Sustainability

By Friend

Pre-workshop

- Do this questionnaire and put your results on Slack
  https://footprint.wwf.org.uk/#/
  - It's a UK quiz, so try to match to you the best you can; for example:
  - Green tariff ≈ carbon tax
  - Use Google Maps to check your flight distance
- I'm at 154% because I flew 4 times last year

Note

- This is going to be a straight-up lecture
- I don’t like lecturing either (notice that most of the previous workshops are activities where you do, and I moderate)
- But this is extremely important, and someone has to do it, so I might as well
- Please pay attention

- Sustainability is also good for you, not just the planet; for example:
- Reducing plastic use saves you plastic and money
- Shipping from a nearer seller saves you shipping costs
- Disposing wastes properly saves you waste disposal fees
- List goes on...

You use a lot of resources

- Look at how much plastic waste we've printed during the workshop, and how much more you'll generate with more failed prints, printing the wrong model, etc.
- It's not just plastics, it's the energy 3D printer used, parts that are worn down, emissions from shipping, etc.
- Extrapolate that to a lifetime of you doing 3D printing, extrapolate that to everyone who has a 3D printer...

- Let's take a look at your survey results on Slack

You use a lot of resources

- As a person with all this rapid prototyping knowledge, you're going to use them to make products much more than a regular person
- With great power, comes great responsibilities
    - Kinda like how I'm responsible to tell you guys this, with my power as a workshop leader (ha!)
- Sustainability is something to consider during the whole process (conception, design, printing, usage, iteration)

Sustainability

The three pillars are:

1. Social
2. Environmental
3. Economic

I’m going to focus mainly on environmental since it’s the most obviously related to 3D printing. However, you should also consider the other two just as much.

Environmental sustainability

In terms of ease and impact, methods to tackle waste are generally ranked as:

1. Reduce
2. Reuse
3. Recycle

Reduce

When designing, some questions to ask yourself:

- Can I design this object so it can be made with more sustainable materials? Ex: cardboard, wood vs. plastic
- If I need to 3D print it, can I design this so it can print without support?
- If the design change reduces strength, do I actually need that much strength for this?
- Has someone already designed this, in a more sustainable way?

When printing, some questions to ask yourself:

- Do I need to print this at all?
- Can I print this smaller?
- Can I find an orientation that prints with minimal support?
- Can I reduce infill?
- Can I reduce print temperature?
- Do I need to keep bed heating after print is done?

Reduce

Other things to consider:

- Filaments are heavy to transit, so there's obviously more emissions from shipping from other countries vs. shipping from Canada. Is there a Canadian manufacturer you can buy from?
- For example, Filaments.ca is guaranteed to source and store in Canada
- https://filaments.ca/pages/about-us
- High quality parts lasts longer so there's less wastes generated. Is there a quality difference in the parts you're looking to buy?

Reuse

- Do I have to buy this part new? Can I buy it second-hand?
- Facebook Marketplace, Craigslists are decent
- FreeGeek Vancouver has a store that sells refurbished laptops and electronic parts
- https://www.freegeekvancouver.org/shop.html#thrift-store

- Can I reuse parts from other retired projects for my current project?
- Can I reuse failed prints as simple things like pencil container, door stopper, paper weight, etc.?

Recycle

- PLA is advertised as compostable, but only under specific conditions. Will your waste collector accept PLA? Check with them first
- https://www.cbc.ca/news/canada/british-columbia/compostable-items-confusion-more-infrastructure-needed-1.4665757
- https://www.creativebc.com/database/files/library/Okay_Whats_up_with_Compostable_Plastics_min.pdf
- UBC WasteNauts are a collective on campus that recycles 3D printer wastes into filament and other things
    - This method is very finicky
- If you are a part of an on-campus research lab or a club, contact them and they can take your plastics from your lab to recycle
- https://ubcwastenauts.com

Recycle

- FreeGeek also accepts electronics for recycling
- Dropping off stuff with them is super easy
- https://www.freegeekvancouver.org/recycle.html#what-we-take

Non-3D-printing related ways

Some everyday things:

- Turn off the lights when you leave a room
- Bring your own container to a take-out
- Bring reusable bags to groceries
- Bike or bus instead of private transport
- Compost your food waste
- Eat less meat
- Take vacations at a nearer place

Some bigger scale things:

- Vote for officials with sustainable agendas
- Attend town halls to make this issue heard
- Donate money to environmental groups
- Attend local events, join local clubs about sustainability
- Argue with online strangers
    - That person won't change their mind, but everyone else who reads that argument later can hear the sustainable arguments

Some further readings

Videos on 3D printing sustainability stuff:

- CNCKitchen on plastic recycling at home https://www.youtube.com/watch?v=vqWwUx8l_Io
- Maker's Muse on designing without support https://www.youtube.com/watch?v=SBHHwid7DWM

Some local orgs about sustainability to drop-in and/or donate to:

- CommonEnergy https://commonenergyubc.com
- Sprouts http://www.ubcsprouts.ca
- FreeGeek https://www.freegeekvancouver.org
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