Notes for 3D printing presentation

What I use 3D printing for
- Tools (golf and guns)
- Models (trains and sculptures)
- Guns
- Other handy stuff

Steps to 3D print:
- Find or make a 3D model
  - Make a quick model in FreeCAD
  - Find a model on Thingiverse
- Decide which material is best for the job
  - Most of the time it is PLA or PLA+ (polylactic acid)
  - Easy materials
    - PETG for slightly better temp resistance (polyethylene terephthalate glycol modified)
    - TPU for flexibility (thermoplastic polyurethane)
  - Advanced
    - PACF (polyamide (nylon)) or PETCF (polyethylene terephthalate) for higher strength and temp resistance
    - Remember that PETCF has poorer layer adhesion
    - Other materials
      - ABS (acrylonitrile butadiene styrene)
      - ASA (acrylonitrile styrene acrylate) for UV resistance
      - PCCF (polycarbonate)
    - Super advanced materials
      - PEEK (polyether ether ketone)
      - PEI (polyetherimide) – commonly used for build plates
- Things to consider for each material
  - Bed adhesion
    - PLA, PETG, TPU generally do not need gluestick, PEI sheet is just fine
    - PACF and PETCF require the use of gluestick
    - ABS and ASA require enclosures with filters (more advanced printers)
  - Nozzles
    - Filled filaments require hardened nozzles
  - Drying
    - PACF especially needs to be dried
    - Mention storage in drybox
- Introduce OrcaSlicer
  - Import a 3D model
  - Go through basic settings

Layer height
Number of walls
Infill
Support
Bed adhesion

Fine tuning your 3D printer
- Tramming/shimming the bed
- Belt tensioning (mention POM wheels too, advanced printers use linear rails or rods)
- Tuning Z offset (more advanced printers do not require this tuning, they have nozzle load cells)
- Flowrate calibration
- Temperature calibration
- Pressure advanced
- Input shaping (resonance compensation, advanced printers have accelerometers on the toolhead for automatic calibration)
- Shrinkage calibration object
- Skew correction object
- PID tuning for temperatures

Discuss the different types of FDM printers
- Bed slingers
- CoreXY
- Delta

Advanced topics
- Multi material printing
  - Different colors (automatic and manual via pausing at layer)
  - Different materials (advanced printers only)
- Upgrading firmware
- Modifying start and end GCode (can show this in OrcaSlicer)
  - Adaptive bed mesh
  - Adaptive purge line
  - Changing the order of things
- Upgrading hardware
  - Custom cooling solutions
  - Quieter fans
  - Better nozzles
  - Entire toolheads

https://youtu.be/AJO_6qjI0JU
https://youtu.be/0xPcEZnL9TM