | provided by NREL – 6 grams biomass |
| ABS plastic | Bioreactor and other parts will be printed in ABS |  | Stratasys P400 ABS |
| 6V micro motor | 110 RPM motor | Spark Fun part number  ROB-12143 | Enclosure also included ROB-12105 |
| Camera | C329-UART-board | electronics 123 | Using lens L361RKC329 or L28IRKC329 |
| Hydrogen Sensor | 5V | SparkFun SEN-10916 |  |
| Solenoid Valve | 5V | SparkFun ROB-11015 |  |
| Photo sensor | 4 sensors | SparkFun SEN-09088 |  |
| Button Cell Battery | CR 1225 A | Renata | 3 x 20 x 20 (mm) 220 mAh 4 needed |
| LED lights | 25 light strip |  |  |
| LED | Various | Sparkfun PRT-12621 |  |
| Real time clock | clock | Superbrightleds.com | WE have ordered several different lights and are currently working to see which will work the best |
| PCB Circuit Board | Board to hold photocells | Sparkfun COM-00540 |  |
| Cadmium-sulfide photocells | 4 photocells for Chlorella | Radio Shack  Prt: 276-004 |  |
| Adhesive | fast drying | Radio Shack  prt:276-1657 |  |
| Adhesive | super glue | 3M 4475 | scotch-weld VOC 600 g/L |
| Polycarbonate | Polycarbonate to enclose the bioreactor | Loctite Super Glue gel |  |
| Acrylic Tubing | various sizes | eplastics sample pack  part # | [www.eplastics.com](http://www.eplastics.com) |
| Bearings | Tapered Outer Diameter, Flanged | United States Plastic Corporations | http://www.usplastic.com/catalog/item.aspx?itemid=23401&catid=440 |
| Bearings | Miniature & Instrument Series (metric) | F2ZZ and F3ZZ | www.astbearings.com |
| Rubber O-rings | #207 O-Ring | 601XHZZ and 602XHZZ | [www.astbearings.com](http://www.astbearings.com) |
| Rubber O-rings | #241 O-Ring | PartsmasterPro 53262 | 1/2“ OD 3/8” ID x 10 |
| Rubber O-rings | #210 O-Ring | PartsmasterPro 58286 | 9/16“ OD 7/16” ID x 10 |
| Gas permeable membrane | silicone sheeting. | SSP-M823-Samplekit | Sample sheeting from sspinc.com |
| Hydrogen sensing tape |  | SSP inc. number:  SSPM823-.005  Batch EH016 |  |
| Silicon Caulk | GE Silicon II | HySense |  |
| Grease | Super Lube Silicone Lubricating Compound | Home Depot |  |
| Fasteners | various | Home Depot  Model #21030 |  |
|  |  |  |  |
| Helicoils | various |  |  |
| Helicoil epoxy | Bob Smith slow cure – 30 min epoxy |  |  |
| Silicon sheeting for gasket | 70A Durometer, Smooth Finish Silicone Sheeting 1/16” thick | Colpar Hobbies |  |
| Silicone Glue | TZ1143 | Amazon.com |  |
| Color Sensor | Sensor to monitor Chlorella lipid content | MarineDepot .com |  |
| Copper tape |  | SparkFun SEN-11195 | 2 sensors needed |
| Female header | Swiss machine pin | Sparkfun: PRT. 10561 |  |
| Break Away Header - straight | 2 mm | Sparkfun: PRT. 00743 |  |
| 2 mm jumper wire | various | Sparkfun: PRT. 00116 |  |
| 2 pin jumper |  | Sparkfun: PRT. 09044 |  |
| Molex – jumper cables | various | Sparkfun: PRT.09044 |  |
| JST Jumperwire | various |  |  |
| Duct Tape | 1 meter | 3M | We are open to whatever would be best from an outgassing perspective |
| Gore Tex |  | Gore Tex | Unknown quantity at this time |
| Acrylic sheeting |  | Standard Plexiglass | Discussions with a partner that will help with the cutting of our plastic covers for the bioreactors have confirmed that we can’t cut polycarbonate with their laser engraver – to many toxins released. The switch to acrylic will allow us to have more precise cuts for our end caps. |
| Caulk | Aquarium caulk | Aqueon pure Silicone Sealant. Product #65003 | Testing is showing some potential problems with the GE Silicon II caulk with prolonged exposure to water. Switching to an aquarium based caulk now will eliminate this potential problem.  http://www.aqueonproducts.com/products/100-silicone-aquarium-sealant.htm# |
| Copper Sheet | Solid Copper sheeting |  | Wires weren’t making good connection to the batteries in our battery pack tests. With the copper pieces in place (just a rectangle of copper cut to fit in our battery holder) we hope to have better electrical contact. Updated CAD files will be uploaded this week or early next to show this design modification |
| Spray Sealant | Spray sealant to keep bioreactor from leaking | Rustoleum | Our bioreactors have been leaking through the plastic – this will seal the plastic so that they provide a level of containment.  MSDS at:  http://www.rustoleum.com/MSDS/ENGLISH/265495.PDF |
| Cable ties |  | Standard ties from Home Depot | From Alli’s visit on 3/9 – these will allow us to secure our wiring within our Nanolab |
| MOSFET |  | Sparkfun PRT-11214, COM-10213, COM-10349, COM-12901 | Will short circuit battery once connect to NanoRack on orbit as suggested by Dr Morgan from Texas A&M – this will minimize glare for photos. |
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