Expectations for a functioning greenhouse

10 points

At the start of lab, I or my henchlings will assess the performance and aesthetics of your greenhouses. Please get them out at the start of lab, set them up, and start them running. You have plenty of other work to do, so have it ready to go at the start of lab – we'll inspect them in random order.

We will check your greenhouse for:

1. **Functioning set-point buttons**. Pressing the buttons will either raise or lower the set-point(s). You have your choice of functionality:
   a) The buttons control the heating set-point only. The cooling set-point is fixed (at some largish number, say 30C) and acts as an "emergency" value to prevent the plants from overheating.
   b) The buttons control both set-points, with a fixed "gap" between them, say 5C. Thus pushing the up button might make the set-points go from 22/27C to 23/28C.
2. **Functioning heating control**. When the temperature rises above the set-point, the heaters turn off. When it drops below a hysteresis differential (0.5 – 1 C less than the set-point), the heaters turn on. Alternatively, you may make the hysteresis band above the set-point. We will use a combination of changing the set-point and/or putting our fingers on the sensors to activate them.
3. **Functioning cooling control**. As with heating, the lid opens and closes when the temperature crosses the cooling set-point, with hysteresis.
4. **Functioning LCD display** with heating set-point, cooling set-point, and current inside temperature. It must also have an indication that the heaters are on (e.g., an asterisk at the end of a line, or "ON" and "OFF").
5. Not a function, but you will be assessed for **fit-and-finish**. Neat wiring (using breadboard wires where possible; jumpers where needed; no excessive lengths or frankencables). Mounted components.