Metal Cutting Processes

How to make chips
Overview

- Metal Cutting
- Equipment and Capabilities
  - Drills
  - Saws
  - Mills
  - Lathes
- Special Tools
Metal Cutting

- Start with a standard size of stock
- Remove material to achieve desired geometry
  - Much easier to remove material than add material
- Tools range from $5 hand saws to million dollar computer-controlled machine tools
Equipment - Drills

- Use a rotating tool to make a round hole
- Tool moves in one axis
- Mills and lathes also can be high-precision drills
Special Tools - Drills
Equipment - Saws

- Make straight or curved slots
- Types
  - Circular
  - Cold
  - Band
  - Jig
  - Scroll
  - Hand
Equipment - Mills

- Moves a rotating tool in 3 (or more!) axes
- Makes general 3-D geometry
- Can use drill bits and some kinds of saw
- Types
  - Manual
  - CNC
  - 5-axis
Special Tools - Mills
Equipment - Lathes

- Moves a fixed tool in two axes while rotating the part
- Makes general round geometry

Types
- Engine (Manual)
- Turret (CNC)
  - Live Tooling
Special Tools - Lathe