EDOSC Purchasing Manual

August 21, 2013

# 1—Introduction

## 1.1—Important General Notes

When stocking classroom kits, there should be enough material that students have choices – be sure there is enough material (quantity and type) to create more than one working solution. Choices of color and decorative elements have been shown to increase appeal to girls and a wider range of boys.

The “Buyer’s Guide” in the back of each EDOSC Lesson Plan contains detailed lists of equipment and supplies, including how to calculate the quantities for a class of a given size. The EDOSC Materials page – <http://opas.ous.edu/EDOSC/Materials.php> -- includes a budget workbook for purchasing equipment and supplies for classroom deployment and/or training workshops:

* [EDOSC Budget Workbook Guide.docx](http://opas.ous.edu/EDOSC/General/EDOSC%20Budget%20Workbook%20Guide.docx)
* [EDOSC-Budget-Workbook-2.8.xlsx](http://opas.ous.edu/EDOSC/General/EDOSC-Budget-Workbook-2.8.xlsx)

This information has been summarized and collated across all lessons in the table that starts on page 3. The Buyer’s Guides have specifications, links, alternatives, and constraints.

## 1.2—Stores

We tried to configure lessons such that purchasing for any single lesson involves no more than a few types of stores; many lessons use materials/equipment already available in many schools:

* Variety: Fred Meyer (in 33 cities in Oregon), [www.amazon.com](http://www.amazon.com)
	+ Alternative is to share out among: grocery, drug, pet, home improvement, toy and craft
* Dollar: DollarTree; [www.dollartree.com](http://www.dollartree.com) (ship to store for free; >=43 stores in Oregon including Baker, Brookings, Hermiston, Klamath Falls)
* Pet: PetSmart (15 stores in Oregon, [www.petsmart.com](http://www.petsmart.com) ), Petco (20 stores in Oregon; [www.petco.com](http://www.petco.com) )
* Craft: Michaels (15 stores in Oregon), JoAnns, Craft Warehouse, [www.flowerfactory.com](http://www.flowerfactory.com),
	+ If buying for many classes, check out [www.discountschoolsupply.com](http://www.discountschoolsupply.com)
* Hardware/Home Improvement/Garden: Home Depot ( 26 stores in Oregon), Lowe’s (12 stores in Oregon)
* Toy: Toys R Us – [www.toysrus.com](http://www.toysrus.com) , [www.amazon.com](http://www.amazon.com)
* Art Store (for clay; alternatives include toy and craft) -- <http://www.georgies.com/>
* Science Supplies:
	+ Algae (green, free-swimming, *Selenastrum* or *Scenedesmus* species preferred) -- [www.nilesbio.com](http://www.nilesbio.com) (cheapest shipping; sold in 2 oz aliquots for 30 students) – <http://www.carolina.com/algae/green-algae-sz-living/FAM_152510.pr?catId=&mCat=&sCat=&ssCat=&question=live+algae> (sold in 25 ml vials)
	+ Lab supplies (graduated cylinders) [www.grainger.com](http://www.grainger.com), [www.nurnberg.com](http://www.nurnberg.com)
* Specialty and Sole Source vendors:
	+ Film Canisters: [filmcanistersforsale.com](http://filmcanistersforsale.com/) –- [www.sciencebobstore.com](http://www.sciencebobstore.com) -- [www.engineeringedu.com/shop/shop/blast/reactionary-rockets-25-student-classroom-pack/](http://www.engineeringedu.com/shop/shop/blast/reactionary-rockets-25-student-classroom-pack/) (kits)
	+ Algae (green, free-swimming, *Selenastrum* or *Scenedesmus* species preferred) -- [www.nilesbio.com](http://www.nilesbio.com) (cheapest shipping; sold in 2 oz aliquots for 30 students) – <http://www.carolina.com/algae/green-algae-sz-living/FAM_152510.pr?catId=&mCat=&sCat=&ssCat=&question=live+algae>
* Bulk LEGO parts: LEGO Education -- [www.legoeducation.com](http://www.legoeducation.com)

# 2—Kitting Supplies Notes

* We found 16 qt plastic lidded bins for $2.99 at Target and $3.99 at Fred Meyer; even more elsewhere.
* The Dollar Store fairly reliably had semi-disposable food containers and 2 Gal plastic zipper bags.
* Dollar Store plastic shoe boxes are too fragile to stand up to classroom (and possibly workshop) use.

## 2.1—Elementary School Materials

* Toad’s Car –When purchasing straws, make sure they accommodate LEGO axles (beware of Dollar Store flex straws).
* Bricks for Pigs – use of garden or dyed gravel, pebble and play sand is ok, but these cost more than garden varieties. (Not true for middle school BioSwale lesson). Plastic cup/bowl for mixing. Extra craft sticks for mixing. Use paper, not plastic, cups for molds to promote drying. Small paper Dixie cups are cheaper per piece at Target than Dollar store.
* Joanie Appleseed – alternative to paper towel is one sheet of cardstock, rolled. Small paper Dixie cups are cheaper per piece at Target than Dollar store.

## 2.2—Middle School Materials

* The Ultimate Speed Challenge – When purchasing straws, make sure they accommodate LEGO axles (beware of Dollar Store flex straws).
* BioSwale – supply your own utility knife or kitchen scissors to cut bottles. Use clean, dye-free sand, gravel, and pebble. Take care to minimize exposure when handling pelletized lime. Avoid narrow-necked bottles.

## 2.3—High School Materials

* Algae Machine: algae provided separately; we have growth judging by color and hope for a relatively pure culture although we did not grow it in sterile lab conditions. Lamp set-up and some bottles available separately. Use a ¼” drill bit for 3/16” tubing.
* Littlefoot’s Ride – we found Icy Overpass track packs much cheaper at Toys R Us than Amazon. When purchasing straws, make sure they accommodate LEGO axles (beware of Dollar Store flex straws).
* Calorimeter: Food-grade Potassium Chloride (KCl) worked as well as laboratory grade.

# 3—Purchasing Manual Table

|  |  |  |
| --- | --- | --- |
| **Item** | **Activities** | **Stores** |
| Clear Plastic lidded bottles, various sizes | Bricks for a Pig\*BioswaleAlgae Machine | Bring from home, reuse from cafeteria, or buy water bottles. Wash any used bottles thoroughly |
| Paper towel rolls or cardstock | Joanie Appleseed | Bring from home, reuse from janitor |
| Large cardboard Boxes | Frankenplants | Bring from home, reuse from stock, packaging store |
| Standard school craft/office:* Glitter
* Pompoms
* Craft sticks, various sizes
* Pipe cleaner/chenille twig/stems
* PlayDoh or clay
* Pottery clay
* Feathers (optional)
* Eraser caps
* Glue sticks
* Cellophane tape
* Masking tape
* Scissors
* Variety of paper: construction, copy, card
* Index cards
* Bubble wrap
* Rubber bands
* Cloth and/or felt squares
 | Joanie AppleseedLittlefoot’s RideUltimate Speed ChallengeCalorimeterFootball helmet (workshop only)Tallest Tower (workshop only)Index Card Chair (workshop only) | Dollar, craft, varietyFeathers not common on web – [www.discountschoolsupply.com](http://www.discountschoolsupply.com)Pottery clay -- [www.georgies.com/](http://www.georgies.com/) |
| Standard food service/toiletry:* 4 oz paper cups
* 16 oz plastic cups (e.g. Solo)
* 12-16 oz paper cups
* Straws
* Flexible Straws
* Coffee Stirrer Straws
* Cotton Balls
* Cheesecloth
* Tea (loose or bagged, green or black)
* Lemon Juice or white vinegar
* Alka-Seltzer (workshop only)
* Sturdy small paper plates
* Cans for weight
* Sturdy bowls/cups for mixing
* Foil
 | Joanie AppleseedLittlefoot’s RideUltimate Speed ChallengeToad’s Wild RideBioswale | Dollar, variety, grocerySome available at [www.flowerfactory.com](http://www.flowerfactory.com)  |
| Toys:* Capsule sponges (optional)
 | Joanie Appleseed | Dollar |
| Aquarium:* 100 gal pump
* Airline tubing
* Gang valves & T adaptors to suit
 | Algae Machine | Pet; note much of the rock product can also be sourced at a pet store |
| Rock:* Sand (play; aquarium)
* Gravel (garden; aquarium)
* River pebble (garden; aquarium)
* Limestone (pelletized)
 | Brick for PigsBioswale | Pet, variety, hardware“Bricks for Pigs” requires rock product clean enough for safety and sanitary considerations; “Bioswale” needs clean, dye-free rock product for predictable, replicable results. |

|  |  |  |
| --- | --- | --- |
| Tools/Hardware:* Watering Can or bottle
* Flourescent light bulbs
* Light sockets
* Shop light
* Fluorescent tubes
* PVC pipes, joints
* Teflon joint tape
* MDF board for ramps
* Drill bits/hand drill
* Box knives (alt: scalpel\*\*)
* Washers (alt: pennies)
* U-bolts
* PVC Cement
* Light timer
 | Brick for PigsToad’s Wild RideWater FilterUltimate Speed ChallengeAlgae MachineCO2 Rockets (workshop only) | Variety, hardwareHex screwdriver can be used to hand-drill -- [www.amazon.com/SKIL-010-350-SKL-10-Piece-T-Handle-Storage/dp/B005FE843Q/ref=sr\_1\_fkmr2\_3?ie=UTF8&qid=1377142073&sr=8-3-fkmr2&keywords=skil+hex+driver+T+handle](http://www.amazon.com/SKIL-010-350-SKL-10-Piece-T-Handle-Storage/dp/B005FE843Q/ref%3Dsr_1_fkmr2_3?ie=UTF8&qid=1377142073&sr=8-3-fkmr2&keywords=skil+hex+driver+T+handle)These bits will cover Algae Machine and Bioswale -- [www.amazon.com/Milescraft-2320-Metal-Stubby-Drill/dp/B001JEOIHW](http://www.amazon.com/Milescraft-2320-Metal-Stubby-Drill/dp/B001JEOIHW) |
| Garden:* Heirloom tomato seed
* Various size Grafting clips\*\*\*
* Rootstock seed\*\*\*
* Fertilizer NPK 24:8:16
* Fertilizer, slow release
* Seed Starter Medium
* Peat pots, trays, plastic dome
 | FrankenplantsAlgae Machine | Variety, gardenEd Hume “Siberia” is one type of Heirloom tomato seedExtensions to the Algae Machine lesson specify a nutrient solution in place of commercial fertilizer |
| ***Sole-source and Difficult-to-find items*** |  |  |
| Flower stems: 5 petals, white to pink, multiple flowers per stem, e.g., apple, stephanotis, waxflowers, cherry blossoms, daisies trimmed to 5 petals | Joanie Appleseed | Dollar, Craft, possibly variety[www.flowerfactory.com](http://www.flowerfactory.com) $1.65-$1.85 each |
| LEGO axles/wheels* Littlefoot’s axles must be size 4M
* Toad, Ultimate: Small size variance ok
 | Littlefoot’s RideToad’s Wild RideUltimate Speed Challenge | [www.legoeducation.us/eng/product/cross\_axles\_sizes\_3m\_through\_12m\_/2233](http://www.legoeducation.us/eng/product/cross_axles_sizes_3m_through_12m_/2233)[www.legoeducation.us/eng/search/wheels](http://www.legoeducation.us/eng/search/wheels) |
| Live algae culture | Algae Machine | [www.nilesbio.com](http://www.nilesbio.com)[www.carolina.com/algae/green-algae-sz-living/FAM\_152510.pr?catId=&mCat=&sCat=&ssCat=&question=live+algae](http://www.carolina.com/algae/green-algae-sz-living/FAM_152510.pr?catId=&mCat=&sCat=&ssCat=&question=live+algae) |
| Film canisters (workshop only) | CO2 Rockets (workshop only) | [filmcanistersforsale.com](http://filmcanistersforsale.com/)[www.sciencebobstore.com](http://www.sciencebobstore.com)(kits with PVC elbows) [www.engineeringedu.com/shop/shop/blast/reactionary-rockets-25-student-classroom-pack/](http://www.engineeringedu.com/shop/shop/blast/reactionary-rockets-25-student-classroom-pack/) |
| Thomas Tank Engine Icy Overpass Track Kit | Littlefoot’s Ride | [www.toysrus.com/product/index.jsp?productId=13148111](http://www.toysrus.com/product/index.jsp?productId=13148111) |
| Jeweler’s Scale\*\* | Ultimate Speed ChallengeLittlefoot’s Ride | [www.amazon.com/American-Weigh-Signature-AWS-100-Digital/dp/B0012LOQUQ/ref=pd\_sbs\_k\_1](http://www.amazon.com/American-Weigh-Signature-AWS-100-Digital/dp/B0012LOQUQ/ref%3Dpd_sbs_k_1) |
| Plastic gusseted bags | Frankenplants | [www.packandseal.com/c-1002-gusseted-poly-bags.aspx](http://www.packandseal.com/c-1002-gusseted-poly-bags.aspx) |
| Food-grade Potassium Chloride (KCl) | Calorimeter | Cheaper than lab-grade, works just as well[www.swansonvitamins.com/now-foods-potassium-chloride-powder-8-oz-pwdr](http://www.swansonvitamins.com/now-foods-potassium-chloride-powder-8-oz-pwdr) |
| Tomato Rootstock, “Maxifort” preferred | Frankenplants | [www.johnnyseeds.com](http://www.johnnyseeds.com)[www.paramountseeds.com](http://www.paramountseeds.com)[www.neseed.com](http://www.neseed.com) [www.amazon.com](http://www.amazon.com)  |
| Garden Grafting Clips, various sizes | Frankenplants | [www.neseed.com](http://www.neseed.com)  |
| pH Test strips, 2.0 – 9.0 | Bioswale | [www.nurnberg.com/pc\_product\_detail.asp?key=78F02A83E58647A99CFC8027A00B69F1](http://www.nurnberg.com/pc_product_detail.asp?key=78F02A83E58647A99CFC8027A00B69F1)  |
| ***Common Science Supplies**** Beakers
* Graduated cylinders, 100 ml, at least semi-translucent
* Alcohol-based Thermometers for liquid
* Stopwatch/timers mm:ss:001
* Scale/balance accurate to 0.01g
* Meter sticks or tape measures
* Safety goggles
* pH Test strips 2.0 – 9.0
* Scalpel (disposable or sterile)
* Thermometers for ambient
* Distilled or bottled Water
* Nitrile gloves
* Dust masks
 | CalorimeterUltimate Speed ChallengeLittlefoot’s RideCO2 Rockets (workshop only)BioswaleFrankenplants |  |

\*see Buyer’s Guide in the Lesson Plan for alternate material/equipment suggestions

\*\* or see Common Science Supplies

\*\*\* See Sole-Source and Difficult to find Items

# 4—Questions

If you still have questions, please contact:

* Bruce Schafer, bruce\_schafer@ous.edu
* Nick Giampietro, nick\_giampietro@ous.edu
* Jo Oshiro, jo\_oshiro@ous.edu