3: Shop Fab Training Video Worksheets

Video #1: Machine Shop 1 – Basic (40:32)
http://techtv.mit.edu/genres/24-how-to/videos/142-machine-shop-1

- Basic Tour:
  - Lathes are for machining ________________ parts with ________________ features.
  - Tool used to smooth down sharp edges from a band saw? ________________

- Layout Techniques:
  - To scribe lines parallel or perpendicular to lines already on a part use what two tools? ________________ & ________________
  - How thick is a scribed line? ________________
  - Is the ruler on the square particularly accurate? ________________
  - What is a more accurate way? ________________
  - What tool is used to mark the location for a hole? ________________
  - What is another way to scribe lines? ________________
  - What is a quick way to transfer relative hole locations? ________________

- Basic Tools: Drill Press
  - What is the benefit of using a drill press over a hand drill? ________________

- Locating and Drilling Holes
  - What tool is used to align the spindle of the drill press with your hole? ______

  - Does the drill press need to be running for this operation? ________________
  - What tool is used to start drilling the hole? ________________
  - What is special about this tool? ________________

  - How far down should you drill with this tool? ________________
  - What tool is used for to clean the hole, and edge of the part? ________________
- Tapping Holes
  - What tool is used to thread holes? ____________________
  - What are two ways to tap a hole? ____________________
  - With the second method, is the machine running? ________________

**Honor Pledge:** *I watched this video fully focused and without distraction. No answers were dishonestly obtained. Signed: ___________________________ Date: ____________*

**Video # 2: Machine Shop 2 – Machining Skills for Prototype Development (57:33)**

[http://techtv.mit.edu/genres/24-how-to/videos/130-machine-shop-2](http://techtv.mit.edu/genres/24-how-to/videos/130-machine-shop-2)

- Drilling Holes
  - For drilling a hole with a large aspect ratio, what should be used? __________ ________________
  - Define in your own words what “aspect ratio means”: ____________________
  - What does cutting fluid do? ____________________
  - What is the purpose of “stepping up” when drilling large holes? How big should the steps be (nominally)? ____________________
  - What does chattering indicate? How should it be fixed? ____________________
  - *Note: drill press transmission in video is different than our lab, and automatic feed rates not available.*
  - What 3 types of drill bits are there? ____________________
  - *Note: Sensitive drilling capabilities not present in lab.*
  - What is different for drilling holes in brass or plastics? ____________________

- Drill Press Limitations
- The drill press is not meant to be used as what, even though the functionality can appear similar? ________________________________

- Band Saw:
  - What feature/characteristic of the saw allows the user to cut curves? ______

- What is the danger of cutting thin materials? ________________________________
  - Note: Hydraulic shear available for TA assist in cutting thin materials

- Suitable Speeds, Feeds, Materials
  - How does one prevent blade wandering? ________________________________

  - Which cuts faster, aluminum or steel? ________________________________
  - Describe proper use of the blade guard/guide? ________________________________

  - Describe your body position relative to the bandsaw? ________________________________

  - Note: Video instructor is seen sitting on stools. NEVER sit down while operating the machinery in the lab. Sitting encourages complacency, and bad places your face closer to the cutting area – an obvious danger.

- What tool do you use to grip round stock when cutting? ________________________________

Honor Pledge: I watched this video fully focused and without distraction. No answers were dishonestly obtained. Signed: ________________________________ Date: ____________

Video #3: Machine Shop 3 – Machining Skills for Prototype Development (30:02)
http://techtv.mit.edu/genres/24-how-to/videos/181-machine-shop-3
- Belt Sander
  - How should hot spots on belt be eliminated? ________________________________
- Description of precautions in holding parts?

- Note: Small belt sander not available in lab.

- Grinder

- What is the primary purpose of the grinder?

- Note: Consult TA prior.

- What happens when you grind aluminum?

- Deburring and Buffing & Finishing

- The deburring wheel is similar to what kitchen tool?

- Can this be used on hard materials?

- What does the buffing wheel need to operate?

Honor Pledge: I watched this video fully focused and without distraction. No answers were dishonestly obtained. Signed: ____________________________ Date: ____________