



Lesson Plan

Course: CNC Machining Course

Instructor:

Lesson Title: Setting Up for the Surface Grinder

Date:

Time Needed for Lesson: 4 hours

Objectives:

- - Understand the process of preparing a surface grinding operation
- - Identify and verify correct wheel type and setup
- - Learn how to safely mount parts on a magnetic chuck using parallels and blocks
- - Dress the grinding wheel using a diamond tool
- - Perform a basic surface grinding setup and conduct rough and finish passes

Materials Needed:

- - Manual Surface Grinder
- - Pre-mounted grinding wheels
- - Magnetic Chuck
- - Diamond Wheel Dresser
- - Parallels, blocks, and basic fixtures
- - Coolant (if used)
- - Safety Glasses and Face Shields
- - Whiteboard / TV / Print Handouts

Hook/Lesson Opener:

Ask students:

- - What steps do you think need to happen before grinding starts?
- - Has anyone clamped something crooked or poorly before? What happened?

Relate this to the importance of clean setups and precision mounting in surface grinding.

Presentation:

Instructor demonstration (on-machine):

- - Visual inspection of wheel and machine cleanliness
- - Mounting and aligning the part on the magnetic chuck using parallels

- - Verifying squareness and alignment with the table
- - Demonstrating wheel dressing technique with diamond dresser
- - Powering on and setting up for a spark-out pass
- - Using dial indicators or visual reference for consistent contact

Video Presentation:

* "Surface Grinder Basics" by Suburban Tool

Link: <https://www.youtube.com/watch?v=Gst3CMvU7D8>

Exercise:

Students form small teams to perform setup steps and basic grinding under instructor guidance:

- - Safety inspection and cleaning of surface grinder and chuck
- - Mount and align part with parallels or blocks
- - Dress the wheel (under supervision)
- - Align for a clean first pass using hand feed
- - Perform a roughing pass
- - Perform a finishing pass with spark-out
- - Measure part flatness with micrometer or indicator
- - Log all setup data and observations

Recap & Connector to Next Lesson:

- - Review each group's challenges and how they overcame them
- - Discuss next lesson: Full Surface Grinding Workflow & Tolerances

Assignment(s):

- Watch: "Surface Grinder Set Up – Practical Machinist" (YouTube)

Link: <https://www.youtube.com/watch?v=UwPSfkI8Bls>

- Write a 1-paragraph reflection: What was the hardest part of the setup and why?

Assessments (current or future):

- - Instructor observation of student setup techniques
- - Peer feedback and teamwork during setup
- - Review of measurement and flatness log
- - Reflection paragraph submission

Notes:

- - Supervise all wheel dressing and grinding closely
- - Reinforce slow, careful, and intentional movements
- - Ensure full safety gear and awareness throughout
- - Pause between groups to reset machine and explain feedback