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| **Electronic Equipment** | | | |
| Computer with: | One for the duration of the camp | Available at the facility or instructor furnished | Various activities |
| Internet connection |
| Overhead light projector |
| External speakers |
| Computer Lab with enough computers for not more than 1-2 students per station | For the duration of the camp | Pre-load any software or set up requirement and test before camp. | Simulations |
| **Tools, Hardware and Electrical** | | | |
| Sandpaper various grits | 5-6 packages | May be able to use emery board instead | Simple Motor  Solar Car |
| Box cutter/Xacto knife | 5-6 (1 per table/team) |  | Multiple |
| PVC pipe  Copper pipe | Schedule 40 thin wall PVC pipe, elbows, Ts and connector. | TBD - PVC  Scrap pieces at least 6” long and medium diameter (¾” or 1”). Either can be used to make windings for Simple Motor or other activities | Wind Turbine Testing Station Nacelle  See Curriculum for building instructions. Should be completed before camp. |
| Zinc Galvanized 10 Penny nails - 1# pack | 3-5 per team |  | Fruit/Potato Battery |
| Hammer 16 oz | 1-2 | For punching holes with nails | Multiple |
| Flashlight | 5-6 (1 per table/team) |  | Multiple |
| Duct Tape | 10 (1 per table/team) |  | CD Car |
| Nylon Washers | 1 per student | Need ¼ “internal diameter (ID) | CD Car |
| Masking/Packing Tape | 5-6 (1 per table/team) |  | Multiple |
| Electrical Tape | 5-6 (1 per table/team) |  | Multiple |
| Bucket 5 gal | 1-2 | Could be used in place of box for Day 2 opening activity | Day 2 Opening  Liquid Light |
| Batteries:  D Cell  9V | 1 per team  2 per team  1 per team |  | Conductor/Insulator  Electromagnet  H2O Electrolysis |
| Paint Stir Stick | 2 per student | May be able to get these donated by speaking with store manager | Paint Stick Boomerang |

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| Wire:  Insulated Copper 16AWG  28 AWG | 2 ea – 8” section/team  36” per team |  | DC Fruit Battery  Option B  H2O Electrolysis  Electromagnet |
| Bare copper 16AWG | 2 ea – 8” section/team |  | Build Simple Motor |
| Enamel coated magnetic 22AWG | About 40” per student |  | Build Simple Motor |
| Dowels |  | Can buy long lengths and cut into 1 ft for each oven | Solar oven |
| D Cell Battery holders |  |  | Conductor/Insulator  Simple Motor |
| Multimeter (voltmeter) | 1 per team or station | #990177 [www.kelvin.com](http://www.kelvin.com) | Alt Solar Activity  Fruit Battery  Wind Turbine |
| Alligator Clips | 5 sets per team  2 sets per team  3 per team  4-6 per team |  | Conductor/Insulator  Fruit/Potato Battery  Simple Motor  Alt Solar Activity |
| Wire Stripper/Cutter | 1 per team | Radio Shack **Model:** 30396 **Catalog #:** 55066671 | Fruit/Potato Battery |
| Knife Switch |  | Radio Shack **Model:** 275-1537  **Catalog #:** 275-1537 | Electromagnet |
| Photovoltaic Cells  0.5V 400mA |  | Stk # 260098 [www.kelvin.com](http://www.kelvin.com) | Alt Solar Activity |
| 1.5V LED lights | 1 per team | [www.kelvin.com](http://www.kelvin.com)   |  |  | | --- | --- | | [260168](http://www.kelvin.com/Merchant2/merchant.mv?Screen=PROD&Product_Code=260168&Category_Code=ELPCLESB&Product_Count=0) | White Super Bright LED | | [260169](http://www.kelvin.com/Merchant2/merchant.mv?Screen=PROD&Product_Code=260169&Category_Code=ELPCLESB&Product_Count=1) | Green Super Bright LED | | [260170](http://www.kelvin.com/Merchant2/merchant.mv?Screen=PROD&Product_Code=260170&Category_Code=ELPCLESB&Product_Count=2) | Red Super Bright LED | | [260171](http://www.kelvin.com/Merchant2/merchant.mv?Screen=PROD&Product_Code=260171&Category_Code=ELPCLESB&Product_Count=3) | Yellow Super Bright LED | | [260172](http://www.kelvin.com/Merchant2/merchant.mv?Screen=PROD&Product_Code=260172&Category_Code=ELPCLESB&Product_Count=4) | Orange Super Bright LED | | Conductor/Insulator  Fruit/Potato Battery |
| 1.5V LED clock Optional | 1 per team |  | Fruit/Potato Battery |
| MAGNETS  Assorted 62 for $8.95 | Inc Bar, Disk, Round and Rectangular | #841584 [www.kelvin.com](http://www.kelvin.com) | Various  Flat – Simple Motor |
| Neodymium (rare earth) | Round ¼ “ | Amazon, Radio Shack or Hardware store | Magnetic Flux Lines  (may also be used for Simple Motor if needed) |
| Optional: 200W Light bulb or infra-red bulb and fixture |  | In case of cloudy or inclement weather | Solar Oven  Solar Car |
| Optional: SunEzoon Solar Car | 1 per student | Item # 28574  [www.pitsco.com/store/detail.aspx?ID=2209&bhcp=1](http://www.pitsco.com/store/detail.aspx?ID=2209&bhcp=1) | Solar Car |

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| **Used Electronics or Thrift Store** | | | |
| Chargeable device (ie) IPod |  | Electronics or thrift store | DC Fruit Battery  Option B – Charge IPod |
| USB Charging Cable |  | Electronics/thrift store | DC Fruit Battery Opt B – Charge IPod |
| **Office Supply or Walmart** | | | |
| Yard Stick | 1 per team |  | Multiple |
| Ruler | 1 per team |  | Multiple |
| Emery Boards | 1 per team | May be used instead of sandpaper | Simple Motor |
| Scotch Tape |  |  | Magnetic Flux Lines  Simple Motor |
| Compact Disks |  |  | CD Car  Wind Turbine Design |
| Markers | 1-2 per table |  | Multiple |
| Glue/Glue Sticks | 1-2 per table |  | Multiple |
| String | 2-3 per camp |  | Multiple |
| Twine | 2-3 per camp |  | Multiple |
| Pencils | 1 per student |  | CD Car |
| Pencils | 2 per student | Sharpened on both ends | H2O Electrolysis |
| Scissors | 1-2 per table |  | Multiple |
| Paper | 25 sheet |  | Mentos Volcano |
| Large Paper Clip  Small Paper Clips | 1 per student  5-6 per team | Metal  Metal | CD Car  Electromagnet |
| Foam Board 3’ x 4’ | 3-4 sheets |  | STEM Career game |
| Clear Name Badge Holders Avery#74471 | 4 pkgs or about 100 |  | STEM Career Game |
| Brads 1” | 2 Boxes of 100 |  | STEM Career game |
| Rubber bands 3” | 2 per student |  | Paint Stick Boomerang  Simple Motor |
| Rubber band 7” flat | 2 per student |  | CD Car |
| Rubber band 10-12” | 1 per student |  | Stored Energy |
| Dominos | 1 set |  | Nuclear Chain Reaction |
| 3 x 5 cards | 1-2 packs/camp |  | Multiple |
| Balloons | 2-3 per team |  | Make Lightning 2 |
| Box Fan | 2 per camp |  | Wind Turbine |
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| **Various Sources** | | | |
| Golf ball | 1 per team | Sporting Goods or Walmart | Ball Drop |
| Tennis ball | 1 per team | Ball Drop |
| Hand or racquet ball | 1 per team | Ball Drop |
| Elenco Snap Circuit Kit SC300 | 1 per 2-4 students | Amazon.com | Electrical Circuits |
| Elenco Green Alternative Energy Kit | 1 per 2-4 students | Amazon.com | Electrical Circuits |
| Iron Filings | Tablespoon per team | 12 oz Jar #282176 [www.kelvin.com](http://www.kelvin.com)  May need more than 1 jar  (or steel end cuts from a stapler catch tray in a copier machine) | Magnetic Flux Lines |
| Clay or Play-Doh | 1” ball per team | Walmart – Toys  Used to seal bottle opening | Make Thermometer |
| **Found, Home or Thrift Store Items** | | | |
| Plastic bottle with lid clean clear straight sided | 1 per team |  | Magnetic Flux Lines  Make Thermometer |
| Toilet Paper empty roll | 1 per student |  | CD Car |
| Large Empty boxes | 4 | Printer paper boxes (or could use 5 gal bucket) | Day 2 Opening |
| Bags of popcorn OR Leaves | 2 | Contact a local movie theater and request donation of the end of day popcorn for you over a week’s time for this activity. OR leaves if dry and not moldy. | Day 2 Opening |
| Assorted items |  | String/twine, coins, toothpick, aluminum foil, paper clip,dollar bill, plastic, etc. | Conductor/Insulator |
| Miscellaneous |  | Items such as plastic, water/soda bottles, card board, card stock (like cereal boxes), feathers, aluminum cans (with some supervision) etc. that can be used to create propellers for the wind turbine. | Wind Turbine Design/Build |
| Shoe box or other suitable cardboard box with lid | 1 per student |  | Solar Oven |
| Empty Milk jug | 1 per team |  | Hydro Power |
| Water |  | Need available sink or hose to fill jugs or glasses | Hydro Power  H2O Electrolysis  Make Thermometer |
| Tall skinny jar | 1 per team | Can use a salsa, olive or mayo jars | Liquid Light |
| Newspaper | 4-5 sheets/ team |  | Liquid Light |
| Iron or Steel pot | 1 per team/camp |  | Make Lightning -1 |
| Iron or Steel fork | 1 per team/camp |  | Make Lightning -1 |
| Drycleaner plastic bag | 1 per team/camp |  | Make Lightning -1 |
| Clear Plastic bottle with narrow neck | 1 per team | Recycle Empty water bottle will work |  |
| Wool or fur | 1 per team |  | Make Lightning -2 |
| Metal tool, door knob | 1 per team |  | Make Lightning -2 |
| Small weight or rock |  |  | Stored Energy |
| Oatmeal round box or coffee can | 1 per team |  | Stored Energy |
| Copper pennies | 6-10 per team |  | Fruit Battery |

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| **Grocery** | | | |
| Aluminum Foil |  |  | Conductor/Insulator  Solar Oven |
| Plastic Wrap |  |  | Solar Oven |
| Aluminum Pie Pan |  |  | Solar Oven |
| 4 Lemons OR 3 Potatoes OR 1 ea Apple, Banana & Orange/Tangerine | 1 set per team |  | DC Fruit Battery  Depends Option you choose A B Or C |
| Diet Coke 2 Qt | 1-2 per team |  | Mentos Volcano |
| Mentos | 1-2 per team |  | Mentos Volcano |
| Clear Plastic 12 oz Cups | 1 per team |  | Simple Motor  H2O Electrolysis |
| Graham crackers, thin chocolate bars, marshmallows | Enough for each student to make 1-2 S’mores | May use other recipes included in materials – purchase ingredients for those recipes | Solar Oven Cook |
| Napkins | 1-2 Packages |  | Multiple |
| Salt |  |  | H2O Electrolysis |
| Rubber gloves |  | Like used for cleaning | Make Lightning -1 |
| Rubbing Alcohol | 2-3 bottles/camp | Each team needs 1 cup | Make Thermometer |
| Red food coloring | 1 bottle |  | Make Thermometer |
| Clear plastic straw | 1 box/camp |  | Make Thermometer |
| **Food Service for Camp** | | | |
| Lunches | Enough for all participants, instructors, helpers and presenters | Place orders day before and have delivered 20-23 mins before scheduled lunch time  Various – Chicken, pizza, sandwiches, etc | Check for any food restrictions of any participant and make arrangements to have alternative food choice delivered at the same time as the other food delivery |
| Breakfasts and Snacks | Breakfast snacks should include: cereal bars, yogurt, milk, juice, and fresh fruits  Walmart, Sams, CostoCo anywhere you can buy in bulk as discounted | Breakfast snacks should be set up before students |
| Drinks | Water should always be available. Limit sodas/other sweet drinks to lunch time.  Walmart, Sams, CostoCo anywhere you can buy in bulk as discounted prices | Need to ensure that sufficient water is on board the bus as well for field trips – estimate at least 3 bottles per person depending on the weather |

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| **Special Order Items** | | | |
| Understanding: Electricity and Magnetism | 1 per student and instructor | Usborn Children’s Books  Order thru Amazon | Printed on demand – **Long Lead Time** |
| Light Bulb Flash Drive | 1 per student | Tmart.com | Mfg & Ship from China – **Long lead time** |
| KCP&L logo Polo | 1 per adult helper | Order from Company Store and have printed with Get Into Energy, UMKC, KCPL and KC STEM logos on back | Get sizes from each adult. May need month to receive order. Can be printed by River City Ts at same time as Tee Shirts |
| Tee Shirts | 1 per student and instructor | Purchased from River City Ts and printed with Get Into Energy front and UMKC, KCPL and KC STEM logos on back | Usually 1 week turnaround  River City T’s  [chris@rivercityts.com](mailto:chris@rivercityts.com)  816-472-7900  1436 Burlington  NKC, MO 64116 |
| Wind Turbine Supplies | Hardware store:  Schedule 40 thin wall PVC pipe and fittings; tools  KidWind:  Motors, Hubs, multimeters and other items  General Mdse:  Box Fan | **This structure should be constructed prior to camp.**  **See building instruction in Day 2 curriculum.**  Suggest building at least 2 complete stations with tower /nacelle, motor, multimeter and box fan (with good velocity).  Have extra motors in case of damage or burn out. Hubs – nice to have 1 per student for building, but not take home.  <http://www.vernier.com/products/kidwind/> |  |
| **UTILITY SUPPLIED PPE** | | | |
| Safety Glass (sunglasses) | 1 per student and adult escorts | For Field Trips to utility facilities. Order from KCP&L Stores | Student may keep. |
| Hard Hats | 1 per student and adult escorts | For Field Trips to utility facilities. Stored in Tech Trng in tubs for use year to year | Students must return to utility. |