1. **Reamers are NOT used to prepare holes for threading:** reamers are used to produce very accurately sized holes (within 0.0005”) with excellent surface finish.

2. **Center drills do NOT "mark" the starting hole location:** center drills start (or center) the hole using a special short, stiff drill that ensures positional accuracy to within ±0.001”.

3. **Tap drills do NOT create threads:** tap drills create properly sized holes in preparation for threading. In addition, tap drills and regular drills are related like squares and rectangles: tap drills are simply particular sized regular drills, but all regular drills are not tap drills.

4. **Hole and thread notes:**
   - **hole note specifications:**
   - **5/8” threads thru aluminum:** 5/8-11 UNC THRU
   - **10mm threads**
   - **20mm deep in steel:** M10x1.25, 20mm DP

5. **Fine thread bolts have a larger cross sectional (tensile) area and coarse female threads have a larger cross sectional (shear) area:** this means female threads in weak materials should be specified as coarse threads and the strongest bolted joints will have fine threads.

6. **Bolt holes are ALWAYS clearance holes:** by definition, bolts freely pass through the parts to be connected and to do so requires clearance between the hole and the bolt shank.

7. **Limiting factor for how deep an endmill can cut per pass in a particular workpiece is STIFFNESS:** the stiffness of the tool, the stiffness of the workpiece and the stiffness of the machine. **Limiting factor for how fast an endmill can rotate when cutting a particular workpiece is HEAT:** the heat produced by the tangential velocity of each cutting flute as it moves across the workpiece. **Limiting factor for how fast a drill or endmill can feed (or advance) in any material** is the size/strength of its cutting edges/lips.

8. **Four lathe operations used to produce the assigned wheel hubs in lab:** facing, turning, drilling/reaming, chamfering (formally, "profiling")

9. **Three controllable cutting conditions that affect the productivity of the turning process:** surface (or spindle) speed, depth of cut, feedrate

10. **Purpose of tap guide** is to guide the tap perpendicular to the surface of the part to be threaded.

11. **Avoid features that require small tools** whenever possible; small tools are weaker and less stiff, so they break more easily and are less accurate because they deflect more than larger tools.

12. **Difference between accuracy & precision:** **accuracy** refers to how closely a measurement comes to measuring the true value (since measurements are always subject to error); **precision** refers to how closely repeated measurements come to duplicating measured values (so it is quite possible to be very precise and totally inaccurate).