Host a Repair Cafe

by YuKonstruct on August 26, 2015

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YuKonstruct is a non-profit society which provides an enthusiastic community of makers and entrepreneurs affordable access to space, equipment and knowledge. This community serves to embrace the individual and the business to support innovation, provide a place for tinkering, prototyping and manufacturing, and offer opportunities for learning and growth. OUR MISSION Providing access to shared space, quality tools, available expertise, and a collaborative environment to help makers build anything.

Intro: Host a Repair Cafe

YuKonstruct runs a Repair Cafe on the fourth Friday of every month. The Repair Cafe is an opportunity for people to bring in their broken items to learn how to fix them. We've worked on everything from jewelry to a vintage Geiger counter.

Why should you host a Repair Cafe?

- Share the "Philosophy of Repair" (e.g. answer the question "Why bother (fixing things)?").
- Pass on skills & reinforce the "Can Do" maker ethic.
- Technical literacy + solving a puzzle = sense of accomplishment and level of comfort with the technology in our lives; (recall "Zen & the Art of Motorcycle Maintenance").
- Promote responsible consumerism (e.g. keep stuff out of land-fill, as much as possible).
- Save money by not having to replace broken items, (and save the time and energy of shopping).
- Promote the Maker's 3Rs: "Repair, Re-purpose, Re-create"!

YuKonstruct is the first makerspace in Canada's north. Our mission is to provide access to shared space, quality tools, available expertise, and a collaborative environment to help makers build anything!

Step 1: Set Up the Workspace

Get organized before participants arrive:

- Set up tables (we use two or three folding tables) and some of the tools that are likely to be needed (or at least have them handy in a good tool box - see next step).
- Have at least two computers with Internet access nearby for looking up manuals, parts lists, other online resources like videos, forums, etc. - and perhaps for ordering parts.
- Good (bright) lighting is important.
- A whiteboard and markers is often very handy.
- Decide if you are going to provide coffee &/or snacks, and perhaps some cool background music.
- Have some sample projects on hand in case people arrive without something specific to work on

Step 2: Tools and Supplies

The following is a list of tools and supplies that our makerspace uses during our Repair Cafe. The tools are all stored in a rolling tool chest to make it easy to bring everything out every month.

Tools:

- digital camera (or smart phone),
- notebook, pens,
- trays for parts,
- headlamp or flashlight,
- magnifying glass,
- shop vacuum, dust pan & brush,
- extension cord &power bar;
- Torch / soldering iron(s) & sucker, flux, solder,
- heat shrinkable tubing,
- heat gun,
- soldering vice,
- multi-meters (with test leads with alligator clips), clamp-on current meter;
- selection of screwdrivers, adjustable wrenches, pliers, "Vise Grips" (or other locking pliers), "Channellock" (or other slip joint pliers),
- rubber mallet;
- jeweler screwdriver set, cell phone tool set,
- tweezers,
- dental pic tools;
- selection of files,
- wire brush,
- hack saw (& blades),
- cordless drill (& bits & drivers),
- pop riveter (& rivets).

Consumable Supplies:

- Various glues (e.g. "5 minute epoxy", "SuperGlue", "Gorilla Glue", "JB Weld", hand workable epoxy putty, silicone caulking (& caulking gun), contact cement (& cleaner), spray adhesive, Sugru);
- Various cleaning solvents (e.g. rubbing alcohol (90-95% isopropyl), acetone, varsol (or paint thinner));
- Various lubricants (e.g. "WD-40", spray silicone, "Blaster" or other penetrating oil, high quality oil (eg for electrical motors), grease (eg high temperature silicone plumbing grease));
- Various tapes (e.g. electrical tape, duct tape, metal foil tape, butyl rubber tape, masking tape, etc.);
- Other chemicals (e.g. clear spray coat, "Locktite" or other thread locking compound);
- Miscellaneous: paper towels, rags, old newspapers, "Q-tips", popsicle sticks / chop sticks / toothpicks, sand paper &steel wool; a variety of screws, bolts, nuts and washers; wire of various sizes.

Step 3: The Approach - Troubleshooting 101

Approach the repair logically:

- "Where do I start (and why)?" then "What next (and why)?"
- The approach must be methodical and strictly logical.
- Take photos before each stage of disassembly - and keep notes.

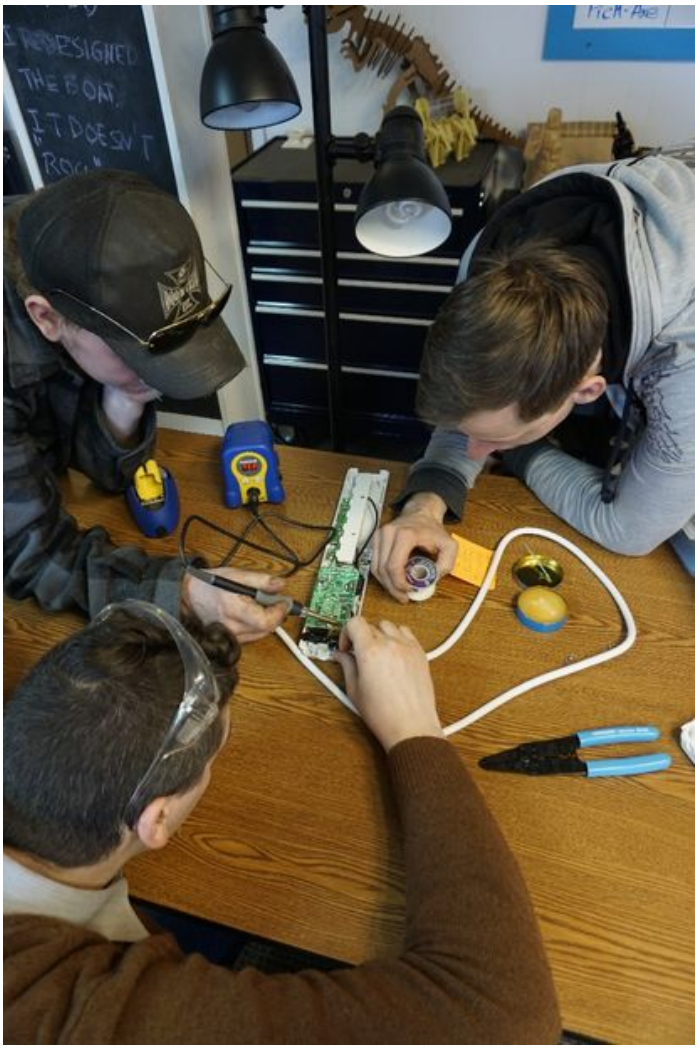
Keep in mind:

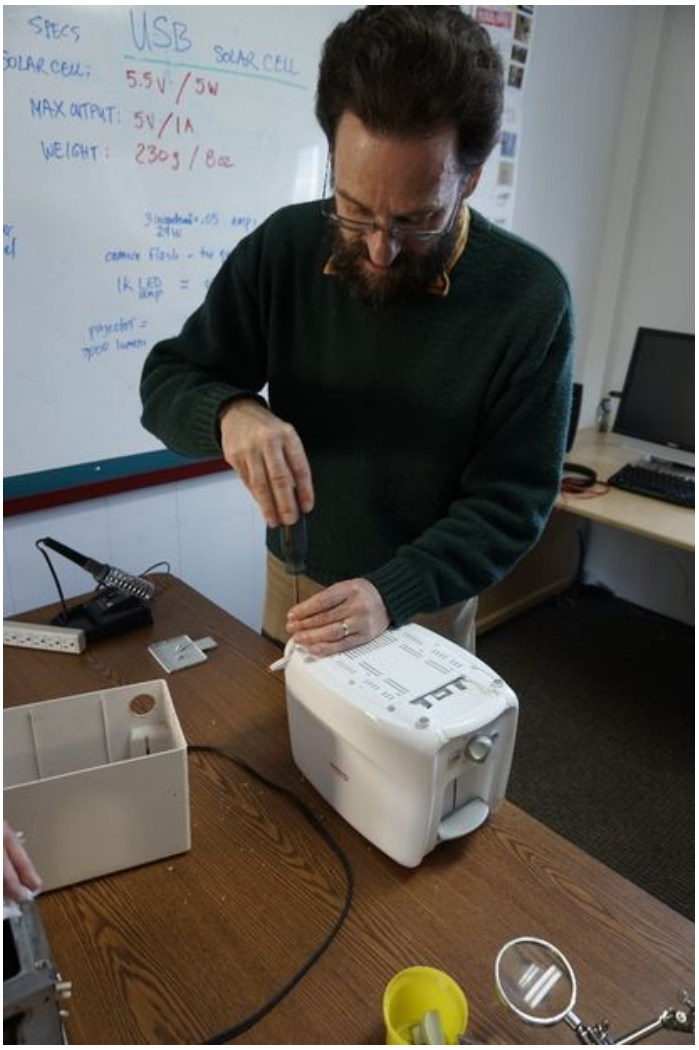
- How should it work? and When exactly did it stop?
- Beware of operator error (e.g. the common "malfunction" of a kitchen oven that often simply due to accidentally initiating delayed/timed start).
- What are the most common causes (e.g. for phone it is the handset cord and then the line cord): see YouTube.com, Ask.com, etc., Google, manufacturer or vendor sites, FAQs, user forums, etc.).
- Be methodical:
    - Mechanical: How do you get things apart? Be patient and gentle (e.g. looking for hidden locking tabs) to avoid damaging the project. Cleaning and lubrication (of bearings) are often all that's required (i.e. regular maintenance!). Look for wear or misalignment (physical adjustment).
    - Electrical: Where does power start & where does it stop? Measure resistance (or voltage) along a circuit; check (measure) batteries or the power cord; look for evidence of problem (broken/scorched wires/contacts, swollen or leaking components, etc.).
    - Software: Download the latest drivers. Watch for configuration inconsistencies as conflicts in settings could cause degraded functionality.
- Be realistic - not everything is going to be repairable. Often repairs might seem to be not cost effective, but a project can still be an interesting, instructive way to learn new skills and become familiar with the technology we take for granted each day. On the other hand, sometimes you can make something work better (or at least differently) than it did originally, which is pretty cool.

Step 4: Safety

Tools & Safety:

- Don't make matters worse: keep in mind the personal safety of yourself & others.
- Electricity
  - 110 V is dangerous;
  - capacitors are meant to hold a charge even with the power off;
  - beware that some components generate high voltages (e.g. power supplies for fluorescent light tubes);
  - ask for assistance when learning to use a soldering iron, solder, multi-meter, etc.
- Mechanical
  - Beware of sharp edges on components, screws, etc.;
  - When applying force: pull wrenches, don't push.
- Emergency preparedness
  - Circuit breaker panel (Where is it, how does it work; which breakers are relevant; etc.)
  - Fire extinguisher (Who is trained? Where is it; type; how do you use it; etc.)
  - First aid kit & eye-wash station (Who is trained? Where is it; type; how do you use it; etc.).

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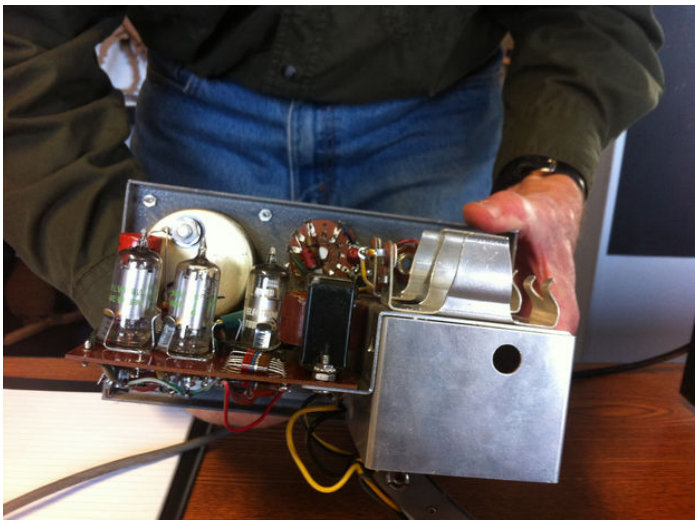
USB
SOLAR CELL
SOLAR CELL:
5.5V / 5W
MAX OUTPUT: 5V / 1A
WEIGHT: 230g / 8oz



Step 5: Let's Get Started

Monitor participants as they work on their repair project (individually or collaboratively);

Use the Socratic method (e.g. pose instructive questions, rather than simply providing prescriptive instructions) to guide methodical troubleshooting;

Watch for (un)safe work habits, especially when using unfamiliar equipment;

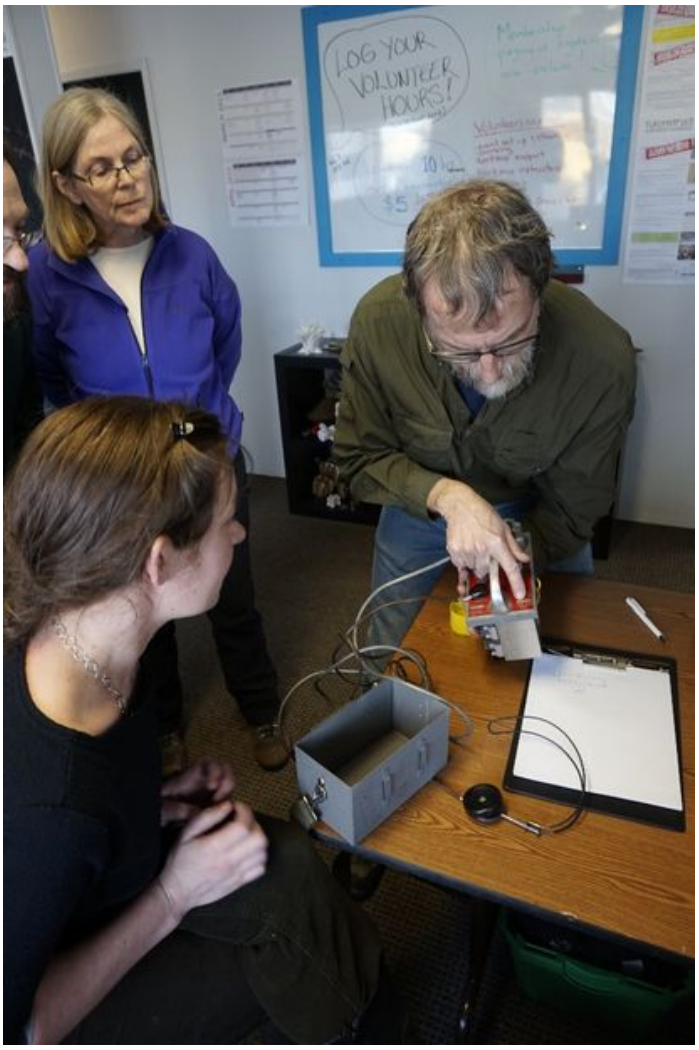
Watch for participants encountering roadblocks and try to defuse potential frustration by encouraging collaboration or a different approach; (often just getting the cover off a small appliance is a challenge);

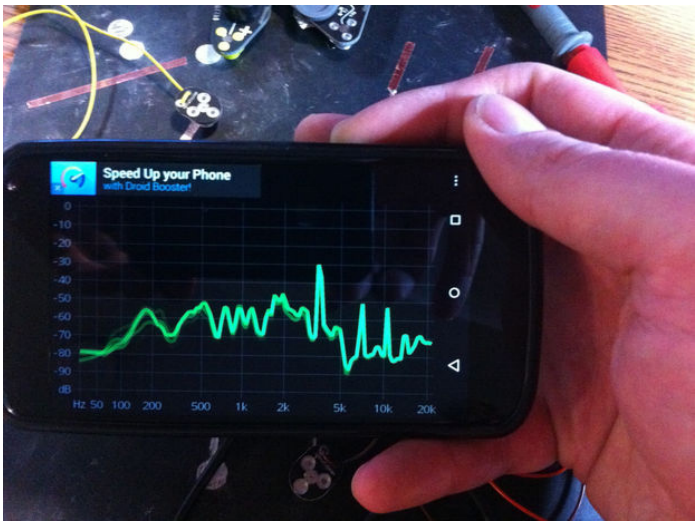
When appropriate, go to the Internet for owner or repair manuals, parts lists or troubleshooting guides, etc.

Monitor interactions between participants to facilitate sharing of skills and knowledge;

Sometimes an app can be found to help troubleshooting (e.g. turning a smart phone into a rudimentary spectrum analyzer);

Often parts, if needed, can be ordered during the course of the evening workshop - though that usually means the repair cannot be completed during that evening.





Step 6: Wrap it up

Watch the time

Even if participants cannot complete their repair project, it's best if they can reach a milestone or logical stopping point; (projects must be taken home as we do not have room to store works in progress).

Celebrate successes!

Have with a short wind up discussion where participants share a quick summary of how their project went:

- What worked and what didn't?
- What did they learn?
- What would they do differently next time?

Ask everyone to fill out an evaluation form, and make suggestions for the next session.

Share names, contact info, etc. for exchanging photos or following up on projects.

Solicit new makerspace memberships, volunteers, and ideas for new workshops (and potential instructors!).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