



Lesson Plan

Course: CNC Machining Course

Instructor:

Lesson Title: Introduction to Surface Grinding Theory & Process

Date:

Time Needed for Lesson: 2 hours

Objectives:

- Understand the purpose of surface grinding in precision manufacturing
- Identify different types of surface grinders and grinding wheels
- Learn the basic theory of grinding and material removal
- Recognize common grinding defects and their causes
- Gain exposure to the noise, motion, and safety zones of a running surface grinder

Materials Needed:

- Surface Grinder
- Grinding wheels (mounted)
- Safety glasses & face shields
- Parallels and basic fixtures (visuals only)
- Computers or TV for video
- Whiteboard/Markers

Hook/Lesson Opener:

Ask students:

- What is the flattest surface you've ever touched?
- Why do you think some parts need to be "surface ground" instead of milled or turned?

Lead discussion into the precision and applications of surface grinding.

Presentation:

- Explain the basic theory of grinding: Abrasive cutting, high precision, small chip load
- Show different wheel types and describe their use
- Explain the role of the magnetic chuck and surface flatness

Video Presentation:

* "What is Surface Grinding?" by Suburban Tool

Link: https://www.youtube.com/watch?v=wGjNqZxMo_4

Instructor-led talk right at the surface grinder (15 min):

- - Point to each part of the machine
- - Explain safety perimeter and hearing protection
- - Demonstrate how small movements = big results

Exercise:

Surface Grinding Theory Match-Up:

Match the term to its function:

Term	Function Letter
Abrasive Wheel	
Magnetic Chuck	
Coolant System	
Spark-Out Pass	
Dressing Tool	

Functions:

1. A. Reduces heat and flushes away particles
2. B. Flattens the wheel face for accuracy
3. C. Holds the workpiece securely using magnetism
4. D. Abrasive cutting element for removing small chips
5. E. Light finish pass that smooths out microscopic inconsistencies

Recap & Connector to Next Lesson:

- - Review the role of grinding in final part accuracy
- - Whiteboard quiz on terms and functions
- - Explain next lesson will be: "Setting Up for the Surface Grinder"

Assignment(s):

- Watch: "How to Dress a Grinding Wheel" – Practical Machinist (YouTube)

Link: <https://www.youtube.com/watch?v=nGRzJmGzF4Y>

- - Take notes and be prepared to explain the process

Assessments (current or future):

- - Match-up quiz
- - Group discussion engagement
- - Reflection paragraph: "Why do we surface grind parts instead of machining them?"

Notes:

- - Ensure safety eyewear is worn during all demos
- - Keep discussion hands-on and visual by standing at the grinder for most of the theory walk-through